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A Full Universal Basic Income for the United States

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Executive Summary

A Universal Basic Income (UBI) is a cash income, regularly paid to all qualifying individuals, without means testing or work requirements. Proponents of a UBI find it attractive because it would have low administrative costs relative to the programs it replaces, guarantee a minimum level of consumption, and create no deadweight loss on its own. However, there is less consensus regarding either the level of a UBI or which government income transfer programs the UBI should replace.

A "full" UBI (FUBI) would be enough to guarantee every individual's basic needs while replacing all redundant cash benefit programs. The poverty line is often cited as the nominal value of basic needs, but this measurement and the related income-transfer programs differ across countries. Additionally, the accepted poverty line may not be enough to cover full cost of basic needs for every individual within a country.

This contrast is important because "partial" UBI's are more common in the literature given that they can be funded entirely by replacing existing mandatory benefit programs. In the United States (US), it would be necessary to supplement these savings to afford a value equal to either the Official Poverty Measure (OPM) or the Supplementary Poverty Measure (SPM).

There are three objectives to this dissertation: (1) determine whether a FUBI based on the OPM could eliminate income poverty in the US, (2) to determine whether a FUBI could be fully funded within the US federal individual income tax system when including behavioral responses, and (3) determine whether a fully funded FUBI yield a net benefit, in terms of income, for the majority of US households.

To address these objectives, I used a static, behavioral, partial-equilibrium, micro-simulation model that analyzes household responses to changes in mandatory spending, sources of tax revenues, and tax expenditures. These changes include a FUBI paid to each individual within the US civilian non-institutionalized population. Each individual adult receives a basic income equal to the value of the US federal poverty guideline for the first household member and each individual minor receives a basic income equal to the value of the US federal poverty guideline for each additional household member. This basic income is financed by replacing existing income transfers, and reforms to the individual income tax system.

The input dataset is a merger of the Consumer Expenditure Survey (CES), the Current Population Survey Annual Social and Economic Supplement (CPS-ASEC), and the Internal Revenue Service Public Use Tax File (IRS-PUTF) for 2009. The year 2009 was primarily chosen due to its availability made by the Suffolk Department of Economics. However, 2009 has the peculiar benefit of also being the last year of the Great Recession (from December 2007 to June 2009). Thus, this dataset should yield relatively conservative estimates of household income, expenditures, and tax revenues.

I found that a FUBI with a value pegged to the OPM via the federal poverty guidelines (FPGs) would be significantly more effective at reducing both income poverty—as it is measured in the United States (US)—and income inequality—as it is measured by the Gini Index—but with lower administrative/compliance costs relative to the income transfer programs it could replace in the US. A FUBI could also reduce deadweight loss because household behavior would neither affect the level nor the availability of its benefits.

To simulate a behavioral response and test the sensitivity of the results, I used the elasticity of broad income (EBI): the ratio of percentage change in broad income to the percentage change in the net-of-tax rate (one minus the marginal tax rate). I used broad income rather than taxable income because the former is less biased by income level. However, I also found that the efficiency loss from fully funding a FUBI via the individual income tax system alone could offset these efficiency gains due to decreases in labor supply, increases in tax avoidance, and/or increases in tax evasion, especially for households in higher income quintiles.

To measure the distributional effects of a FUBI and the associated tax changes, I used disposable personal income (DPI). DPI is of interest for my analysis because it measures the income available to persons for satisfying their basic needs. In each of the FUBI simulations, it is estimated that more than 50% of households in total are expected to receive a net benefit to DPI from the FUBI relative to the BASE simulation. In other words, despite the increase in average tax rates, fewer households on average stand to lose from the FUBI relative to the status quo—in terms of DPI—for all scenarios in 2009.

Health care is also a basic need. Thus, a UBI cannot be considered "full"—sufficient to guarantee every individual's basic needs at the poverty line—if not every individual can afford medically necessary health care in addition to the rest of their basic needs. Unlike other basic needs—such as food, clothing, shelter, and utilities—health care expenditures are often inconsistent across households of a given composition and are also often unpredictable for a given time or place. This implies it would be more efficient to provide an insurance policy rather than a lump-sum grant for the reimbursement of health care costs.

However, not every individual or household can afford the insurance premia or out-of-pocket costs associated with medically necessary health care. In the same way that a UBI could compensate the costs of non-medical basic needs, the public sector could also compensate the costs of medical basic needs via a national health insurance system. Using the same static, behavioral, partial-equilibrium, micro-simulation model; the same input dataset; the same changes in mandatory spending, sources of tax revenues, and tax expenditures; and the same EBI to simulate a behavioral response and test the sensitivity of the results, I analyze a single-payer Universal Health Care (UHC) system in addition to the FUBI paid to each individual within the US civilian non-institutionalized population.

Employer contributions to private health insurance, household contributions to private health insurance, and household medical out-of-pocket costs are replaced with a payroll tax on employers. Also, each individual adult receives a UHC policy valued equal to the average Personal Health Care (PHC) expenditures—total NHEs minus investments, administrative costs, and government public health activities—per capita.

In each simulation, a single-payer UHC system combined with a FUBI could be significantly more effective for guaranteeing the fulfillment of household basic needs relative to the health care system and income transfer programs it could replace in the US. A FUBI alone—with a value pegged to the federal poverty guidelines—could be significantly effective at reducing income poverty—as it is measured in the US. However, it would not be sufficient to guarantee that all households—regardless of their poverty status—would be able to fulfil their basic need for health care in the absence of a single-payer UHC system.

Abstract

The objective of this dissertation is to estimate whether a "full" Universal Basic Income (FUBI), within or without a single-payer Universal Health Care (UHC) system, would be both sufficient to eliminate income poverty and affordable without increasing federal borrowing or decreasing federal discretionary spending in the United States.

In Chapter 1, I elaborate on the components and benefits of a FUBI. In Chapters 2 and 3, I present the results from a static, behavioral, partial-equilibrium, micro-simulation model that analyzes household responses to changes in mandatory spending, sources of tax revenues, and tax expenditures. These changes include introducing a FUBI in Chapters 2 and 3 and a single-payer UHC system in Chapter 3.

The dataset is merger of the IRS Public Use Tax File, the Current Population Survey (CPS), and the Consumer Expenditure Survey (CES) for 2009. To finance the FUBI in Chapters 2 and 3, I repealed several federal cash income-transfer programs and individual tax expenditures. I also increased the federal individual income tax rates for each of the existing brackets to compensate for the remaining tax revenue deficit. To finance the UHC in Chapter 3, I reintroduce payroll taxes but without a wage base.

The measure of wellbeing for this analysis was the Bureau of Economic Analysis' Disposable Personal Income (DPI). The measures of poverty were the United States Census Bureau's pre-tax Official Poverty Measure (OPM) and post-tax Supplemental Poverty Measure (SPM). To test the sensitivity of these estimates, I utilized the elasticity of “broad” income (EBI) to simulate household responses to the resulting increases in effective marginal tax rates (EMTRs).

Abbreviations

ATR	Average Tax Rate
BASE	Base/Historical Scenario (2009)
BEA	Bureau of Economic Analysis
CES	Consumer Expenditure Survey
DPI	Disposable Personal Income
EBI	Elasticity of Broad Income
EMTR	Effective Marginal Tax Rate
FCSU	Food, Clothing, Shelter, and Utilities
FICA	Federal Insurance Contributions Act
FPG	Federal Poverty Guideline
FUBI	Full Universal Basic Income
IRS	Internal Revenue Service
M4A	Medicare for All
MOOP	Medical Out-Of-Pocket
NHE	National Health Expenditure
OPM	Official Poverty Measure
PI	Personal Income
RPP	Regional Price Parity
SPM	Supplemental Poverty Measure
UBI	Universal Basic Income
UHC	Universal Health Care

1. Universal Basic Needs and Basic Income in the United States

1.1 Introduction

A Universal Basic Income (UBI) is a cash income, regularly paid to all qualifying individuals, without means testing or work requirements. Proponents of a UBI find it attractive because it would have low administrative costs relative to the programs it replaces, guarantee a minimum level of consumption, and create no deadweight loss on its own. However, there is less consensus regarding either the level of a UBI or which government income transfer programs the UBI should replace.

A "full" UBI would be enough to guarantee every individual's basic needs while replacing all redundant cash benefit programs (Parker, 1989, 128). The poverty line is often cited as the nominal value of basic needs, but this measurement and the related income-transfer programs differ across countries. Additionally, the accepted poverty line may not be enough to cover full cost of basic needs for every individual within a country.

The United States (US) federal government regularly estimates more than one measure of poverty, but the “official” poverty line ignores the cost of health care, despite the absence of universal health care (Citro et al., 1995, p. 2). Though the US is considered one of the wealthiest countries in the world, it also has one of the highest poverty levels in the Organization for Economic Co-operation and Development (OECD) (Alston, 2019, pp. 3-4). The objective of this chapter is to analyze how basic needs are measured in the US and how a “full” UBI could satisfy those basic needs more efficiently than the current welfare system.

1.2 Basic Needs and Poverty

"Poverty is a circumstance, defined by a set of specific conditions that are considered to reflect economic deprivation" (Citro et al., 1995, p. 21). The measurement of poverty includes two elements: first, a budget or threshold below which people are considered impoverished; second, an estimate of economic resources available to people to compare with that budget or threshold (Citro et al., 1995, p. 21).

Basic needs also include two elements. First, they include minimum standards for the consumption of private goods, such as food, shelter, clothing, and household goods. Second, they include minimum standards for the provision of public goods, such as utilities, public transportation, health care, education, and cultural activities (International Labour Office, 1977, p. 32).

Assuming that the economic cost of these basic needs is consistent across households of a given composition–and at a given time and geographic location–the value of this "basket" of commodities can be interpreted as a poverty threshold. Thus, any household with a level of consumption below this threshold, or the income necessary for this level of consumption, is considered impoverished. This interpretation is called the cost-of-basic-needs (CBN) method of setting poverty (Ravallion & Bidani, 1994, p. 77).

Though consumption can be measured directly as household expenditure, developed economies most commonly measure poverty using household income. This is because household income is comparatively easy to measure, while household expenditure is not as easy to verify (Haughton & Khandker, 2009, p. 30). However, this

measure may not include all sources of household income, such as capital gains/losses, non-cash benefits, or tax credits (United States Census Bureau, 2020a).

Over time, a poverty threshold can be adjusted in absolute or relative terms. A poverty line that remains fixed over time, and adjusted only for inflation, such as in the United States, measures absolute poverty. A poverty line that is adjusted over time for changes in the social consensus about what constitutes poverty (Haughton & Khandker, 2009, p. 39) or the composition of household expenditure (e.g., food, clothing, shelter, and utilities) measures relative poverty.

Though health care is also a basic need, its composition of household expenditure is not only more often inconsistent across households of a given composition–even at a given time and geographic location–but it is also more often unpredictable. Thus, the poverty threshold must either include the value of an insurance policy that reimburses unavoidable medical costs or subtract these costs before determining whether the household is impoverished. If these necessary insurance premia and/or out-of-pocket health care costs are not taken into consideration, then the measure could underestimate a household's basic needs and the resulting poverty rate.

1.3 Poverty in the United States

1.3.1 Federal Poverty Measures

In 1969, the US Office of Management and Budget (OMB) first issued Statistical Policy Directive No. 14 (it was reissued in 1978). This directive specifies a set of gross income thresholds that vary by family size and composition to determine who is in poverty. "If a family's total income is less than the family's threshold, then that family and every

individual in it is considered in poverty" (United States Census Bureau, 2020a, "How the Census Bureau Measures Poverty").

When Mollie Orshansky first defined the US thresholds in 1963-64 (Fisher, 1992b, p. 3), she was unable to measure a market basket of goods fulfilling these basic needs.

> If generally accepted standards of minimum need had been available for all or most of the major essential consumption items of living--housing, medical care, clothing, transportation, and so on--Orshansky could have followed a standard budget approach by costing out all the standards and adding up the costs. However, except for the area of food, no definitive and accepted standards of minimum need for major consumption items existed at the time Orshansky developed the thresholds--and it is still true that no such standards in non-food areas exist today. (Fisher, 1992b, p. 4)

Using a two-adult, two-child household as the point of reference, the Agriculture Department's economy food plan became the standard of minimum need for food. Further referencing the Agriculture Department's 1955 Household Food Consumption Survey, Orshansky decided to use a one-to-three ratio of food expenditures to after-tax money income in developing the poverty thresholds (Fisher, 1992b, p. 5). Thus, the Agriculture Department's economy food plan multiplied by three became the US poverty threshold and has since been maintained by adjusting by the Consumer Price Index for All Urban Consumers (CPI-U) each year.

The only other updates made by the US Census Bureau have been to the money income used to compute poverty status: it includes before-tax earnings, unemployment

compensation, workers' compensation, Social Security, Supplemental Security Income, public assistance, veterans' payments, survivor benefits, pension or retirement income, interest, dividends, rents, royalties, income from estates, trusts, educational assistance, alimony, child support, assistance from outside the household, and other miscellaneous sources (United States Census Bureau, 2018, "How the Census Bureau Measures Poverty").

However, it excludes noncash benefits such as the Supplemental Nutrition Assistance Program (SNAP), housing assistance, Medicaid, the State Children's Health Insurance Program (SCHIP), energy assistance, the school lunch and breakfast programs, and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). It also does not count refundable tax credits, such as the Earned Income Tax Credit (EITC), and it ignores the value of assets (including home ownership), although it counts any income generated by assets (but not capital gains or losses) (United States Census Bureau, 2018, "How the Census Bureau Measures Poverty").

Though this threshold varies according to the size of the household and the ages of its members, it does not vary geographically throughout the United States. In addition, the poverty thresholds only apply to family members, which means that they exclude the income of nonfamily household members, such as datefriends (Besharov & Germanis, 2004, pp. 1-2).

In application, this measurement exists as a threshold, or line, below which a family household is labeled as impoverished for official statistics and, furthermore, becomes eligible for certain programs and benefits. However, these same poverty thresholds are not used to determine the financial eligibility for most federal programs for

a given year, because the thresholds are not calculated until September or October of the following year (Besharov & Germanis, 2004, p. 5).

To determine income eligibility for most federal programs, the US Department of Health and Human Services publishes a simplified variation of the poverty thresholds called the "poverty guidelines". The guidelines are calculated for a family of four and then a fixed amount per person is added or subtracted to adjust for family size. To accommodate inflation, the guidelines reflect price changes through the preceding year (Besharov & Germanis, 2004, p.5).

Among the Federal programs using the poverty guidelines, some use the guidelines as only one of several eligibility criteria or use a percentage multiple of the guidelines (e.g., 130 percent or 185 percent of the guidelines). Other programs may use the guidelines for the purpose of giving priority to lower-income persons or families in need of assistance or services; the guidelines are also used in setting sliding fee scales in certain programs. In some cases, the most recent update of the guidelines may not become effective for certain programs until a regulation or notice specifically applying to the program in question has been issued (Fisher, 1992a, "Poverty Guidelines for 1992").

