The Impact of an Unconditional Basic Income on Income Inequality in the United States

Aleida Baumgartner
New York University Economics Department
April 16, 2022

TABLE OF CONTENTS

I. Abstract

In the past 20 years, income inequality in developed nations, particularly the United States (U.S.), has been on the rise. An Unconditional Basic Income (UBI) policy has been proposed as a solution to poverty, but UBI's potential effects on income inequality have not been systematically evaluated in a developed country context. This literature review fills this gap by examining the theoretical and empirical effects of a potential UBI on current U.S. income inequality. I first define UBI and establish its comparative context within the existing U.S. welfare system. I then evaluate the theoretical taxation literature from macroeconomics and public economics that models the effects of lump-sum transfers (close approximations of UBI) on indicators of income inequality (primarily the Gini index), work disincentives, and other macroeconomic indicators. I complement this theoretical debate with a discussion of the empirical results of basic income pilots conducted over the past half-century in the U.S. and other developed nations. Overall, I find that the existing empirical and theoretical evidence on UBI's impact on income inequality is mixed and heavily contingent on the underlying assumptions in each taxation model. I also identify areas of further research needed to understand UBI's full effects on U.S. income inequality.

II. Introduction

In his *General Theory*, John Maynard Keynes wrote: "The outstanding faults of the economic society in which we live are its failure to provide for full employment and its arbitrary and inequitable distribution of wealth and incomes" (Keynes 1936, 372). Over 80 years after the publication of his theory, the modern U.S. economy is still grappling with issues of income inequality. In 2019, the top 1% of households earned 24.1 times the median household income, a figure that was 8.6% in 1976 (Victor and Luduvice 2019, 2). Concurrently, there has been a decline in labor force participation, especially among young men. This trend, paired with the increasing proliferation of automation, raises concerns over the abilities of the labor force to adapt to an increasingly automated economy, and is causing many to question the very role of work in wealthy economies (Michaels 2017).

An Unconditional Basic Income (UBI) is a policy which has been proposed many times over the course of the past century as a potential solution to the issue of increasing income inequality. While such a policy has taken many forms and names, at its core, a UBI would provide citizens with a sufficient additional cash transfer to cover their basic expenses, such as food and clothing

(Hoynes and Rothstein 2019, 5). Contrary to current welfare systems, an unconditional basic income would provide this income regardless of employment status and provide no requirements for how such income must be spent (Van Parijs and Vanderborght 2017, 8). When such a policy is universal, the transfer is provided to all citizens of a country (Van Parijs and Vanderborght 2017).

Such a policy could provide a swath of potential benefits over the current welfare system, and is often proposed as a solution to income inequality depending on its underlying taxation and funding structure (Grofman, Merill, and Barnes 2021). A basic income scheme could replace a tax allowance (whose value rises with the marginal tax rate, and hence with income) by a refundable tax credit (which is equal for everyone), thus helping to redistribute income to those on the bottom of the distribution (Atkinson 1997, 1).

A UBI could further undermine income inequality by eradicating the "unemployment trap," since the payment of the transfer is not tied to the means-testing present in current welfare systems (Atkinson 1997, 3). Under the present system, as the poorest citizens begin to earn income, they must forfeit a large portion of their means-tested transfers as their income rises (amounting to an implicit benefit reduction). The rate of this marginal tax is significantly higher than the highest rates in the income tax rate, making it difficult for a family to work itself out of poverty, and discouraging low income persons from supplementing their income by working (Garfinkel 2002, 2). Additionally, without the burden of means-testing and eligibility conditions required to receive benefits in the current system, a UBI avoids mis-targeting issues (R. A. Moffitt 2003, 128). The lack of means-testing/eligibility conditions and a singular welfare benefit paid to all would also reduce administration costs for governments (Atkinson 1997, 3).

A UBI could also theoretically reduce income inequality by improving labor market flexibility (Clark and Kavanagh 1996, 401). With a guaranteed income cushion, individuals could leave poor working conditions and invest in their human capital through education without compromising their basic needs. As trends in automation and the shift to high-skilled, highly-educated labor persist (Acemoglu and Restrepo, 2020), this increased flexibility of the workforce could make it possible for low-skilled workers to work their way up the wage distribution, thereby reducing income inequality.

The Purpose of this Review:

Given this context of increasing income inequality, I examine literature on the effects of a potential UBI on income inequality in the U.S. To that end, there is a large taxation and theoretical literature from macroeconomics and public economics dating back to the 1960's and 1970's with the birth of Income Maintenance Experiments (IME's) that attempts to model the effects of lump sum transfers (close approximations to UBI) on overall economic indicators, particularly work disincentives. For the sake of scope, I summarize only those findings related to UBI's potential impacts on income inequality, leaving literature on a UBI's potential long-term wealth, consumption, and spending inequality effects to other research efforts. I begin this discussion with a more precise definition of UBI and its context within the U.S. welfare system, and from there present the theoretical literature of a potential UBI's effects on income inequality and other macroeconomic indicators. I conclude with the empirical evidence of UBI's effects on actual economies based on a variety of experiments conducted over the past half-century, followed by a discussion of the future areas of research needed to understand such a policy's full effects on inequality and the income distribution in the United States.

Defining UBI:

Over the decades, the definition of UBI has undergone a variety of transformations as new policies and economic trends have arisen. However, Hoynes and Rothstein (2019) define three features of a classic UBI policy as being universal, unconditional, and basic. A UBI provides a basic income when it 1) offers a sufficiently generous cash benefit to live on, without other earnings. It is unconditional when 2) it does not phase out or phases out only slowly as earnings rise, and it is universal when 3) it is available to a large proportion of the population, rather than being targeted to a particular subset, including those with already relatively high incomes (Hoynes and Rothstein 2019, 5). Hoynes and Rothstein (2019) also point out that none of the policy experiments that claim to test UBI have all three features, since a truly universal pilot would be incredibly expensive without some sort of targeting or phasing out of benefits (Hoynes and Rothstein 2019). Until such a full basic income pilot can be carried out, current pilots can approximate the effects of a classic UBI by testing programs utilizing unconditional transfers, lump sum transfers, and generous partial transfers for a subset of the population.

Welfare System Context:

A discussion of UBI's effects on income inequality must also contextualize UBI in the setting of current U.S. welfare and cash transfer systems. Money transfers in welfare systems can fall into three types: means-tested, conditional, or categorical. Means-tested transfers depend on the recipient's own income and/or wealth. Conditional transfers are subject to some conditions or contingencies, such as job-seeking, sending children to school, experiencing a lay-off, or having a disability. Categorical transfers are limited to specific segments of the population, such as age groups (e.g., social security). Transfers can fall into more than one of these types. Using these terms, one can refer to an unconditional transfer as one that is not means-tested and unconditional (Colombino 2017).

The current social assistance policies of most industrialized countries, including the United States, are the closest to means-tested, categorical, and conditional transfers, which have a high implicit benefit reduction rate, in which benefits are withdrawn as the recipients receive higher labor earnings. If the implicit benefit reduction rate is too high, the welfare system can introduce work disincentives when individuals gain less income from returning to labor than they do from benefits. The income testing and contingency requirements may also increase monitoring and litigation costs, opening up opportunities for fraud and error (Colombino 2017).

A UBI would act as an alternative to this conditional regime (Van Parijs and Vanderborght 2017). A potential UBI is shown in the image below, where *G* represents the unconditional transfer. Income above the exemption level *E* is taxed at a flat rate. UBI can be interpreted as a special case of the negative income tax (NIT), originally presented by Milton Friedman in 1962 (Friedman 1962). With a UBI/NIT, those below the exemption level *E* receive a compensation that increases their disposable income without being tied to their own income. UBI is an upfront transfer that gets taxed away afterwards, while an NIT is a contingent transfer to people whose income falls below the exemption level *E*.

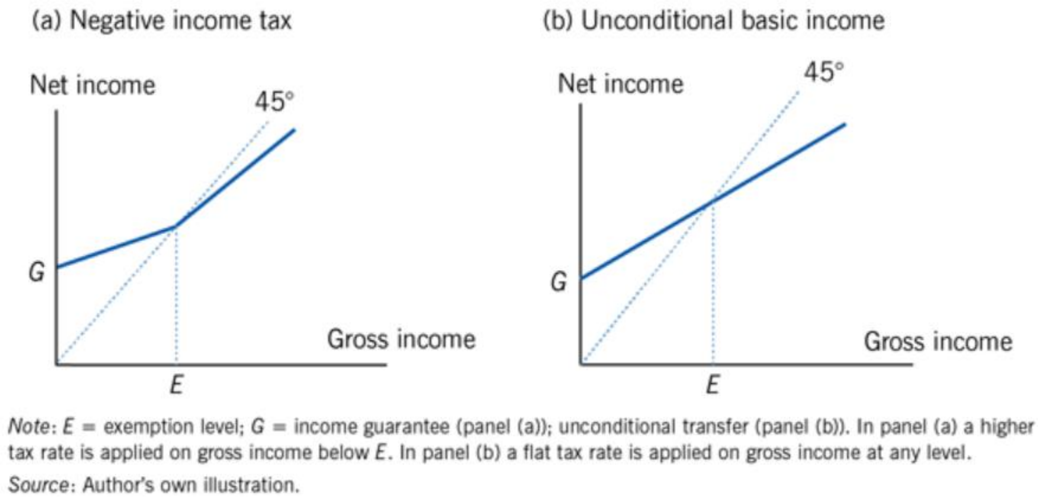

Figure 1: Negative Income Tax vs. Unconditional Basic Income. Colombino (2017).

Experimental literature attempts to test the effects of UBI by means of UBI pilots which closely approximate the three conditions discussed previously. However, none can simulate a true, universal UBI since that would be prohibitively expensive. UBI-adjacent policies which are addressed below include baseline incomes, minimum income guarantees, a negative income tax, basic income guarantees or basic income variations. In theoretical literature, UBI is often modeled as a combination of a flat tax/uniform lump-sum transfer combination. The literature studying the effects of UBI-adjacent policies is hitherto the best approximation for the potential effects of a full UBI on income inequality in the United States.

