The Income Distributional Effects of Basic Income Schemes on Different Ethnic Groups in the UK: A Static Microsimulation

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Abstract

Background

In recent years, attention around basic income (BI), unconditional cash transfer or universal basic income (UBI) has risen in many countries' policy agendas. Many papers have used microsimulations to model its potential effects in a specific country setting (Tory, 2016, 2020; Martinelli, 2017, 2019; De Wispelaere et al, 2012, 2016). Roughly 30% of ethnic minorities of Asian and Black descent are found to be in the bottom quintile of income, compared to 18% from a Caucasian ethnicity (Department for Work and Pensions, 2020). However, few of these papers investigates how different BI schemes would impact ethnic minority communities.

Objective

This paper aimed to investigate the income distributional effects of basic income on different ethnic minorities in the United Kingdom.

Method

The paper uses the UK component of the static microsimulation program called EUROMOD. Three different basic income schemes were explored, and a cross-sectional snapshot was taken before and after the simulation. A distributional analysis was then conducted on individual level characteristics to assess the effects of each basic income scheme. Odds ratios were used to display these results.

Results

The results suggest that Southeast Asian, East Asian and Arab ethnic groups would benefit the most from basic income schemes. Second, female individuals would benefit more from basic income than their male counterparts and regardless of ethnicity. However, females from certain ethnicities (Southeast Asian, East Asian and Arab)

would benefit more than females from other ethnicities (White, Black, Mixed and Other). Third, much of the redistribution occurs from 'White' working age adults to other economic status groups as the basic income scheme becomes more progressive. Lastly, this redistribution helps to close the gap in disposable income of groups with the same economic status but different ethnicity groups i.e 'White pensioners' and 'Ethnic minority pensioners.'

Conclusion

In terms of policy impact, results suggest that basic income schemes have a positive impact in reducing inequality for certain ethnic groups in the United Kingdom and increase disposable income for female individuals. Nevertheless, the conclusions presented here should be taken with caution as the data used in the paper has a high percentage of missing data and have not explored dynamic factors which would be crucial to understanding basic income schemes' impact on ethnicities. Second, despite the debate on whether or not households do pool their income, further research should be conducted on basic income impacts on a household level.

1 BACKGROUND

In recent years, attention around basic income (BI), unconditional cash transfer or universal basic income (UBI) has risen in many countries' policy agendas. The advent of the Covid pandemic has only increased its prominence with countries such as the UK implementing a furlough scheme (HMRC, 2020) which has many basic income like-qualities. Much of the current discussion around the topic has been around its technical and political feasibility and benefits it brings to the citizens of the respective nation (Tory, 2016, 2020; Martinelli, 2017, 2019; De Wispelaere et al, 2012, 2016). Exploring different payment levels, Torry (2016) and Reed & Lansley (2016) have used microsimulations to design basic income schemes that balance both of these types of feasibilities. Such microsimulation papers have also given readers insight into the income-distributional effects of certain household characteristics i.e single-parent households and pensioners (Martinelli, 2017b). An area where there has been less of a focus is the varying income distributional impacts of different BI schemes for the ethnic minority community within the UK. Various academic papers have highlighted the differences between ethnic groups such as labour market discrimination (Berrittella, 2012), health/obesity (Saxena et al, 2004), income levels (Department for Work and Pensions, 2020) and many more. Hence it is logical to assume that different basic income schemes would have different distributional effects on different ethnic groups. This paper will attempt to investigate the impacts of three different hypothetical basic income schemes on the disposable income of different ethnic groups in the UK.

1.1 What is Basic Income?

To put it simply, basic income is a government cash transfer paid to a population. While names such as negative income tax and universal basic income, often used synonymously with basic income, are ways in which this is achieved. Negative income tax is a uniform and refundable tax credit such as the personal allowance for income tax. While a key characteristic of a UBI is that the size of the cash transfer is the same irrespective of age (Gentilini et al, 2019, p. 130) paid to every citizen of a country or territory. However, other UBI proposals argued for payments to be differentiated by demographic characteristics e.g a smaller payment for children (Gentilini et al, 2019, p. 130).

Basic income is an idea that has garnered heightened interest across the political spectrum. In the recent US Presidential 2020 election, it was a significant policy agenda for the democratic candidate Andrew Yang (Lach, 2021), who like many others, proposed UBI as a possible method of dealing with prognostications of a future with extreme inequality driven both socioeconomic and technological factors.

1.2 History of BI in the UK

The idea of a basic income can be traced back to Thomas More's (1478-1535) Utopia, as a more effective solution to deal with theft than the death penalty in the city of Antwerp. Since then, it has been revisited by thinkers such as Abraham Lincoln, Henry George, Franklin Roosevelt, and Tony Atkinson (Klein, 2016). Much of the discussion of UBI in the United Kingdom began in the 1920s and towards the end of the first world war with a publication from Nobel Laureate Bertrand Russell (1918) arguing for a UBI that is "sufficient for necessaries". During the same year, an engineer and Labour party

member, Dennis Milner and his wife Mabel produced a pamphlet pitching for income to be paid at 20% of GDP per capita, the “State bonus” was hoped to make it possible to solve the problem of poverty, particularly after the first world war (Trier, 1995). However, basic income was soon to be relegated to the fringe of the UK’s policy relevant debate, largely due to a different welfare proposal by William Beveridge (BIEN, 2021).

1.3 Current Situation of BI

Since the Covid-19 pandemic, there have been increasing attention put on the idea of basic income. Calls have been made by the Scottish First Minister for a UBI program (Paton, 2020) and a letter signed by 170 MPs and sent to the Chancellor, Rishi Sunak, calling for an emergency basic income scheme (Paton, 2020). Furthermore, plans are currently being developed for a UBI pilot trial in Wales (Thomas et al, 2021). There have been some full-blown BI programs that have been put into place elsewhere in the world, such as in Alaska Permanent Dividend Fund, which began in the 1980s (Jones & Marinescu, 2018). In addition, there is an increase in the number of country-specific BI papers ranging from Australia (Murry, 2012), New Zealand (Preston, 1998), the US (Harvey, 2006) and the UK (Torry, 2016). Very recently, there is an increase in the use of microsimulations in academic research. In particular in the EU with the utilisation of EUROMOD and the UK component, UKMOD, have enhanced the debate around basic income on its viability and efficiency. Leading to questions on whether the huge costs involved in a basic income programme, is really the most effective way to reduce poverty? Or is it “a case of a large income tax ‘horse’ pulling a tiny poverty-alleviation ‘cart’” (Martinelli 2017, p.37).

1.4 Supporters and Detractors

Supporters of BI argue that such a policy would reduce social problems such as income insecurity, improve gender equality and encourage entrepreneurship (Standing, 2004 and Bregman, 2017). Van Parijs (2004) argues that regular income payments would also allow individuals more freedom in their lives, including their living arrangements and other lifestyle choices. In addition to alleviating economic problems such as poverty, inequality and solving the unemployment trap which exists in the current welfare system due to high marginal tax rates (Hirsch, 2015; Gamel et al, 2006;). A key advantage over the current welfare system is the reduction in the costs involving eligibility conditions and mean testing as well as eliminating gaps in coverage due to 'exclusion errors' (Standing, 2017, p. 131-132; Goodin, 1992).

However, detractors of UBI would point out the practical feasibility of funding and implementing such a drastic reform (Piachaud, 2018). Martinelli (2019) points out the current trilemma which policymakers face. First would be the claim that basic income is unaffordable due to the effects on work incentives and the fiscal cost of any serious basic income program would be excessively high (Vanderborght, 2017; Kay, 2017). However, results from the more recent UBI experiment in Finland points to no differences in labour market behaviour (Kangas, 2019), but very little empirical evidence exists in this area to be completely ruled out. Second, is the view that a mixture of basic income and the incumbent welfare system would negate the primary advantage of UBI, its relative simplicity. Lastly, is the view that "the uniform payment structure is inadequate to cover the complex array of circumstances and needs for which social security systems are designed. In this view, "basic income is at best an inefficient

way of alleviating poverty, and at worse would actually exacerbate it." (Martinelli, 2019, p. 462).

1.5 How would Universal Basic Income affect Ethnic Minorities and why is it important?

Within the UK, people from ethnic minority backgrounds have historically been those who are the most exposed to poverty. A Department for Work and Pensions report (2020), found that roughly 30% of individuals of Asian and Black descent are in the bottom quintile of income, in comparison to 18% of those from white ethnicities. However, the same report showed the utilisation of the welfare from ethnic minorities are in line with their white counterparts, highlighting a problem of a lack of coverage and indirectly possible exclusion gaps in the current regime. As stated earlier, one of the main advantages of UBI over conditional welfare would be its universality and logically, given that levels of payments are the same, we would expect a reduction of both inequality and poverty rates in ethnic minority populations in the UK.

In recent literature, UBI is also seen as a means of addressing inequalities perpetuated over a longer historical period. In Barchiesi (2007), looked at how UBI could be utilised in post-apartheid South Africa, and argued that such a policy can help to redress pervasive racial and discriminatory inequalities that persist in the country. A study by Harell et al. (2016) in the US suggests that support for welfare reform is heavily influenced by citizens' racial attitudes and therefore people from ethnic minorities. During the survey, when white participants associate benefits with race, they tend to be less generous toward welfare recipients and to view them as less deserving. It is theorised this was down to people's preferences to their own group and hostility to and

outgroup (Harell et al, 2016). One hope is for UBI to destigmatise welfare and improve social cohesion, since everyone would be a recipient, therefore removing the association of welfare recipients to ethnic minorities (Heumann, 2002).

This study aims to look at the redistributive effects of three basic income programs on ethnic minorities within the UK. The study will utilise the UK component of the microsimulation program called EUROMOD. The program is widely utilised to model changes to the tax scheme across European countries and for the purpose of this paper has been adapted to look at the implementation of basic income. Furthermore, utilising a microsimulation method would only measure the morning aftereffects/first-order effects and not take into account other potential dynamic impacts such as the ones previously stated. Therefore, the paper will not discuss the evidence of these potential pathways. The resultant evidence and discussion will add to the current political and policy-making debate concerning an implementation of a full/partial UBI within the UK.

2 DATA AND METHODOLOGY

After giving a background on the history of UBI in the UK and the research question on which this paper is focused. This section will first discuss the reasoning for undertaking a microsimulation. Second, discuss the data being used for the empirical analysis. Third, the details on the microsimulation program used by the researcher and the familiarity/training of the researcher with the software. Fourth, details on three basic income schemes analysed in this paper and the reasoning for each. Finally, data analysis and the operationalisation of output variables and the categorical variable used.

2.1 Choosing Research Methods

The decision to use a microsimulation over other research methods is due to the fact there is no full basic income scheme/pilot program within the UK. Leading to a lack of information in this specific research area, making it difficult to analyse, both through other quantitative means and by systematic review. UKMOD is a component of EUROMOD and is a static micro-simulation utilising the FRS data. A key strength of utilising this data is the inclusion of ethnicity data along with up-to-date information on other individual level characteristics i.e Economic Status. Due to the lack of data for other research methods stated previously, I believe currently that this is the best way to investigate how different basic income schemes would affect different ethnic communities in the UK setting.