1.3.2 Experimental Poverty Measures

In 1995, a National Academy of Sciences (NAS) panel provided six major criticisms of the US "official" poverty measure (OPM): (1) the current measure does not distinguish between the needs of workers and non-workers; (2) because of differences in health status and insurance coverage, different population groups face significant variations in medical care costs, but the current measure does not take account of them; (3) the thresholds are the same across the nation, although significant price variations across

geographic areas exist for such needs as housing; (4) the family size adjustments in the thresholds are anomalous in many respects, and changing demographic and family characteristics underscore the need to reassess the adjustments; (5) changes in the standard of living call into question the merits of continuing to use the values of the original thresholds updated only for inflation; and (6) because the current measure defines family resources as gross money income, it does not reflect the effects of important government policy initiatives that have significantly altered families' disposable income and, hence, their poverty status (Citro et al., 1995, pp. 2-3).

In the same report, the NAS provided recommendations for an experimental, expenditure-based poverty threshold: (1) the poverty thresholds should represent a budget for food, clothing, shelter, and a small additional amount to allow for other needs; (2) the threshold for a reference family type should be developed using actual consumer expenditure data and updated annually to reflect changes in expenditures on food, clothing, and shelter over the previous 3 years; (3) the reference family threshold should be adjusted to reflect the needs of different family types and to reflect geographic differences in housing costs; and (4) family resources should be defined as the sum of money income from all sources together with the value of near-money benefits that are available to buy goods and services in the budget, minus expenses that cannot be used to buy these goods and services (Citro et al., 1995, pp. 4-5).

To account for health care costs, the NAS panel recommended subtracting Medical Out-Of-Pocket (MOOP) expenditures. "These medical expenses include health insurance premiums, copayments made to medical providers that are not covered by

insurance, and other expenses paid out of the patient's pocket, such as over-the-counter medications" (Dalaker, 2005, p. 9).

The NAS recommendations lead to an alternative basis for the poverty threshold, which consists of household expenditures on food, clothing, shelter, utilities, and MOOP (FCSUM). To overcome the lack of "definitive and accepted standards of minimum need", the NAS Panel used the U.S. Census Bureau's Consumer Expenditure Survey (CES) to determine the median FCSU expenditures for reference households (two adults and two children) from a three-year average across the data collection quarters. The FCSU threshold was then calculated as the average of the lower bound (30^{th} percentile of FCSU expenditures times 1.15 for other needs) and the upper bound (35^{th} percentile of FCSU expenditures times 1.25 for other needs) (Short, 2001, p. A-1).

The FCSUM threshold is then the sum of the FCSU threshold and the average obligations for the cost of medical care to the threshold, using data from both the National Medical Expenditure Survey (NMES) and the Medical Expenditure Panel Survey (MEPS) (Short, 2001, pp. A-10-A-11). Adjustments could then be made to reflect geographic differences in interarea housing costs and produce thresholds for household units with different characteristics from those of the reference unit (Short, 2001, p. A-1).

In 2010, the Interagency Technical Working Group (ITWG) provided an updated framework for a second set of experimental, expenditure-based poverty thresholds, known as the Supplemental Poverty Measure (SPM). Following the recommendations of the NAS panel, this measure should be based on the expenditures for a set of commodities that all families must purchase food, shelter, clothing, and utilities (FSCU).

In contrast to the NAS thresholds, the SPM thresholds use a reference sample that includes all family units with exactly two children. Expenditure data for family units with two children that do not contain two adults should be adjusted using the equivalence scale (discussed below) so that their expenditures are equivalent to those of a family unit with two adults and two children (Interagency Technical Working Group, 2010, p. 3).

This reference sample is also based on the most recent five years of available data on equivalized expenditures for the reference sample. The larger sample that is provided by five years of data will increase the stability of the thresholds and ensure that they move more slowly from year-to-year. From the distribution of equivalized FSCU expenditures within the reference sample, the dollar amount at the 33rd percentile of the distribution (times 1.2 for other needs) is selected. Since the NAS report was issued, it has become clear that a significant number of low-income families own a home without a mortgage and therefore have quite low shelter expense requirements. Not taking this into account may overstate their poverty rates. This suggests the need to adjust the thresholds for housing status, distinguishing renters, owners with a mortgage, and owners without a mortgage (Interagency Technical Working Group, 2010, pp. 3-4).

1.3.3 Self-Sufficiency Measures

Though both the NAS and SPM expenditure-based poverty measures overcome several obstacles and criticisms facing the official U.S. poverty threshold, neither of them accommodates the actual market prices for all the commodities included in the expenditures. These measurements would underestimate basic needs thresholds because the FCSU prices are often significantly subsidized for households in these percentiles. Thus, if the basic income is intended to provide for individuals who do not (or no longer)

have access to these subsidies, especially as some may be mitigated for the purpose of funding the basic income, then an alternative (higher) estimate which includes the unsubsidized prices of goods will provide a more accurate measurement of basic needs.

In 2004, the Living Wage Calculator was created as an alternative measure of basic needs. It references geographic-specific expenditure data to calculate a basic needs budget using food cost, childcare cost, health insurance premiums, out-of-pocket health care costs, housing costs, transportation costs, and other necessities costs (e.g., clothing, personal care items, etc.) costs. The living wage is the sum of the basic needs budget and the geographic-specific taxes. The Living Wage Calculator also accounts for families of twelve different compositions (Glasmeier, 2020).

In addition, the Economic Policy Institute provides the Family Budget Calculator which measures the monthly income a family needs to attain a modest yet adequate standard of living. The budgets estimate community-specific costs for 10 family types (one or two adults with zero to four children). The EPI Family Budget Calculator presents data for all 3,171 U.S. counties and county equivalents as of 2017 (some locations are not inside any county but are defined as county-equivalents by the federal government for administrative and statistical reasons). They have also constructed cost estimates for all 611 metropolitan areas ("metro areas") using both metro-level data and aggregations of county data. The EPI family budgets consist of seven individual components: housing, food, transportation, childcare, health care, taxes, and "other necessities" (Gould et al., 2018).

The main analytical limitations of these market-based alternatives are that they neither offer historical data nor extrapolations of costs for alternative household

compositions. Thus, it would not be possible to use either of these datasets alone to estimate poverty for all households or for other periods in history.

1.3.4 Poverty after Federal Income Transfer Programs

According to the US Office of Management and Budget (OMB), the federal government paid $3,116 billion in outlays to individuals (including grants to state and local governments for payments for individuals) in 2019. "The basic purpose of the payments for individuals aggregation is to provide a broad perspective on Federal cash or in-kind payments for which no current service is rendered, yet which constitutes income transfers to individuals and families" (2020).

Despite these outlays, the official poverty rate (those below the poverty line) in 2019 was estimated to be 10.5 percent with 34.0 million individuals in poverty (Semega, et al., 2020, p. 12). Furthermore, the deep-poverty rate (those below 50 percent of the poverty line) was estimated to be 4.7 percent with 15.3 million individuals in deep poverty and the near-poverty rate (those below 125 percent of the poverty line but not in poverty) was estimated to be 3.9 percent with 12.6 million individuals in near poverty (Semega, et al., 2020, p. 59).

In addition, the official poverty rate for all related children in families under the age of 18 was 14.1 percent with 10.2 million individuals in poverty; the deep-poverty rate was estimated to be 6.0 percent with 4.3 million individuals in poverty; and the near-poverty rate was estimated to be 5.2 percent with 3.7 million individuals (Semega, et al., 2020, pp. 58-59). Though related children under age 18 represented 22% of the total population, they represented 30% of the officially impoverished (Semega, et al., 2020, pp. 58-59).

Among those in official poverty, 20.8 million individuals (61%) relied upon Medicare, Medicaid, or VA/CHAMPVA (Civilian Health and Medical Program of the Department of Veteran Affairs) and had no private insurance. However, 5.5 million impoverished individuals (16%) had neither private nor public health insurance (Fox, 2020, p. 25). Thus, not only does the U.S. welfare system not guarantee minimum standards for the consumption of private goods, it also does not guarantee minimum standards for the provision of public goods.

To accommodate taxes and noncash benefits, an alternative measure of poverty is necessary, such as the Supplementary Poverty Measure (SPM). In 2019, the SPM estimated poverty rate was 11.7 percent with 38.2 million individuals in poverty (Fox, 2020, p. 22). Thus, the SPM estimated 1.3 percentage points and 4.1 million more in poverty than the official poverty rate, despite including another $1,998 billion in benefits to individuals. The deep-poverty rate was estimated to be 3.9 percent with 12.7 million individuals in poverty (Fox, 2020, p. 27). This estimate was 0.8 percentage points and 2.6 million individuals fewer in deep poverty. There was no estimate for the near poverty rate with the SPM.

To compare the SPM poverty rate for minors with the official poverty rate for minors, the official poverty thresholds would need to be applied for all people under the age of 18, and not just related children in families. Using the official poverty thresholds, the poverty rate for all people under the age of 18 was estimated to be 14.4 percent with 10.5 million individuals in poverty in 2019 (Semega, et al., 2020, p. 16). For the same thresholds, the deep-poverty rate was estimated to be 6.2 percent with 4.5 million

individuals under 18 in poverty (Semega, et al., 2020, p. 59). There was also no estimate provided for the near poverty rate with the OPM for all people under the age of 18.

In 2019, the SPM poverty rate for all people under the age of 18 was estimated to be 12.5 percent with 9.1 million individuals in poverty (Fox, 2020, p. 24). The deep-poverty rate was estimated to be 3.4 percent with 2.5 million individuals in poverty (Fox, 2020, p. 27). These SPM estimates had 1.9 percentage points and 1.4 million individuals fewer in poverty, and 2.8 percentage points and 2.0 million fewer individuals in deep poverty.

Among those in poverty according to the SPM thresholds, 19.6 million individuals (51%) relied upon Medicare, Medicaid, or VA/CHAMPVA (Civilian Health and Medical Program of the Department of Veteran Affairs) and had no private insurance. Also, there were 6.4 million impoverished individuals (17%) who had neither private nor public health insurance (Fox, 2020, p. 25). These SPM estimates included 1.2 million fewer individuals (-10 percentage points) with public insurance (no private insurance) and 0.9 million more individuals (+1 percentage point) with no insurance. These differences are consistent with including health care-related tax and noncash benefits in the SPM measurements of income.

1.4 Full Basic Income

"The poverty gap is defined as the total dollars needed to raise all families to the poverty line and can therefore be interpreted as a measure of the 'intensity' of poverty" (Meyer & Wu, 2018, p. 23). The poverty gap also measures the minimum expenditure necessary to directly eliminate poverty, assuming that there would be no behavioral changes in response

In 2019, the US Census Bureau reported that there were 6.6 million primary families, 0.1 million unrelated subfamilies, and 11.3 million unrelated individuals in the country with an income below the poverty threshold (2020b, "All Races"). According to its data, the income deficit (the difference between a family's income and its poverty threshold) for these primary, unrelated subfamilies, and individuals, was on average $10,668, $10,998, and $7,375, respectively (2020b, "All Races"). Multiplying the headcounts by the respective average poverty gap yields an estimated $154.5 billion poverty gap.

This also means that the poverty gap was only 5 percent of the $3,116 billion in federal outlays to individuals (including grants to state and local governments for payments for individuals) in 2019. However, if every family's, subfamily's, and individual's household income was guaranteed to be at least equal to their respective poverty line, then there would be no incentive to earn, or at least declare, an income less than the poverty line. There would be an effective marginal tax rate of 100% on these household's income as each dollar gained would represent a dollar lost in transfers. Also, the poverty gap would not be known until the following year, which could be too late to prevent all households from going into poverty in 2019.

Without means testing, it would be necessary to pay each household the full value of their respective poverty threshold to eliminate poverty. In 2019, the OPM threshold for a related family with two adults and two children was $25,926 (U.S. Bureau of Labor Statistics, 2020a). Given that the OPM includes Social Security, Supplemental Security Income, and Unemployment Insurance benefits (United States Census Bureau, 2020a)

and the full UBI replaces all redundant cash benefit programs (Parker, 1989, 128), these programs would no longer be necessary.

However, the official poverty thresholds "are intended for use as a statistical yardstick, not as a complete description of what people and families need to live" (United States Census Bureau, 2020a). In 2019, the SPM threshold for a household with two adults, two children, and a mortgage (before geographic difference in housing costs) was $29,234 (U.S. Bureau of Labor Statistics, 2020a). As far back as the first available measurement for 2007, the SPM rate has consistently been higher than the OPM rate (Fox, 2020, p.6).

Unlike the OPM thresholds, the SPM threshold is calculated after deducting federal individual income tax expenses, state individual income tax expenses, payroll taxes, child support payments, medical out-of-pocket expenses (MOOP), and work expenses (including childcare expenses). The SPM includes the value of in-kind benefits such as the Supplemental Nutrition Assistance Program (SNAP) and tax credits such as the Earned Income Tax Credit (EITC), which means these programs would be redundant and no longer be necessary.

This annual income would need to be individual income tax exempt, exempt from debt collection (including child support), and supplemented with health insurance to cover MOOP expenses to guarantee that a household's income would not fall below their respective SPM threshold. If neither this income nor the supplementary health care compensation includes work requirements, then work expenses (including childcare expenses) need not be covered.

In addition to being paid in cash, and without means testing or work requirements, this basic income would need to be paid directly to individuals to be a UBI. Ignoring the economies of consumption in household size, this would increase the SPM threshold for a household with two adults, two children, and a mortgage (before geographic difference in housing costs) from $29,234 to $40,891 ($13,549 per adult and $6,897 per child) to eliminate poverty under all household compositions (U.S. Bureau of Labor Statistics, 2020b).

Critics argue that all these requirements will only make the full UBI too expensive and reduce incentives for beneficiaries to earn their way out of poverty (Parker, 1989, 132). However, proponents will argue that the absence of these requirements is why there are still millions of impoverished Americans despite receiving billions of dollars from government income transfer programs.

1.5 Efficiency of a Universal Basic Income

1.5.1 Cash Income

Unlike in-kind transfers and vouchers, such as food stamps and housing subsidies, a UBI "is provided in cash, without any restriction as to the nature or timing of the consumption or investment it helps fund" (Parijs, 2004, p. 8). In terms of efficiency, the distribution of cash requires significantly less bureaucracy than the distribution of in-kind transfers and vouchers, such as food or housing, of equal value. This distribution of cash is even more efficient when and where electronic payments are available for the beneficiaries (Parijs & Vanderborght, 2017, p. 13).

One of the main arguments in favor of the provision of basic needs by in-kind transfers and vouchers is that they increase "the likelihood that resources will provide for

basic necessities for all members of the household rather than be wasted on luxuries or worse" (Parijs & Vanderborght, 2017, pp. 12). However, this "likelihood" depends on whether the amount of the in-kind transfer or voucher is less than what the recipient would have consumed in its absence (infra-marginal), because, in this case, the outcome should be the same as a cash transfer of equivalent value (Hoynes & Schanzenbach, 2009, p. 109).

Furthermore, this "likelihood" also depends on whether the amount of the in-kind transfer or voucher is more than what the recipient would have consumed in its absence (extra-marginal), because the availability of secondary markets for in-kind transfers and vouchers allows recipients to exchange their in-kind transfers and vouchers for cash and/or non-necessities. "If the government cannot force consumption of an extra-marginal transfer, the recipient will have an incentive to sell or trade it away" (Cunha, 2014, pp. 195-196).

A UBI must also be predictable, which means that both the timing and the value of its disbursement should be "consistent with helping people to meet their daily needs for food, shelter, and other necessities" (Gentilini et al., 2020, p. 40). Thus, it is usually recommended that a UBI be provided at fixed intervals, such as weekly, monthly, or annually (Parijs, 2004, p. 9). However, it is not recommended that the value of a UBI be fixed (in nominal terms) over time. "Once in place, it can meaningfully be linked to a price index or, even more meaningfully, to GDP per capita" (Parijs & Vanderborght, 2017, p. 9).