I. Theory: Modeling How a UBI Would Impact Income Inequality in the United States

Before presenting the theoretical literature on the inequality effects of a UBI, it is important to introduce two key areas which the following theoretical models address: 1) the underlying cost and tax structure of a UBI and 2) a UBI's potential effects on labor supply. A UBI is inherently dependent on the underlying taxation scheme funding it, so determining the underlying cost structure of a UBI is a key element in ascertaining a UBI's distributional effects. UBI proposals are often modeled theoretically using the flat tax/lump sum transfer approach, as discussed below. The flat tax most frequently modeled is funded by personal incomes, and would eliminate all or most tax deductions in order to widen the tax base (Hoynes and Rothstein 2019). Some models do use a progressive tax on income and alternative taxation regimes (such as an energy tax) to fund the UBI (Clark and Kavanagh 1996). If a potential UBI funds its lump sum distribution using progressive taxes, theoretically, it would have a greater reduction on income inequality than one which paid out the same amount in equal sized lump sum transfers that were funded through a flat tax. Thus, accurately modeling the underlying funding structure, be that through a flat tax, progressive tax, deficit spending, charitable donations, or some mix, is critical to understanding the final effects of UBI on income inequality.

The theoretical literature regarding UBI's distributional implications also takes into account its potential effects on labor supply. Standard neoclassical theory would predict that a UBI could have two effects on labor: the income effect and the substitution effect. As consumers receive a new and predictable stream of unearned income, they can afford more leisure, causing many to either leave the labor force (cutting labor force participation rates and affecting the extensive margin of labor) or to cut their hours (affecting the intensive margin), for the same amount of income (income effect). Concurrently, as individuals receive more income for the same amount of labor hours, consumers could also substitute existing leisure time with more labor hours, since the relative cost of leisure has now increased (substitution effect).

Through these two effects, a UBI could disincentivize work. In the case that a UBI does cause a reduction in labor supply, the UBI would lead to increased wages for those that remain in the labor market, leading to greater income inequality rather than less over time, if such dynamics put enough upward pressure on wages. Which effect dominates in the long run though is entirely dependent on labor supply elasticities, the size of which can only be determined by empirical pilot studies (see part III), but have important implications for the efficiency of a potential UBI, and so are discussed in the following subsections as well.

a. Macroeconomic and Microsimulation Models of a Potential UBI

A common model for papers theoretically demonstrating the impacts of a UBI is the combination of a basic flat tax, followed by a lump-sum redistribution of tax revenues. Following this initial exploration, varying levels of complexity are added to resemble a UBI in a piecewise manner. There is moderate to low emphasis on modeling the effects of a UBI on general levels of income inequality, or any other inequality for that matter in the limited macroeconomic literature that does address UBI and related policies. However, for those that do, an additional step of analysis often involves comparing the effect of a general, flat-tax funded and lump-sum distributed UBI to the effects of the current progressive and targeted welfare system in the United States. Papers that do not utilize this BI/FT (basic income/flat tax) model often rely on the use of a generous NIT to model the effects of a basic income, funded by various taxation regimes.

One of the main papers to model the effects of a potential UBI on inequality is by Merill, Grofman, and Barnes (2021), where the authors provide evidence of how non-targeted transfers can be non-trivially redistributive, particularly when the size of GDP collected in taxes is high (Merrill, Grofman, and Barnes 2021, 2). The authors show how a flat tax and lump-sum redistribution could lead to significant redistributive consequences for the income distribution in terms of the Gini index, one of the main measurements of income inequality, and compare these consequences to our current progressive and targeted welfare system (Merrill, Grofman, and Barnes 2021).

Merill, Grofman, and Barnes (2021) begin by modeling a flat tax, t, on a population, where each individual has the same percentage of their income taxed, a policy which has no effects on the Gini index since it does not lead to reordering of individuals in terms of income on the Lorenz curve. The government therefore collects a total of t times the national income, I, which is divided by the population, n, so everyone receives the same lump sum transfer. This process results in a new Gini index that is $(1 – t)$ times the original Gini index before the transfer, showing that the Gini index was reduced by this process in proportion to the flat tax rate. Regardless of the tax rate t, a flat tax with uniform lump sum transfers of the revenues collected essentially provides a negative income tax to all the members of the population with incomes below the mean. The authors conclude that presumably, if some portion of the present U.S. government spending is analogous to a lump sum transfer, then government action could currently be reducing effective income inequality. The authors go on to model the effects on the Gini index for various initial income distributions, including a uniform distribution, an exponential distribution, and other Gamma distributions (which have been shown to be effective at modeling British and U.S. income distributions) to similar effect: a flat tax rate and lump-sum redistribution have redistributive effects and reduce the Gini index (Merrill, Grofman, and Barnes 2021).

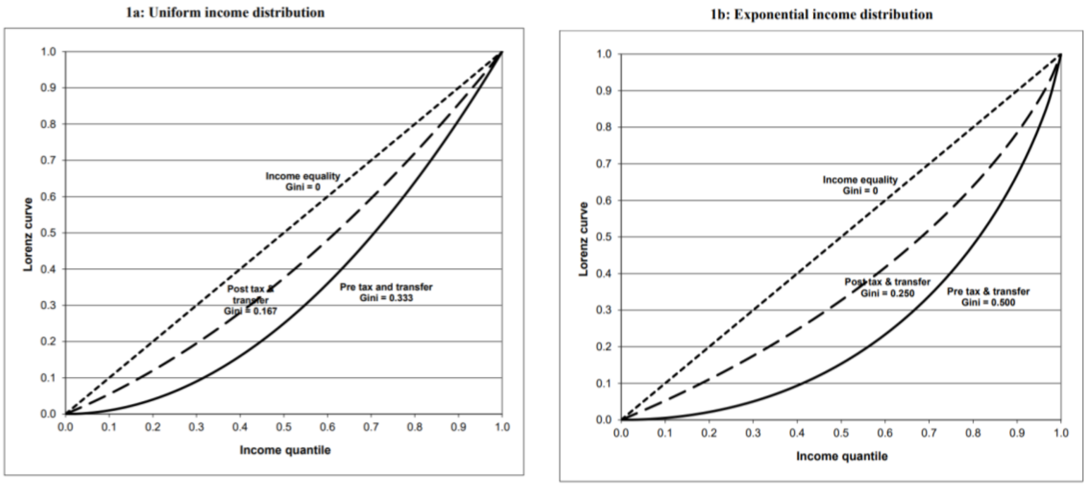

Figure 2: Uniform and Exponential Income Distributions. Merrill, Grofman, and Barnes (2021). Both graphs are shown for $t = 0.5$. Authors point out that a Gini index value of 0.33 is well in the range of values for developed countries such as Canada, France, and Luxembourg.

To compare these results to the existing progressive tax system, they impose a two-tiered tax system on an exponential income distribution, with two tax rates. Lump sum redistribution remains as before. Comparison of the Lorenz curves for initial incomes after a flat tax and uniform transfers under a progressive two-tier system reveal that, while the progressive tax system reduces the Gini index further than the flat tax, the reduction is relatively small. Finally, they model a targeted redistribution of income funded by an initial flat tax, in which the Gini index is reduced more than by a uniform lump sum redistribution as long as the final incomes retain the same ordering as original incomes. Thus, the authors conclude that while a flat-tax and lump sum redistribution could reduce the Gini index on any income distribution, targeting the redistribution would have the greatest effect on reducing income inequality (Merrill, Grofman, and Barnes 2021).

Although this model indicates that targeting is a more effective way to bring down the Gini index, and consequently, income inequality, the authors do show that a UBI or similar policy, like an NIT, could have a net reducing effect on inequality compared to a nation-state that lacks an existing welfare system. In fact, the greater the initial inequality of the distribution, the greater the inequality reducing effect of the transfer (since there are more individuals earning less than the mean income in such a case). Of course, this model is not calibrated to data, so this result would not necessarily hold in actuality. However, future research could calibrate data to match this model and evaluate its effectiveness in determining the income inequality impacts of a UBI. The model also acts as a reasonable theoretical foundation for developing a more in-depth model of a lump-sum transfer that could account for greater levels of progressivity in underlying taxation structures and income distributions (Merrill, Grofman, and Barnes 2021).

Victor and Luduvice (2021) take a more deeply comparative approach than Grofman, Merill, and Barnes (2021) by developing a more in-depth model of the U.S. welfare system (a means-tested system), determining its effects on the U.S. macro economy, and comparing these to the effects of two potential UBI schemes. One UBI scheme is expenditure neutral, while the other models Andrew Yang's proposed UBI from his U.S. presidential campaign in 2020, which is significantly more generous and not expenditure neutral. The authors then compare results on a variety of macroeconomic indices, including the Gini index. Their model also has the advantage of being calibrated to two sets of data, firstly, the 2008 Survey of Income and Program Participation (SIPP), and the Alaska Permanent Dividend Fund, which has long been touted as a prime example of a guaranteed income scheme (for further discussion see Part III). In this way their model can more accurately and precisely determine the effects of a UBI on the U.S. income distribution than the purely theoretical model of Grofman, Merill, and Barnes (2021). Victor and Luduvice's model is an overlapping generations model, which incorporates retirement and heterogeneity across households, and models the U.S. welfare machinery with two systems: the IS and SS systems (income security and social security, respectively). The IS model contains the formulas to represent the effects of the Earned Income Tax Credit (EITC), the Supplemental Nutrition Assistance Program (SNAP), Temporary Assistance for Needy Families (TANF), and the Supplemental Security Income (SSI) programs in the United States. Once the model parameters are calibrated to the 2008 SIPP data to develop a benchmark welfare system, the authors apply it to estimate the impacts of the Alaska Permanent Divided Fund as a further indicator of model fit (Victor and Luduvice 2021).

The results from the three potential welfare schemes – means-tested, expenditure-neutral UBI, and Andrew Yang's UBI, are shown in table 1. In the initial SIPP 2008 data, the Gini index for earnings is given as 0.6, and 0.74 for wealth. When the means-tested welfare program model is applied, Victor and Luduvice (2021) find that the earnings Gini remains at 0.6 while the wealth Gini increases to 0.79. Meanwhile, the initial UBI counterfactual generates an earnings

Gini of 0.57 and a wealth Gini of 0.74. The authors generate this initial UBI by replacing all welfare equations with an unconditional payment, holding constant the commitment on spending and debt level, and distributing the same aggregate level of total transfers computed for the benchmark equilibrium in a per-household base. Thus, the total value of transfers for this expenditure-neutral UBI is the same as that of the means-tested system (Victor and Luduvice 2021, 38).

Table 1: Comparison of Aggregates for Means-Tested, UBI, and UBI AY Programs

Variable	Means-Tested	UBI	UBI AY
Y	100	102.4	89.2
K	100	104.0	92.2
L	100	101.7	87.7
C	100	102.7	93.2
HC	100	99.7	88.2
H	33.0%	34.4%	25.7%
LFP	76.5%	76.2%	63.5%
K/Y	290.3%	294.5%	299.8%
C/Y	62.6%	62.1%	65.3%
L/Y	56.3%	55.9%	55.3%
HC/Y	232.8%	226.0%	229.4%
TR/Y	4.0%	3.9%	22.4%
w	1.154	1.163	1.174
r	0.042	0.040	0.038
τ_c	7.3%	8.0%	29.6%
Earnings Gini	0.60	0.57	0.64
Wealth Gini	0.79	0.74	0.75

Source: Victor and Luduvice (2021).