2.2 Data for the microsimulation

This paper utilises data from the Family Resources Survey (FRS) collected in 2018 and published in 2019. The FRS is a continuous household survey starting from 1994 to the current day. The survey is cross-sectional and the 2018 survey consists of 43,087 individuals from 19,169 unique households. The publication provides statistics for each individual's/household's sources of income, housing tenure, economic status, disability, disposable income, and ethnicity. The 2018-2019 FRS data was the most recent data at the time of writing of this paper, however a newer edition has since been released.

2.3 Data Sampling

According to FRS's Methodology publication (Cameron et al, 2020), the FRS sample was drawn from Royal Mail's small users Post Code Address File (PAF), which are a list of addresses that receive less than 50 letters/packages a day. This ensures that

institutions and businesses are excluded. The Great Britain FRS uses a stratified clustered probability sample design and is stratified by 27 regions and by the socioeconomic status of the household reference person (HRP), the proportion of economically active adults and the proportion of economically active men who are unemployed.

The Northern Ireland FRS utilises a sampling frame from the POINTER address database. A systematic random sample of 4,080 addresses was selected for the 2018/2019 survey.

2.4 Data collection

Data was collected by a consortium consisting of the Office of National Statistics and NatCen Social Research on behalf of the Department for Work and Pensions (DWP). FRS interviews were conducted using Computer Assisted Personal Interviewing (CAPI) and comprised of three segments, the interview on average lasted 51 mins. First-time interviewees were briefed on the process before the commencement of the interview. Out of a UK sample of 43,047 UK households, 47% (27872 households) were either non-contactable or refused to proceed with the interview. Although 50% non-response rate is not considered unreasonable after considering the size and complexity of the FRS. This does introduce an element of the systematic bias in the survey results, but no information exists on the extent and the nature of the bias (Cameron et al, 2020, p 25).

2.5 EUROMOD Simulation

The empirical analysis makes use of microsimulation methods, using the UK component (UKMOD) of the EUROMOD tax and benefit microsimulation model.

EUROMOD program allows for the simulation of cash benefit entitlements, income taxation and social insurance contribution, based on the availability of information and tax-benefit rules (Sutherland and Figari, 2013). EUROMOD would then produce a microdata set with the simulated variables as output. The output variables are first-order results (i.e those before any behavioural changes). These output variables are inequality measures, poverty measures, percentage and winners and average gain by different subgroups and level of disposable income by individual/household.

The UK component of EUROMOD was developed by CeMPA at the University of Essex. Currently, there are three popular ways of using UKMOD to investigate BI schemes. The first is to calculate the level of basic income which a tax scheme could support. Second is the change in the tax rates required to support a given level of basic income. Lastly, it calculates the effect of the fiscal balance of given changes to both the level of basic income and the tax schedule (De Henau et al, 2021, p.5-6). This paper will utilise the first two methods in simulating basic income programs.

2.6 UKMOD MICROSIMULATION VALIDATION

Validation of the UKMOD A2.0+ program was carried out in the EUROMOD's UK country report (Reis & Tasseva, 2020). The input data used, and the output variables simulated by UKMOD are compared with external benchmarks (Reis & Tasseva, 2020, p.93).

Input Variables

FRS 2018 input data is compared with estimates from the Annual Survey of Hours and Earnings (ASHE) in 2018. The results showed that the distribution of earnings and the average gross monthly earnings are similar to each other (Reis & Tasseva, 2020, p.94-

95). However, there is an ‘under-representation of non-simulated benefits’ (Reis & Tasseva, 2020, p.97), which would weaken the implications for the variables which are simulated in the paper.

Simulated Variables

UKMOD simulated variables are compared with administrative figures and results show an under-simulation of less than 10% in the Winter-fuel allowance, mean-tested benefits and tax credits, Pension credit and Income tax. With total pension credit expenditure, housing benefit and social insurance contributions being underestimated by more than 10%. Furthermore, some variables have been over-estimated such as income support, benefit cap and Universal credit (Reis & Tasseva, 2020, p.98-102).

Adjustments

Due to these inaccuracies, adjustments have been made to the baseline to ensure the model is more accurate however some benefits remain overestimated (Income support and Universal Credit) and others underestimated (Working tax credit and child tax credit) (Reis & Tasseva, 2020, p.104).

2.7 Researcher Experience and Training

The author of this paper has undergone a 5-day training program, in addition to a daylong workshop to specialise in simulating basic income programs both events were conducted by a team from CeMPA. The author had a total of 36 hours of training for the UKMOD program. R was further utilised to construct categorical variables and output variables.

2.8 Basic Income Schemes Analysed in this paper

This paper has chosen three basic income schemes to look at how a hypothetical basic income scheme would impact ethnic minorities and will not focus on their feasibility. Despite this, the paper has taken the fiscal neutrality route, which is where the expenditure of the government cannot exceed the revenue gained from taxation. Such a condition may be necessary for a basic income scheme to achieve initial political acceptance and for it to be sustainable in the long run (De Henau et al, 2021, p. 4), often this would also mean a reform of the tax system. Imposing a condition of fiscal neutrality for basic income programs has also been used by other authors who have modelled basic income in the UK (Martinelli, 2017, Torry, 2021, Bezzo, 2021). In addition to the changes in the tax scheme, this paper has used the suggested reforms from (De Henau et al, 2021) to achieve fiscal neutrality in all three of the basic income models.

Suggested Reforms from De Henau et al, 2021:

- Abolishment of Personal allowance in the income tax system
    - Reason: The personal allowance in the income tax system is a form of basic income for those with a source of income.
- Removal of both upper and lower limits for National Insurance Contributions (NICs) which effectively makes it into a flat rate
    - Reason: Lower limit is removed since each BI scheme should be sufficient enough to allow everyone to pay it. A higher limit is removed to make the scheme less regressive.
- Children receive a fixed proportion of the working-age BI. This proportion is set at 0.45 of the working-age adult BI.

- Reason: This proportion is based on what a lone parent and a teenager require over a lone adult in the Minimum Income Standard (MIS). MIS is further used in Model B.

Three Basic Income Schemes

Model A (Base Scenario)	
BI is set at a level which the current system with the following changes can support	
Model Details	**Payment Levels per month**
Abolishing the personal tax allowance for income tax	Adult: £416.67
Abolishment of the upper and lower limit of National Insurance	Child: £187.5
Setting children's UBI at 0.45 of working-age adults (age 18 and over)	Pensioner: £759.17
Basic Income payments are not taxable	

Model A looks into the level of basic income payment which the current tax system can support with the changes suggested previously. Using this scenario as the least progressive scenario, this paper will use this model as the most realistic and other more optimistic models will be compared to this model.

Model B (MIS Scenario)	
A more generous form of BI set according to MIS	
Model Details	**Payment Levels per month**
Abolishing the personal tax allowance for income tax	Adult: £1389.5
Abolishment of the upper and lower limit of National Insurance	Child: £625.28
Setting children's UBI at 0.45 of working-age adults (age 18 and over)	Pensioner: £1230.33
Basic Income payments are not taxable	

Model B uses a more generous form of BI, which uses the Centre for Research in Social Policy's Minimum Income Standard (MIS) (Hirsch et al., 2020). This model gives

adults the level of UBI needed for the basic rate taxpayers to achieve the income after tax stated in MIS.

Model C (BI Taxable Scenario)	
A more generous form of BI set according to MIS standards, BI is now taxable	
Model Changes	**Payment Levels per month**
Abolishing the personal tax allowance for income tax	Adult: £4288.58
Abolishment of the upper and lower limit of National Insurance	Child: £1929.86
Setting children's UBI at 0.45 of working-age adults (age 18 and over)	Pensioner: £3797.33
Basic Income payments are taxable	

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Model C use the same level of BI as that in Model B but with an additional change where the basic income is now a form of taxable income. This model is considered the most progressive of the three.

2.9 Data Analysis Process

Previous sections have gone over the data and the microsimulation program used for the empirical analysis. This section will cover the different stages of the data analysis.

This paper uses UKMOD version A2.0+ and 2018 FRS data, links to both are detailed in the appendix. After inputting the FRS data into the microsimulation, the first stage of the analysis was the creation of each of the individual BI models previously discussed. The creation of Model A involved the removal of personal allowance and the upper and lower limit of NI. Second, sets the Child's basic income payments to be 0.45 of the adult's basic income level. Then using the Basic income loop function into EUROMOD, which incrementally adjusts the level of basic income payment for all recipients until the total BI payments and other government expenditure is equal to

government revenue i.e revenue neutral. This simulation is ran three more times to ensure the results are accurate and the same.

Model B begins similar to Model A with adjustments with the personal allowance, National insurance and child BI. Afterwards, a gross level of basic income is inputted into the microsimulation, those gross levels are £1389.50 per month for working-age adults, £625.28 per month for children below the age of 18 and £1230.33 per month for pensioners. Since a level of basic income is given to the microsimulation, a new level of the tax rate would need to be calculated. In this scenario, the built-in Tax loop function is used to incrementally increase the tax rates for all three income tax bands by 0.2% until the system is back to revenue neutral. It is important to note that although this incremental increase could be adjusted where the tax rate of one tax band increases more than the other bands, the decision was made to keep it uniform as the incremental revenue gained would be minimal. This simulation is run three more times to ensure the loop ran correctly.

Model C is very similar to Model B with the addition that basic income payments are now counted as taxable income. Making BI as a taxable income makes the entire scheme more progressive and offsets the regressive effects from the abolishment of the personal allowance and lower limit of national insurance. This is done by adding the variable ‘buc_s’ (denoting basic income payments) as a taxable variable. A taxloop was then used with 0.2% increments to bring the system to being revenue neutral. This simulation is run three more times to ensure the loop ran correctly.

The second stage of the data analysis involves the creation of new categorical variables and the use of summary statistics. Unfortunately, UKMOD’s statistics presenter is

rather limited in the information provided for different scenarios, hence the necessity for creating new summary statistics. Using both the output file from UKMOD and the users guide from FRS, new categorical variables were created for each specific group of interest through R. In Martinelli (2017), he refers to these categorical variables as benefit units i.e groups of individuals/households with certain characteristics. This paper will also adopt the use of this terminology. After creating each of the benefit units, summary statistics are then created to see the proportions of losers and gainers for each basic income scheme. For example, the number of 'Black' individuals who seen their weekly disposable decrease by 10%. This was then used to calculate odds ratios with the group with the largest number of observations being the reference group. Unsurprisingly this turns out to be the Caucasian ethnic group. The decision was also made not to group individuals into households as many other BI simulation papers have. As grouping the data into households and then further group them into ethnic groups would have drastically reduced the number of observations within some groups and therefore widen the confidence intervals drastically. This is further compounded by the limited data in certain ethnic groups on an individual level.

2.10 Operationalisation of Variables

Disposable Income Quintiles

Income quintiles are created by first removing individuals who are classed as 'Students' and in 'Pre-school'. The reasoning for this is that including 'Students' and 'Pre-school' individuals would inflate the bottom quintile of individuals and hide the distributive effects of basic income on those who are 'Unemployed' or 'Disabled'. Disposable

income quintiles are then calculated and created from the disposable income variable 'yds' in the FRS dataset.

Gini Coefficient

The Gini coefficient is calculated using the R package called 'reldist'. Gini uses a variable that combines income before tax 'il_tc_means' and taxes paid 'ils_taxsim' to create income after tax.