It is also not always recommended that the value of a UBI should be uniform for all individuals. "First, it could vary with age... Second, it could vary with geography"

(Van Parijs & Vanderborght, 2017, p. 9). Thus, a UBI is also referred to as a "demogrant" because its value is often based on demographic principles.

Last, the value of a UBI must be protected from confiscation, such as collecting debts or alimony. "This requirement naturally flows from viewing basic income not as a top-up on other incomes but rather as the bottom layer for every person's income, which current legislation usually protects against seizure" (Parijs & Vanderborght, 2017, p. 10).

1.5.2 Qualifying Individuals

Even if a UBI is to be provided by a government, then there is still debate as to who among the governed qualify for its benefits. Those who label a UBI as a "citizen's income" limit the beneficiaries to native or naturalized citizenship. Others extend benefits to all legal, permanent residents. "The operational criterion may be, for non-citizens, a minimum length of past residence, or it may simply be provided by the conditions that currently define residence for tax purposes, or some combination of both" (Parijs, 2004, p. 10).

Though there is much disagreement about the benefit status of non-citizens, there is little disagreement about the benefit status of incarcerated individuals. That is, prisoners who would otherwise qualify for a UBI should not qualify for a UBI for the duration of their imprisonment. "Detaining criminals in prison is far more expensive to the community than paying them a modest basic income, even if full account is taken of any productive work they may be made to perform" (Parijs, 2004, p. 11). Furthermore, there should be no restriction upon the UBI benefits of these individuals when they are released, regardless of whether parole is required.

Another accepted characteristic of a UBI is that it benefits individuals directly, without regard to their respective household sizes. Though it is commonly argued that benefits should take into consideration the economies of scale in household consumption, there are practical reasons why it should not. "The first is that cohabitation is hard to confirm. Second, and more fundamentally, differentiating according to household composition has the effect of discouraging people from living together" (Parijs & Vanderborght, 2017, p. 15).

Just as there is debate about benefitting non-citizens, there is also debate about benefiting non-adults. For a full UBI, benefits for minors would be necessary but could be at a reduced level, especially if it is tied to either the OPM or SPM. In that event, a minor's legal guardian(s) would likely receive the UBI (Van Parijs & Vanderborght, 2017, p. 9).

1.5.3 Without Means Testing

A basic income scheme operates without any means testing, which is what it means by "universal". In other words, the same level of UBI is provided to both those whose incomes are below the value of its benefit as well as those whose incomes are above the value of its benefit. In addition, no other assets should be taken into consideration when determining the value of an individual's benefit (Parijs, 2004, p. 12).

One of the main arguments in favor of means testing government benefits is that as an individual's income rises, then the value of benefits should be reduced because said individual's needs remain the same (Torry, 2016, p. 3). However, as the value of an individual's benefits are reduced, their effective marginal tax rate increases, which

reduces their incentive to increase their income. "This unintended consequence of means-testing is the poverty trap. It keeps people poor" (Torry, 2016, p. 4).

In 2015, approximately 3.0 million US households received SNAP + EITC + Child Tax Credits (CTC) + Medicaid/CHIP means-tested benefits, and these households experienced a median effective marginal tax rate of 42 percent (Chien & Macartney, 2019, p. 2). For the same year, approximately 400,000 US households received SNAP + EITC + CTC + Medicaid/CHIP + housing benefits, and these households experienced a median effective marginal tax rate of 63 percent (Chien & Macartney, 2019, p. 2).

These US households in the lowest tax brackets experienced higher effective marginal tax rates than households in the highest tax bracket rate of 39.6 percent in 2015 (Internal Revenue Service, 2020). This effect can be mitigated by smoothing any kinks and reductions in the phase-out rate but the smaller the phase-out rate, the higher the qualifying income. Thus, the more individuals who qualify, the more whom need to be monitored.

In addition, if an individual is unemployed and receiving means-tested benefits, then their benefits may be reduced upon gaining employment if their earned income level is above the respective phase-out threshold. Thus, not only is their incentive to increase their income reduced, but their incentive to find paid employment is also reduced. This situation is called the "unemployment trap" because it keeps them unemployed (Torry, 2016, p. 4).

In summary, a non-means-tested (i.e., "universal") basic income necessarily removes these disincentives to finding employment and increasing wages for beneficiaries (Miller, 2017, p. 82). In addition, these beneficiaries are not necessarily

limited in their occupations when their income increases due to improvements in labor productivity and/or availability (Parijs, 2004, p. 17)

1.5.4 Without Work Requirements

Though "universality" addresses both the "poverty" and "unemployment" traps, "unconditionality" (i.e., no work requirements) is also necessary to address the "employment trap". That is, a basic income including work requirements would effectively subsidize employers by enabling them to pay lower wages - even below the reservation wages of laborers - with a reduced risk of labor supply shortages. "The [employers] could get away with paying lower wages to workers obliged to accept and stay in jobs if they wanted to retain their benefits" (Parijs & Vanderborght, 2017, p. 22).

Besides affordability, the most recurrent criticism against UBI is that "unearned" income disincentivizes the supply of labor by beneficiaries, especially among those whose benefits represent a significant proportion of their total actual or prospective earnings. However, "UBI advocates argue that guaranteeing everyone an unconditional income floor potentially enables workers to turn down insecure, low-paid, exploitative work or demand improved work conditions by granting them an exit option from such work or employment relations" (Gentilini et al., 2020, p.100).

In addition, a compensated-labor requirement for benefits received implies that the work itself is more beneficial/necessary if it is compensated. However, a non-conditional UBI enables beneficiaries to supply their labor for uncompensated work while still maintaining at least a subsistence level of income (Gentilini et al., 2020, pp. 100-101).

Uncompensated work, such as household activities, caregiving, and/or education, can be argued to be more beneficial/necessary than the paid alternatives for both individuals in particular and the economy in general. "In the case of domestic and care work, still disproportionately carried out by women and girls, advocates argue that a UBI could support its redistribution between the sexes" (Gentilini et al., 2020, pp. 101).

1.6 Partial Basic Income

"It is generally accepted that a 'full' UBI must be large enough to meet an individual's basic needs without a work requirement. Thus, a nonzero income less than that level is a 'partial' UBI" (Widerquist & Sheahen, 2012, p. 12). A "partial" basic income could be used to supplement (or "top off") existing poverty-relief programs that would achieve a value of benefits greater than or equal to the poverty threshold (i.e., a "full" basic income). This arrangement could create less disruption for the existing arrangement of programs with a similar result in terms of the value received by a "full" basic income.

However, this "top off" does not resolve the aforementioned disincentives and overhead costs associated with the programs left in place, which could significantly mitigate the benefits associated with a "partial" basic income. In particular, the administrative efficiencies are highly contingent upon whether basic income replaces or supplements the existing forms of income and social support (De Wispelaere & Stirton, 2011, p. 124).

If any of the retained social protection schemes have different requirements in terms of residency, household size, or even regularity, then it would be necessary to make the partial UBI large enough to guarantee that every individual's net income achieves its respective threshold. Making the partial UBI large enough to guarantee that every

individual's net income achieves its respective threshold would not only require updating its value each time the value of the retained social protection schemes change; it would also open the possibility that some households would benefit more than others and even above the value of a "full" UBI, depending on which schemes are retained.

Alternatively, it would be necessary to make the value of the partial UBI non-uniform across households of a given composition, at a given time and geographic location. Making the partial UBI non-uniform to ensure that every individual's net income achieves its respective threshold would necessarily require means testing, which would no longer qualify as "universal".

"[T]he interaction between a partial UBI and other support policies that remain means-tested or conditional is likely to hollow out many of the effects expected from a UBI" (Gentilini et al., 2020, p. 201). Retaining means testing implies phasing out benefits as income increases, which disincentivizes increasing earned income in general (the "poverty trap") and entering the labor force in particular (the "unemployment trap"). Retaining conditionality can force the supply of labor below its reservation wage (the "employment trap") and it can discriminate by requiring paid labor without regard for unpaid labor, such as household activities, caregiving, and education.

As mentioned previously, basic needs not only include minimum standards for the consumption of private goods but also minimum standards for the provision of public goods. In addition, the cost of medical care is not only more often inconsistent across households of a given composition, but it is also more often unpredictable. Thus, if the goal of a full UBI is to guarantee a standard of basic needs that eliminates poverty, then it

is necessary to also provide reimbursement for the cost of medical care (e.g., universal health care) or it is only a partial UBI, and poverty remains.

1.7 Conclusions

A full UBI with a value equal to the poverty line could be more effective at eliminating poverty and with lower administrative costs relative to the redundant income transfer programs it could replace in the US. It would also create relatively less deadweight loss because household behavior would neither affect the level nor the availability of its benefits.

However, it would be necessary to first determine which poverty line sufficiently represents the value of basic needs. The US has multiple poverty measures, each with its own advantages and disadvantages. Only after this value has been determined can the aggregate costs be calculated, and the financial feasibility of the program can be estimated.

Last, it would be necessary to determine how this program would accommodate for health care expenses. Currently, preventative and non-discretionary health care are not universally compensated in the US, even for the officially impoverished. If a new health care financing system needs to be implemented to guarantee that all basic needs are satisfied, then there will be further implications for costs and financing.

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2. Micro-Simulating a Universal Basic Income System for the United States

2.1 Introduction

A Universal Basic Income (UBI) is a cash income, regularly paid to all qualifying individuals, without means testing or work requirements. A "full" UBI (FUBI)—in contrast to a “partial” UBI—is a UBI valued at a level sufficient to guarantee every individual's basic needs while replacing all redundant cash-benefit programs (Parker, 1989, 128). In this chapter, it is assumed that every individual’s basic need for health care is satisfied with or without this basic income.

This contrast is important because "partial" UBI's are more common in the literature given that they can be funded entirely by replacing existing mandatory benefit programs. In the United States (US), it would be necessary to supplement these savings to afford a value equal to either the Official Poverty Measure (OPM) or the Supplementary Poverty Measure (SPM).

This chapter presents the results from a static, behavioral, partial-equilibrium, micro-simulation model that analyzes household responses to changes in mandatory spending, sources of tax revenues, and tax expenditures. These changes include a FUBI paid to each individual within the US civilian non-institutionalized population. Each individual adult receives an income equal to the value of the US federal poverty guideline for the first household member and each individual minor receives an income equal to the value of the US federal poverty guideline for each additional household member. This basic income is financed by replacing existing income transfers and reforms to the individual income tax system.

The dataset is a merger of the Consumer Expenditure Survey (CES), the Current Population Survey Annual Social and Economic Supplement (CPS-ASEC), and the Internal Revenue Service Public Use Tax File (IRS-PUTF) for 2009. The year 2009 was primarily chosen due to its availability made by the Suffolk Department of Economics.

However, 2009 has the peculiar benefit of also being the first time a year-to-year decrease in consumer spending has been measured by the Bureau of Labor Statistics (BLS) CES since the BLS began publishing integrated data in 1984 (United States Bureau of Labor Statistics, 2011, p. 1). Thus, this dataset should yield relatively conservative estimates of household income, expenditures, and tax revenues.

Section 2 describes the micro-simulation model and associated assumptions; section 3 describes the data sources, the method for synthesizing households, and sample weights; and section 4 presents the results of the micro-simulation model and sensitivity analyses.

2.2 Model and Assumptions

2.2.1 Micro-Simulation Model

"Income tax… and cash transfer payments (benefits) are reverse sides of the same coin, the former garnering from income, and the latter transferring it" (Miller, 2017, p. 168). To finance the FUBI, I repealed several federal cash income-transfer programs, payroll taxes, and individual tax expenditures. I also disproportionally increased the federal individual income tax rates for the existing brackets to compensate for the remaining tax revenue deficit.

I used the tax calculator model from Haughton et al. (2017) to compute the tax revenue collected under the proposed tax structures. In this model, the calculation of

individual income tax revenue follows the format of the IRS 1040 forms and the accompanying schedules for which the IRS provided data. For each household in the dataset, I first estimated taxable income under the 2009 law and then applied the 2009 tax rate schedule (the "BASE" simulation). Next, I did the same calculations with the program I have built in Stata using the proposed tax rules and rates. By comparing the BASE simulation with the FUBI simulation, I measured the overall effect on revenue, and the distributional effects.

I am not only interested in which households bear the actual burden of federal individual income taxes (effective incidence); I am also interested in which households stand to gain from the changes in both the income tax code and receipt of a basic income. I make assumptions like those made by Haughton et al. (2017), but with some modifications. The following are my assumptions about the incidence of the primary federal taxes:

1. Federal individual income tax: The burden of this tax is assumed to fall on the income earner and the tax calculator model computes the amount of this tax directly.
2. Federal Insurance Contributions Act (FICA) payroll taxes: In 2009, employee gross wages were taxed at 6.2% for Social Security, up to $106,800, and at 1.45% for Medicare taxes, with no limit. Employers matched these percentages for a total of 15.3% on the first $106,800 of gross wages and a total of 2.9% gross wages thereafter. The self-employed paid the total as though they were both the employer and employee. In allocating this tax, I separated the employer and household contributions because household contributions are subtracted in the

BASE simulation when measuring poverty based on net income. Though FICA taxes are repealed in the FUBI simulation, employer contributions are assumed to be redistributed to employees as labor income.

3. Existing income transfers: Mandatory programs and tax expenditures each decrease in their respective benefits as household income increases. Due to the lack of data, I did not include these phaseouts in the Effective Marginal Tax Rates (EMTRs) for the BASE simulation. This omission could significantly overestimate the difference between the average EMTRs in the BASE simulation vs. the FUBI simulation, particularly for relatively lower income households, as they were repealed in the latter simulation.
4. New income transfers: The FUBI is a non-taxable, garnish-exempt, lump-sum transfer, paid directly in cash to all households on a recurring basis throughout the tax year. Since the value of the FUBI paid to each individual is unaffected by household behavior and does not affect relative prices, I assume that it did not affect household composition, income, or expenditures.

2.2.2 Mandatory Programs

"It is generally accepted that a 'full' UBI must be large enough to meet an individual's basic needs" (Widerquist & Sheahen, 2012, p. 12). Assuming that the economic cost of these basic needs is consistent across households of a given composition – and at a given time and geographic location - the value of this "basket" of commodities can be interpreted as a poverty threshold. The US has an income-based, absolute, official poverty measure (OPM).

However, the OPM thresholds are not used to determine the financial eligibility for most federal programs for a given year, because the thresholds are not calculated until September or October of the following year (Besharov & Germanis, 2004, p. 5). The same limitation applies to the Supplemental Poverty Measure (SPM), which is both expenditure-based and relative (Interagency Technical Working Group, 2010, p. 3). In addition, the official poverty thresholds are the same across the nation, although significant price variations across geographic areas exist for such needs as housing (Citro et al., 1995, p. 2).

To determine income eligibility for most federal programs, the US Department of Health and Human Services publishes a simplified variation of the poverty thresholds called the "federal poverty guidelines" (FPGs). The FPGs are calculated for a family of four and then a fixed amount per person is added or subtracted to adjust for family size. To accommodate inflation, the FPGs reflect price changes through the preceding year (Besharov & Germanis, 2004, p.5).