Lastly, the authors test the effect of Andrew Yang's proposed non-expenditure neutral UBI on macroeconomic indicators. Andrew Yang, a presidential candidate in the 2020 presidential elections, proposed to give every U.S. citizen $1000 per month, amounting to $12,000 per year. This second UBI counterfactual (UBI AY), results in an earnings Gini of 0.64 and a wealth Gini of 0.75 - slightly higher numbers than the original expenditure-neutral UBI, particularly regarding the earnings Gini. Additionally, the economy contracts significantly (reduced GDP) and becomes much more unequal in terms of pre-tax labor earnings. In terms of consumption and disposable income inequality, the UBI AY increases consumption inequality (with a Gini of 0.37 as opposed to 0.42 for the UBI counterfactual and the benchmark, not shown in the table above) and reduces disposable income inequality (with a Gini of 0.55 as opposed to 0.56 and 0.58 for the first counterfactual and the benchmark, respectively) (Victor and Luduvice 2021, 40).

Victor and Luduvice (2021) find that the aggregate response of the economy to Yang's proposal is a contraction of both capital and output. They explain that the second UBI reform increases the Gini coefficient for pre- tax earnings mostly due to the selection mechanism arising from the high-productivity agents who remain in the labor force and who are able to buffer consumption through a higher level of savings (the UBI AY reduces the labor force participation rate from about 76% to 63.6%, while maintaining about the same amount of labor per unit of output as the benchmark and expenditure-neutral counterfactual) (Victor and Luduvice 2021, 38). There is net redistribution in both UBI's toward the bottom (if you consider both the earnings and wealth Gini indices for the UBI AY policy), driven by a reduction in the means accrued by the top. Victor and Luduvice's model shows that a UBI, modeled as such, would have moderate-to-mixed effects on income inequality reduction compared to the current means-tested programs. While Grofman, Merill, and Barnes' (2021) model indicates that a targeted welfare system has a greater reducing effect on income inequality, Victor and Luduvice's model is mixed – here the expenditure-neutral UBI reduces the earnings Gini more than the means-tested program, but the non-expenditure neutral program, UBI AY, actually increases the earnings Gini from the benchmark amount of 0.6 while leading to a net-contraction of the economy. To further validate such findings, it would also be beneficial to re-calibrate the model to more recent SIPP data (Victor and Luduvice 2021).

Garfinkel, Huang, and Naidich (2002) take an approach similar to the comparative one of Victor and Luduvice (2021) to model various forms of a partial Basic Income Gaurantee, which they call BIG. Garfinkel, Huang, and Naidich have the advantage of comparing a number of plans with various funding strategies, while Victor and Luduvice (2021) model only two. The four BIG plans are summarized in the table below:

Table 2: Summary of the Basic Income Guarantee (BIG) Plans

Plan Name	Benefits	Financing
Standard Plan	Elderly (E) $8,000; Adult (A) $4,000; Children (C) $2,175 OASDI kept harmless.	Offsets from OASDI. Elimination of 115 programs. Elimination of personal exemptions. Taxation of BIG benefits.
Children Plus Plan	E $8,000; A $3,150; C $4,000 OASDI kept harmless.	Offsets from OASDI. Elimination of 115 programs. Elimination of personal exemptions. Taxation of BIG benefits.
Single-Parent Plus Plan	E $8,000 First A with children $6,000 Other A $3,000 C $2,700 OASDI kept harmless.	Offsets from OASDI. Elimination of 115 programs. Elimination of personal exemptions. Taxation of BIG benefits.
Adult Plus Plan	E $8,000; A $6,000; C $2,000 OASDI kept harmless.	Offsets from OASDI. Elimination of 115 programs. Elimination of personal exemptions. Taxation of BIG benefits. Imposition of a federal contribution equal to a proportional tax rate of 0.0548.

Source: Garfinkel, Huang, and Naidich (2002).

The gross costs of the BIG would be 1,030,888 US dollars (1994 dollars), equivalent to 1,933,422.79 US dollars in 2021 (Garfinkel, Huang, and Naidich 2002, 7). These costs would be financed from a combination of revenue from taxing the distributions of the BIG, eliminating personal exemptions, offsets in social security (since these programs would be cut), and elimination of other federal programs (like special needs/social services, federal student loans, farm subsidies and price supports, employment programs, direct income support programs, etc.) The authors use a microsimulation model to estimate and compare effectiveness of the current welfare system and compare the outcomes of the four proposed BIG plans on reducing poverty and redistributing income. The authors simulate the effects of the model on actual households using data on the 63,756 families in the 1995 March CPS (Garfinkel, Huang, and Naidich 2002, 7).

The steps of the microsimulation are as follows: 1) select representative population data base from the 1995 March CPS; 2) reconcile the microdata from the CPS with administrative record data; 3) impute the value of the in-kind and other programs; 4) calculate the value of the current system (Post-transfer and Post-tax Income Plus In-Kind and Imputed Benefits) from pretransfer and pretax income; 5) remove all benefits from the current system; 6) simulate the BIG plans; 7) adjust for labor supply change of low-income people (the authors assume that 100% of the low-income adults able to work will find half-time jobs (20 hours a week) at the minimum wage ($5.15 per hour in 2005 dollars) because the BIG plans do not penalize individuals who earn additional income); and 8) for the Adult Plus Plan, add in the financing of the system (Garfinkel, Huang, and Naidich 2002, 9).

Once these steps are completed, the authors find that all four BIG plans reduce the aggregate poverty rate regardless of the assumptions about the value of in-kind benefits to recipients. However, the authors find that the BIG plans have a small effect on the vertical distribution of income in comparison to the current welfare system. Under the current welfare system, before transfer and tax, the lowest 20% of earners received less than 1% of the income; the highest received 50%. The current system raises the lowest quintile to 5% and reduces the highest quintile to 43%. Meanwhile, under the BIG plans, the first quintile of income earners saw a less than 1% increase in all cases, while the two highest quintiles did not benefit at all (Garfinkel, Huang, and Naidich 2002, 16). In terms of the horizontal distribution of income (redistribution within quintiles of the income distribution), BIG redistributed a great deal of money within quintiles. In the standard plan, for example, over 80% of families in the bottom quintile gain or lose 10% or more, and the figures for the next three quintiles are 71%, 61%, and 46%. Within the first three quintiles, while more families gain than lose, a large minority of families in these quintiles experience significant losses (Garfinkel, Huang, and Naidich 2002, 18).

Overall, the authors find that the BIG plans decrease poverty rates more effectively than the current system, and all redistribute income from the highest quintiles to the lowest quintiles. However, the redistribution is more equitable within quintiles, particularly the people in the first quintile. This mixed-to-moderate impact on inequality is in line with that of Victor and Luduvice (2021). However, these authors discuss variations on only a partial basic income scheme, as opposed to a full basic income, since the amounts paid out to all individuals are well below what is necessary to live on for a given year or month. It is also targeted, in that it provides greater benefits to different sub-groups, like the elderly and children. This structure makes the UBI modeled here less UBI-like and more conditional (although the underlying revenue source remains a basic flat tax, except for the higher rate imposed for the adult plan). This result then is in-line with that of Grofman, Merrill, and Barnes (2021), who predicted that targeting would have a stronger effect on reducing income inequality than a lump-sum, untargeted basic income transfer.

Hoynes and Rothstein (2019) maintain the comparative approach that Garfinkel, Huang, and Naidich (2002) employ, only Hoynes and Rothstein (2019) develop an overall framework for describing existing transfer programs which is flexible enough to encompass most current welfare programs as well as proposed and piloted UBIs. Their framework for comparing transfers is built upon the following equation:

$$B(X,Y) = E(X) \times \min(G + SY, M, \max(M - T(Y - P), 0)$$

Where B is the transfer (or benefit) for a family with characteristics X and earnings/income Y, and the parameters; G (guarantee) is the transfer to a family with zero earnings; S (subsidy rate) is the rate at which the transfer grows as earnings rise above zero; M (maximum transfer) is the maximum transfer, reached at earnings of (M – G)/S; P (for the beginning of the "phase out" of the transfer) is the highest earnings a family could have and still receive M; T (for "tax rate") is the rate at which the transfer is reduced for earnings above P, until it reaches zero when earnings equal P+M/T; and E (for "eligibility") is the definition of which individuals or families are eligible (based on factors other than earnings/income) for the program. This is often referred to as "categorical eligibility." One can think of it as a function E(X) mapping (non-earnings) characteristics X to an indicator for eligibility. Currently, no program in the U.S. has a schedule like this. However, the basic features of most existing programs can be captured by varying the six parameters (Hoynes and Rothstein 2019, 6).

Using this framework, Hoynes and Rothstein (2019) model a UBI as a transfer program that pays sufficient benefits to meet basic needs without unearned income while maintaining broad eligibility so that the benefit is available to both non-workers and those with relatively high earned income. In this framework, G > 0, S = 0 and M = G, a high (or even infinite) P, low T, and minimal restrictions on eligibility (E). They then apply this model to various UBI proposals and pilots in existence in order to compare their impacts on various economic indicators in relation to existing welfare programs. Existing U.S. welfare programs compared include Aid to Families with Dependent Children (AFDC), the Earned Income Tax Credit (EITC), Supplemental Security Income (SSI), and Social Security (SS). These programs are compared to UBI proposals and pilots in tables 3 and 4:

Table 3: Parameters of Selected Transfer Programs

Program Type	Cash welfare	In-work benefits	Disability benefits	Retirement	Child allowance	NIT	UBI
Example Program	AFDC	EITC	SSI	Social Security	Shaefer et al (2016)	Ex of Canonical	Ex of Canonical
Guarantee (G)	$7,285/yr	$0	$8,820/yr	$16,392/yr	$3,000/yr	$5000/yr	$12,000/yr
Subsidy rate (S)	0%	40%	0%	0%	0%	0%	0%
Maximum transfer (M)	$7,285/yr	$5,616/yr	$8,820/yr	$16,392/yr	$3,000/yr	$5000/yr	$12,000/yr
Beginning of phase-out of transfer (P)	$90/mo	$18,340/yr	$85/mo	$0	$0	$0	infinite
Tax rate in phase-out (T)	100%	21%	50%	0%	0%	50%	0%
Eligibility restrictions (E)	Single parents	Must be 25-64; and there is only a small credit for those without children	Documented disability	Over 62 with sufficient work history	All families with children	All families	All adults

Notes: Several programs have additional eligibility criteria (e.g., asset limits) not shown here. AFDC benefits are based on the 1996 schedule for a single parent with two children in the median state, and are in 2017 dollars. P and T reflect the policy after 12 months of work; earlier, P is higher and T is lower. EITC benefits are for an unmarried parent with two children in 2017, and reflect only the federal credit. SSI amount is for an individual without dependents in 2017. Social Security parameters are for the average retirement amount in 2018, and ignore the earnings test, which reduces current benefits but recycles them into higher later benefits.