Relative Poverty Rate

The relative poverty rate uses the R package called 'ineq'. Firstly, a median level of income is calculated using the aggregate individual income after tax (details is stated in Gini Coefficient). This is then multiplied by 0.60 to get the relative poverty line and then Foster's poverty rate function is used to get the final percentage. The paper uses the definition of relative set out in the House of Commons paper by Francis-Devine (2021, p.4).

Ethnicity

This paper uses a modified ethnicity variable based on the original FRS dataset. Instead of having the original 18 classifications, the paper uses a cruder 7 by combining similar groups. The assumption being made is that ethnicities combined together are similar enough to each other. Having cruder ethnicity classifications allows for more observations within each group and hence allows for a better distributional analysis.

The following table shows which ethnicity variables have been combined:

FRS Ethnicity Classifications	Paper Ethnicity Classifications
White British	White
Irish	
White Gypsy	
Other White	
White and Black Caribbean	Mixed
White and Black African	
White and Asian	
Other Mixed	
Indian	Southeast Asian
Pakistani	
Bangladeshi	
Chinese	East Asian
Other Asian	
Black African	Black
Black Caribbean	
Other Black	
Arab	Arab
Other	Other

Gender

No Changes made

Economic Status

This paper uses a modified version of the variable ‘les’ in the FRS dataset as the economic status variable. The changes made were combining pre-school and students together as just Students. Two groups were removed those were ‘Farmer’ as there were no observations given in the FRS and ‘Other’ where there were very few observations. Leaving the Economic status variable with seven distinct groups.

Ethnic Minority

Ethnic Minority, groups all ethnic groups except White into an ethnic minority variable. This would allow for an easier high-level view of the distributional effects of each basic income scheme.

Weekly Disposable Income

Weekly disposable income uses the output variable ‘ils_dispy’. No changes made

3 RESULTS

This section will discuss the simulated results of the three basic income schemes described in the Methods section. Firstly, an overview of the impact of each basic income scheme in each quintile and the gainers and losers. Second, looks at the impact of each BI scheme on different ethnic groups. Third, looks at the effects on gender and then a more in-depth analysis within each gender. Finally, looks at the distributional impacts by ethnic group and economic status.

3.1 GAINS AND LOSSES BY QUINTILE

The following three tables will give an overview of the results of the three models. Each of the tables shows the changes in disposable income in each quintile group for those aged 18 and older. Bar charts are used to depict the proportion of individuals who have gained/lost more than 5% & 15% of disposable income. A breakdown of winners and losers by percentage can be found in Appendix Table 1.

Table 1a: Model A Gains and Losses by Quintile

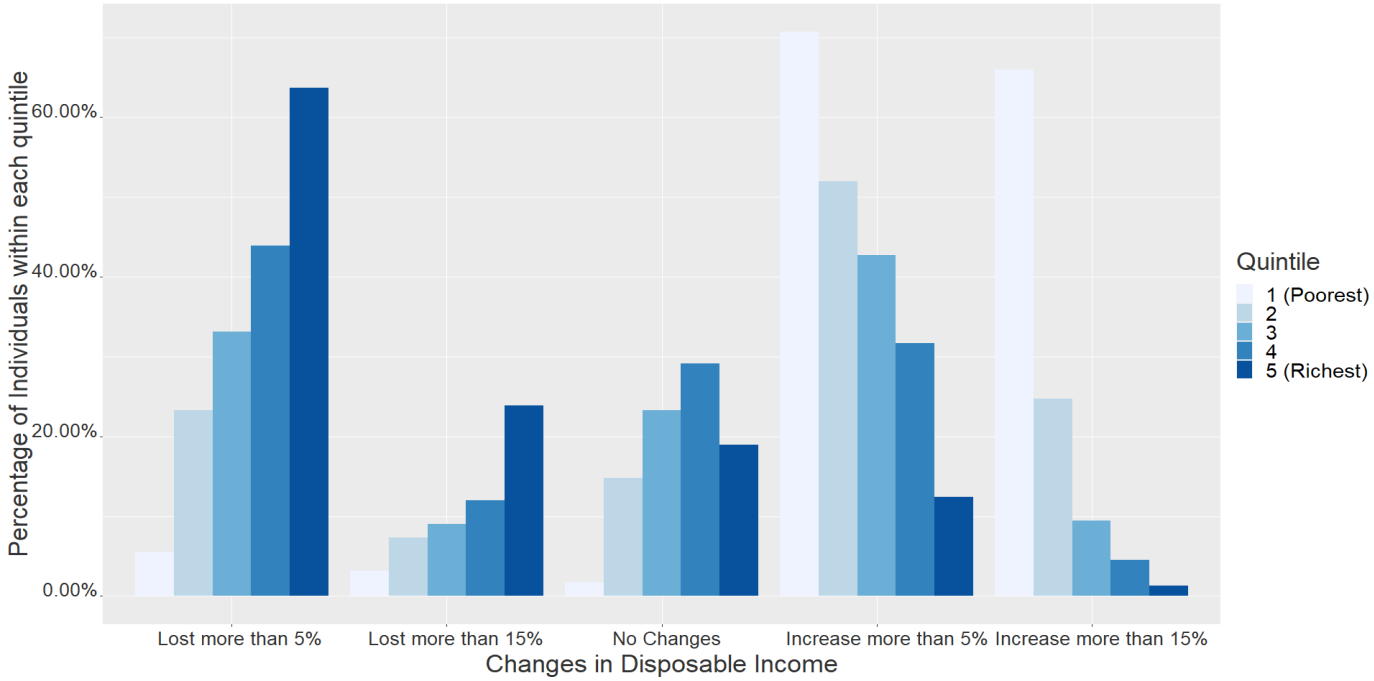
Model	Quintile	Disposable Income Pre-Basic Income	Disposable Income Post-Basic Income	Disposable Income Change	Economic Metrics
A	1 (poorest)	£206.13	£727.65	353%	**Gini**
	2	£947.74	£1,029.95	109%	0.39
	3	£1,376.43	£1,390.78	101%	**Relative Poverty Rate**
	4	£1,902.22	£1,827.38	96%	
	5 (richest)	£4,009.82	£3,173.30	79%	0.29

Table 1a : Biggest gainers are those from the lowest quintile, while biggest losers are the richest quintile. Weekly disposable income is displayed. Poverty Rate is calculated by 60% by Median Income after tax for individuals. Gini is calculated through individuals
Source: author's own calculation using output data from UKMOD

Income Tax rates for Model A stayed the same with the lower rate at 20%, higher rate at 40% and the additional rate at 45%. The biggest gainers from such a basic income scheme are those in the lowest quintile with their disposable income increased by 3.5 times while there are negligible changes in income in the middle quintiles. The biggest

reduction of disposable income are individuals in the highest quintile with weekly disposable income reduced by ~20%. Furthermore, based on calculations from FRS data, the individual relative poverty rate is calculated to be at 33% and the Gini coefficient (a measure of inequality) is to be at 47% within the UK. Model A improves on both metrics reducing relative poverty by 4% and improving the Gini coefficient 8%, with a lower Gini coefficient being a more equal society.

Chart 1a: Model A Proportion of Winners and Losers



Source: Based on Appendix Table 1 and on the author's own calculation using output data from UKMOD

In terms of proportional of gainers and losers, 66% of individuals in the poorest quintile gained more than 15% of their weekly disposable income, while 22% of those in the richest quintile lose more than 15% of their weekly disposable income. Although this result achieves a more equal society, later in this paper we will see that this result hides a lot of the downsides and the redistribution from the rich to the poor might not be all that it seems.

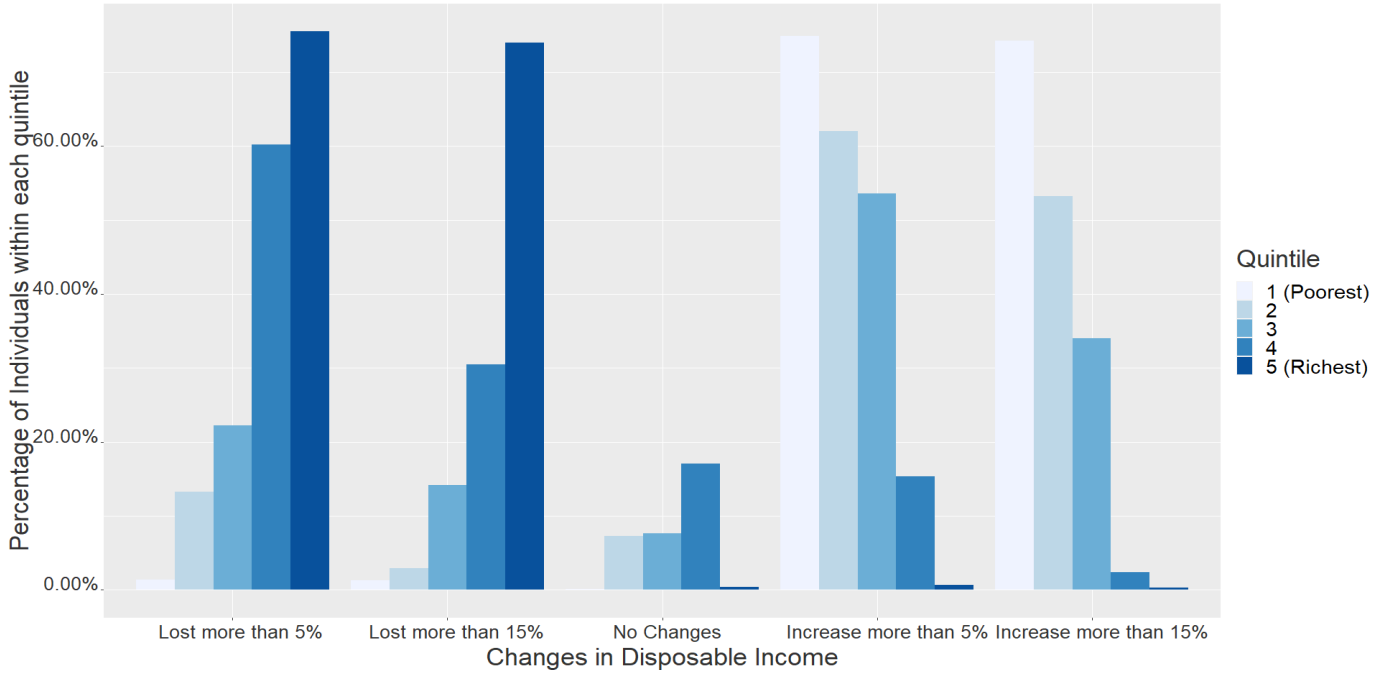
Table 1b: Model B Gains and Losses by Quintile

Model	Quintile	Disposable Income Pre-Basic Income	Disposable Income Post-Basic Income	Disposable Income Change	Economic Metrics
B	1 (poorest)	£206.13	£1,308.92	635%	**Gini**
	2	£947.74	£1,333.99	141%	0.18
	3	£1,376.43	£1,502.80	109%	**Relative**
	4	£1,902.22	£1,657.55	87%	**Poverty Rate**
	5 (richest)	£4,009.82	£1,834.98	46%	0.12

Table 1b: Biggest gainers are those from the two lowest quintile, while biggest losers are the two richest quintile. Weekly disposable income is displayed. Poverty Rate is calculated by 60% by Median Income after tax for individuals. Gini is calculated through individuals
Source: author's own calculation using output data from UKMOD

Model B uses a much more generous form of BI which is based on the Minimum Income Standard report. After adjusting for the income tax rates to achieve the condition of revenue neutrality. All three income band tax rates would have to increase by 49.8% to sustain this level of basic income. Such a high tax rate would almost definitely be politically infeasible. Despite this, the Gini coefficient has drastically dropped to 18%, a difference of 21%, from Model A. In line with this, the relative poverty rate has decreased by 17%. Model B also benefits the 2nd to last quintile more than in Model A with average weekly disposable income increasing by 41%, much of this is at the expense of the top two quintiles.