In 2009, the poverty guideline was $10,830 for a 1-person family and $3,740 for each additional person in the family (Leavitt, 2009). Given that a UBI benefits individuals directly, without regard to their respective household sizes, it would be necessary to pay each household member the same value. Though benefits for minors would also be necessary under a FUBI, they could be at a reduced level (Parijs & Vanderborght, 2017, p. 9). Thus, it would be consistent to pay each adult $10,830 and each minor $3,740.

Separate poverty guideline figures are available for Alaska and Hawaii, but the 48 Contiguous States and the District of Columbia share the same FPGs (Leavitt, 2009).

However, the Bureau of Economic Analysis (BEA) annually estimates the regional price parities (RPPs) for the US, which I used to instead to compare relative price levels among each of the fifty United States and the District of Columbia (Aten & D'Souza, 2008, p. 64). These RPPs are expressed relative to the national average and are set at 100 for each year. By the end of 2008, the most recent state and metropolitan RPPs available were from 2006.

The redundant cash-benefit programs I repealed were Old-Age, Survivors, and Disability Insurance (OASDI) payments of $675.5 billion (Board of Trustees, Federal Old-Age and Survivors Insurance and Federal Disability Insurance, 2010, p. 29); Supplemental Security Income (SSI) of $42.6 billion (Social Security Administration, 2011, p. 3); Unemployment Trust Fund (Unemployment Insurance, Extended Benefits, and Emergency Unemployment Compensation) of $117.3 billion (Office of Management and Budget, 2011, p. 427); Supplemental Nutritional Assistance Program (SNAP) of $53.6 billion (Food and Nutrition Service, 2021a); Low Income Home Energy Assistance Program (LIHEAP) funding distributed of $5.1 billion (Congressional Research Service, 2018, p. 6); tenant-based vouchers (Section 8) of $16.2 billion (Congressional Research Service, 2019, p. 12); and National School Lunch Program (NSLP) subsidies of approximately $9 billion (Congressional Budget Office, 2015, p. 38) in 2009.

Given that some households were receiving higher benefits from Social Security, for which they had contributed for many years, those households would receive an equally higher FUBI. The Railroad Retirement transfer of $4.1 billion (Board of Trustees, Federal Old-Age and Survivors Insurance and Federal Disability Insurance, 2010, p. 29) would also be retained to maintain the Railroad Retirement program.

Additionally, the Women, Infants and Children (WIC) program costs of $6.5 Billion (Food and Nutrition Service, 2021b) would be retained as the household payment data was not directly available and it benefits pregnant women who are only counted as individuals for UBI benefits. The Temporary Assistance for Needy Families (TANF) total federal funds available of $18.6 billion would also be retained—cash assistance was only 29.7% of Federal TANF Grants in 2009—which would probably be transferred to non-cash benefit programs in the event of a FUBI (Office of Family Assistance, 2010).

Lastly, the Old-Age, Survivors, and Disability Insurance (OASDI) administrative expenses of $6.2 billion (Board of Trustees, Federal Old-Age and Survivors Insurance and Federal Disability Insurance, 2010, p. 29) were retained as a proxy for the UBI administrative expenses.

2.2.3 Tax Sources

In 2009, Social Security and Medicare payroll taxes were 12.4% and 2.9%, respectively, of wages and tips after exempting the employee's contribution to the cost of employer-sponsored health coverage. Employers and employees split the tax rates (7.65% each), but self-employed workers paid the full tax rate (15.3%). Furthermore, the wage base limit for Social Security taxes was $106,800 in 2009. This limit made FICA taxes regressive on wage-based income and income in general if non-wage income was a larger proportion of total income for higher income households. Without OASDI, FICA taxes would be repealed, but Medicare would then need to be funded by general revenues. This could have the additional benefit of making Medicare funding more sustainable, but that is not a target of analysis in this chapter.

However, this update removes OASDI payroll taxes of $667.3 billion (Board of Trustees, Federal Old-Age and Survivors Insurance and Federal Disability Insurance, 2010, p. 29); Medicare payroll taxes of $190.9 billion; and taxation of Medicare benefits of $12.4 billion (Board of Trustees, Federal Hospital Insurance and Federal Supplementary Medical Insurance Trust Funds, 2010, p. 10) in 2009. Thus, it would be necessary to source additional revenue for the $203.3 billion of Medicare funding.

Though the FUBI would replace UI benefits, the UI payroll taxes are experience-rated to encourage employers to retain their employees by making layoffs more costly. For this reason, this source of revenue is not replaced in this model. The Unemployment Trust Fund (UTF) is primarily financed by payroll taxes levied against individual employers. In 2009, the UTF had government receipts of $37.9 billion, interest receipts from Federal funds of $2.7 billion, and other receipts from Federal funds of $18.1 billion (Office of Management and Budget, 2011, p. 427). These funds could be added to general revenues or earmarked for UBI benefits.

2.2.4 Tax Expenditures

Tax expenditures are defined in the law as "revenue losses attributable to provisions of the Federal tax laws which allow a special exclusion, exemption, or deduction from gross income or which provide a special credit, a preferential rate of tax, or a deferral of tax liability" (Congressional Budget and Impoundment Control Act of 1974, H.R. 7130, 93rd Cong., 1974, p. 299). The UBI literature includes suggestions for closing tax loopholes as an acceptable means of generating incremental revenues for financing higher UBI benefits (Miller, 2017, p. 173).

Exclusions, exemptions, deductions, and preferential rates (e.g., capital gains taxes) are also relatively more beneficial to individuals in higher tax rate brackets and tax credits are relatively more beneficial to individuals in lower tax rate brackets. Thus, removing the former and replacing the latter with a FUBI could significantly increase both the progressivity and revenue potential of the individual tax system. In addition, reducing the complexity of the individual income tax system could significantly reduce both the associated administrative and compliance costs (Marcuss et al., 2013, p. 850).

In 2009, the individual income tax returns reported total statutory adjustments of $113.0 billion, total exemptions of $1,029.1 billion, and total deductions of $1,951.6 billion (Internal Revenue Service, p. 4, 2011). Furthermore, the exclusion of employer contributions for health care, health insurance premiums, and long-term care insurance premiums reduced tax revenues by $94.4 billion and the exclusion of pension contributions reduced tax revenues from defined benefit plans by $38.4 billion, defined contribution plans by $32.6 billion, and Keogh plans by $9.2 billion (Joint Committee on Taxation, 2010).

In 2009, individual income tax returns reported a total of $73.6 billion in tax-exempt interest, such as from municipal bonds (Internal Revenue Service, p. 2, 2011). This exemption is not just an indirect subsidy for individuals but also for state and local governments. Given that these bonds are for financing non-business activities and their interest rates are lower than private bond interest rates, their interest payments are still exempt in this tax model.

2.3 Data and Calibration

Per Haughton et al. (2017), Internal Revenue Service (IRS) Individual Public-Use Micro-Data (PUMD) files on individual federal income tax returns for 2009 was the central component of my household database. This file has records on 217 variables for 152,526 tax filers. The IRS uses "top-coding" to set a ceiling on the reported values of many of the variables to mask the identity of taxpayers, but this reduces the precision of simulations based on these data. The file also oversampled high-income tax filers intentionally due to their relative uniqueness but provided weights that allowed me to adjust for this over-sampling.

Consistent with the Congressional Budget Office's analysis of the distribution of household income and federal taxes, I used households as the unit of analysis.

> A household consists of the people who share a housing unit, regardless of their relationships. The presumption is that households make joint economic decisions, although that may not be true in every case (in a group house, for example). Households may comprise more than one taxpaying unit, such as a married couple and their adult children living together. (2012, p. 22)

Some of these tax filers represented subunits of households, which is not the unit of interest here when looking at income distribution. Like Haughton et al. (2017), I excluded the 5,541 cases of tax returns filed by dependents (typically children) and dropped the 3,039 cases of married couples filing separately because I cannot associate these returns with those of their partners, which would be needed to create household-level variables. 143,948 tax returns remained to be taken to represent households, and I adjusted the sample weights to reflect these changes.

The IRS dataset contains information on sources of income and on the direct taxes paid by individuals who filed their federal individual income taxes in 2009. However, it did not include any information on non-filers, which was a not insignificant subgroup of the population. Per Haughton et al. (2017), I used the Current Population Survey (CPS) for 2009 to fill this gap, from which I extracted records of households that did not file a federal tax return in 2009. By inserting 11,480 non-filers from the CPS, I created a new dataset with 155,428 observations.

Tax non-filers are those whose total income for the year does not exceed certain thresholds and choose not to file. However, some of these non-filers may have large amounts of non-taxable income such as tax-exempt disbursements from bonds and/or retirement plans. Per Haughton et al. (2017), I merged the IRS and CPS datasets since the datasets have several variables in common. The IRS and CPS datasets were similarly weighted, and I adjusted the weights for the merged dataset appropriately.

The merged IRS/CPS dataset is still not sufficient for two reasons. First, neither dataset includes information on payroll deductions, such as contributions to private pensions and health insurance premiums. Second, neither dataset includes household geographic identifiers for all 50 states in the US, which is necessary for determining RPP's.

To fill these remaining gaps, I merged the 2009 Consumer Expenditure Survey (CES), which has this information, with the already merged IRS/CPS dataset. However, the households sampled in the CES were not the same as those in either the IRS or CPS datasets. Per Haughton et al. (2017), I used a matching procedure that assigned

observations on spending from the CES to each observation in the merged IRS/CPS dataset.

First, I created a measure of household total income with variables represented in both the CES and IRS/CPS files and allocated this income to one of 10 income tiers. Next, I cross-tabulated this with information on whether a household received income from interest, income from social security, income from both sources, or income from neither source. I combined the 10 income tiers with the 4 income source groups to create 40 distinct cells for categorizing households. All households in the CES and IRS/CPS datasets were then each assigned to one of these 40 cells within their respective dataset.

Second, for each household in the merged IRS/CPS dataset, I randomly chose a household from the corresponding cell in the CES dataset and merged the data from the respective CES variables into the merged IRS/CPS household. The resulting merged dataset of IRS, CPS, and CES households and variables has detailed information on federal individual income tax filings, employer contributions, in-kind benefits, and imputed expenditures. It also has limited demographic information on household composition and geographic identification, which could be used for aggregating household income at state and federal levels.

Last, I calibrated the weights for the dataset such that the population of adults and minors would match the CPS for comparison purposes. "The universe is the civilian noninstitutional population of the United States living in housing units and members of the Armed Forces living in civilian housing units on a military base or in a household not on a military base" (United States Census Bureau, 2009, p. 1-1). The Census Bureau uses the Annual Social and Economic Supplement (ASEC) of the Current Population

Survey (CPS) in March to estimate poverty statistics for the previous. In March of 2010, there were estimated totals of 304.280 million individuals, 229.240 million adults, and 75.040 million minors in this population (United States Census Bureau, 2010, p. 23).

2.4 Simulations and Results

2.4.1 Program Costs and Poverty Rates

Before adjusting for state RPPs, a national FUBI for all civilian noninstitutional population of the United States in 2009 would cost $2,763,318 million (229.240 million adults x $10,830 per adult + 75.040 million minors x $3,740 per minor). After allowing for state RPPs and including a "top-off" to prevent FUBI benefits from falling below Social Security benefits, this cost increases to $2,904,420 million. Though cost is significantly larger than the combined value of the mandatory programs and tax expenditure, my main concern is whether it is sufficient to reduce and potentially eliminate income poverty in the United States for 2009.

I calculated the United States Census Bureau's separate measures of "cash income" utilized for the OPM (2020) and the SPM (Interagency Technical Working Group, 2010). I further calibrated the SPM based on homeownership and metro vs. nonmetro location for each of the fifty United States and the District of Columbia (Renwick, 2011). In addition to the accompanying updates to the US individual income tax system that replace redundant programs and increase the statutory individual income tax rates, a FUBI could reduce the OPM (pre-tax) by 12.9 percentage points to 1.6% and reduce the SPM (post-tax) by 14.3 percentage points to 1.0% (Table 2.1). The SPM is higher than the OPM in the BASE scenario but lower in the FUBI scenario because the FUBI cannot be garnished (by definition), which means that negative cash income is

Table 2.1

Official and Supplemental Poverty Measures, 2009

Measure	BASE (%)	FUBI (%)	Change
Official Poverty Measure - All	14.5	1.6	-12.9
Official Poverty Measure - Minors	21.2	0.8	-20.4
Official Poverty Measure - Deep	6.4	0.0	-6.4
Supplemental Poverty Measure - All	15.3	1.0	-14.3
Supplemental Poverty Measure - Minors	17.3	1.0	-16.3
Supplemental Poverty Measure - Deep	5.1	0.0	-5.1

Note. Measures refer to household cash income, as defined by the United States Census Bureau. Author's calculations based on IRS public use file (IRS 2016), Current Population Survey (CPS 2016), and Consumer Expenditure Survey (CES 2016), all for 2009.

treated as "0" income before adding the FUBI and calculating the SPM.

Poverty could still exist by both measures because both the FPGs and RPPs were estimated based on a previous year's data while both the OPM and SPM were estimated based on the year-in-question's data. Also, the OPM does not account for RPPs, which could overstate poverty in lower RPP areas. In 2009, this discrepancy was small enough that deep poverty (50% of the respective poverty threshold) was effectively reduced to 0 by both measures but to do the same for all or minors would require a larger FUBI value for and/or better inflation forecasting when imputing the current FPGs from previous OPMs.

2.4.2 Average Tax Rates

The FUBI simulation requires a significant increase in the statutory individual income tax rates for each taxable income bracket. This increase is necessary to compensate for the net increase in federal spending from the FUBI, as well as the revenue loss from repealing the FICA taxes. This increase also results in higher average tax rates (ATR) for all income quintiles (Table 2.2).

Table 2.2

Average Tax Rates (ATR) and Tax Liability by Income Group, 2009

	BASE		FUBI	
Quintile	ATR (Mean %)	Tax Liability (Share %)	ATR (Mean %)	Tax Liability (Share %)
Lowest Quintile	0.2	0.1	5.9	1.1
Second Quintile	5.1	2.7	11.4	3.4
Middle Quintile	9.6	7.7	16.8	7.4
Fourth Quintile	13.9	18.0	23.3	15.8
Highest Quintile	19.6	71.5	36.4	72.3
All Quintiles	9.7	100.0	18.7	100.0

Note. Author's calculations based on IRS public use file (IRS 2016), Current Population Survey (CPS 2016), and Consumer Expenditure Survey (CES 2016), all for 2009. Only households with positive personal incomes from the BASE scenario are included.

Repealing individual income tax adjustments, deductions, exemptions, and credits results in the share of tax liability increasing for the bottom income quintile. This is primarily the result of reducing the total number of net-beneficiary and non-filer households in the FUBI simulation.

2.4.3 Personal Income

To measure the distributional effects of a FUBI and the associated tax changes, I used personal income (PI). The Bureau of Economic Analysis (BEA) defines PI as the "income that persons receive in return for their provision of labor, land, and capital used in current production, plus current transfer receipts less contributions for government social insurance (domestic)" (2020, p. 26). PI is a pre-tax aggregate measure reported by the BEA in the United States National Income and Product Accounts.

This measure of income includes wages, salaries, employer contributions for employee pension, employer contributions for employee insurance, employer contributions for government social insurance, farm proprietor's income, non-farm proprietor's income, rental income, personal interest income, personal dividend income,

government social benefits paid to persons, and other transfer receipts from business. Unrealized capital gains are not included and personal contributions for government social insurance (FICA) are subtracted from this income.