Source: Hoynes and Rothstein (2019).

Table 4: Paramaterized UBI Proposals and Pilots

	Proposals			Pilots			
	Murray (2016)	Stern (2016)	Switzerland	Stockton	Finland	Ontario	Y Combinator
Guarentee (G)	$10,000	$12,000	$31,938	$6,000	$6,000	$9,848	$12,000
Subsidy rate (S)	0%	0%	0%	0%	0%	0%	0%
Maximum transfer (M)	$10,000	$12,000	$31,938	$6,000	$6,000	$9,848	$12,000
Beginning of phase-out of transfer (P)	$25,000	infinite	infinite	infinite	infinite	$0	Area median income
Tax rate in phase-out (T)	20%	0%	0%	0%	0%	50%	Infinite
Eligibility restrictions (E)	U.S. citizen, age 21+	Age 18+.	None	None	Age 25-58. Receipt of unemployment payments prior to pilot	Age 18-64 with low income <$48,000/yr for couples	Ages 21-40

Notes: Table does not reflect all complexities of proposals and pilots. For example, under the Murray proposal, the transfer would phase out only to $5,000 per adult per year. Under the Stern proposal, the program differs for seniors. Swiss proposal parameters are based on suggestions advanced by supporters of the referendum, and apply to a family with two adults and one child. Ontario parameters are for a couple. Non-U.S. programs are converted to U.S. dollars using purchasing power parity.

Source: Hoynes and Rothstein (2019).

To describe the distributional implications of these UBI programs relative to existing US welfare programs, the authors divide households into four demographic groups based on the 2017 Current Population Survey and show each group's average transfers: 1) households with children (anyone under 18); 2) anyone 62 or older but no one under 18 are classified as "households with elderly"; 3) households without children or elderly with disabled individuals; 4) households without children or elderly and without disabled individuals. To account for the distribution of benefits across income groups as well, the groups provide two income classifications: after-tax income, transfer (ATT) income (total money income plus near cash transfers, such as SNAP and school meals, minus taxes owed). Finally, the authors divide the households into deciles by earnings rather than ATT income, incorporating an 11th category for those without earnings (Hoynes and Rothstein 2019, 12). Results are shown in figure 3:

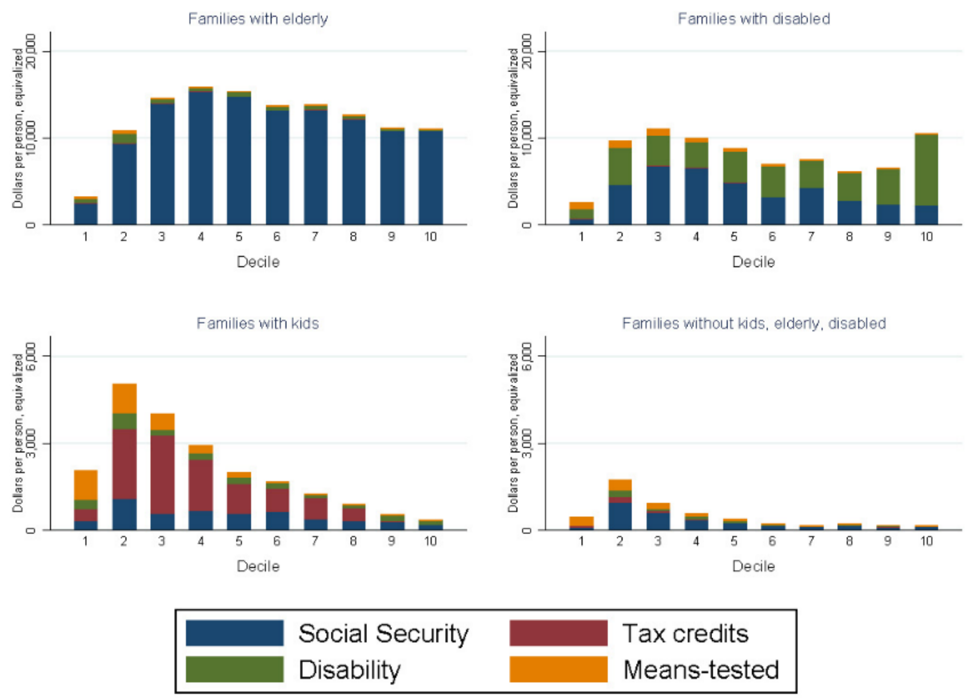

Figure 3: Average Household Transfers, by Family Type, and Decile of After-Tax and Transfer Income**.** Hoynes and Rothstein (2019).

Collectively, the authors find that higher transfers are given to the elderly and disabled, to those with children, and to those with low earnings, in the current system. They argue that this result implies that if we eliminate current income supports and apply our tax revenue sources to establishing a UBI, there would be a relative redistribution from low-earners to zero-earners. This shift to a UBI would simultaneously be a redistribution from the elderly and disabled towards those who are neither, and a redistribution to those without children. By shifting our current system toward a UBI, we could face detrimental impacts on income inequality (we would rather a high-income earner provide a zero-earner with income than transfer from low-earners) in addition to the neediest welfare recipients facing a reduction in transfers, while paying for a more expensive welfare program (Hoynes and Rothstein 2019, 13). The authors also find that a smaller proportion of UBI dollars would go to the bottom of the income distribution, due to lack of targeting. However, Hoynes and Rothstein agree that a generous UBI would increase the absolute size of transfers to the bottom and thus represent a large downward redistribution of income (so, if the large amounts of revenue can be sourced for a generous UBI, a UBI could theoretically reduce inequality and reduce the Gini index). Nevertheless, a canonical UBI without an increase in the national deficit would send a larger share of transfers to non-elderly and non-disabled.

The last paper to use a theoretical simulation model to represent the effects of a UBI on income inequality is by Browne and Immervoll (2017). In this work the authors develop a basic income (BI) scenario to assess the distributional effects of a potential UBI policy in the comparative context of different countries in the OECD. This international analysis provides a useful comparison for the discussions of the U.S. welfare system, since European nations possess the closest global approximation to the U.S. welfare system, besides Canada and Australia. Browne and Immervoll (2017) simulate sequential steps from the current welfare systems of France, Italy, and the United Kingdom to a UBI for ease of analysis (Browne and Immervoll 2017).

The authors use EUROMOD, a population-based tax benefit microsimulation model covering all 28 member states of the EU. EUROMOD uses household micro-data from European Survey of Income and Living Conditions (EU-SILC) and national SILC surveys along with countries' tax and benefit rules to calculate tax liabilities and benefit entitlements for representative population samples. The countries of interest include Finland, France, Italy and the United Kingdom, and the baseline is provided by tax scenarios from 2015. Hypothetical BI scenarios are set at the level of the guaranteed minimum income (GMI) that existed in 2015 for each country (GMI is a term that refers to the means-tested income program of a European nation, not to be confused with another basic income scheme). The BI developed in this model is taxable, so it is more affordable, since higher income individuals pay more of it and lower income people pay less taxes, simultaneously making it more redistributive. However, the effect of taxability varies significantly by country; countries with already low GMI's see a surplus from making their BI taxable, while the reverse is true for those with higher GMI's (Browne and Immervoll 2017, 334). See table 4 for the monthly net-of-tax BI amounts that would cost the same as existing benefits:

Table 4: Monthly Net-of-Tax Budget-Consistent BI Amounts

	Adult	Child (<18)	Poverty line for single person
Finland	EUR 527	EUR 316	EUR 1074
France	EUR 456	EUR 100	EUR 909
Italy	EUR 158	EUR 158	EUR 737
United Kingdom	GBP 230	GBP 189	GBP 702

Note: Hypothetical reform where a BI would replace most existing working-age benefits, as well as the tax-free allowance. See main text for details. BI amounts are shown after tax and are 9% higher than existing single-person GMI in Finland and as much as 97% higher in Italy. In France, the budget-neutral BI amount would be 2% below current GMI levels and in the United Kingdom, the budgetary neutral BI amount would be 28% below current GMI levels. Poverty line is 50% of median household income adjusted for household size using square root of household size

Source: Browne and Immervoll (2017).

Table 4 represents the final BI established in one fell swoop. However, Browne and Immervoll (2017) evaluate the effects of the BI by establishing it in sequential steps and determining their impacts: These steps are 1) levelling down the benefit entitlements of those who currently receive more than the GMI; 2) removing the income taper for existing claimants of GMI benefits; 3) expanding coverage of this non means- tested benefit set at the GMI level to all households; 4) “individualizing” the benefit, to create an entitlement whose value is independent of family circumstances; 5) making the BI taxable, and abolishing tax-free allowances; and 6) adjusting the BI amount up or down to make the reform budget-neutral (Browne and Immervoll 2017, 334).

In so doing, the authors find that expanding coverage to all families would produce sizeable average income gains. The absolute gain would be smaller for lower-income households (as many of them already receive benefits under existing policies), but these gains would still represent a larger share of income for lower income groups and would therefore reduce inequality overall. The sizes of each of these effects vary significantly between the four countries, however. Countries that currently have policies that are more targeted to low-income individuals see more effect of reducing benefits to a GMI level (less reduction of inequality) while countries that target the poor less currently see greater reduction in inequality, because the poor now gain relatively more. For example, existing benefits are more targeted on low-income households in Finland than in France, so reducing these benefits to the GMI level would affect lower-income households more strongly in Finland than in France (Browne and Immervoll 2017, 339).