Chart 1b: Model B Proportion of Winners and Losers



Source: Based on Appendix Table 1 and on the author's own calculation using output data from UKMOD

In terms of the proportionality of winners and losers, 74% of individuals in the highest quintile have their disposable income reduced by 15% while 74% of the poorest quintile see their income increase by more than 15%. This is unsurprising considering the drastic increase in income tax rates and basic income pay outs. However, unlike Model A the redistributive effects now reach into the 2nd highest quintile and the 2nd to last bottom quintile. Here the 53% of those in the 2nd quintile see their disposable income increase by 15% or more and 30% of those in the 4th quintile see their disposable income reduced by more than 15%.

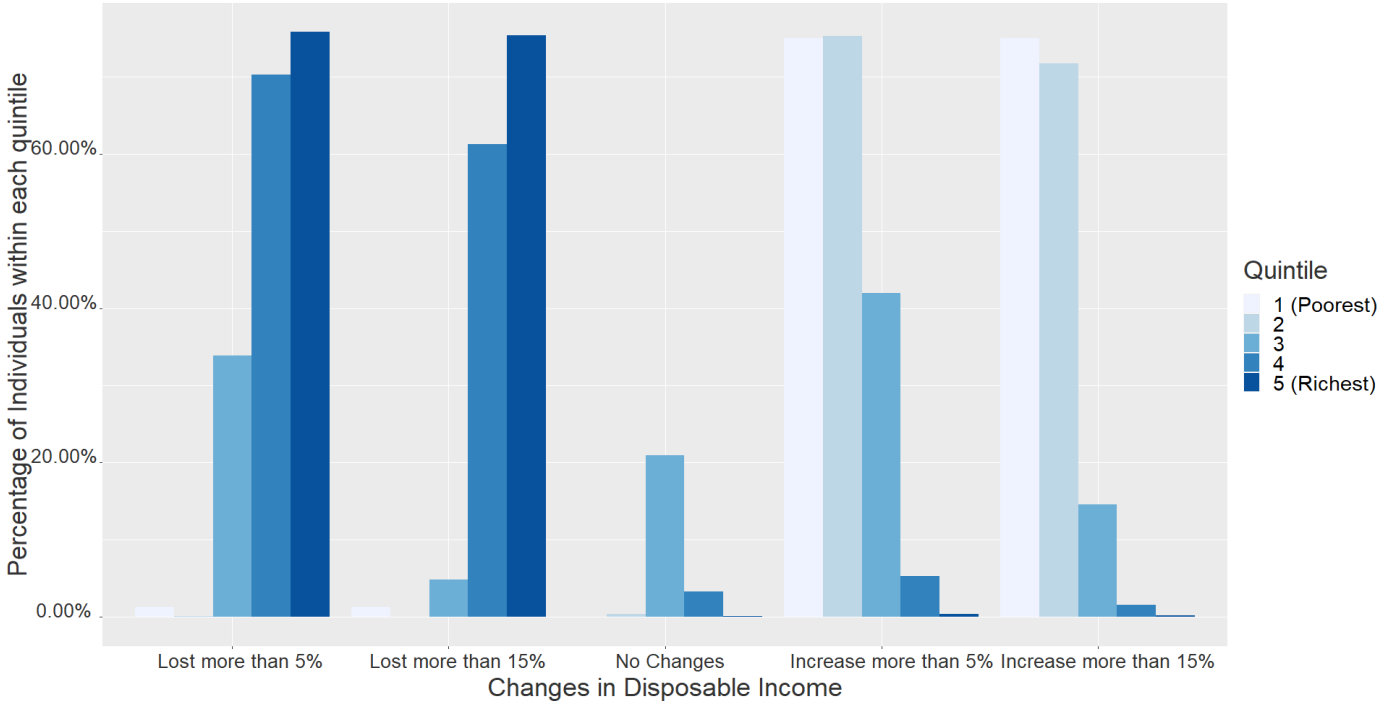
Table 1C: Model C Gains and Losses by Quintile

Model	Quintile	Disposable Income Pre-Basic Income	Disposable Income Post-Basic Income	Disposable Income Change	Economic Metrics
C	1 (poorest)	£206.13	£1,356.76	658.2%	**Gini**
	2	£947.74	£1,397.09	147.4%	0.08
	3	£1,376.43	£1,425.34	103.6%	**Relative**
	4	£1,902.22	£1,432.56	75.3%	**Poverty Rate**
	5 (richest)	£4,009.82	£1,445.74	36.1%	0.001

Table 1c: Biggest gainers are those from the two lowest quintile, while biggest losers are the two richest quintile. Weekly disposable income is displayed. Poverty Rate is calculated by 60% by Median Income after tax for individuals. Gini is calculated through individuals
Source: author's own calculation using output data from UKMOD

This model is the same as Model B but with the inclusion of the condition that basic income is now taxable, therefore making this basic income program more progressive than the previous one. The income bands tax rates would now have to increase by 47.6%. Like the previous model, this level of tax increase would make it politically difficult to adopt. In terms of equality, this is the most equalizing model, by a large margin, and eliminates relative poverty in the UK. However, like Model B, this is at a large expense of the richest 20% of individuals with their weekly disposable income on average reducing by 64% and the 4th quintile with a reduction of about 20%.

Chart 1C: Model C Proportion of Winners and Losers



Source: Based on Appendix Table 1 and on the author's own calculation using output data from UKMOD

Here, a similar story plays out to Model B with the top two quintiles having their disposable income drastically reduced to pay for the basic income scheme in Model C. The biggest benefactors are the bottom two quintiles with the middle quintile seeing little to no change. (Further details on the breakdown of winners and losers can be found in Appendix Table 1).

Overall, the most progressive basic income scheme is Model C with the elimination of relative poverty and having a Gini coefficient of 0.08. Such a BI scheme is highly unlikely to be adopted due to the drastic increases in Income Tax. However, for the purposes of this paper, utilising a very optimistic BI scheme would allow insight into how a BI scheme would impact ethnic groups if used to achieve its purported aims elimination of poverty and reduce inequality.

3.2 GAINS AND LOSSES BY ETHNICITY

Table 2A: Distributional Changes by Ethnic Group – Model A

Model	Ethnicity	Disposable Income increased more than 10% (Odds Ratio)	99% Confidence Intervals	Disposable Income decreased more than 10% (Odds Ratio)	99% Confidence Intervals
A	White	1.00	-	1.00	-
	Mixed	1.24	(0.90, 1.69)	1.33*	(0.93, 1.86)
	SE Asian	1.77**	(1.54, 2.05)	0.99	(0.83, 1.17)
	East Asian	2.02**	(1.56, 2.63)	0.96	(0.69, 1.31)
	Black	1.38**	(1.12, 1.69)	1.15	(0.90, 1.44)
	Arab	2.31**	(1.30, 4.11)	1.63*	(0.85, 2.95)
	Other	1.34*	(0.95, 1.87)	1.25	(0.84, 1.80)

Table 2a : Arabic, East Asian and South East Asian are most likely to benefit from Model A BI. No ethnic minority group are more likely to lose 10% of disposable income in the 99% CI compared to reference group. Reference group is based on the group with the most individuals. Reference Group = 'White', * = Significant at 95%, ** = Significant at 99%

Source: author's own calculation using output data from UKMOD

Using odd ratios, Table 2a looks into how BI Model A would impact different ethnic groups. The ethnic group which benefits the most from this type of BI scheme are individuals in the 'Arabic' group who, compared to 'White' individuals, are 2.31 times more likely to benefit (1.30, 4.11, 99% Confidence interval). Interestingly enough. all ethnic minor groups benefit more from the BI scheme than the reference group apart from individuals from the 'Mixed' group. This is also corroborated with percentage changes in Appendix Table 2, where each ethnic minority benefit unit has a 10% increase in comparison to 'White' in gaining more than 10% disposable income.

The rightmost columns detail the likelihood of individuals losing 10% or more of their disposable income in reference to the 'White' ethnic group. Here only two ethnic minority groups find themselves having a higher likelihood of losing 10% or more of their disposable income, 'Mixed' and curiously 'Arab'. While for other ethnic groups there seems to be no effect at the 95% Confidence interval.

Table 2B: Distributional Changes by Ethnic Group – Model B

Model	Ethnicity	Disposable Income increased more than 10% (Odds Ratio)	99% Confidence Intervals	Disposable Income decreased more than 10% (Odds Ratio)	99% Confidence Intervals
B	White	1.00	-	1.00	-
	Mixed	1.28*	(0.94, 1.73)	0.85	(0.61, 1.16)
	SE Asian	1.84**	(1.59, 2.13)	0.62**	(0.53, 0.72)
	East Asian	1.82**	(1.39, 2.37)	0.59**	(0.44, 0.79)
	Black	1.28**	(1.04, 1.56)	0.74**	(0.59, 0.91)
	Arab	2.50**	(1.38, 4.71)	0.41**	(0.19, 0.79)
	Other	1.30*	(0.93, 1.82)	0.84	(0.58, 1.18)

Table 2b : Arabic, Sout East Asian and East Asian are most likely to benefit at 99% CI from Model A BI. Reference group is based on the group with the most individuals. Reference Group = 'White', * = Significant at 95%, ** = Significant at 99%
Source: author's own calculation using output data from UKMOD

In Model B, a much more progressive BI scheme, we see all ethnic groups benefit more from the scheme than the reference group. The largest gain being individuals from 'Arab' ethnic group followed by 'Southeast Asian' and 'East Asian'. While the group which is least likely to benefit are those from 'White' and 'Mixed' ethnic groups. Where only 48.7% and 54.5% of individuals respectively gaining 5% or more in disposable income, the lowest across the ethnic groups (Appendix Table 2). However, the odds ratios for 'Southeast Asian' and 'Black' has fallen showing that the gap between them and 'White' individuals have decreased from Model A to Model B. This is also shown in Appendix Table 2a where the gap of weekly average disposable income between these ethnic groups and 'White' individuals has shrunk.

In contrast, 'Southeast Asian', 'East Asian'. 'Black' and 'Arab' individuals are much less than likely to be negatively affected by such a BI scheme in comparison to the reference group 'White'. All four of these groups are also highly significant at the 99% confidence interval. In comparison to Model A, the odd ratios in Model B suggest that individuals from 'White' ethnic group are much more likely to lose more than 10% of their disposable income but some individuals still benefiting.