The average PI increases for all quintiles with the inclusion of a FUBI, despite the replacement of mandatory programs (income transfers) that were included in the base simulation (Table 2.3). Given that all individuals receive the same FUBI with respect to household size and age of members, the relative benefit to personal income would be highest for relatively lower income households, which matches the results for the share of PI by quintile.

Table 2.3

Personal Income (PI) and Inequality by Income Group, 2009

	BASE		FUBI	
Quintile	PI (Mean $)	PI (Share %)	PI (Mean $)	PI (Share %)
Lowest Quintile	12,226	3.6	23,224	5.3
Second Quintile	25,980	7.7	39,635	9.1
Middle Quintile	41,736	12.3	58,303	13.4
Fourth Quintile	67,860	20.1	89,778	20.6
Highest Quintile	190,517	56.3	225,349	51.7
All Quintiles	67,663	100.0	87,257	100.0
Gini Index	0.52		0.46	

Note. Quintiles refer to household personal income. Author's calculations based on IRS public use file (IRS 2016), Current Population Survey (CPS 2016), and Consumer Expenditure Survey (CES 2016), all for 2009. Only households with positive personal incomes from the BASE scenario are included.

The BEA also measures disposable personal income (DPI), which is defined as personal income minus federal, state, and local taxes. DPI is of interest for national accounting because it measures the income available to persons for spending or saving (Bureau of Economic Analysis, 2020, p. 9). DPI is of interest for my analysis because it measures the income available to persons for satisfying their basic needs.

The average DPI increases for the first four income quintiles and decreases significantly for the highest quintile (Table 2.4). This means that for the highest quintile, the average increase in individual income tax liability outweighs the average benefit from a FUBI. The highest quintile is also the only quintile whose share of DPI decreases in the FUBI simulation. The average DPI decreases for all quintiles because counterfactual income taxes rates also increase due to rounding and to compensate for the loss of revenue from the taxation of FICA benefits.

Table 2.4

Disposable Personal Income (DPI) and Inequality by Income Group, 2009

	BASE		FUBI	
Quintile	DPI (Mean $)	DPI (Share %)	DPI (Mean $)	DPI (Share %)
Lowest Quintile	13,327	4.4	21,746	7.2
Second Quintile	26,576	8.7	35,080	11.6
Middle Quintile	40,730	13.3	48,402	16.0
Fourth Quintile	63,531	20.8	68,634	22.7
Highest Quintile	161,291	52.8	128,499	42.5
All Quintiles	61,090	100.0	60,472	100.0
Gini Index	0.48		0.36	

Note. Quintiles refer to household personal income. Author's calculations based on IRS public use file (IRS 2016), Current Population Survey (CPS 2016), and Consumer Expenditure Survey (CES 2016), all for 2009. Only households with positive personal incomes from the BASE scenario are included.

2.4.4 Sensitivity Analysis

The results of the FUBI simulation above implicitly assumed that income and spending behavior by households do not respond to changes in taxation and spending behavior by the federal government. However, households do respond to these changes, which means that a behavioral response must be included in the simulation to test the robustness of the results.

The elasticity of taxable income (ETI) is the ratio of the percentage change in taxable income to the percentage change in the net-of-tax rate (one minus the marginal tax rate). This single measure represents household adjustments—such as changing the supply of labor, shifting income between sources taxes at different rates, and/or evading taxes through non-declaration of income—in response to changes in income taxation (Creedy, 2009, p. 1).

Though ETI measures relevant behavioral responses, the literature has found that the ETI increases with income, which reduces the robustness of its application as a single elasticity measure (Giertz, 2008, p.4). According to Doerrenberg et al., "the behavioral response is mainly due to (itemized) deductions which are relatively less likely to be third-party reported and which can be more easily adjusted by taxpayers" (2017, p. 42). By extension, a single ETI applied to all levels of income would be overestimated for lower income households and underestimated for higher income households.

Alternatively, the elasticity of "broad" income (EBI) is the ratio of percentage change in "broad" income to the percentage change in the net-of-tax rate (one minus the marginal tax rate). "Broad" income is defined in the literature as total income (income before adjustments) minus capital gains and social security benefits. Capital gains are excluded because they are taxed at a different rate than the rest of income and Social Security benefits are excluded—for the same reason as adjustments—because its tax treatment has varied over time (Gruber & Saez, 2002, p. 30). In other words, "broad" income is income with consistent tax treatment over time.

Since the FUBI here includes repealing the most significant adjustments, deductions, and exemptions in the individual income tax code, the taxable income in this

simulation is closer to the definition of “broad” income. Thus, I used an EBI—which is less biased by income level—from the literature referencing US data with a value of 0.1 (Kumar & Liang, 2020, p. 15) for a third simulation and doubled it to 0.2 for a fourth simulation to test the robustness of my results.

To apply the EBI, I first calculated the change in the net-of-tax rate of "broad" income". Second, I calculated the percentage change in "broad" income by multiplying the percentage change in the net-of-tax rate by the respective EBI. Last, I calculated the new level of "broad" income by multiplying "broad" income by one plus the percentage change in "broad" income.

Despite reducing taxable cash income by the EBI and the resulting increase in EMTRs, neither the official nor supplemental poverty rates change significantly for both of the new simulations (Table 2.5). This is primarily because the FUBI is nontaxable and lower-bracket households are relatively less impacted by changes in marginal tax rates.

Table 2.5

Official and Supplemental Poverty Rates (%) by Simulation, 2009

Measure	BASE	FUBI + 0.0 EBI	FUBI + 0.1 EBI	FUBI + 0.2 EBI
OPM - All	14.5	1.6	1.6	1.6
OPM - Minors	21.2	0.8	0.8	0.8
OPM - Deep	6.4	0.0	0.0	0.0
SPM - All	15.3	1.0	1.0	1.1
SPM - Minors	17.3	1.0	1.0	1.1
SPM - Deep	5.1	0.0	0.0	0.0

Note. Measures refer to household cash income, as defined by the United States Census Bureau. Author’s calculations based on IRS public use file (IRS 2016), Current Population Survey (CPS 2016), and Consumer Expenditure Survey (CES 2016), all for 2009. Only households with positive personal incomes from the BASE scenario are included.

Statutory tax rates increased more between the second and third FUBI simulations than the first and second FUBI simulations (Table 2.6). Average PI increased for all

Table 2.6

Statutory Individual Income Tax Rates (%) by Income Brackets ($) by Simulation, 2009

Single					
Individual Income Tax Brackets ($)		Statutory Individual Income Tax Rates (%)			
Over	But Not Over	BASE	FUBI + 0.0 EBI	FUBI + 0.1 EBI	FUBI + 0.2 EBI
0	8,350	10.0	23.5	24.8	26.7
8,350	33,950	15.0	34.2	36.2	39.0
33,950	82,250	25.0	53.9	57.7	61.4
82,250	171,550	28.0	59.4	62.7	67.6
171,550	372,950	33.0	67.9	71.7	77.4
372,950		35.0	71.2	75.2	81.1
Married Filing Jointly					
Individual Income Tax Brackets ($)		Statutory Individual Income Tax Rates (%)			
Over	But Not Over	BASE	FUBI + 0.0 EBI	FUBI + 0.1 EBI	FUBI + 0.2 EBI
0	16,700	10.0	23.5	24.8	26.7
16,700	67,900	15.0	34.2	36.2	39.0
67,900	137,050	25.0	53.9	57.7	61.4
137,050	208,850	28.0	59.4	62.7	67.6
208,850	372,950	33.0	67.9	71.7	77.4
372,950		35.0	71.2	75.2	81.1
Head of Household					
Individual Income Tax Brackets ($)		Statutory Individual Income Tax Rates (%)			
Over	But Not Over	BASE	FUBI + 0.0 EBI	FUBI + 0.1 EBI	FUBI + 0.2 EBI
0	11,950	10.0	23.5	24.8	26.7
11,950	45,500	15.0	34.2	36.2	39.0
45,500	117,450	25.0	53.9	57.7	61.4
117,450	190,200	28.0	59.4	62.7	67.6
190,200	372,950	33.0	67.9	71.7	77.4
372,950		35.0	71.2	75.2	81.1

Note. Author's calculations based on IRS public use file (IRS 2016), Current Population Survey (CPS 2016), and Consumer Expenditure Survey (CES 2016), all for 2009. Married Filing Separately omitted from analysis due to inability to identify households in common.

quintiles and average DPI increased for all quintiles but the highest in the first FUBI simulation (Table 2.7). However, both PI and DPI decreased relative to the first FUBI

Table 2.7

Personal Income ($), Tax Rates (%), and Tax Liability (%) by Quintile by Simulation, 2009

Simulation	Quintile	PI (Mean $)	DPI (Mean $)	PI (Share %)	DPI (Share %)	ATR (Mean %)	Tax Liability (Share %)
BASE	Lowest Quintile	12,226	13,327	3.6	4.4	0.2	0.1
	Second Quintile	25,980	26,576	7.7	8.7	5.1	2.7
	Middle Quintile	41,736	40,730	12.3	13.3	9.6	7.7
	Fourth Quintile	67,860	63,531	20.1	20.8	13.9	18.0
	Highest Quintile	190,517	161,291	56.3	52.8	19.6	71.5
	All Quintiles	67,663	61,090	100.0	100.0	9.7	100.0
FUBI + 0.0 EBI	Lowest Quintile	23,224	21,746	5.3	7.2	5.9	1.1
	Second Quintile	39,635	35,080	9.1	11.6	11.4	3.4
	Middle Quintile	58,304	48,402	13.4	16.0	16.8	7.4
	Fourth Quintile	89,778	68,634	20.6	22.7	23.3	15.8
	Highest Quintile	225,349	128,499	51.7	42.5	36.4	72.3
	All Quintiles	87,257	60,472	100.0	100.0	18.7	100.0
FUBI + 0.1 EBI	Lowest Quintile	23,178	21,622	5.4	7.4	6.2	1.2
	Second Quintile	39,452	34,649	9.3	11.9	12.0	3.6
	Middle Quintile	57,686	47,493	13.6	16.3	17.5	7.6
	Fourth Quintile	88,376	66,831	20.8	23.0	24.1	16.1
	Highest Quintile	216,651	120,609	50.9	41.4	37.6	71.6
	All Quintiles	85,067	58,240	100.0	100.0	19.5	100.0
FUBI + 0.2 EBI	Lowest Quintile	23,092	21,426	5.6	7.7	6.7	1.2
	Second Quintile	39,134	33,991	9.5	12.3	13.0	3.8
	Middle Quintile	56,755	46,221	13.8	16.7	18.4	7.9
	Fourth Quintile	86,331	64,361	21.0	23.3	25.2	16.4
	Highest Quintile	205,140	110,513	50.0	40.0	39.1	70.6
	All Quintiles	82,089	55,302	100.0	100.0	20.2	100.0

Note. Quintiles refer to household personal income. Author's calculations based on IRS public use file (IRS 2016), Current Population Survey (CPS 2016), and Consumer Expenditure Survey (CES 2016), all for 2009. Only households with positive personal incomes from the BASE scenario are included.

simulation for each subsequent simulation.

The share of PI, DPI, and tax liability for all quintiles but the highest continued to increase with each subsequent simulation as well. Both average PI and DPI increased in all quintiles for all FUBI simulations relative to the base simulation. The Gini index for both PI and DPI continued to decrease for each subsequent FUBI simulation, but this is primarily due to the increasing progressivity of the federal individual income tax system used to offset the increasing EBI (Table 2.8).

Table 2.8

Inequality (Gini Index) by Income Type by Simulation, 2009

Measure	BASE	FUBI + 0.0 EBI	FUBI + 0.1 EBI	FUBI + 0.2 EBI
Personal Income	0.52	0.46	0.45	0.44
Disposable Personal Income	0.48	0.36	0.35	0.33

Note. Author's calculations based on IRS public use file (IRS 2016), Current Population Survey (CPS 2016), and Consumer Expenditure Survey (CES 2016), all for 2009. Only households with positive personal incomes from the BASE scenario are included.

Though the FUBI directly benefits all households, the accompanying updates to the US individual income tax system that replace redundant programs and increase the statutory individual income tax rates do not benefit all households. As a result, not all households receive net benefits from this program (Table 2.9), especially in the highest quintile where more than 50% of households are expected to receive net losses in each of the three FUBI simulations.

The estimated efficiency loss, measured by the change in taxable income due to inclusion the 0.1 EBI, was $310.4 billion. Furthermore, the estimated efficiency loss, measured by the change in taxable income due to inclusion the 0.2 EBI, was $732.7 billion. Thus, the efficiency loss more than doubled by an additional $422.3 billion when the EBI doubled from 0.1 to 0.2.

Besides affordability, the most recurrent criticism against UBI is that "unearned"

Table 2.9

Disposable Personal Income (DPI) "Non-Losers" (%) by Quintile by Simulation, 2009

Quintile	FUBI + 0.0 EBI	FUBI + 0.1 EBI	FUBI + 0.2 EBI
Lowest Quintile	83.6	83.3	82.9
Second Quintile	81.8	81.1	79.7
Middle Quintile	75.9	71.7	64.3
Fourth Quintile	62.1	56.4	51.0
Highest Quintile	33.7	25.4	17.3
All Quintiles	67.4	63.6	59.0

Note. Quintiles refer to household personal income. "Non-Losers" are households whose DPI did not decrease relative to the BASE scenario. Author's calculations based on IRS public use file (IRS 2016), Current Population Survey (CPS 2016), and Consumer Expenditure Survey (CES 2016), all for 2009. Only households with positive personal incomes from the BASE scenario are included.

income disincentivizes the supply of labor by beneficiaries, especially among those whose benefits represent a significant proportion of their total actual or prospective earnings. If the efficiency losses above of $310.4 billion (EBI of 0.1) and $732.7 billion (EBI of 0.2) fell entirely upon salaries and wages, then they would represent 5.4% and 12.8%, respectively, of total estimated salaries and wages in 2009 (Internal Revenue Service, p. 2, 2011).

These efficiency losses would then represent the value of labor income lost due to a reduction in labor hours (intensive margin) and/or labor participation (extensive margin). This also assumes that none of this burden fell on tax avoidance or tax evasion, though reducing the complexity of the individual income tax system could significantly reduce the potential of these latter two sources.

However, in each of the three FUBI simulations, it is still estimated that more than 50% of households in total are expected to receive a net benefit to DPI from the FUBI relative to the BASE simulation. In other words, despite the increase in average

tax rates, fewer households on average stand to lose from the FUBI relative to the status quo—in terms of DPI—for all scenarios in 2009.

2.5 Conclusions

A "full" Universal Basic Income (FUBI) with a value pegged to the federal poverty guidelines (FPGs) would be significantly more effective at reducing both income poverty—as it is measured in the United States (US)—and income inequality—as it is measured by the Gini Index—but with lower administrative/compliance costs relative to the income transfer programs it could replace in the US.

A FUBI could also reduce deadweight loss because household behavior would neither affect the level nor the availability of its benefits. However, the efficiency loss from fully funding a FUBI via the individual income tax system could offset these efficiency gains due to decreases in labor supply, increases in tax avoidance, and/or increases in tax evasion, especially for households in higher income quintiles.

This analysis does not include decreasing federal discretionary spending (e.g., defense spending), increasing the money supply (e.g., deficit spending), or creating new sources of federal revenues (e.g., a sovereign wealth fund) to mitigate the significant increase in individual income tax rates.