However, the authors find that the final BI results in very small reductions in inequality even when the BI does reduce inequality (with reductions around 1%, 2%) (Browne and Immervoll 2017, 339). In the case of Finland, they find that income distribution becomes more unequal, since the BI reduces its targeting on low-income households. These mixed-to-small effects are in line with those seen in Garfinkel, Huang, and Naidich’s (2002) work. These effects are combined with a large amount of increased revenue that would be needed to support the BI. Browne and Immervoll (2017) do show that the eventual distributional effect of any BI is highly dependent on the given funding and tax structure that supports its distribution. That is, a BI has less-inequality reducing effect compared to the status-quo of a means-tested system if that system already targets the poor. Of course, this difference is small, but it is in line with the results of Grofman, Merrill, and Barnes (2021) who find that a targeted system seems to work well in reducing income inequality. The following section elaborates further on these underlying tax and funding structures of a potential UBI.

b. Optimal Tax Literature & Theories of Labor Supply

In addition to attempts to directly model the effects of a potential UBI on the economy, there is a prolific optimal tax literature which is focused on determining the optimal tax rate associated with a potential UBI policy built using the flat tax/uniform lump sum transfer combination seen above. Certain authors in this sub-literature have been instrumental in proliferating thought on UBI and triggering larger macroeconomic studies on its effects on the overall economy, including income inequality to a certain extent, so it has been included in a cursory manner here. The discussion of optimal taxation necessitates discussion of other factors associated with taxation, notably, labor supply effects, which are of primary concern when discussing the impacts of UBI. This section thus also addresses labor supply in relation to the taxation framework.

One of the most notable economists in this regard was Tony Atkinson (1997). In the book, *Public Economics in Action*, he presents results related to the Basic Income (BI) proposals which were funded by flat taxes. His main purpose in this book was to provide evidence for the optimal tax which could be used to fund a basic income proposal for the United Kingdom. He discusses the general merits of a graduated tax and conditional welfare payments vs. flat income tax combined with a single universal payment structure and addresses the equity and efficiency arguments involved in choosing between these two approaches. According to Atkinson, the key issue when analyzing the optimum rate for such a linear tax is to choose between different levels of the basic income guarantee (B) and the tax rate *t* so as to maximize the BI transfer *B* and minimize *t* along a menu of choices similar to the Laffer curve. As Laffer originally suggested, the rate *t* and level *B* hit a peak and then taper off as work disincentives increase since the optimal rate of t has been surpassed. As a result, greater tax revenues cannot be collected, and *B* reduces past the optimal *t*. With no supply side response, *B* is a linear function of *t*, where there is no disincentive to work as taxes increase (Atkinson 1997, 6).

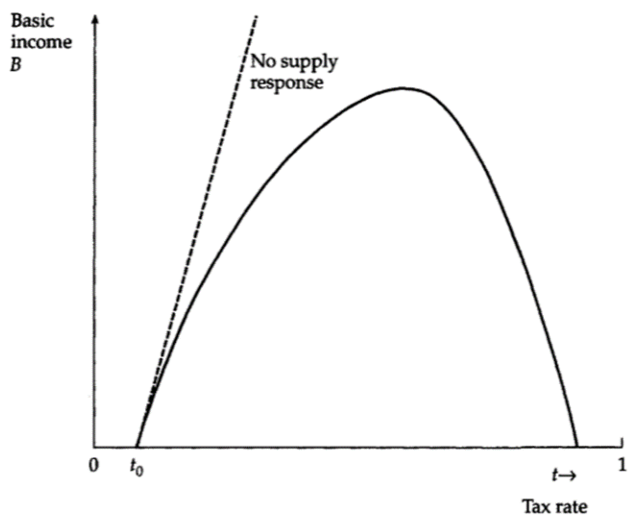

Figure 4: Menu of Possibilities for a Basic Income**.** Atkinson (1997).

In order for there to be differences in receipt of transfers, and thus distributional effects of a BI, there must be differences in the income distribution. These are posited to come from the differences in earning power, *w*, before and after taxes. Atkinson assumes that *w* is lognormal with coefficient of variation, *n*. A value of 0.2 for *n* means that the upper quartile of the income distribution has a wage rate 30% higher than that of the person at the lower quartile, whereas a value of 0.4 means that the difference is 68%. The difference in total earnings (i.e., *w* x *L*, where *L* is the labor supply function) increases over time since hours are assumed to increase with *w*. With a labor supply elasticity of 0.5, for example, the upper quartile is 49% higher in the former case and 117% higher in the latter. Thus, getting to the optimal point of taxation and seeing the resulting distributional effects of a BI requires an empirical understanding of elasticity of labor supply in response to wage increases and tax increases (Atkinson 1997, 6).

Regarding the issue of labor supply, Atkinson references the work of Browning and Johnson 1984 who take a range of labor supply estimates to calculate the cost of redistribution via a basic income/flat tax package to different quintile groups (fifths) of the US population. For the case Browning and Johnson (1984) describe as 'most plausible', the overall average (compensated) labor supply elasticity is 0.312. The results may be summarized in terms of the gains or losses of net equivalent income (rounded to the nearest dollar) by different quintile groups from a 1 percentage point increase in the flat tax rate, used to finance a basic income: the bottom 20% would receive an increase in 47 U.S. dollars (1990 dollars) from a one percentage point increase in the flat tax rate; the next 20%, would receive 33 U.S. dollars (1990 dollars) (Atkinson 1997, 11). The other three quintile groups lose on average. If the redistribution from the BI were purely a matter of sharing out a fixed cake, then the sum of these losses would be 80 U.S. dollars (1990 dollars). However, the increase in the tax distorts labor supply decisions and reduces total (equivalent) income. It is this loss that generates the equity/efficiency trade-off. According to the estimates of Browning and Johnson, the losses are: Middle 20%, $11; Next 20%, $72; Top 20%, $196 (1990 dollars). The total of these losses is greater than three times the gains. The weights given to different income groups would have to decline quite rapidly with income for this redistribution to be seen as desirable (Atkinson 1997, 11).

From this result, it appears that while a BI structured as a flat tax/lump sum transfer and with labor supply elasticities around 0.3 (see above) would bring about income redistribution and thereby reduce income inequality, labor disincentives accompanying the tax rate necessary to fund this system would render this redistribution inefficient, benefitting those whose labor reduces the most due to work disincentives. However, Atkinson notes that labor supply is not the only choice variable involved in the distributional effects of a flat tax/uniform lump sum transfer, and labor supply itself has many dimensions (Atkinson 1997, 12). To properly evaluate UBI's effects on the larger economy, income inequality included, it needs to be compared to other policy insurance schemes using models that are not always perfectly competitive and that lack perfect information (i.e., not the simple Arrow-Debreu market-clearing models). Outside of the narrow assumptions of an Arrow-Debreu context, it is possible that taxes and transfers are no longer distortions (Atkinson 1997, 12).

One such paper which points out how cash transfers may not be necessarily distortive on labor market outcomes comes from Baird, McKenzie, and Özler (2018), who set out to address misinformation regarding work disincentives in low- and middle-income countries (LMIC's). While their empirical work applies to LMIC's, their theoretical framework is still applicable to developed labor markets such as that of the U.S. where portions of the labor force is low-income, and largely supports the point that outside of perfectly competitive and otherwise imperfect markets, labor supply incentives may not be distortive (Baird, McKenzie, and Özler 2018).

The authors point out two mechanisms applicable in a developed market context by which work disincentives may not appear as a result of an increase in unearned income. Firstly are the price effects from behavioral conditions attached to means-tested and conditional transfers, such as those currently existing in the U.S. Conditions for cash transfers can change the relative prices of labor and leisure, in turn affecting labor supply and labor earnings (Baird, McKenzie, and Özler 2018), potentially creating a deterrence effect: if individuals know they are planning to migrate or that they will lose funding from a conditional welfare program by earning too much, they will work less. Providing an unconditional transfer could therefore increase labor supply and reduce economic distortions. Providing unconditional transfers could also provide parents with more time for labor by reducing time consuming activities – for example, having more money to send children to day-care reduces at home care activities and makes it possible to take more labor hours. Additionally, there are potential long term human capital accumulation effects from unconditional transfers for adults who received cash transfers as children. These transfers lead to children getting more education, increasing their likelihood of working as adults and thereby increasing labor force participation in the long run (Baird, McKenzie, and Özler 2018).

Finally, there are dynamic and general equilibrium effects which could result in cash transfers increasing labor supply. If a cash transfer is known to be temporary, individuals will not reduce labor hours as much as standard neoclassical theory would predict. Additionally, if other people in a community receive transfers, this communal transfer affects one's own labor supply. As other members cut their hours, wages rise. Spending by others additionally acts as a demand shock. Meanwhile, the value of leisure increases when friends are also not working (Baird, McKenzie, and Özler 2018).

Thus, it is entirely possible that cash transfers such as those provided by a UBI are compatible with labor supply increases without economic losses, particularly in poor or low-income communities. A UBI could then potentially lead to overall reductions in income inequality at the community and national level when these labor supply increases coincide with wage increases due to a transfer. The main exceptions are transfers to the elderly and to some refugees, who reduce work. Contrary to Browning and John (1984), it is possible that with more updated labor supply elasticity estimates, there would be few to no net losses associated with redistributive effects of a UBI. However, it is only the empirical studies in the following section which can determine the true value of labor supply elasticities for various demographic groups, which we leave to the microeconomic literature in part III.

c. Theoretical Literature: Findings & Discussion

Overall, the literature presented here has mixed reviews of the effects of a basic income on income inequality in the United States. Among the papers that intend to directly model the effect of a basic income or related policy on income inequality, Grofman, Merrill, and Barnes (2021) provide a purely theoretical model of a standard flat-tax and lump-sum redistribution. After comparing their initial results from a classical UBI to a two-tiered progressive system and a targeted welfare system, they find that the system which targets the lowest-income individuals has the greatest reducing effect on the Gini index, while the classic UBI still has a net inequality reducing effect. Even so, the differences in the Gini index outcomes are small, and not calibrated to existing data, making this paper a purely theoretical exercise.

Victor and Luduvice (2021) take a more empirical approach, developing a model calibrated to data from the 2008 SIPP and the Alaska Permanent Fund. They predict impacts on macroeconomic parameters from a benchmark welfare system, an expenditure-neutral UBI, and Andrew Yang's proposed UBI from the 2020 U.S. presidential election. They find that the Yang UBI results in an earnings Gini of 0.64 and a wealth Gini of 0.75, slightly higher numbers than the original expenditure-neutral UBI. They also find that the expenditure-neutral UBI results in an earnings Gini of 0.57 and a wealth Gini of 0.74, while the benchmark resulted in an earnings Gini remaining at 0.6 while the wealth Gini increased to 0.79 compared to the original economy (Victor and Luduvice 2021, 38). They explain that the Yang UBI reform increases the Gini coefficient for pre-tax earnings mostly due to the selection mechanism arising from the high-productivity agents who remain in the labor force and are able to buffer consumption through a higher level of savings. There is redistribution in both UBI's toward the bottom, driven by a reduction in the means accrued by the top. While Grofman, Merrill, and Barnes' (2021) work showed that a targeted welfare program would result in the least income inequality, Victor and Luduvice's (2021) model shows that the UBI's both result in lower levels of earnings and wealth inequality. Victor and Luduvice's (2021) model is also calibrated to two sets of data, making their outcomes more reliable, but nevertheless there is no strong evidence that a UBI would alleviate income equality significantly more than current welfare systems.