Table 2C: Distributional Changes by Ethnic Group – Model C

Model	Ethnicity	Disposable Income increased more than 10% (Odds Ratio)	99% Confidence Intervals	Disposable Income decreased more than 10% (Odds Ratio)	99% Confidence Intervals
C	White	1.00	-	1.00	-
	Mixed	1.07	(0.79, 1.45)	1.14	(0.83, 1.54)
	SE Asian	1.53**	(1.32, 1.76)	0.73**	(0.63, 0.84)
	East Asian	1.49**	(1.14, 1.93)	0.80*	(0.60, 1.03)
	Black	0.97	(0.79, 1.18)	1.01	(0.81, 1.23)
	Arab	2.14**	(1.20, 3.95)	0.51**	(0.25, 0.93)
	Other	0.97	(0.69, 1.35)	1.12	(0.79, 1.56)

Table 2c: Arabic, Sout East Asian and East Asian are most likely to benefit at 99% CI from Model A BI. Mixed, Black and Other are just as likely as the reference group to lose 10% of their disposable income. Reference group is based on the group with the most individuals.
Reference Group = 'White', * = Significant at 95%, ** = Significant at 99%
Source: author's own calculation using output data from UKMOD

Model C, despite being the most progressive, has lower odds ratios between Model B and Model C showing that individuals in the 'White' ethnic category also benefit from such a BI scheme and therefore closing the gap between ethnic groups. The ethnic groups which most benefit is still those of 'Arabic' descent, with them being 2.14 times more likely to gain 10% or more in disposable income than 'White' individuals followed by both Asian ethnic groups. While those from 'Mixed', 'Black' and 'Other' ethnicities are not likely to benefit more from those from 'White' ethnicities.

A similar story plays out for those who are likely to lose disposable income with 'Southeast Asian', 'East Asian' and 'Arab' all being the least likely to lose 10% of disposable income. While other ethnic groups have no effect at the 95% confidence interval.

3.3 Gains and Losses by Ethnicity and Gender

A top-down view on the distributive effects of basic income by ethnicity gives readers an idea of the overall effects. However, there is a multitude of other characteristics that should be considered to fully understand the distributive effects. Table 3a and Table 3b

show the distributive effects by gender broken down by ethnicity and Table 3c gives the distributional effect across both genders.

Table 3A: Distributional Changes by Male and Ethnicity

Model	Males by Ethnicity	Disposable Income increased more than 10% (Odds Ratio)	99% Confidence Intervals	Disposable Income decreased more than 10% (Odds Ratio)	99% Confidence Intervals
A	White	1.00	-	1.00	-
	Mixed	1.56*	(0.94, 2.51)	1.31	(0.77, 2.13)
	SE Asian	1.72**	(1.39, 2.12)	1.08	(0.85, 1.36)
	East Asian	2.26**	(1.50, 3.38)	1.22	(0.77, 1.89)
	Black	2.14**	(1.57, 2.92)	0.61**	(0.40, 0.90)
	Arab	2.09*	(0.88, 4.72)	2.64**	(1.15, 5.98)
	Other	1.80**	(1.06, 2.99)	1.29	(0.73, 2.19)
B	White	1.00	-	1.00	-
	Mixed	1.64**	(1.03, 2.61)	0.62**	(0.38, 0.98)
	SE Asian	1.74**	(1.42, 2.14)	0.65**	(0.53, 0.80)
	East Asian	1.88**	(1.25, 2.81)	0.61**	(0.40, 0.92)
	Black	1.69**	(1.24, 2.29)	0.52**	(0.37, 0.71)
	Arab	1.92*	(0.84, 4.37)	0.49*	(0.20, 1.14)
	Other	1.50*	(0.89, 2.47)	0.68	(0.40, 1.12)
C	White	1.00	-	1.00	-
	Mixed	1.48*	(0.92, 2.35)	0.93	(0.59, 1.49)
	SE Asian	1.47**	(1.20, 1.81)	0.77**	(0.63, 0.94)
	East Asian	1.50*	(0.99, 2.24)	0.78	(0.52, 1.17)
	Black	1.30*	(0.95, 1.77)	0.70**	(0.51, 0.95)
	Arab	1.90*	(0.83, 4.32)	0.55	(0.23, 1.26)
	Other	1.13	(0.66, 1.88)	0.96	(0.58, 1.60)

Table 3a : Males from Arabic, Sout East Asian and East Asian are most likely to benefit at 99% CI from Model A BI. No male ethnicity group is more likely than the reference group to lose 10% of their disposable income. Reference group is based on the group with the most individuals.
Reference Group = 'White', * = Significant at 95%, ** = Significant at 99%
Source: author's own calculation using output data from UKMOD

Table 3a shows the gainers and losers of male individuals and their respective ethnicities. Within table 3a, the distributive pattern follows a very similar line to that of Table 2a, Table 2b and Table 2c with all ethnic groups being more likely to benefit from Basic income models A and B than the reference group. With the biggest winners from all three BI schemes being males from the two 'Asian' groups and 'Arab' ethnicities. Interestingly, Males from the 'Mixed' ethnicity group are now significant at the 95% confidence interval where previously in the aggregate ethnicity grouping, they were not. Furthermore, the odds ratio for 'Black' males is also higher in every model in

comparison to their aggregate grouping. Both may be suggestive that distributive effects happen along ethnicity and gender lines and not just by ethnic group.

Looking at males who lose more than 10% of their disposable income, the table suggests that 'Arab' males, while gaining the most, are also likely to lose the most which seems quite counter-intuitive. However, this may be down to the low number of observations in this ethnic group, something discussed in the limitation section. Overall, it seems that the trend suggests that all-male ethnic minority groups are less likely to lose more than 10% of their disposable income in comparison to the reference group. These results are also backed up by Appendix Table 3a.

Table 3B: Distributional Changes by Female and Ethnicity

Model	Females by Ethnicity	Disposable Income increased more than 10% (Odds Ratio)	99% Confidence Intervals	Disposable Income decreased more than 10% (Odds Ratio)	99% Confidence Intervals
A	White	1.00	-	1.00	-
	Mixed	1.03	(0.67, 1.55)	1.38	(0.85, 2.18)
	SE Asian	1.92**	(1.57, 2.35)	0.88	(0.68, 1.14)
	East Asian	1.81**	(1.29, 2.57)	0.78	(0.47, 1.22)
	Black	0.97	(0.74, 1.28)	1.80**	(1.33, 2.41)
	Arab	2.78**	(1.22, 6.88)	0.83	(0.24, 2.22)
	Other	1.05	(0.66, 1.65)	1.23	(0.70, 2.05)
B	White	1.00	-	1.00	-
	Mixed	1.01	(0.67, 1.53)	1.20	(0.76, 1.85)
	SE Asian	2.16**	(1.74, 2.71)	0.51**	(0.39, 0.66)
	East Asian	1.70**	(1.18, 2.47)	0.60**	(0.38, 0.91)
	Black	0.99	(0.75, 1.30)	1.08	(0.80, 1.45)
	Arab	4.58**	(1.65, 17.6)	0.21**	(0.02, 0.77)
	Other	1.13	(0.72, 1.80)	1.07	(0.64, 1.73)
C	White	1.00	-	1.00	-
	Mixed	0.80	(0.53, 1.21)	1.43*	(0.93, 2.17)
	SE Asian	1.69**	(1.37, 2.10)	0.64**	(0.50, 0.80)
	East Asian	1.39*	(0.98, 2.01)	0.86	(0.58, 1.25)
	Black	0.74**	(0.56, 0.97)	1.44**	(1.09, 1.90)
	Arab	2.87**	(1.16, 8.57)	0.37*	(0.09, 1.04)
	Other	0.83	(0.53, 1.30)	1.35	(0.84, 2.12)

Table 3b: Females from Arabic, Sout East Asian and East Asian are most likely to benefit at 99% CI from any BI. Females from Black ethnicity are more than the reference group to lose 10% of their disposable income. Reference group is based on the group with the most individuals.
Reference Group = 'White', * = Significant at 95%, ** = Significant at 99%
Source: author's own calculation using output data from UKMOD

Within Table 3b, the biggest gainers are the same as that in Table 3a across the three models. However, now female individuals from 'Mixed', 'Black' and 'Other' are not

more likely to gain 10% in disposable income than their ‘White’ peers something which is drastically different from the aggregate grouping. Furthermore, in Model C it seems that females from the ‘Black’ ethnicity are 0.80 times less likely to gain than their ‘White’ counterparts (0.56, 0.97, 99% confidence level). This is also seen in Appendix Table 3b, where only 50% of ‘Black’ females would see their disposable income increase by 5%, the lowest in all ethnic groups. An interesting development that the paper will discuss further in the next section.

In terms of female individuals losing more than 10% of disposable income, ‘Black’ females seem to have the short end where in Model A they are 1.8 times (1.33, 2.41, 99% confidence level) and in Model C they are 1.44 times (1.09, 1.99, 99% confidence level) more likely to lose more than 10% of their disposable income than their white peers. Both Asian and ‘Arab’ groups benefit more in Models B and Model C, while other ethnicities are no more likely to benefit than the reference group.

Table 3c: Distributional Changes across Ethnicities and Gender

Model	Ethnicity	Disposable Income increased more than 10% (Odds Ratio)	99% Confidence Intervals	Disposable Income decreased more than 10% (Odds Ratio)	99% Confidence Intervals
A	**White**				
	Male	1.00	-	1.00	-
	Female	2.10**	(1.94, 2.26)	0.74**	(0.68, 0.80)
	Ethnic Minority				
	Male	1.87**	(1.60, 2.17)	1.06	(0.89, 1.24)
	Female	3.11**	(2.71, 3.57)	0.84**	(0.70, 0.98)
B	**White**				
	Male	1.00	-	1.00	-
	Female	2.59**	(2.40, 2.78)	0.36**	(0.33, 0.38)
	Ethnic Minority				
	Male	1.73**	(1.48, 1.99)	0.62**	(0.53, 0.71)
	Female	3.99**	(3.46, 4.61)	0.26**	(0.22, 0.31)
C	**White**				
	Male	1.00	-	1.00	-
	Female	2.52**	(2.34, 2.70)	0.39**	(0.36, 0.41)
	Ethnic Minority				
	Male	1.43**	(1.22, 1.65)	0.78**	(0.67, 0.90)
	Female	3.03**	(2.63, 3.48)	0.37**	(0.31, 0.42)

Table 3c: Females are more likely than Males to benefit more from BI than the reference group. Reference group is based on the group with the most individuals. Reference Group = 'White', * = Significant at 95%, ** = Significant at 99%
Source: author's own calculation using output data from UKMOD

Table 3C shows the distributive effects across both genders and between the dominant ethnic group in the UK (White) and the combined group of Ethnic Minorites. As stated in the Methodology section, the decision was made to combine the groups together to more easily see the distributional effects between the genders. However, a more detailed breakdown exists in Appendix table 3.

In all three models, the biggest gainers from the BI schemes are females with them being 2-4 times more likely to see their disposable income increase in comparison to 'White' males. Males from the Ethnic Minority group also gain but by a smaller amount in comparison to their female peers.

These results are also seen when it comes to those who see their disposable income reduced. In Model B and Model C 'White Female' and both genders from 'Ethnic Minority' are much less likely to see their weekly disposable income be reduced.

3.4 Gains and Losses by Ethnicity and Economic Status

Looking past gender, the paper will now look at how each BI scheme's distributional impact would affect individuals by Ethnicity and by Economic status.