In addition, it is beyond the simulations in this model to determine the effects on personal spending, savings, investment, innovation, immigration, emigration, and employment in the US. Though these unmeasured responses could have implications for the financial feasibility of a FUBI, these results are only based on data from 2009, which overlapped the Great Recession (from December 2007 to June 2009).

Last, this model assumed zero transition costs from the historical federal mandatory programs, tax sources, tax expenditures, and tax rates to the counterfactual FUBI simulations. The costs of these fiscal transitions and the associated changes in long-term expectations of households could significantly impact the efficacy of the results in this chapter.

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3. Micro-Simulating a Universal Health Care and Basic Income System for the United States

3.1 Introduction

Health care is a basic need. Thus, a Universal Basic Income (UBI) cannot be considered "full"—sufficient to guarantee every individual's basic needs at the poverty line—if not every individual can afford medically necessary health care in addition to the rest of their basic needs.

Unlike other basic needs—such as food, clothing, shelter, and utilities—health care expenditures are often inconsistent across households of a given composition and are also often unpredictable for a given time or place. This implies it would be more efficient to provide an insurance policy rather than a lump-sum grant for the reimbursement of health care costs.

However, not every individual or household can afford the insurance premia or out-of-pocket costs associated with medically necessary health care. In the same way that a UBI could compensate the costs of non-medical basic needs, the public sector could also compensate the costs of medical basic needs via a national health insurance system.

This chapter presents the results from a static, behavioral, partial-equilibrium, micro-simulation model that analyzes household responses to changes in mandatory spending, sources of tax revenues, and tax expenditures. These changes include a single-payer Universal Health Care (UHC) system and a "full" Universal Basic Income (FUBI) paid to each individual within the United States (US) civilian non-institutionalized population.

Employer contributions to private health insurance, household contributions to private health insurance, and household medical out-of-pocket costs are replaced with a payroll tax on employers. Also, each individual adult receives an income equal to the value of the US federal poverty guideline for the first household member and each individual minor receives an income equal to the value of the US federal poverty guideline for each additional household member.

The dataset is a merger of the Consumer Expenditure Survey (CES), the Current Population Survey Annual Social and Economic Supplement (CPS-ASEC), and the Internal Revenue Service Public Use Tax File (IRS-PUTF) for 2009. The year 2009 was primarily chosen due to its availability made by the Suffolk Department of Economics.

Section 2 describes the existing health care system and the potential benefits of a single-payer UHC; section 3 specifies the micro-simulation model and associated assumptions; section 4 describes the data sources, the method for synthesizing households, and sample weights; section 5 summarizes the results of the micro-simulation model and sensitivity analyses; and section 6 compares the results of this chapter with the previous chapter.

3.2 Health Care in the United States

"The U.S. health system is a mix of public and private, for-profit and nonprofit insurers and health care providers" (The Commonwealth Fund, 2020, p. 211). Public health insurance includes such federal programs as Medicare, Medicaid, and the Civilian Health and Medical Program of the Department of Veterans Affairs (CHAMPVA); the Children's Health Insurance Program (CHIP); and individual state health plans. Private

health insurance is a plan provided through an employer or a union or purchased by an individual from a private company.

In 2009, 194.5 million individuals (63.9 percent) were covered by private health insurance, 93.2 million individuals (30.6 percent) were covered by government health insurance, and 50.7 million individuals (16.7 percent) were not covered by any health insurance (U.S. Census Bureau, 2010, p. 71). This also means that 11.0% of individuals were covered by both private and public health insurance. Though non-coverage may not have been due to affordability for some individuals, there were both insured and uninsured individuals—including those not qualified as impoverished—who did not receive needed health care due to costs.

Of individuals 18–64 years of age in 2009, 37% of those who were uninsured did not receive, or delayed, needed medical care in the past 12 months due to cost, compared with 9% of adults with private coverage and 14% of adults with Medicaid; 19%–21% in families with income below 200% of the poverty line did not receive needed prescription drugs due to cost in the past 12 months , compared with 12% of those with a family income at 200%–399% of the poverty line, and 4% of those with a family income 400% of the poverty line or higher; and 28% with any basic actions difficulty or complex activity limitation reported they did not receive needed dental care due to cost in the past 12 months, compared with 13% of adults with no disability (National Center for Health Statistics, 2010, p. 7).

In other words, many individuals and households—regardless of their poverty status—were unable to fulfil their basic need for health care in 2009. According to the World Health Organization (WHO), this also meant that the United States did not have

Universal Health Care (UHC). The WHO defines UHC as when all individuals and communities receive the health care they need, without suffering financial hardship (2021).

A prominent solution for this problem in the United States is a single-payer health care system—also known as "Medicare for All" (M4A)—by extending Medicare benefit plans to all individuals and paying the insurance premiums out of tax revenues. In theory, a single-payer health care system is a type of UHC financed by a single source (e.g., the federal government) and delivered by any number of sources (i.e., public and/or private sectors). In practice, a single-payer health care system is financed by the public sector within a hybrid of subnational systems characterized by population group, category of service, and/or jurisdiction (Tuohy, 2009, pp. 491-492). This "practical" definition allows for the continuation of other public health insurance programs, such as Medicaid, to reimburse those who cannot afford the out-of-pocket costs.

To clarify, a single-payer health care system is not defined by comprehensive coverage or little-to-no cost sharing (Liu, 2016, p. 41) but it does not compete with private insurers for the same coverage (Tuohy, 2009, p. 491). Comprehensive coverage here means that the insurance policy is neither supplemental nor a limited-benefit. However, most M4A proposals offer comprehensive coverage, little-to-no cost sharing, and allow for private supplemental/limited-benefit policies for services that are not covered.

In addition to providing UHC coverage and mitigating out-of-pocket costs for related households, proponents claim that M4A will reduce National Health Expenditures (NHEs) via administrative efficiencies, increased purchasing power, and budgetary

control by the public sector (Liu, 2016, p. 5). M4A will also mitigate the effects of adverse selection—when individuals opt out of coverage due to costs, creating even higher costs for those who opt in—and job lock—when individuals are "locked" into a job because the alternatives provide lesser health care coverage.

Opponents of M4A claim that it will constrain the supply of health care services, diminish innovation, and have further consequences due to ineffective cost control strategies (Liu, 2016, p. 5). Also, it will be necessary for the public sector to increase its revenues to compensate for the reduction in private sector expenditures and it could exacerbate the effects of moral hazard—when individuals engage in riskier behaviors because they know that reimbursement can still be expected.

The literature already contains several M4A simulations modeling these assumptions and parameters above. The effects on NHEs ranged from 19 percent in savings when the supply of health care is constant in the short-term (Friedman, 2013, p. 1) to 18 percent in additional costs when the supply of health care is in the long-term equilibrium (Blumberg et al., 2019, p. 37).

Though each of these M4A proposals are unique regarding the scope of coverage and the weights of the associated costs, any of them would provide for a higher minimum standard of health care in the US. However, these analyses focus on the total costs and savings associated with a single-payer UHC and not effects on poverty or inequality because of accompanying income transfers.

In this analysis, I simulate the effects on household income and poverty from a single-payer UHC system with a UBI sufficient to guarantee every individual's basic

needs. I assume that the supply of health care is constant in the short-term but there is no effect on total NHEs.

3.3 Model and Assumptions

3.3.1 Micro-Simulation Model

"Income tax… and cash transfer payments (benefits) are reverse sides of the same coin, the former garnering from income, and the latter transferring it" (Miller, 2017, p. 168). To finance a single-payer UHC system in addition to a FUBI (UHC+FUBI), I reinstated payroll taxes on employers and disproportionally increased the federal individual income tax rates for the existing brackets to compensate for the remaining tax revenue deficit.

I used the tax calculator model from Haughton et al. (2017) to compute the tax revenue collected under the proposed tax structures. In this model, the calculation of individual income tax revenue follows the format of the IRS 1040 forms and the accompanying schedules for which the IRS provided data. For each household in the dataset, I first estimated taxable income under the 2009 law and then applied the 2009 tax rate schedule (the "BASE" simulation). Next, I did the same calculations with the program I have built in Stata using the proposed tax rules and rates. By comparing the BASE simulation with the UHC+FUBI simulation, I measured the overall effect on revenue, and the distributional effects.

I am not only interested in which households bear the actual burden of federal individual income taxes (effective incidence); I am also interested in which households stand to gain from the changes in both the income tax code and receipt of UHC+FUBI. I make assumptions like those made by Haughton et al. (2017), but with some

modifications. The following are my assumptions about the incidence of the primary federal taxes:

1. Federal individual income tax: The burden of this tax is assumed to fall on the income earner and the tax calculator model computes the amount of this tax directly.
2. Federal Insurance Contributions Act (FICA) payroll taxes: In 2009, employee gross wages were taxed at 6.2% for Social Security, up to $106,800, and at 1.45% for Medicare taxes, with no limit. Employers matched these percentages for a total of 15.3% on the first $106,800 of gross wages and a total of 2.9% gross wages thereafter. The self-employed paid the total as though they were both the employer and employee. In allocating this tax, I separated the employer and household contributions because household contributions are subtracted in the BASE simulation when measuring poverty based on net income. In the UHC+FUBI simulation, employers are taxed the full 15.3%, contributions are income tax-exempt, and there is no wage base of $106,800.
3. Existing income transfers: Mandatory programs and tax expenditures each decrease in their respective benefits as household income increases. Due to the lack of data, I did not include these phaseouts in the Effective Marginal Tax Rates (EMTRs) for the BASE simulation. This omission could significantly overestimate the difference between the average EMTRs in the BASE simulation vs. the FUBI simulation, particularly for relatively lower income households, as they were repealed in the latter simulation.

4. New income transfers: Increased individual and payroll tax revenues replace the household contributions to employer-sponsored health insurance premiums, contributions to direct purchase insurance, and out-of-pocket health expenditures. Private business contributions to employer-sponsored private health insurance premiums are assumed to be redistributed to employees as labor income. The FUBI is a non-taxable, garnish-exempt, lump-sum transfer, paid directly in cash to all households on a recurring basis throughout the tax year. Since the value of the FUBI paid to each individual is unaffected by household behavior and does not affect relative prices, I assume that it did not affect household composition, income, or expenditures.

3.3.2 Mandatory Programs

"It is generally accepted that a 'full' UBI must be large enough to meet an individual's basic needs" (Widerquist & Sheahen, 2012, p. 12). Assuming that the economic cost of these basic needs is consistent across households of a given composition – and at a given time and geographic location - the value of this "basket" of commodities can be interpreted as a poverty threshold. The US has an income-based, absolute, official poverty measure (OPM).

However, the OPM thresholds are not used to determine the financial eligibility for most federal programs for a given year, because the thresholds are not calculated until September or October of the following year (Besharov & Germanis, 2004, p. 5). The same limitation applies to the Supplemental Poverty Measure (SPM), which is both expenditure-based and relative (Interagency Technical Working Group, 2010, p. 3). In addition, the official poverty thresholds are the same across the nation, although

significant price variations across geographic areas exist for such needs as housing (Citro et al., 1995, p. 2).

To determine income eligibility for most federal programs, the US Department of Health and Human Services publishes a simplified variation of the poverty thresholds called the "federal poverty guidelines" (FPGs). The FPGs are calculated for a family of four and then a fixed amount per person is added or subtracted to adjust for family size. To accommodate inflation, the FPGs reflect price changes through the preceding year (Besharov & Germanis, 2004, p.5).

In 2009, the poverty guideline was $10,830 for a 1-person family and $3,740 for each additional person in the family (Leavitt, 2009). Given that a UBI benefits individuals directly, without regard to their respective household sizes, it would be necessary to pay each household member the same value. Though benefits for minors would also be necessary under a FUBI, they could be at a reduced level (Parijs & Vanderborght, 2017, p. 9). Thus, it would be consistent to pay each adult $10,830 and each minor $3,740.

Separate poverty guideline figures are available for Alaska and Hawaii, but the 48 Contiguous States and the District of Columbia share the same FPGs (Leavitt, 2009). However, the Bureau of Economic Analysis (BEA) annually estimates the regional price parities (RPPs) for the US, which I used to instead to compare relative price levels among each of the fifty United States and the District of Columbia (Aten & D'Souza, 2008, p. 64). These RPP's are expressed relative to the national average and are set at 100 for each year. By the end of 2008, the most recent state and metropolitan RPPs available were from 2006.

The redundant cash-benefit programs I repealed were Old-Age, Survivors, and Disability Insurance (OASDI) payments of $675.5 billion (Board of Trustees, Federal Old-Age and Survivors Insurance and Federal Disability Insurance, 2010, p. 29); Supplemental Security Income (SSI) of $42.6 billion (Social Security Administration, 2011, p. 3); Unemployment Trust Fund (Unemployment Insurance, Extended Benefits, and Emergency Unemployment Compensation) of $117.3 billion (Office of Management and Budget, 2011, p. 427); Supplemental Nutritional Assistance Program (SNAP) of $53.6 billion (Food and Nutrition Service, 2021a); Low Income Home Energy Assistance Program (LIHEAP) Funding Distributed of $5.1 billion (Congressional Research Service, 2018, p. 6); tenant-based vouchers (Section 8) of $16.2 billion (Congressional Research Service, 2019, p. 12); and National School Lunch Program (NSLP) subsidies of approximately $9 billion (Congressional Budget Office, 2015, p. 38) in 2009.

Given that some households were receiving higher benefits from Social Security, for which they had contributed for many years, those households would receive an equally higher FUBI. The Railroad Retirement transfer of $4.1 billion (Board of Trustees, Federal Old-Age and Survivors Insurance and Federal Disability Insurance, 2010, p. 29) would also be retained to maintain the Railroad Retirement program.

Additionally, the Women, Infants and Children (WIC) program costs of $6.5 Billion (Food and Nutrition Service, 2021b) would be retained as the household payment data was not directly available and it benefits pregnant women who are only counted as individuals for UBI benefits. The Temporary Assistance for Needy Families (TANF) total federal funds available of $18.6 billion would also be retained—cash assistance was

only 29.7% of Federal TANF Grants in 2009—which would probably be transferred to non-cash benefit programs in the event of a FUBI (Office of Family Assistance, 2010).

Lastly, the Old-Age, Survivors, and Disability Insurance (OASDI) administrative expenses of $6.2 billion (Board of Trustees, Federal Old-Age and Survivors Insurance and Federal Disability Insurance, 2010, p. 29) were retained as a proxy for the UBI administrative expenses.

3.3.3 Tax Sources

In 2009, Social Security and Medicare payroll taxes were 12.4% and 2.9%, respectively, of wages and tips after exempting the employee's contribution to the cost of employer-sponsored health coverage. Employers and employees split the tax rates (7.65% each), but self-employed workers paid the full tax rate (15.3%). Furthermore, the wage base limit for Social Security taxes was $106,800 in 2009. This limit made FICA taxes regressive on wage-based income and income in general if non-wage income was a larger proportion of total income for higher income households. Removing the wage base limit would increase revenues from FICA taxes but UHC may still require supplemental funds from general revenues. This could have the additional benefit of making UHC funding more sustainable, but that is not a target of analysis in this chapter.

However, this update removes OASDI payroll taxes of $667.3 billion (Board of Trustees, Federal Old-Age and Survivors Insurance and Federal Disability Insurance, 2010, p. 29); Medicare payroll taxes of $190.9 billion; and taxation of Medicare benefits of $12.4 billion (Board of Trustees, Federal Hospital Insurance and Federal Supplementary Medical Insurance Trust Funds, 2010, p. 10) in 2009. Thus, it would be necessary to source additional revenue for the $203.3 billion of Medicare funding.