The results from Garfinkel, Huang, and Naidich (2002) regarding the impacts of four BIG programs on income inequality are also not particularly strong. After running a microsimulation on a representative population database from the 1995 March CPS on four levels of a partial basic income guarantee, they find that the BIG plans have a small but reductive effect on the vertical distribution of income compared to the current welfare system. Interestingly, their model does result in a great deal of income redistribution within quintiles. Nevertheless, results for income inequality reductions are not as strong as they find for poverty and poverty gap reductions (Garfinkel, Huang, and Naidich 2002). An additional drawback of this work is that it addresses a partial rather than full basic income, making its results less comparable to the others presented here. Browne and Immervoll (2017) also find that introducing a BI would have small to limited effects on reducing income inequality (reductions around 1 or 2%) compared to existing programs. However, differential effects are dependent on the existing programs within the given country – those with lower pre-existing GMI's would see higher inequality reductions from introducing a BI (Browne and Immervoll 2017).

Hoynes and Rothstein (2019) develop a similar framework to compare the results of the current welfare system to that of a UBI. They find that higher transfers are given to the elderly and disabled, to those with children, and to those with low earnings in the current system. Hoynes and Rothstein argue that this result implies that if we eliminate current income supports for a UBI, there would be a relative redistribution from low-earners to zero-earners, and a redistribution from the elderly and disabled towards those who are neither, and a redistribution to those without children. They find that under a UBI, a smaller proportion of UBI dollars would go to the bottom of the income distribution. However, they do find that a generous UBI would increase the absolute size of transfers to the bottom and thus represent a large downward redistribution of income (so, if funded correctly, a UBI could theoretically reduce inequality and reduce the Gini index) (Hoynes and Rothstein 2019).

The results from optimal tax and labor supply theories are similarly mixed. The combined results of Atkinson (1997) and Baird, McKenzie, and Özler (2018) indicate that, while redistribution effects depend on the elasticity of labor supply to income shocks and taxes, it is unclear without direct and contextual empirical evidence how labor supply will react to a sudden shock to the redistribution/taxation system (more on the empirical consensus surrounding labor supply elasticities can be found in part III).

These differential impacts from introducing UBI policies are mixed, and, as Browne and Immervoll (2017) show, significantly dependent on the underlying and pre-existing tax and welfare structure in place as the status quo. While no author finds severe increases in income inequality due to a UBI, the limited to non-existent improvements predicted are dependent on vast increases in government revenues. Some authors, such as Garfinkel, Huang, and Naidich (2002), introduce partial income schemes for this reason. The limited benefits with high costs do not lend themselves to a positive interpretation of UBI's potential to alleviate income inequality. Even so, it is important to note that none of the authors find that a UBI would be a severely detrimental policy for U.S. income inequality, and also that all of these authors have only modeled potential and highly theoretical UBI's. In order to find less mixed and more accurate results, further studies using more recent data (and perhaps recalibration of existing models to more recent iterations of the CPS) would be incredibly beneficial, in addition to further UBI pilot studies which can more accurately report on the highly context-dependent results of actual UBI policies.

A related drawback to this literature is that, due to its limited extent, the literature contains few points of comparison across the studies, since each piece of research investigates a slightly different version of UBI. One addresses a partial income; another addresses a full basic income which is not universal; yet another addresses a full, basic income which is based on a flat tax, another on a progressive tax. This variation combined with lack of repetition makes accumulating consistent results across the literature challenging.

III: Experiments & Pilots: What Basic Income Pilots and Experiments Have to Say About Income Inequality in the United States

Hitherto this review has focused on the theoretical literature's findings regarding UBI and such a policy's potential impacts on income inequality in the United States. A concurrent literature addresses questions related to UBI from the perspective of UBI pilots and experiments. This section balances the theoretical overview provided in the previous section with results from large scale experiments with actual attempted UBI policies. The first two following subsections address issues raised regarding labor supply and labor elasticities, and the following subsections address the effects found regarding UBI-related programs. While this literature is less focused on general effects of UBI on income inequality, prominent results of key experiments in the UBI literature as they relate to income inequality are included.

a. Lotteries & Labor Supply Effects

The literature on lotteries is relevant to UBI, since it provides evidence for how individuals respond to sudden large, unconditional shocks to their permanent income, similar to the effect of initially instituting a UBI. Literature along this vein focuses on estimating the impacts to labor supply from winning a lottery, which, as we have demonstrated in part II, has significant implications for inequality and the efficiency of the income distribution instituted by a potential UBI. The work by Cesarini et al. (2017) is one of the most notable of these studies. The authors study the effect of winning a lottery on labor supply, exploiting the randomized assignment of monetary prizes in a large sample of Swedish lottery players (Cesarini et al. 2017).

The authors conglomerate three sets of data from three different lottery samples to determine these effects. The first sample is a panel of Swedish individuals who held prize-linked savings (PLS) accounts between 1986 and 2003. PLS accounts include a lottery element by randomly awarding prizes to some accounts rather than paying interest. PLS accounts were initially subsidized by the Swedish government, but when the subsidies ceased in 1985, the government authorized banks to continue to offer PLS products. Information is taken from the PLS program run by the commercial banks, Vinnarkontot ("The Winner Account"). The study also uses data from the Kombi Lottery, where half a million individuals participate in a monthly ticket-subscription lottery called Kombilotteriet ("Kombi"). The last set of data come from the Triss Lotteries, a scratch-ticket lottery run by the Swedish government-owned operator Svenska Spel since 1986. Merging three lotteries gives sample of 435,966 observations corresponding to 334,532 unique individuals (Cesarini et al. 2017, 3921 - 3922).

The authors find that winning a lottery prize modestly reduces earnings, with the reduction being immediate, persistent, and quite similar by age, education, and sex. A calibrated dynamic model implies lifetime marginal propensities to earn out of unearned income drop from −0.17 at age 20 to −0.04 at age 60, and finds labor supply elasticities in the lower range of previously reported estimates. Pretax earnings decrease by about 1% of the wealth shock in each of the first ten years following the win. The response is about 40% smaller when the authors instead consider after-tax income, and about 40% larger when we measure labor supply in terms of production value (earnings including employer-paid social security contributions). The earnings response is mainly due to a reduction in wage earnings due to fewer hours worked. Contrary to most literature on women being systematically more sensitive to price and wealth changes, there were no significant differences in responses of men and women (Cesarini et al. 2017, 3944).

These results are generally in line with other literature which examines lottery winners in Sweden and the Netherlands, beneficiaries of negative income tax experiments in Canada, and recipients of fund dividend programs in the U.S. (i.e., the Alaska Permanent Fund). These studies consistently find small reductions in earnings and hours worked (Baird, McKenzie, and Özler 2018; Marinescu 2018; Picchio, Suetens, and van Ours 2018). Small reductions in earnings and hours worked then imply that a similar income shock from a UBI policy would have limited effect on labor supply, at least in the short run, contrary to the findings of Browning and John (1984). If individuals work about the same amount under a UBI, then such a policy’s main channel for influencing inequality would be through the size of the transfer and the progressivity of its underlying tax funding structure.

b. U.S. and Canadian Income Maintenance Experiments (IME’s)

Overarching concern with labor supply effects from unconditional cash transfers were first tested in the United States in a series of four NIT experiments conducted in the 1960’s and 1970’s, collectively referred to at the US Income Maintenance Experiments (IME’s) (Robins 1985). The U.S. government was primarily concerned with labor disincentives which could be associated with a massive NIT scheme of the type Milton Friedman had proposed in 1962. To determine the impacts of a potential NIT on labor supply and other variables, like poverty, health, and nutrition, the government sponsored four experiments, named according to their location: New Jersey (1968 – 1972); the Rural Experiment in Iowa and North Carolina; the Gary Experiment in Gary, Indiana (1971 – 1974); and the Seattle-Denver Experiment (SIME/DIME). According to Robins (1985) and other researchers at the time, there was a consensus that the labor supply response of these experiments was negative, showing a fairly consistent pattern for each racial group tested (Blacks, Chicanos, and Whites). However, no researchers found evidence of a massive withdrawal of the labor force, and found employment rate reductions between 1 and 10%. The results of the massive experiments did find negative uncompensated wage elasticities for husbands and single female heads, and positive uncompensated wage elasticities for wives (Robins 1985, 573).

Since the initial explorations of the data in the mid-20th century, scholars have returned to the experimental design and data, and have come to other conclusions (List and Rasul 2011, 112). Authors such as Ashenfelter and Plant (1990) noted that because of attrition it is not actually possible to simply tabulate the results. The experiments were flawed in part because the design took little advantage of the inherent advantages of randomization. (Moffitt 1981) argued that the ultimate policy test was whether the IME's increased work incentives relative to existing welfare programs, which at that time did have large benefit-reduction rates which may have already discouraged work. Widerquist (2005) re-evaluates the evidence from the experiments, agreeing that their conclusiveness regarding labor supply reductions is overstated.

Around the same time that the United States was experimenting with basic income programs, Canada founded its Mincome experiment in the town of Duaphin, Manitoba in the 1970's (Calnitsky and Latner 2017), which also attempted to estimate the effect of a large-scale, generous NIT on labor supply and participation rates. Uniquely, the Manitoba experiment provides insight into "community context" effects of a potential UBI, since it involved 100% saturation of an entire town. Recipients were offered guaranteed incomes equivalent to $19,500 for a four-person family (2014 Canadian dollars), which was about 38% of median family income (a measure that excludes relatively low income "non-family persons") or 49% of median household income in 1976. Mincome payments gradually phased out so that recipients could always increase their incomes by working (thus, the experiment was designed to reduce labor disincentives) (Calnitsky and Latner 2017, 10). Despite this design, the authors found that there was an 11.3% reduction in labor market participation, far higher than other studies in the U.S., which have more equivocal results. The authors find that young and single-headed households drove the work withdrawals (Calnitsky and Latner 2017, 10). Canada attempted to reinstate a basic income from 2016 – 2018 in Ontario, but the experiment was cut short due to the election of a more conservative government (Mendelson 2019).