Table 4A: Distributional Changes by Ethnicity and Economic Status (Model A)

Model	Ethnicity	Disposable Income increased more than 10% (Odds Ratio)	99% Confidence Intervals	Disposable Income decreased more than 10% (Odds Ratio)	99% Confidence Intervals
A	**White**				
	Employee	1.00	-	1.00	-
	Self Employed	1.45**	(1.25, 1.67)	1.70**	(1.46, 1.96)
	Pensioner	1.12**	(1.01, 1.22)	0.85**	(0.76, 0.94)
	Unemployed	9.41**	(7.06, 12.73)	0.72**	(0.51, 0.99)
	Student	28.32**	(17.0, 51.00)	0.23**	(0.11, 0.42)
	Inactive	6.94**	(6.00, 8.05)	0.72**	(0.60, 0.85)
	Disability	2.95**	(2.51, 3.48)	1.58**	(1.32, 1.88)
	Ethnic Minority				
	Self Employed	1.28**	(1.10, 1.49)	1.15*	(0.97, 1.34)
	Employee	1.71**	(1.20, 2.40)	1.89**	(1.32, 2.67)
	Pensioner	1.78**	(1.30, 2.41)	0.96	(0.66, 1.37)
	Unemployed	9.98**	(5.81, 18.18)	0.65	(0.32, 1.20)
	Student	57.29**	(25.1, 171.13)	0.17**	(0.05, 0.40)
	Inactive	8.44**	(6.40, 11.25)	0.86	(0.62, 1.16)
	Disability	3.43**	(2.30, 5.11)	1.72**	(1.11, 2.59)

Table 4a : Unemployed and Inactive groups are most likely to benefit than the reference, no matter the ethnicity. Biggest losers are those from white employee, white self-employed and those who are disabled. Reference group is based on the group with the most individuals.
Reference Group = 'White', * = Significant at 95%, ** = Significant at 99%
Source: author's own calculation using output data from UKMOD

Model A shows the biggest gainers are 'Students', however this is deceptive since the majority began with 0 weekly income. The next two biggest gainers are those who are 'Unemployed' and 'Inactive' this can be seen in both 'White' and 'Ethnic minority' categories. While the odds ratios between the 'Unemployed' in both categories are similar there is a decrease in odds ratios between 'Inactive' in the ethnic minority category and those in the 'White' category.

On the other side, in both ethnic groups of individuals who are 'Self-employed', they are 1.70 and 1.15 times more likely than 'White' employees to lose more than 10% of their disposable income. What is a weakness for this model of basic income scheme is

that people who are classified as having ‘Disabilities’ are also amongst those who are more likely to lose more than 10% of their disposable income.

Table 4B: Distributional Changes by Ethnicity and Economic Status (Model B)

Model	Ethnicity	Disposable Income increased more than 10% (Odds Ratio)	99% Confidence Intervals	Disposable Income decreased more than 10% (Odds Ratio)	99% Confidence Intervals
B	**White**				
	Employee	1.00	-	1.00	-
	Self Employed	1.33**	(1.16, 1.52)	0.92	(0.80, 1.05)
	Pensioner	0.82**	(0.75, 0.89)	1.05	(0.97, 1.14)
	Unemployed	25.46**	(15.7, 44.45)	0.05**	(0.02, 0.09)
	Student	42.86**	(20.4, 111.54)	0.02**	(0.00, 0.06)
	Inactive	9.29**	(7.78, 11.15)	0.13**	(0.10, 0.163)
	Disability	9.71**	(7.79, 12.21)	0.08**	(0.05, 0.11)
	Ethnic Minority				
	Self Employed	1.15*	(0.99, 1.32)	0.88*	(0.76, 1.01)
	Employee	1.66**	(1.18, 2.31)	0.74*	(0.52, 1.04)
	Pensioner	1.41**	(1.04, 1.90)	0.64**	(0.46, 0.86)
	Unemployed	18.13**	(8.42, 48.11)	0.05**	(0.01, 0.15)
	Student	66.39**	(22.4, 351.14)	0.02**	(0.00, 0.08)
	Inactive	13.27**	(9.17, 19.91)	0.09**	(0.05, 0.14)
	Disability	7.85**	(4.78, 13.65)	0.13**	(0.05, 0.24)

Table 4b: Unemployed and Inactive groups are most likely to benefit than the reference, no matter the ethnicity. Biggest losers are those from white employee and white pensioners. Reference group is based on the group with the most individuals.
Reference Group = ‘White’, * = Significant at 95%, ** = Significant at 99%
Source: author’s own calculation using output data from UKMOD

The second model is similar to the previous model where the biggest gainers are individuals from ‘Student’, ‘Unemployed’ and ‘Inactive’. Since this is a more progressive BI scheme, there is also significantly higher odds ratios for those who have ‘Disability’. However, ‘Pensioners’ who are ‘White’ are only 0.82 times likely to see their disposable income increase by 10% than ‘White employees’. Further compounding this ‘Pensioners’ are also as likely to see their disposable income decrease by 10% as ‘White employees’. Such redistributive effects are not seen in ‘Pensioners’ from the ‘Ethnic Minority’ category.

Table 4C: Distributional Changes by Ethnicity and Economic Status (Model C)

Model	Ethnicity	Disposable Income increased more than 10% (Odds Ratio)	99% Confidence Intervals	Disposable Income decreased more than 10% (Odds Ratio)	99% Confidence Intervals
C	**White**				
	Employee	1.00	-	1.00	-
	Self Employed	1.88**	(1.63, 2.17)	0.68**	(0.59, 0.77)
	Pensioner	4.22**	(3.86, 4.61)	0.19**	(0.18, 0.21)
	Unemployed	47.02**	(29.0, 82.26)	0.02**	(0.01, 0.05)
	Student	79.12**	(37.7, 207.85)	0.01**	(0.00, 0.03)
	Inactive	12.64**	(10.7, 14.96)	0.10**	(0.08, 0.12)
	Disability	16.83**	(13.5, 21.11)	0.04**	(0.03, 0.06)
	Ethnic Minority				
	Self Employed	1.17*	(0.99, 1.36)	0.89	(0.78, 1.03)
	Employee	2.35**	(1.66, 3.28)	0.52**	(0.37, 0.73)
	Pensioner	6.87**	(4.99, 9.56)	0.11**	(0.07, 0.17)
	Unemployed	33.47**	(15.5, 88.85)	0.02**	(0.00, 0.08)
	Student	122.57**	(41.4, 647.76)	0.01**	(0.00, 0.04)
	Inactive	22.04**	(15.4, 32.53)	0.05**	(0.03, 0.08)
	Disability	13.93**	(8.53, 24.06)	0.06**	(0.03, 0.13)

Table 4c: Unemployed and Disabled groups are most likely to benefit than the reference, no matter the ethnicity. Biggest losers are those from white employee. Reference group is based on the group with the most individuals.
Reference Group = 'White', * = Significant at 95%, ** = Significant at 99%
Source: author's own calculation using output data from UKMOD

After making BI payments taxable, Model C shows that 'White Pensioners' now are 4.22 times more likely to find their disposable income increase by 10% than 'White Employees' (3.86, 4.61, 99% confidence level). Individuals from both 'White' and 'Ethnic Minority' all benefit more from Model C than the reference group no matter their economic status. However, the lowest odd ratios are those who are from an 'Ethnic Minority' background and are individuals who are 'Self-employed' where they are only 1.17 times more likely to benefit at the 95% confidence interval, while they are also just as likely to find their disposable income decrease by 10% as the reference group.

4 DISCUSSION

4.1 REVIEW OF FINDINGS

Quintile Results

As expected, Model C was found to be the most progressive BI scheme of the three models simulated in this paper. Having its Gini coefficient calculated to be at 0.08 and almost eliminating all relative poverty within the UK. Despite the major benefits the Income tax rate for all three bands would increase by 47.6%, a wildly politically infeasible hike in taxes. Much of the redistribution happens from the top 20% of individuals to the bottom 20% of individuals across the three models.

Ethnicity Results

Overall, ethnic minority groups are more likely to benefit from a BI scheme in comparison to the reference group of 'White'. Model B is a BI model with the highest odds ratios, with 'Arab' ethnicity benefiting the most at 2.50 times (99% confidence interval) and 1.28 times for 'Mixed' (95% confidence interval), indicating that this model benefits ethnic minorities the most. This is interesting since Model C is seen as the most progressive overall. The only difference between the two Models is that BI becomes taxable income in Model C. Indicating that Model B relies more on taxing the biggest ethnic tax base 'White' individuals while Model C spreads the cost more evenly. This is also supported by Model C having higher odds ratios in the Ethnic minority groups for Disposable income decreasing more than 10% than Model B. Lastly, the only ethnic minority groups which did not benefit as much are those from 'Mixed', 'Black' and 'Other' ethnic groups. Something the paper discusses later. In

sum, all three BI schemes in general benefit ethnic minorities more than ‘White’ individuals.

Ethnicity and Gender Results

The distributional change from the BI schemes not only occurs along ethnic lines but also across genders. Table 3C shows that Females from both ‘White’ and ‘Ethnic Minority’ groups benefit more than their respective male counterparts. Showing that Females are much more likely to benefit from BI than their Male counterparts (and regardless of their ethnicity), something which is also supported by findings from (Cantillon et al, 2016).

However, within each gender, some ethnic groups benefit more than others. One of which is that ‘Black’ and ‘Mixed’ females are no more likely to benefit than their ‘White’ counterparts in two of the models and in fact ‘Black’ females become less likely to benefit in Model C. This is a sharp contrast to ‘Black’ and ‘Mixed’ males who are more likely to benefit in all three BI schemes compared to their ‘White’ counterparts. Investigating this further, Appendix Table 3 gives a more detailed breakdown of both genders and then their ethnicities. Seeing that ‘Black’, ‘Mixed’ and ‘Other’ females generally benefit in line with ‘White’ females in Model A and Model B but when BI payments become taxable in Model C this drops considerably. Therefore, the gains in which Males get is wholly offset by the loss of disposable income for females in Model C, leaving those three ethnic groups being the ones being no more likely to benefit than the reference ethnic group. Despite this, the data suggest that the three BI schemes would more likely benefit Females than Males regardless of ethnicity.

Ethnicity and Economic Status Results

An outcome from all BI schemes is that there is an increased likelihood of individuals from both Ethnic groups to benefit more than 'White' employees in all three BI schemes. However, in Model A there is also an increased likelihood of certain groups of individuals losing more of their disposable income than the reference group. Namely, those who are classed as having 'Disability' and 'Self-Employed'. This is due to Model A's BI payment being wholly inadequate to offset the losses incurred due to the elimination of the Personal Allowance and changes to Social Insurance. This can also be seen in Pensioners from both categories having a lower odd ratio for benefiting and a higher odd ratio from losing disposable income in comparison to other economic status groups.

Model B, highlight this effect more clearly for 'White' Pensioners due to the elimination of personal allowance, their pension payments are now subject to the higher increases in taxes rates which aren't offset by the increases in BI. Such an effect does not play out for pensioners of 'Ethnic Minority' descent, and this is down to the lower weekly income they start off with at £895 weekly income compared to pensioners of 'White' ethnicity at £1300 and arguably closing the gap between the two. However, this would mean that an income transfer occurs from 'White' pensioners to other groups which also include the working age adults in both 'Employee' and 'Self-employed' groups, something which isn't desirable.