Though the FUBI would replace UI benefits, the UI payroll taxes are experience-rated to encourage employers to retain their employees by making layoffs more costly. For this reason, this source of revenue is not replaced in this model. The Unemployment Trust Fund (UTF) is primarily financed by payroll taxes levied against individual employers. In 2009, the UTF had government receipts of $37.9 billion, interest receipts from Federal funds of $2.7 billion, and other receipts from Federal funds of $18.1 billion (Office of Management and Budget, 2011, p. 427). These funds could be added to general revenues or earmarked for UBI benefits.

3.3.4 Tax Expenditures

Tax expenditures are defined in the law as "revenue losses attributable to provisions of the Federal tax laws which allow a special exclusion, exemption, or deduction from gross income or which provide a special credit, a preferential rate of tax, or a deferral of tax liability" (Congressional Budget and Impoundment Control Act of 1974, H.R. 7130, 93rd Cong., 1974, p. 299). The UBI literature includes suggestions for closing tax loopholes as an acceptable means of generating incremental revenues for financing higher UBI benefits (Miller, 2017, p. 173).

Exclusions, exemptions, deductions, and preferential rates are also relatively more beneficial to individuals in higher tax rate brackets and credits are relatively more beneficial to individuals in lower tax rate brackets. Thus, removing the former and replacing the latter with a FUBI could significantly increase both the progressivity and revenue potential of the individual tax system. In addition, reducing the complexity of the individual income tax system could significantly reduce both the associated administrative and compliance costs (Marcuss et al., 2013, p. 850).

In 2009, the individual income tax returns reported total statutory adjustments of $113.0 billion, total exemptions of $1,029.1 billion, and total deductions of $1,951.6 billion (Internal Revenue Service, p. 4, 2011). Furthermore, the exclusion of employer contributions for health care, health insurance premiums, and long-term care insurance premiums reduced tax revenues by $94.4 billion and the exclusion of pension contributions reduced tax revenues from defined benefit plans by $38.4 billion, defined contribution plans by $32.6 billion, and Keogh plans by $9.2 billion (Joint Committee on Taxation, 2010).

In 2009, individual income tax returns reported a total of $73.6 billion in tax-exempt interest, such as from municipal bonds (Internal Revenue Service, p. 2, 2011). This exemption is not just an indirect subsidy for individuals but also for state and local governments. Given that these bonds are for financing non-business activities and their interest rates are lower than private bond interest rates, their interest payments are still exempt in this tax model.

3.4 Data and Calibration

Per Haughton et al. (2017), Internal Revenue Service (IRS) Individual Public-Use Micro-Data (PUMD) files on individual federal income tax returns for 2009 was the central component of my household database. This file has records on 217 variables for 152,526 tax filers. The IRS uses “top-coding” to set a ceiling on the reported values of many of the variables to mask the identity of taxpayers, but this reduces the precision of simulations based on these data. The file also oversampled high-income tax filers intentionally due to their relative uniqueness but provided weights that allowed me to adjust for this over-sampling.

Consistent with the Congressional Budget Office's analysis of the distribution of household income and federal taxes, I used households as the unit of analysis.

> A household consists of the people who share a housing unit, regardless of their relationships. The presumption is that households make joint economic decisions, although that may not be true in every case (in a group house, for example). Households may comprise more than one taxpaying unit, such as a married couple and their adult children living together. (2012, p. 22)

Some of these tax filers represented subunits of households, which is not the unit of interest here when looking at income distribution. Like Haughton et al. (2017), I excluded the 5,541 cases of tax returns filed by dependents (typically children) and dropped the 3,039 cases of married couples filing separately because I cannot associate these returns with those of their partners, which would be needed to create household-level variables. 143,948 tax returns remained to be taken to represent households, and I adjusted the sample weights to reflect these changes.

The IRS dataset contains information on sources of income and on the direct taxes paid by individuals who filed their federal individual income taxes in 2009. However, it did not include any information on non-filers, which was a not insignificant subgroup of the population. Per Haughton et al. (2017), I used the Current Population Survey (CPS) for 2009 to fill this gap, from which I extracted records of households that did not file a federal tax return in 2009. By inserting 11,480 non-filers from the CPS, I created a new dataset with 155,428 observations.

Tax non-filers are those whose total income for the year does not exceed certain thresholds and choose not to file. However, some of these non-filers may have large

amounts of non-taxable income such as tax-exempt disbursements from bonds and/or retirement plans. Per Haughton et al. (2017), I merged the IRS and CPS datasets since the datasets have several variables in common. The IRS and CPS datasets were similarly weighted, and I adjusted the weights for the merged dataset appropriately.

The merged IRS/CPS dataset is still not sufficient for two reasons. First, neither dataset includes information on payroll deductions, such as contributions to private pensions and health insurance premiums. Second, neither dataset includes household geographic identifiers for all 50 states in the US, which is necessary for determining RPPs.

To fill these remaining gaps, I merged the 2009 Consumer Expenditure Survey (CES), which has this information, with the already merged IRS/CPS dataset. However, the households sampled in the CES were not the same as those in either the IRS or CPS datasets. Per Haughton et al. (2017), I used a matching procedure that assigned observations on spending from the CES to each observation in the merged IRS/CPS dataset.

First, I created a measure of household total income with variables represented in both the CES and IRS/CPS files and allocated this income to one of 10 income tiers. Next, I cross-tabulated this with information on whether a household received income from interest, income from social security, income from both sources, or income from neither source. I combined the 10 income tiers with the 4 income source groups to create 40 distinct cells for categorizing households. All households in the CES and IRS/CPS datasets were then each assigned to one of these 40 cells within their respective dataset.

Second, for each household in the merged IRS/CPS dataset, I randomly chose a household from the corresponding cell in the CES dataset and merged the data from the respective CES variables into the merged IRS/CPS household. The resulting merged dataset of IRS, CPS, and CES households and variables has detailed information on federal individual income tax filings, employer contributions, in-kind benefits, and imputed expenditures. It also has limited demographic information on household composition and geographic identification, which could be used for aggregating household income at state and federal levels.

Third, I calibrated the weights for the dataset such that the population of adults and minors would match the CPS for comparison purposes. "The universe is the civilian noninstitutional population of the United States living in housing units and members of the Armed Forces living in civilian housing units on a military base or in a household not on a military base" (United States Census Bureau, 2009, p. 1-1). The Census Bureau uses the Annual Social and Economic Supplement (ASEC) of the Current Population Survey (CPS) in March to estimate poverty statistics for the previous. In March of 2010, there were estimated totals of 304.280 million individuals, 229.240 million adults, and 75.040 million minors in this population (United States Census Bureau, 2010, p. 23).

Last, I calibrated the values associated with the amounts paid during the reference period for non-Medicare health insurance premiums, payments for medical expenses, and reimbursements for medical expenses from the CES dataset. This was necessary to match the values associated with the NHEs for accurately measuring both the costs and benefits to households due to UHC. It was not necessary to perform the same calibration to the values associated with the amounts paid during the reference period for Medicare

health insurance premiums from the CES dataset or the employer contributions for health insurance, person market value of Medicaid, or the person market value of Medicare from the CPS dataset.

3.5 Simulations and Results

3.5.1 Program Costs and Poverty Rates

Funding the UHC requires an additional $937.2 billion in tax revenues from replacing the household contributions to employer-sponsored health insurance premiums ($210.4 billion), contributions to direct purchase insurance ($38.3 billion), and out-of-pocket health expenditures ($296.5 billion). Though private business contributions to employer-sponsored private health insurance premiums ($392.0 billion) are assumed to be redistributed to employees as labor income, this additional income is also subject to the 15.3% employer payroll tax.

Before adjusting for state RPPs, a national FUBI for all civilian noninstitutional population of the United States in 2009 would cost $2,763,318 million (229.240 million adults x $10,830 per adult + 75.040 million minors x $3,740 per minor). After allowing for state RPPs and including a "top-off" to prevent FUBI benefits from falling below Social Security benefits, this cost increases to $2,904,420 million. Though cost is significantly larger than the combined value of the mandatory programs and tax expenditure, my main concern is whether it is sufficient to reduce and potentially eliminate income poverty in the United States for 2009.

I calculated the United States Census Bureau's separate measures of "cash income" utilized for the OPM (2020) and the SPM (Interagency Technical Working Group, 2010). I further calibrated the SPM based on homeownership and metro vs.

nonmetro location for each of the fifty United States and the District of Columbia (Renwick, 2011). In addition to the accompanying updates to the US individual income tax system that replace redundant programs and increase the statutory individual income tax rates, UHC+FUBI could reduce the OPM (pre-tax) by 13.0 percentage points to 1.5% and reduce the SPM (post-tax) by 14.5 percentage points to 0.8% (Table 3.1). The SPM is higher than the OPM in the BASE scenario but lower in the FUBI scenario because the FUBI cannot be garnished (by definition), which means that negative cash income is treated as "0" income before adding the FUBI and calculating the SPM.

Table 3.1

Official and Supplemental Poverty Measures, 2009

Measure	BASE (%)	FUBI (%)	Change
Official Poverty Measure - All	14.5	1.5	-13.0
Official Poverty Measure - Minors	21.2	0.8	-20.4
Official Poverty Measure - Deep	6.4	0.0	-6.4
Supplemental Poverty Measure - All	15.3	0.8	-14.5
Supplemental Poverty Measure - Minors	17.3	0.8	-16.5
Supplemental Poverty Measure - Deep	5.1	0.0	-5.1

Note. Measures refer to household cash income, as defined by the United States Census Bureau. Author's calculations based on IRS public use file (IRS 2016), Current Population Survey (CPS 2016), and Consumer Expenditure Survey (CES 2016), all for 2009.

Poverty could still exist by both measures because both the FPG's and RPP's were estimated based on a previous year's data while both the OPM and SPM were estimated based on the year-in-question's data. Also, the OPM does not account for RPP's, which could overstate poverty in lower RPP areas. In 2009, this discrepancy was small enough that deep poverty (50% of the respective poverty threshold) was effectively reduced to 0 by both measures but to do the same for all or minors would require a larger

FUBI value and/or better inflation forecasting when imputing the current FPGs from previous OPMs.

3.5.2 Average Tax Rates

The UHC+FUBI simulation requires a significant increase in the statutory individual income tax rates for each taxable income bracket. This increase is necessary to compensate for the net increase in federal spending from both the UHC and the FUBI. This increase also results in higher average tax rates (ATR) for all income quintiles (Table 3.2).

Table 3.2

Average Tax Rates (ATR) and Tax Liability by Income Group, 2009

	BASE		FUBI	
Quintile	ATR (Mean %)	Tax Liability (Share %)	ATR (Mean %)	Tax Liability (Share %)
Lowest Quintile	0.2	0.1	7.0	1.3
Second Quintile	5.1	2.7	15.6	4.6
Middle Quintile	9.6	7.7	20.1	8.8
Fourth Quintile	13.9	18.0	25.9	16.5
Highest Quintile	19.6	71.5	40.4	68.8
All Quintiles	9.7	100.0	21.9	100.0

Note. Author's calculations based on IRS public use file (IRS 2016), Current Population Survey (CPS 2016), and Consumer Expenditure Survey (CES 2016), all for 2009. Only households with positive personal incomes from the BASE scenario are included.

Repealing individual income tax adjustments, deductions, exemptions, and credits results in the share of tax liability increasing for the bottom income quintile. This is primarily the result of reducing the total number of net-beneficiary and non-filer households in the FUBI simulation.

3.5.3 Personal Income

To measure the distributional effects of UHC+FUBI and the associated tax changes, I used personal income (PI). The Bureau of Economic Analysis (BEA) defines PI as the

"income that persons receive in return for their provision of labor, land, and capital used in current production, plus current transfer receipts less contributions for government social insurance (domestic)" (2020, p. 26). PI is a pre-tax aggregate measure reported by the BEA in the United States National Income and Product Accounts.

This measure of income includes wages, salaries, employer contributions for employee pension, employer contributions for employee insurance, farm proprietor's income, non-farm proprietor's income, rental income, personal interest income, personal dividend income, government social benefits paid to persons, and other transfer receipts from business. Unrealized capital gains are not included and personal contributions for government social insurance (FICA) are subtracted from this income.

I assumed the value of the UHC per individual equal to the average Personal Health Care (PHC) expenditures—total NHEs minus investments, administrative costs, and government public health activities—per capita of $6,884 and included this value in PI for the UHC+FUBI simulations (Centers for Medicare & Medicaid Services, 2021).

The average PI increases for all quintiles with the inclusion of UHC+FUBI, despite the replacement of mandatory programs (income transfers) that were included in the base simulation (Table 3.3). Given that all individuals receive the same FUBI with respect to household size and age of members, the relative benefit to personal income would be highest for relatively lower income households, which matches the results for the share of PI by quintile.

The BEA also measures disposable personal income (DPI), which is defined as personal income minus federal, state, and local taxes. DPI is of interest for national accounting because it measures the income available to persons for spending or saving

Table 3.3

Personal Income (PI) and Inequality by Income Group, 2009

	BASE		FUBI	
Quintile	PI (Mean $)	PI (Share %)	PI (Mean $)	PI (Share %)
Lowest Quintile	12,226	3.6	25,832	5.7
Second Quintile	25,980	7.7	44,551	9.8
Middle Quintile	41,736	12.3	65,095	14.3
Fourth Quintile	67,860	20.1	96,380	21.2
Highest Quintile	190,517	56.3	221,960	48.9
All Quintiles	67,663	100.0	90,761	100.0
Gini Index	0.52		0.43	

Note. Quintiles refer to household personal income. Author's calculations based on IRS public use file (IRS 2016), Current Population Survey (CPS 2016), and Consumer Expenditure Survey (CES 2016), all for 2009. Only households with positive personal incomes from the BASE scenario are included.

(Bureau of Economic Analysis, 2020, p. 9). DPI is of interest for my analysis because it measures the income available to persons for satisfying their basic needs.

The average DPI increases for the first four income quintiles and decreases significantly for the highest quintile (Table 3.4). This means that for the highest quintile, the average increase in individual income tax liability outweighs the average benefit from UHC+FUBI. The highest quintile is also the only quintile whose share of DPI decreases in the UHC+FUBI simulation. The average DPI increases for all quintiles because the average PHC expenditure per capita of $6,884 is added to PI for each individual within a household in the UHC+FUBI simulation.

3.5.4 Sensitivity Analysis

The results of the UHC+FUBI simulation above implicitly assumed that income and spending behavior by households do not respond to changes in taxation and spending behavior by the federal government. However, households do respond to these changes,

Table 3.4

Disposable Personal Income (DPI) and Inequality by Income Group, 2009

	BASE		FUBI	
Quintile	DPI (Mean $)	DPI (Share %)	DPI (Mean $)	DPI (Share %)
Lowest Quintile	13,327	4.4	24,432	7.5
Second Quintile	26,576	8.7	39,386	12.2
Middle Quintile	40,730	13.3	54,667	16.9
Fourth Quintile	63,531	20.8	76,357	23.6
Highest Quintile	161,291	52.8	128,908	39.8
All Quintiles	61,090	100.0	64,748	100.0
Gini Index	0.48		0.33	

Note. Quintiles refer to household personal income. Author's calculations based on IRS public use file (IRS 2016), Current Population Survey (CPS 2016), and Consumer Expenditure Survey (CES 2016), all for 2009. Only households with positive personal incomes from the BASE scenario are included.

which means that a behavioral response must be included in the simulation to test the robustness of the results.