Overall, the original studies on these income experiments found moderately sized negative effects on labor supply, while more recent studies on labor supply elasticities find relatively small labor supply elasticities (Baird, McKenzie, and Özler 2018; Marinescu 2018; Picchio, Suetens, and van Ours 2018). However, results vary by time, context, and type of transfer receipt. Unfortunately, these experiments did not attempt to directly capture effects on income inequality in the communities where they tested these transfers. However, Widerquist (2005) does mention that the result of direct cash transfers in each of the experiments could have resulted in reductions in income inequality, and it is certainly likely that in the Manitoba experiment, Manitoba saw distinct reductions in income inequality due to its community level saturation. The following subsections sections provide more direct insight into how a UBI could impact income inequality aside from the channel of labor supply.

c. The Alaska Permanent Fund

The Alaska Permanent Fund is one of the primary examples of an actual universal and unconditional cash transfer, which has been going on since 1982, for which the literature does provide resulting effects on income inequality. Worth about $81.9 billion in fiscal year 2021 ("Our Performance," 2021), cash payments are sourced from a government-run, diversified portfolio of invested oil reserve royalties. Since 1982, all Alaskan residents of any age are entitled to a yearly dividend payment from the fund, which in recent years has amounted to around $2000 per person. Anyone is eligible for the transfer as long as they have lived in Alaska for at least one year**.** Since it is one of the few existing programs to utilize universal and unconditional transfers, there are a number of studies which aim to show the effects of the dividend on various outcomes of Alaskans, such as labor market outcomes, child poverty rates, savings rates, and health effects (Jones and Marinescu 2020).

One such paper is by Jones and Marinescu (2020), which attempts to analyze the long run impacts of this transfer on the Alaskan labor market. Using a difference-in-difference approach and matched controls, they find, similar to the lottery literature citied above which saw some reduction in labor supply, that the fund results in an increase of 1.8 percentage points (17%) in the share of Alaskans who work a part time job. However, the employment to population ratio in Alaska after the dividend is similar to synthetic control states (Jones and Marinescu 2020, 2).

This fund is also one of the few for which income inequality effects have been determined. Kozminski and Baek (2017) directly investigate the impacts of the Permanent Fund Dividend (PFD) payouts on Alaska's income inequality using an autoregressive distributed lag (ARDL) approach to cointegration and the Jansen cointegration approach to annual time series data from 1963 to 2012. The authors use three measures of income inequality in a Kuznets curve framework to evaluate the fund's impacts on Alaskan income inequality: the Gini coefficient, relative mean deviation (RMD), and Thiel's entropy index. After regressing income using the ARDL approach, they find that long- and short-run coefficients are positive for all three types of income inequality and are highly significant, implying that the PFD payouts seem to have exacerbated Alaska's income inequality over the past three decades (see table 5 below). Interestingly, the dummy variable for Thiel's entropy index does not have a significant effect. Signs and long-run relationships from the Johansen approach to cointegration are also remarkably consistent with those estimated by ARDL, suggesting that income and population increases in addition the payouts from the fund have all been significant factors influencing Alaska's rates of income inequality (Kozminski and Baek 2017, 101).

Table 5: Full-Information Estimates of the ARDL Model

	Gini coefficient ARDL (1, 1, 1, 2)	Relative mean deviation ARDL (1, 2, 2, 2)	Thiel entropy index ARDL (1, 1, 1, 1)
Panel A: Short-run estimates			
$\Delta \ln y_t$	1.86 (4.47)**	4.83 (3.18)**	−0.13 (0.15)
$\Delta \ln y_{t-1}$		−4.18 (2.77)**	
$\Delta \ln(y_t)^2$	−0.09 (4.23)**	−0.23 (3.12)**	0.01 (0.25)
$\Delta \ln(y_{t-1})^2$		0.20 (2.75)**	
$\Delta \ln pop_t$	−1.08 (3.98)**	−1.20 (3.26)**	−0.89 (1.57)
$\Delta \ln pop_{t-1}$	0.49 (1.83)	1.11 (3.14)**	
PFD_t	0.09 (3.82)**	0.06 (1.96)*	0.27 (4.85)**
DUM_t	0.15 (4.63)**	0.18 (5.38)**	0.09 (1.36)
Panel B: Long-run estimates			
$\ln y_t$	4.28 (4.94)**	3.62 (4.58)**	−0.18 (0.15)
$\ln(y_t)^2$	−0.20 (4.67)**	−0.17 (4.22)**	0.01 (0.24)
$\ln pop_t$	−0.89 (4.90)**	−0.90 (4.53)**	0.01 (0.02)
PFD_t	0.21 (3.87)**	0.13 (2.06)*	0.36 (5.03)**
DUM_t	0.35 (5.04)**	0.40 (4.86)*	0.11 (1.41)
Constant	−11.98 (2.88)**	−8.40 (2.11)*	−0.70 (0.13)
Panel C: Diagnostic statistics			
F	11.15**	13.83**	11.36**
ec_{t-1}	−0.44 (6.28)**	−0.46 (5.36)**	−0.73 (6.51)**
Serial correlation	0.01	2.26	0.04
Normality	0.71	0.31	0.78
Heteroskedasticity	1.59	0.01	0.35
$CS(CS^2)$	Stable (Stable)	Stable (Stable)	Stable (Stable)
Adjusted R^2	0.56	0.66	0.50

Note: Numbers inside the parentheses next to coefficient estimates are absolute value of *t*-ratios. ** and * indicate significance at the 1% and 5% levels, respectively. The upper bound critical values of the F-test for cointegration are 5.61 and 4.35 at the 1% and 5% levels of significance, respectively. These come from Pesaran et al. (2001, Table CI, Case III, p. 300).The critical value for significance of ECM_{t-1} is −3.47 (−3.82) at the 10% (5%) level when $k = 3$. These come from Banerjee et al. (1998, Table 1). *DUM* represents a dummy variable capturing a structural break for each index. Serial correlation is tested using Lagrange multiplier (LM) of residual serial correlation. Normality test is based on a test of skewness and kurtosis of residuals. Heteroskedasticity test is based on the regression of squared residuals on squared fitted values. They are distributed as χ^2 with one degree of freedom. The critical values are 6.63 and 3.84 at the 1% and 5% levels, respectively. CS and CS^2 indicate the cumulative sum and cumulative sum of squares tests, respectively.

Source: Kozminski and Baek (2017**).**

The authors posit that these findings are the result of differing spending habits of the low and high-income residents of Alaska. While low-income residents would be more likely to spend on disposable goods, higher-income residents would be able to invest the dividend into longer-term payoffs, like their homes, savings accounts, 401k's, and other investments, which could later be cashed out for more money. Such differing spending habits could have lead to the increase in income inequality over time in Alaska (Kozminski and Baek 2017, 101). Interestingly, this finding of increased income inequality is directly at odds with that of Widerquist and Howard (2012), who argue that the fund decreased inequality over the interval by providing a greater percentage increase to low-income households (Widerquist and Howard 2012). They briefly argue this point based on the results of other studies of Alaska's income inequality over the same period, but lack empirical evidence to support their claim. The mixed results regarding the outcomes of Alaska's fund on income inequality in the state imply that further empirical studies are required to more certainly ascertain the fund's impacts on income inequality (Kozminski and Baek 2017, 101).

d. Recent Country-Level Basic Income and Related Policies

While the following natural UBI experiment took place outside the United States, it does reflect massive experiments at a national level with a basic income, making it relevant to this discussion. This nation is Iran, which in 2011 replaced its monthly energy subsidies with monthly deposits of cash into individual accounts for more than 70 million people, using transfers that amounted to 28% of the median per capita household income (Salehi-Isfahani and Mostafavi-Dehzooei 2018, 350)**.** The Iranian government had promised every citizen energy and bread subsidies for personal use from 1979 on. These payments amounted to 20% of GDP, but due to their popularity, remained in effect until President Mahmoud Ahmadinejad eliminated them and instead gave cash monthly transfers (90 USD PPP and 28% of median income) starting in 2011 (Salehi-Isfahani and Mostafavi-Dehzooei 2018, 350). To investigate the impacts of such a guaranteed income, authors Salehi-Isfahani and Mostafavi-Dehzooei (2018) use panel data to see the effect on labor supply using exogenous variation in the time households first began to receive the pure-cash transfers. Exploiting the fact that 30% of the population had to wait to receive the transfer as a result of poor administration of the change, the authors employ a difference-in differences approach on the panel data of households to determine the effects of the transfer. The authors find that there are no discernable negative labor supply effects for hours worked and labor force participation rates (Salehi-Isfahani and Mostafavi-Dehzooei 2018, 363). However, the authors also note that credit and labor markets are heavily rationed in Iran (which has an existing unemployment rate of 40%), making these labor supply results largely incomparable to other nations with far lower rates of unemployment, like the U.S (Salehi-Isfahani and Mostafavi-Dehzooei 2018, 364). They also find that the policy proved to be a net improvement over the previous energy and bread subsidies. The authors also find that the 2009 Gini index of energy subsidies per capita was 0.49 compared to 0.42 for all other expenditures per capita, indicating that the original policy unequally spread the wealth of Iran to a high degree (Salehi-Isfahani and Mostafavi-Dehzooei 2018, 351). Replacing the policy with a redistributional policy like the cash transfer is thus a net improvement for income inequality in Iran (Salehi-Isfahani and Mostafavi-Dehzooei 2018)**.**

Other programs which are still underway (or are not yet analyzed as part of the basic income and inequality literature) include experiments such as the Finland experiment, city-level experiments in the Netherlands, Spain, and other wealthy nations (Allas et al. 2021) and independently funded UBI experiments in the United States in locations like Jackson, Mississippi (Samuels 2019), Stockton, California ("Economic Security Project," 2021) and Silicon Valley through a firm called Y Combinator Research (Sadowsky 2016). Results for Finland are available, however, the full report 9 have not been made available in English (Results of Finland's Basic Income Experiment," 2020).

IV. Discussion, Conclusions, and Areas for Further Research

As was mentioned in the discussion portion of part II, this review of the effects of a potential UBI on income inequality in the United States finds that, currently, results from the micro-simulation, optimum tax, and experimental literature are mixed and rather inconclusive regarding UBI's effects on income inequality. Results regarding labor supply are also relatively mixed, with more recent studies finding smaller labor supply elasticities. Results from the Mincome and IME experiments of the 1960's and 1970's, while they vary regarding the extent of negative impacts of labor supply, do find that labor supply differs depending on the demographics of the recipient – women are more likely to cut labor force participation, in addition to the elderly and the young in pursuit of higher education, a result which remains generally consistent for basic income pilots. However, the extent to which labor supply affects the resulting income distributions of UBI pilots is unclear, since, as Wilderquist (2005) points out, these labor supply effects must be compared to current labor disincentives present in existing welfare systems due to conditionality and cutting of benefits when work is found. The remaining literature investigating effects of implemented UBI-adjacent policies in Alaska and Iran is also inconclusive, with different authors finding support for and against the reduction of income inequality as a result of these programs, particularly in regards to Alaska. The conclusions of Iran are also difficult to track back to the U.S. due to its permanently high levels of unemployment and small existing labor participation rates.