Model C now allows for BI to become taxable and re-adjusts BI payments drastically and allowing for a sufficiently high BI for pensioners to offset the losses. Comparing Economic status groups from both 'White' and 'Ethnic minority', almost all groups in

‘Ethnic minority’ benefit more than their counterpart apart from those in the ‘Disability’ and ‘Unemployed’ category. This is also mainly due to ‘Ethnic minority’ in these two categories having higher pre-tax income than their ‘White’ counterparts.

4.2 LIMITATIONS

Missing Data

The biggest limitation of this paper is the amount of missing data. To begin with, the dataset used, the FRS dataset, had a purported non-response rate of 50%, leading to the risk of systematic bias already being within the dataset (Cameron et al, 2020, p 25). Second, FRS data was chosen due to being it is the only dataset used by UKMOD but also since it collects ethnicity data. However, there are still considerable amounts of missing data which has meant that all findings in this paper should be suggestive and not sufficient to make any final conclusions.

The FRS data has 43,087 individual observations of which, 18,050 observations were missing their ethnicity data which meant the findings were based on 25,037 observations, a little less than 60% of original observations. This also meant some ethnic groups having a few observations, for example, ‘White Gypsy’ having only 6 individuals. Hence to partially offset the problem, cruder ethnic groups were made. Despite this, some groups still had low numbers of individuals i.e Arab ethnic group having only 83 individuals. Leading to wide confidence intervals in all distributional analysis made and weakening the validity. Lastly, by combining ethnicities together I have assumed that they have similar characteristics. This assumption may not hold up in all cases and likely would hide key details of import.

Missing Household Analysis

Due to the reduction in the number of observations from missing data. The decision was made to look at individual level distributional changes rather than household level distributional changes. This has meant overlooking key pieces of information i.e looking at households with single mothers by ethnicity, households with more than two children or households with one working parent etc. This household level analysis has been done without looking at ethnicity by other simulation papers (Martinelli, 2017b, Torry, 2016 and Reed & Langley, 2016). However, there is still some debate on whether households pool their income (Bennett, 2013).

Lacking Dynamic Analysis

Since EUROMOD is a static microsimulation program, no dynamic analysis could be conducted. However, dynamic factors such as behavioural changes in spending, unemployment and higher educational uptake should not be discounted and would warrant further research.

Validity of EUROMOD/UKMOD

The validity of UKMOD was discussed in the Country report by Reis & Tasseva (2020) showing that some of the input and simulated variables had been underestimated and overestimated by UKMOD, despite the adjustments made. Therefore, reducing the validity of the results of the simulated basic income schemes.

Other BI Schemes

The paper looked at three BI schemes, one low level BI scheme, one optimistic BI scheme where BI payments are not taxed and lastly an optimistic BI scheme where it is

taxed. It is important to note that the structure of BI schemes can be formulated in a multitude of different ways and could be very different to the ones looked at here and hence their distributional result for those schemes would be very different. Despite this, the paper aims to give an idea of the suggestive impacts of BI schemes on ethnic minorities.

4.3 Policy Implications

The illustrative schemes examined in the paper are examples of schemes that are unfeasible. Model A despite being the one with the least amount of changes to the tax schedule would also provide the least amount of distributional changes and would likely harm some of the most vulnerable in society i.e those with disabilities. Model B and Model C would drastically reduce/eliminate relative poverty and inequality in the UK, but huge reforms would need to be made to the tax schedule for such changes. Such changes are also increasingly unlikely due to the economic fallout from Covid-19.

Despite this, the value of looking at these three BI schemes is to understand how ethnic communities in the UK would be affected by a hypothetical basic income scheme. The results suggest that BI schemes would likely benefit some ethnic communities more than others. The biggest winners are those from ‘Southeast Asian’, ‘East Asian’ and of ‘Arab’ descent. Much of this redistribution occurs from ‘White’, ‘Mixed’ and ‘Other’ to these groups.

Second, the results support the idea that BI schemes that have a similar structure would redistribute income from Males to Females regardless of ethnicity. However, Females from certain ethnicities would benefit more than others i.e Southeast Asians, East Asian and Arab ethnicities. More research is needed to understand why this occurs; a plausible

reason is likely due to biases already in the input data i.e attrition from FRS data collection.

Lastly, redistribution occurs from the 'White' working age adults to individuals of an ethnic minority background but also individuals within 'White' ethnic backgrounds. Such redistribution also helps in closing the gap in average income for the most vulnerable in society in both groups, i.e Pensioners, Disabled and the unemployed. Crucially, Model A and Model B also highlight those changes to the tax scheme would disproportionately affect certain groups more than others.

5 CONCLUSION

This paper aimed to investigate the distributional effects of basic income on different ethnic minorities in the United Kingdom. This was done by using a static microsimulation program called EUROMOD. Three different basic income schemes were explored, and a cross-sectional snapshot was taken before and after the simulation. A distributional analysis was then conducted on individual level characteristics to assess the effects of each basic income scheme. The results suggest that Southeast Asian, East Asian and Arab ethnic groups would benefit the most from basic income schemes. Second, female individuals would benefit more from basic income than their male counterparts and regardless of ethnicity. However, females from certain ethnicities (Southeast Asian, East Asian and Arab) would benefit more than females from other ethnicities (White, Black, Mixed and Other). Third, much of the redistribution occurs from 'White' working age adults to other economic status groups as the basic income scheme becomes more progressive. Lastly, this redistribution helps to close the gap in disposable income of groups with the same economic status but different ethnicity

groups i.e ‘White pensioners’ and ‘Ethnic minority pensioners.’ In terms of policy impact, results suggest that basic income schemes have a positive impact in reducing inequality for certain ethnic groups in the United Kingdom and increase disposable income for female individuals. Nevertheless, the conclusions presented here should be taken with caution as the data used in the paper has a high percentage of missing data and UKMOD has been shown to over/under-estimate certain output variables. Furthermore, dynamic factors have not been explored which would be crucial to understanding basic income schemes’ impact on ethnicities. Third, despite the debate on whether or not households do pool their income, further research should be conducted on basic income impacts on a household level.

Conflict of Interest

None

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7 APPENDIX

UKMOD A2.0+ Installation Link: https://www.microsimulation.ac.uk/ukmod/

FRS Data Sign up: https://www.ukdataservice.ac.uk/help/new-user.aspx

Access Guide: https://www.microsimulation.ac.uk/ukmod/access/

Appendix Table 1: Proportion of Winners and Losers by Quintile (Disposable Income)

		Proportion of Benefit Units in Each Category				
Model	Quintile	Disposable Income Increase >15%	Disposable Income Increase >5%	Minor Change	Disposable Income Decrease >5%	Disposable Income Decrease >15%
A	1 (poorest)	66.00%	69.90%	1.70%	4.70%	3.20%
	2	24.70%	43.70%	14.80%	16.80%	7.30%
	3	9.40%	30.30%	23.30%	22.30%	9.00%
	4	4.50%	17.50%	29.20%	28.90%	12.00%
	5 (richest)	1.30%	5.30%	18.90%	51.90%	23.90%
B	1 (poorest)	74.30%	74.80%	0.20%	1.30%	1.30%
	2	53.20%	58.60%	7.30%	9.30%	2.90%
	3	34.00%	49.10%	7.60%	19.10%	14.20%
	4	2.40%	7.80%	17.00%	50.70%	30.50%
	5 (richest)	0.30%	0.40%	0.40%	75.30%	74.00%
C	1 (poorest)	74.90%	74.90%	0.00%	1.30%	1.30%
	2	71.70%	74.90%	0.40%	0.00%	0.00%
	3	14.50%	31.70%	20.90%	23.20%	4.80%
	4	1.60%	3.60%	3.30%	68.70%	61.20%
	5 (richest)	0.20%	0.30%	0.20%	75.60%	75.30%

Source: author's own calculation using output data from UKMOD

Appendix Table 2: Proportion of Winners and Losers by Ethnicity (Disposable Income)

Model	Ethnicity	Proportion of Benefit Units in Each Category			
		Lose more than 10%	Lose more than 5%	Gained more than 5%	Gained more than 10%
A	*White*	21.9%	33.6%	42.6%	33.9%
	Mixed	27.2%	35.5%	46.9%	39.0%
	SE Asian	21.8%	29.8%	54.3%	47.7%
	East Asian	21.2%	26.0%	57.2%	51.0%
	Black	24.4%	33.2%	48.4%	41.6%
	Arab	31.3%	36.1%	56.6%	54.2%
	Other	25.9%	32.9%	49.8%	40.7%
B	*White*	38.7%	43.0%	48.7%	45.2%
	Mixed	34.8%	38.6%	54.5%	51.4%
	SE Asian	28.1%	31.7%	63.1%	60.4%
	East Asian	27.3%	28.7%	62.0%	60.0%
	Black	31.8%	34.4%	57.1%	51.4%
	Arab	20.5%	21.7%	73.5%	67.5%
	Other	34.6%	37.4%	55.1%	51.9%
C	*White*	41.7%	45.0%	48.4%	45.1%
	Mixed	44.8%	47.6%	49.3%	46.9%
	SE Asian	34.4%	36.8%	58.3%	55.8%
	East Asian	36.2%	39.5%	57.5%	55.0%
	Black	41.9%	46.0%	48.0%	44.4%
	Arab	26.5%	28.9%	68.7%	63.9%
	Other	44.4%	46.9%	46.5%	44.4%

Source: author's own calculation using output data from UKMOD

Appendix Table 2a: Average Disposable Income by Ethnicity

Model	Ethnicity	**Average Weekly Disposable Income Post BI (£)**
A	*White*	£1,671.46
	Mixed	£1,748.16
	SE Asian	£1,404.94
	East Asian	£1,580.77
	Black	£1,537.16
	Arab	£1,113.46
	Other	£1,690.35
B	*White*	£1,529.46
	Mixed	£1,656.15
	SE Asian	£1,556.84
	East Asian	£1,733.16
	Black	£1,607.35
	Arab	£1,588.45
	Other	£1,621.67
C	*White*	£1,422.66
	Mixed	£1,460.64
	SE Asian	£1,408.09
	East Asian	£1,569.87
	Black	£1,435.99
	Arab	£1,471.87
	Other	£1,424.16

Source: author's own calculation using output data from UKMOD

Appendix Table 3a: Proportion of Winners and Losers by Ethnicity (Male)

Model	Males by Ethnicity	Proportion of Benefit Units in Each Category			
		Lose more than 10%	Lose more than 5%	Gained more than 5%	Gained more than 10%
A	*White*	24.6%	38.8%	33.7%	25.4%
	Mixed	29.9%	37.0%	44.1%	34.6%
	SE Asian	26.2%	36.8%	44.1%	36.9%
	East Asian	28.6%	35.7%	48.2%	43.5%
	Black	16.7%	27.2%	50.0%	42.2%
	Arab	46.3%	53.7%	43.9%	41.5%
	Other	29.6%	38.0%	42.6%	38.0%
B	*White*	51.2%	55.6%	36.4%	33.1%
	Mixed	39.4%	43.3%	48.0%	44.9%
	SE Asian	40.7%	45.4%	48.8%	46.3%
	East Asian	39.3%	40.5%	51.2%	48.2%
	Black	35.4%	37.8%	52.0%	45.6%
	Arab	34.1%	36.6%	56.1%	48.8%
	Other	41.7%	45.4%	46.3%	42.6%
C	*White*	53.6%	57.2%	36.4%	33.3%
	Mixed	52.0%	55.1%	43.3%	42.5%
	SE Asian	47.2%	50.3%	45.3%	42.5%
	East Asian	47.6%	51.2%	45.8%	42.9%
	Black	44.9%	48.6%	44.2%	39.5%
	Arab	39.0%	41.5%	56.1%	48.8%
	Other	52.8%	53.7%	38.0%	36.1%