The elasticity of taxable income (ETI) is the ratio of the percentage change in taxable income to the percentage change in the net-of-tax rate (one minus the marginal tax rate). This single measure represents household adjustments—such as changing the supply of labor, shifting income between sources taxes at different rates, and/or evading taxes through non-declaration of income—in response to changes in income taxation (Creedy, 2009, p. 1).

Though ETI measures relevant behavioral responses, the literature has found that the ETI increases with income, which reduces the robustness of its application as a single elasticity measure (Giertz, 2008, p.4). According to Doerrenberg et al., "the behavioral response is mainly due to (itemized) deductions which are relatively less likely to be third-party reported and which can be more easily adjusted by taxpayers" (2017, p. 42).

By extension, a single ETI applied to all levels of income would be overestimated for lower income households and underestimated for higher income households.

Alternatively, the elasticity of "broad" income (EBI) is the ratio of percentage change in "broad" income to the percentage change in the net-of-tax rate (one minus the marginal tax rate). "Broad" income is defined in the literature as total income (income before adjustments) minus capital gains and social security benefits. Capital gains are excluded because they are taxed at a different rate than the rest of income and Social Security benefits are excluded—for the same reason as adjustments—because its tax treatment has varied over time (Gruber & Saez, 2002, p. 30). In other words, "broad" income is income with consistent tax treatment over time.

Since the FUBI here includes repealing the most significant adjustments, deductions, and exemptions in the individual income tax code, the taxable income in this simulation is closer to the definition of “broad” income. Thus, I used an EBI—which is less biased by income level—from the literature referencing US data with a value of 0.1 (Kumar & Liang, 2020, p. 15) for a third simulation and doubled it to 0.2 for a fourth simulation to test the robustness of my results.

To apply the EBI, I first calculated the change in the net-of-tax rate of "broad" income". Second, I calculated the percentage change in "broad" income by multiplying the percentage change in the net-of-tax rate by the respective EBI. Last, I calculated the new level of "broad" income by multiplying "broad" income by one plus the percentage change in "broad" income.

Despite reducing taxable cash income by the EBI and the resulting increase in EMTR’s, neither the official nor supplemental poverty rates change significantly for both

of the new simulations (Table 3.5). This is primarily because the FUBI is nontaxable and lower-bracket households are relatively less impacted by changes in marginal tax rates.

Table 3.5

Official and Supplemental Poverty Rates (%) by Simulation, 2009

Measure	BASE	FUBI + 0.0 EBI	FUBI + 0.1 EBI	FUBI + 0.2 EBI
OPM - All	14.5	1.5	1.6	1.6
OPM - Minors	21.2	0.8	0.8	0.8
OPM - Deep	6.4	0.0	0.0	0.0
SPM - All	15.3	0.8	0.8	0.9
SPM - Minors	17.3	0.8	0.8	0.8
SPM - Deep	5.1	0.0	0.0	0.0

Note. Measures refer to household cash income, as defined by the United States Census Bureau. Author's calculations based on IRS public use file (IRS 2016), Current Population Survey (CPS 2016), and Consumer Expenditure Survey (CES 2016), all for 2009. Only households with positive personal incomes from the BASE scenario are included.

Statutory tax rates increased more between the second and third FUBI simulations than the first and second FUBI simulations (Table 3.6). Average PI increased for all quintiles and average DPI increased for all quintiles but the highest in the first FUBI simulation (Table 3.7). However, both PI and DPI decreased relative to the first FUBI simulation for each subsequent simulation.

The share of PI, DPI, and tax liability for all quintiles but the highest continued to increase with each subsequent simulation as well. Both average PI and DPI increased in all quintiles for all FUBI simulations relative to the base simulation. The Gini index for both PI and DPI also decreased for each subsequent FUBI simulation, but this is primarily due to the increasing progressivity of the federal individual income tax system used to offset the increasing EBI (Table 3.8).

Though the FUBI directly benefits all households, the accompanying updates to the US individual income tax system that replace redundant programs, remove the wage

Table 3.6

Statutory Individual Income Tax Rates (%) by Income Brackets ($) by Simulation, 2009

Single					
Individual Income Tax Brackets ($)		Statutory Individual Income Tax Rates (%)			
Over	But Not Over	BASE	FUBI + 0.0 EBI	FUBI + 0.1 EBI	FUBI + 0.2 EBI
0	8,350	10.0	25.2	27.5	31.6
8,350	33,950	15.0	36.8	40.1	46.2
33,950	82,250	25.0	57.9	63.3	72.8
82,250	171,550	28.0	63.8	69.6	80.1
171,550	372,950	33.0	73.0	79.7	91.6
372,950		35.0	76.5	83.5	96.0
Married Filing Jointly					
Individual Income Tax Brackets ($)		Statutory Individual Income Tax Rates (%)			
Over	But Not Over	BASE	FUBI + 0.0 EBI	FUBI + 0.1 EBI	FUBI + 0.2 EBI
0	16,700	10.0	25.2	27.5	31.6
16,700	67,900	15.0	36.8	40.1	46.2
67,900	137,050	25.0	57.9	63.3	72.8
137,050	208,850	28.0	63.8	69.6	80.1
208,850	372,950	33.0	73.0	79.7	91.6
372,950		35.0	76.5	83.5	96.0
Head of Household					
Individual Income Tax Brackets ($)		Statutory Individual Income Tax Rates (%)			
Over	But Not Over	BASE	FUBI + 0.0 EBI	FUBI + 0.1 EBI	FUBI + 0.2 EBI
0	11,950	10.0	25.2	27.5	31.6
11,950	45,500	15.0	36.8	40.1	46.2
45,500	117,450	25.0	57.9	63.3	72.8
117,450	190,200	28.0	63.8	69.6	80.1
190,200	372,950	33.0	73.0	79.7	91.6
372,950		35.0	76.5	83.5	96.0

Note. Author's calculations based on IRS public use file (IRS 2016), Current Population Survey (CPS 2016), and Consumer Expenditure Survey (CES 2016), all for 2009. Married Filing Separately omitted from analysis due to inability to identify households in common.

base from federal payroll taxes, and increase the statutory individual income tax rates do not benefit all households. As a result, not all households receive net benefits from this

Table 3.7

Personal Income ($), Tax Rates (%), and Tax Liability (%) by Quintile by Simulation, 2009

Simulation	Quintile	PI (Mean $)	DPI (Mean $)	PI (Share %)	DPI (Share %)	ATR (Mean %)	Tax Liability (Share %)
BASE	Lowest Quintile	12,226	13,327	3.6	4.4	0.2	0.1
	Second Quintile	25,980	26,576	7.7	8.7	5.1	2.7
	Middle Quintile	41,736	40,730	12.3	13.3	9.6	7.7
	Fourth Quintile	67,860	63,531	20.1	20.8	13.9	18.0
	Highest Quintile	190,517	161,291	56.3	52.8	19.5	71.5
	All Quintiles	67,663	61,090	100.0	100.0	9.7	100.0
FUBI + 0.0 EBI	Lowest Quintile	25,832	24,432	5.7	7.5	7.0	1.3
	Second Quintile	44,551	39,386	9.8	12.2	15.6	4.6
	Middle Quintile	65,095	54,667	14.3	16.9	20.1	8.8
	Fourth Quintile	96,380	76,357	21.2	23.6	25.9	16.5
	Highest Quintile	221,960	128,908	48.9	39.8	40.4	68.8
	All Quintiles	90,761	64,748	100.0	100.0	21.9	100.0
FUBI + 0.1 EBI	Lowest Quintile	25,705	24,177	5.8	7.8	7.5	1.4
	Second Quintile	44,096	38,556	10.0	12.5	16.4	4.8
	Middle Quintile	64,004	53,119	14.6	17.2	21.4	9.0
	Fourth Quintile	94,410	73,767	21.5	23.9	26.8	16.7
	Highest Quintile	211,627	118,424	48.1	38.4	41.8	68.1
	All Quintiles	87,967	61,608	100.0	100.0	22.8	100.0
FUBI + 0.2 EBI	Lowest Quintile	25,503	23,763	6.1	8.4	8.2	1.5
	Second Quintile	43,355	37,122	10.3	13.1	18.1	5.2
	Middle Quintile	62,315	50,669	14.9	17.8	22.9	9.3
	Fourth Quintile	91,393	69,649	21.8	24.5	28.4	17.0
	Highest Quintile	196,552	103,237	46.9	36.3	44.1	66.9
	All Quintiles	83,883	56,887	100.0	100.0	24.3	100.0

Note. Quintiles refer to household personal income. Author's calculations based on IRS public use file (IRS 2016), Current Population Survey (CPS 2016), and Consumer Expenditure Survey (CES 2016), all for 2009. Only households with positive personal incomes from the BASE scenario are included.

program (Table 3.9), especially in the highest quintile where more than 50% of households are expected to receive net losses in all three FUBI simulations.

Table 3.8

Inequality (Gini Index) by Income Type by Simulation, 2009

Measure	BASE	FUBI + 0.0 EBI	FUBI + 0.1 EBI	FUBI + 0.2 EBI
Personal Income	0.52	0.43	0.42	0.41
Disposable Personal Income	0.48	0.33	0.32	0.30

Note. Author's calculations based on IRS public use file (IRS 2016), Current Population Survey (CPS 2016), and Consumer Expenditure Survey (CES 2016), all for 2009. Only households with positive personal incomes from the BASE scenario are included.

Table 3.9

UHC+FUBI vs. BASE: Disposable Personal Income (DPI) "Non-Losers" (%) by Quintile by Simulation, 2009

Quintile	FUBI + 0.0 EBI	FUBI + 0.1 EBI	FUBI + 0.2 EBI
Lowest Quintile	64.3	64.1	63.5
Second Quintile	80.6	79.5	75.5
Middle Quintile	76.8	69.8	61.0
Fourth Quintile	68.2	65.3	60.1
Highest Quintile	43.7	36.7	29.6
All Quintiles	66.7	63.1	58.0

Note. Quintiles refer to household personal income. "Non-Losers" are households whose DPI did not decrease relative to the BASE scenario. Author's calculations based on IRS public use file (IRS 2016), Current Population Survey (CPS 2016), and Consumer Expenditure Survey (CES 2016), all for 2009. Only households with positive personal incomes from the BASE scenario are included.

The estimated efficiency loss, measured by the change in taxable income due to inclusion the 0.1 EBI, was $396.0 billion. Furthermore, the estimated efficiency loss, measured by the change in taxable income due to inclusion the 0.2 EBI, was $983.4 billion. Thus, the efficiency loss more than doubled by an additional $587.4 billion when the EBI doubled from 0.1 to 0.2.

Besides affordability, the most recurrent criticism against UBI is that "unearned" income disincentivizes the supply of labor by beneficiaries, especially among those whose benefits represent a significant proportion of their total actual or prospective earnings. If the efficiency losses above of $310.4 billion (EBI of 0.1) and $732.7 billion

(EBI of 0.2) fell entirely upon salaries and wages, then they would represent 6.9% and 17.2%, respectively, of total estimated salaries and wages in 2009 (Internal Revenue Service, p. 2, 2011).

These efficiency losses would then represent the value of labor income lost due to a reduction in labor hours (intensive margin) and/or labor participation (extensive margin). This also assumes that none of this burden fell on tax avoidance or tax evasion, though reducing the complexity of the individual income tax system could significantly reduce the potential of these latter two sources.

However, in each of the three FUBI simulations, it is still estimated that more than 50% of households in total are expected to receive a net benefit to DPI from the FUBI relative to the BASE simulation. In other words, despite the increase in average tax rates, fewer households on average stand to lose from the UHC+FUBI relative to the status quo for all scenarios in 2009.

3.6 Comparative Statics

Since the respective values of the UHC and the FUBI are fixed per individual, the estimated value of the UHC+FUBI is also necessarily greater than the FUBI alone for a given individual. However, the additional benefit of the UHC requires a necessarily greater cost than the FUBI alone to maintain the same level of NHEs and a balanced federal budget. Like the comparisons between the UHC+FUBI scenarios and the BASE scenario, it would be expected that not all households receive net benefits from the UHC+FUBI program relative to the FUBI only program.

Also like the comparisons between the UHC+FUBI scenarios and the BASE scenario, it is estimated that more than 50% of households are expected to receive a DPI

from the UHC+FUBI simulations that is greater than or equal to a DPI from the respective FUBI only simulation (Table 3.10). In other words, despite the increase in average tax rates necessary to fund the UHC+FUBI relative to the FUBI alone, fewer households on average stand to lose from the UHC+FUBI relative to the FUBI alone for all scenarios in 2009.

Table 3.10

UHC+FUBI vs. FUBI only: Disposable Personal Income (DPI) "Non-Losers" (%) by Quintile by Simulation, 2009

Quintile	FUBI + 0.0 EBI	FUBI + 0.1 EBI	FUBI + 0.2 EBI
Lowest Quintile	54.6	54.6	54.1
Second Quintile	74.9	72.4	66.3
Middle Quintile	74.3	70.0	63.7
Fourth Quintile	73.2	70.9	64.7
Highest Quintile	54.8	49.3	41.2
All Quintiles	66.4	63.4	58.0

Note. Quintiles refer to household personal income. "Non-Losers" are households whose DPI did not decrease. Author's calculations based on IRS public use file (IRS 2016), Current Population Survey (CPS 2016), and Consumer Expenditure Survey (CES 2016), all for 2009. Only households with positive personal incomes from the BASE scenario are included.

3.7 Conclusions

A single-payer Universal Health Care (UHC) system combined with a "full" Universal Basic Income (FUBI) could be significantly more effective for guaranteeing the fulfillment of household basic needs relative to the health care system and income transfer programs it could replace in the United States (US). A FUBI alone—with a value pegged to the federal poverty guidelines—could be significantly effective at reducing income poverty—as it is measured in the US. However, it would not be sufficient to guarantee that all households—regardless of their poverty status—would be able to fulfil their basic need for health care in the absence of a UHC system.

This analysis assumed that total National Health Expenditures (NHEs) in the US remained unchanged by replacing the household contributions to employer-sponsored health insurance premiums, contributions to direct purchase insurance, and out-of-pocket health expenditures with increased individual and payroll tax revenues. It was also assumed that the previous private business contributions to employer-sponsored private health insurance premiums would be redistributed to employees as labor income.

The measure of wellbeing for this analysis was Disposable Personal Income (DPI) and the average Personal Health Care (PHC) expenditures per capita was added as a proxy for measuring the benefits of the single-payer UHC system. The costs and benefits not measured include changes to the health care experience (e.g., patient choice of providers and waiting times), innovation, labor mobility/participation (i.e., "job lock"), industry consolidation, moral hazard, population health (e.g., longevity and mortality rates), producer profitability, or alternative models of financial reimbursement and containment (e.g., Accountable Care Organizations).

In addition, it is beyond the simulations in this model to determine the effects on personal spending, savings, investment, innovation, immigration, emigration, and employment in the US. Though these unmeasured responses could have implications for the financial feasibility of a UHC+FUBI, these results are only based on data from 2009, which overlapped the Great Recession (from December 2007 to June 2009).

Last, this model assumed zero transition costs from the historical federal mandatory programs, tax sources, tax expenditures, tax rates, and private health insurance system to the counterfactual UHC+FUBI simulations. The costs of these fiscal

transitions and the associated changes in long-term expectations of households could significantly impact the efficacy of the results in this chapter.

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