Admittedly, the literature on the effects of UBI as an inequality-reducing policy is quite limited. Taking these mixed results in hand, and considering the large costs that a true UBI would require, it is very likely that the limited-to-mixed impacts on income inequality here outweigh their high costs compared to existing transfer systems in the United States. Of course, this is the result only for income inequality, and excludes other potential benefits (and deficits) that a UBI could infer on citizens, such as health, well-being, poverty, and educational attainment in developed and developing-country contexts.

However, for policymakers and researchers alike to come to a conclusion about UBI's potential as an inequality-reducing program specifically, more research is needed in particular areas. Firstly, continuing to increase the number of theoretical studies of the type discussed in section I with each variation of tax rates, underlying funding structure, and more recent data will enable researchers to systematically understand the effects of a potential UBI on the overall U.S. economy, income inequality included, for each potential UBI. By using micro-simulation and macro-simulation models, results of eventual impacts on income inequality are highly dependent on the underlying revenue and funding structure chosen. As Hoynes and Rothstein (2019) point out, increasing the number of studies and maximizing the variation in the underlying funding and tax structures in the models is critical for understanding how a true, complex UBI would likely impact income inequality in the United States.

The literature needs to further investigate and compare the distributional effects of underlying funding structures of a potential UBI. Where the money for such a large set of transfers comes from would have instrumental effects on the resulting income and wealth distribution, and is important for comparing a UBI's potential effects to the existing status quo. Much of the literature discussed in part II studies the effects of UBI's with highly simplified tax structures, such as flat taxes or incredibly simple progressive taxing systems. Studies of the effects of a UBI with funding structures more similar to the complex current welfare and tax system are needed to realistically determine the income inequality effects of a UBI.

In terms of experimental and UBI-pilot literature, thus far, UBI pilots have taken place in areas with already high rates of poverty, particularly those in developing countries. To predict a UBI's full impacts on income inequality in the context of developed countries, more studies need to be done in economies with significant numbers of both low- and high-income individuals. Existing studies of UBI pilots in developed countries also lack explicit focus on the effects of a

UBI on income inequality. To the extent that policymakers are interested in using UBI as a tool to reduce income inequality, it would be beneficial for future research to re-evaluate the evidence for many of the pilots mentioned in part III in terms of their impacts on income inequality measures. Additionally, no pilots or randomized control trials have been developed which attempt to experimentally compare the effects of a partial rather than full basic income as two separate treatments in wealthy nations. The development of such a study would be highly beneficial for evaluating which program is most beneficial for income inequality reduction. Additionally, as Hoynes and Rothstein (2019) point out, experimentation aimed at identifying parameters and mechanisms would be more useful than evaluations of small UBI pilots in communities with pre-existing high rates of low-income individuals. Future studies should also include the interaction between income and wealth inequality, which has been largely untouched in this review for the purpose of space. By investigating these areas, it may be possible for researchers and policy makers to more fully determine how a basic income policy could operate as a tool for reducing income inequality.

References

Acemoglu, Daron, and Pascual Restrepo. 2020. “Robots and Jobs: Evidence from US Labor Markets.” http://www.journals.uchicago.edu/t-and-c.

Allas, Tera, Jukka Maksimainen, James Manyika, and Navjot Singh. 2021. “An Experiment to Inform Universal Basic Income.” McKinsey & Company, June 23, 2021. https://www.mckinsey.com/industries/public-and-social-sector/our-insights/an-experiment-to-inform-universal-basic-income.

Ashenfelter, Orley, and Mark W Plant. 1990. “Nonparametric Estimates of the Labor-Supply Effects of Negative Income Tax Programs Published by : University of Chicago Press on Behalf of the Society of Labor Economists and the NORC at the University of Chicago Stable” 8 (1): 397–415.

Atkinson, A. B.. *Public Economics in Action: The Basic Income/Flat Tax Proposal*, Oxford University Press, Incorporated, 1997.

Baird, Sarah, David McKenzie, and Berk Özler. 2018. “The Effects of Cash Transfers on Adult Labor Market Outcomes.” *IZA Journal of Development and Migration* 8 (1). https://doi.org/10.1186/s40176-018-0131-9.

Browne, James, and Herwig Immervoll. 2017. “Mechanics of Replacing Benefit Systems with a Basic Income: Comparative Results from a Microsimulation Approach.” *Journal of Economic Inequality* 15 (4): 325–44. https://doi.org/10.1007/s10888-017-9366-6.

Browning, Edgar K., and William R. Johnson. 1984. “The Trade-Off between Equality and Efficiency.” *Journal of Political Economy* 92 (2): 175–203. https://doi.org/10.1086/261219.

Calnitsky, David, and Jonathan P. Latner. 2017. “Basic Income in a Small Town: Understanding the Elusive Effects on Work.” *Social Problems* 64 (3): 373–97. https://doi.org/10.1093/socpro/spw040.

Cesarini, David, Erik Lindqvist, Matthew J. Notowidigdo, and Robert Östling. 2017. “The Effect of Wealth on Individual and Household Labor Supply: Evidence from Swedish Lotteries.” *American Economic Review* 107 (12): 3917–46. https://doi.org/10.1257/aer.20151589.

Clark, Charles M.A., and Catherine Kavanagh. 1996. “Basic Income, Inequality, and Unemployment: Rethinking the Linkage between Work and Welfare.” *Journal of Economic Issues* 30 (2): 399–406. https://doi.org/10.1080/00213624.1996.11505803.

Colombino, Ugo. 2019. "Is Unconditional Basic Income a Viable Alternative to Other Social Welfare Measures?" IZA Institute of Labor Economics, March 6, 2019. https://wol.iza.org/articles/is-unconditional-basic-income-viable-alternative-to-other-social-welfare-measures/long.

"Economic Security Project." 2021. Economic Security Project, March 29, 2021. https://www.economicsecurityproject.org/.

Friedman, Milton. 1962. *Capitalism and Freedom*. Chicago, IL: University of Chicago Press.

Garfinkel, Irwin, Chien-Chung Huang, and Wendy Naidich. 2002. "The Effects of a Basic Income Guarantee on Poverty and Income Distribution," no. 014.

Hoynes, Hilary, and Jesse Rothstein. 2019. "Universal Basic Income in the United States and Advanced Countries." *Https://Doi.Org/10.1146/Annurev-Economics-080218-030237* 11 (August): 929–58. https://doi.org/10.1146/ANNUREV-ECONOMICS-080218-030237.

Jones, Damon, and Ioana Marinescu. 2020. "The Labor Market Impacts of Universal and Permanent Cash Transfers: Evidence from the Alaska Permanent Fund" 1: 105–12.

Keynes, John Maynard, 1883-1946. 1936. *The General Theory of Employment, Interest and Money*. New York: Harcourt, Brace.

Kozminski, Kate, and Jungho Baek. 2017. "Can an Oil-Rich Economy Reduce Its Income Inequality? Empirical Evidence from Alaska's Permanent Fund Dividend." *Energy Economics* 65: 98–104. https://doi.org/10.1016/j.eneco.2017.04.021.

List, John A., and Imran Rasul. 2011. *Field Experiments in Labor Economics*. *Handbook of Labor Economics*. Vol. 4. Elsevier Inc. https://doi.org/10.1016/S0169-7218(11)00408-4.

Mendelson, Michael. 2019. *Lessons from Ontario's Basic Income Pilot*.

Merrill, Samuel, Bernard Grofman, and Lucy Barnes. 2021. "Simple Analytics of the Gini Index."

Michaels, Ryan. 2017. "Why Are Men Working Less These Days?" Federal Reserve Bank of Philadelphia, 2017. https://www.philadelphiafed.org/the-economy/macroeconomics/why-are-men-working-less-these-days.

Moffitt, Robert A. 1981. "The Negative Income Tax: Would It Discourage Work." *Monthly Labor Review* 104 (4): 23.

Moffitt, Robert A. 2003. "The Negative Income Tax and the Evolution of U.S. Welfare Policy." *Source: The Journal of Economic Perspectives* 17 (3): 119–40.

"Our Performance." 2021. Alaska Permanent Fund Corporation, September 3, 2021. https://apfc.org/our-performance/.

Picchio, Matteo, Sigrid Suetens, and Jan C. van Ours. 2018. "Labour Supply Effects of Winning a Lottery." *Economic Journal* 128 (611): 1700–1729. https://doi.org/10.1111/ecoj.12465.

"Results of Finland's Basic Income Experiment: Small Employment Effects, Better Perceived Economic Security and Mental Wellbeing - News Archive for Customers." 2020. kela.en. The Social Insurance Institution of Finland, May 6, 2020. https://www.kela.fi/web/en/news-archive/-/asset_publisher/lN08GY2nIrZo/content/results-of-the-basic-income-experiment-small-employment-effects-better-perceived-economic-security-and-mental-wellbeing.

Robins, Philip K. 1985. "A Comparison of the Labor Supply Findings from the Four Negative Income Tax Experiments." *The Journal of Human Resources* 20 (4): 567. https://doi.org/10.2307/145685.

Sadowsky, Jathan. 2016. "Why Silicon Valley Is Embracing Universal Basic Income." The Guardian. Guardian News and Media, June 22, 2016. https://www.theguardian.com/technology/2016/jun/22/silicon-valley-universal-basic-income-y-combinator.

Samuels, Robert. 2019. "$1,000 a Month, No Strings Attached." The Washington Post. WP Company, September 1, 2019. https://www.washingtonpost.com/politics/2019/09/01/month-no-strings-attached/.

Salehi-Isfahani, Djavad, and Mohammad H. Mostafavi-Dehzooei. 2018. "Cash Transfers and Labor Supply: Evidence from a Large-Scale Program in Iran." *Journal of Development Economics* 135 (July): 349–67. https://doi.org/10.1016/j.jdeveco.2018.08.005.

Victor, André, and Doherty Luduvice. 2021. "The Macroeconomic Effects of Universal Basic Income Programs," no. December 2021.

Van Parijs, Philippe, and Vanderborght, Yannick. 2017. *Basic Income: A Radical Proposal for a Free Society and a Sane Economy*. Cambridge: Harvard University Press.

Widerquist, Karl. 2005. "A Failure to Communicate: What (If Anything) Can We Learn from the Negative Income Tax Experiments?" *Journal of Socio-Economics* 34 (1): 49–81. https://doi.org/10.1016/j.socec.2004.09.050.

Widerquist, K., and Howard, M., eds. 2012. *Alaska's Permanent Fund Dividend: Examining Its Suitability As a Model*. New York: Palgrave Macmillan US.