Source: author's own calculation using output data from UKMOD

Appendix Table 3b: Proportion of Winners and Losers by Ethnicity (Female)

Model	Females by Ethnicity	Proportion of Benefit Units in Each Category			
		Lose more than 10%	Lose more than 5%	Gained more than 5%	Gained more than 10%
A	*White*	19.5%	28.9%	50.6%	41.6%
	Mixed	25.2%	34.4%	49.1%	42.3%
	SE Asian	17.7%	23.4%	63.9%	57.8%
	East Asian	15.9%	19.0%	63.8%	56.5%
	Black	30.4%	37.9%	47.2%	41.1%
	Arab	16.7%	19.0%	69.0%	66.7%
	Other	23.0%	28.9%	55.6%	43.0%
B	*White*	27.4%	31.6%	59.7%	56.1%
	Mixed	31.3%	35.0%	59.5%	56.4%
	SE Asian	16.3%	19.0%	76.4%	73.5%
	East Asian	18.5%	20.3%	69.8%	68.5%
	Black	29.1%	31.7%	61.1%	56.0%
	Arab	7.1%	7.1%	90.5%	85.7%
	Other	28.9%	31.1%	62.2%	59.3%
C	*White*	31.0%	34.2%	59.2%	55.7%
	Mixed	39.3%	41.7%	54.0%	50.3%
	SE Asian	22.4%	24.2%	70.5%	68.1%
	East Asian	28.0%	31.0%	65.9%	63.8%
	Black	39.5%	44.0%	50.9%	48.3%
	Arab	14.3%	16.7%	81.0%	78.6%
	Other	37.8%	41.5%	53.3%	51.1%

Source: author's own calculation using output data from UKMOD

Appendix Table 3c: Average Disposable Income by Ethnicity and Gender (Male)

Model	Males by Ethnicity	**Average Weekly Disposable Income Post BI (£)**
A	*White*	£1,945.21
	Mixed	£2,008.72
	SE Asian	£1,673.55
	East Asian	£1,846.48
	Black	£1,733.22
	Arab	£1,382.91
	Other	£1,882.41
B	*White*	£1,559.18
	Mixed	£1,668.49
	SE Asian	£1,584.40
	East Asian	£1,685.21
	Black	£1,611.19
	Arab	£1,590.47
	Other	£1,622.86
C	*White*	£1,413.43
	Mixed	£1,437.73
	SE Asian	£1,386.49
	East Asian	£1,470.46
	Black	£1,430.83
	Arab	£1,437.63
	Other	£1,385.92

Source: author's own calculation using output data from UKMOD

Appendix Table 3d: Average Disposable Income by Ethnicity and Gender (Female)

Model	Females by Ethnicity	**Average Weekly Disposable Income Post BI (£)**
A	*White*	£1,425.69
	Mixed	£1,545.15
	SE Asian	£1,154.04
	East Asian	£1,388.36
	Black	£1,383.45
	Arab	£850.43
	Other	£1,536.70
B	*White*	£1,502.78
	Mixed	£1,646.54
	SE Asian	£1,531.10
	East Asian	£1,767.88
	Black	£1,604.33
	Arab	£1,586.48
	Other	£1,620.71
C	*White*	£1,430.93
	Mixed	£1,478.49
	SE Asian	£1,428.26
	East Asian	£1,641.86
	Black	£1,440.03
	Arab	£1,505.28
	Other	£1,454.75

Source: author's own calculation using output data from UKMOD

Appendix Table 3d: Impact of BI across Gender and Ethnicity

Model	Ethnicity	Disposable Income increased more than 10%(Odds Ratio)	99% Confidence Intervals	Disposable Income decreased more than 10%(Odds Ratio)	99% Confidence Intervals
A	**Male**				
	White	1.00	-	1.00	-
	Mixed	1.56*	(0.94, 2.51)	1.31	(0.77, 2.13)
	SE Asian	1.72**	(1.39, 2.12)	1.08	(0.85, 1.36)
	East Asian	2.26**	(1.50, 3.38)	1.22	(0.77, 1.89)
	Black	2.14**	(1.57, 2.92)	0.61**	(0.40, 0.90)
	Arab	2.09*	(0.88, 4.72)	2.64**	(1.15, 5.98)
	Other	1.80**	(1.06, 2.99)	1.29	(0.73, 2.19)
	Female				
	White	2.09**	(1.94, 2.26)	0.74**	(0.68, 0.80)
	Mixed	2.16**	(1.42, 3.25)	1.03	(0.63, 1.62)
	SE Asian	4.03**	(3.30, 4.94)	0.65**	(0.50, 0.84)
	East Asian	3.81**	(2.70, 5.41)	0.58**	(0.35, 0.90)
	Black	2.05**	(1.55, 2.70)	1.33*	(0.99, 1.78)
	Arab	5.85**	(2.57, 14.4)	0.62**	(0.18, 1.64)
	Other	2.21**	(1.40, 3.47)	0.91**	(0.52, 1.52)
B	**Male**				
	White	1.00	-	1.00	-
	Mixed	1.64**	(1.03, 2.61)	0.62**	(0.38, 0.98)
	SE Asian	1.74**	(1.42, 2.14)	0.65**	(0.53, 0.80)
	East Asian	1.88**	(1.25, 2.81)	0.61**	(0.40, 0.92)
	Black	1.69**	(1.24, 2.29)	0.52**	(0.37, 0.71)
	Arab	1.92*	(0.84, 4.37)	0.49*	(0.20, 1.14)
	Other	1.50*	(0.89, 2.47)	0.68*	(0.40, 1.12)
	Female				
	White	2.58**	(2.40, 2.78)	0.36**	(0.33, 0.38)
	Mixed	2.61**	(1.73, 3.96)	0.43**	(0.27, 0.66)
	SE Asian	5.60**	(4.49, 7.02)	0.18**	(0.14, 0.24)
	East Asian	4.39**	(3.06, 6.41)	0.21**	(0.13, 0.33)
	Black	2.57**	(1.95, 3.38)	0.39**	(0.28, 0.52)
	Arab	11.86**	(4.28, 45.7)	0.07**	(0.00, 0.27)
	Other	2.93**	(1.87, 4.67)	0.38**	(0.23, 0.62)
C	**Male**				
	White	1.00	-	1.00	-
	Mixed	1.48*	(0.92, 2.35)	0.93	(0.59, 1.49)
	SE Asian	1.47**	(1.20, 1.81)	0.77**	(0.63, 0.94)
	East Asian	1.50*	(0.99, 2.24)	0.78	(0.52, 1.17)
	Black	1.30*	(0.95, 1.77)	0.70**	(0.51, 0.95)
	Arab	1.90*	(0.83, 4.32)	0.55	(0.23, 1.26)
	Other	1.13	(0.66, 1.88)	0.96	(0.58, 1.60)
	Female				
	White	2.51**	(2.34, 2.70)	0.38**	(0.36, 0.41)
	Mixed	2.02**	(1.34, 3.04)	0.56**	(0.36, 0.84)
	SE Asian	4.27**	(3.46, 5.29)	0.25**	(0.19, 0.31)
	East Asian	3.52**	(2.47, 5.06)	0.33**	(0.22, 0.48)
	Black	1.86**	(1.42, 2.45)	0.56**	(0.42, 0.74)
	Arab	7.24**	(2.93, 21.5)	0.14**	(0.03, 0.40)
	Other	2.09**	(1.33, 3.28)	0.52**	(0.32, 0.82)

Appendix Table 3d: Females are more likely than Males to benefit more from BI than the reference group. Reference group is based on the group with the most individuals. Reference Group = 'White', * = Significant at 95%, ** = Significant at 99%

Source: author's own calculation using output data from UKMOD

Appendix Table 4a: Proportion of Winners and Losers by Economic Status

Model	Economic Status by Ethnicity	Proportion of Benefit Units in Each Category			
		Lose more than 10%	Lose more than 5%	Gained more than 5%	Gained more than 10%
A	**White**				
	Self Employed	33.7%	22.1%	37.1%	26.0%
	Employee	41.8%	32.6%	40.4%	33.7%
	Pensioner	36.9%	19.5%	36.1%	28.1%
	Unemployed	19.6%	17.0%	77.7%	76.8%
	Student	6.9%	6.2%	91.6%	90.9%
	Inactive	20.0%	17.0%	74.6%	70.9%
	Disability	36.3%	31.1%	56.3%	50.9%
	Ethnic Minority				
	Self Employed	34.5%	24.7%	41.1%	31.1%
	Employee	45.3%	35.0%	43.2%	37.4%
	Pensioner	33.2%	21.5%	46.3%	38.4%
	Unemployed	18.0%	15.6%	77.9%	77.9%
	Student	4.7%	4.7%	95.3%	95.3%
	Inactive	21.6%	19.6%	76.1%	74.8%
	Disability	35.1%	32.8%	57.5%	54.6%
B	**White**				
	Self Employed	49.3%	44.6%	41.7%	37.8%
	Employee	46.8%	42.5%	47.2%	44.8%
	Pensioner	51.5%	45.9%	37.2%	33.3%
	Unemployed	4.9%	4.0%	94.6%	94.0%
	Student	2.2%	1.5%	97.1%	96.4%
	Inactive	10.7%	9.6%	86.2%	85.0%
	Disability	7.6%	6.3%	88.7%	85.5%
	Ethnic Minority				
	Self Employed	45.7%	41.6%	45.6%	41.2%
	Employee	41.2%	37.4%	54.3%	50.2%
	Pensioner	37.8%	33.9%	50.8%	46.3%
	Unemployed	4.1%	4.1%	94.3%	91.8%
	Student	1.7%	1.7%	97.7%	97.7%
	Inactive	7.8%	6.9%	90.1%	89.0%
	Disability	10.3%	9.2%	84.5%	82.8%
C	**White**				
	Self Employed	65.5%	61.5%	27.7%	24.8%
	Employee	54.6%	52.1%	40.5%	38.3%
	Pensioner	27.8%	24.2%	63.3%	58.2%
	Unemployed	5.1%	4.5%	94.6%	94.0%
	Student	2.2%	1.8%	97.1%	96.4%
	Inactive	15.1%	13.9%	82.3%	80.6%
	Disability	8.2%	7.1%	87.8%	84.7%
	Ethnic Minority				
	Self Employed	62.9%	58.9%	31.2%	27.8%
	Employee	49.0%	45.7%	46.5%	43.6%
	Pensioner	18.9%	15.6%	73.9%	69.4%
	Unemployed	4.9%	4.1%	93.4%	91.8%
	Student	1.7%	1.7%	97.7%	97.7%
	Inactive	9.1%	7.8%	89.0%	87.9%
	Disability	10.9%	9.8%	83.9%	82.2%

Source: author's own calculation using output data from UKMOD