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**Race, Inflation and Voting Behaviour:
The 2018 and 2022 US Midterm Elections**

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Abstract

This Thesis examines the relationship between heterogenous inflation, race and voting behaviour - using the 2018 and 2022 US Midterm Elections as a case study. Multiple datasets are combined to build a congressional district level, race-weighted measure of perceptions of inflation to examine heterogenous inflation impacts on voting behaviour. The results of the study supply robust evidence that race-based heterogeneous inflation perceptions did in fact have an impact on the 2022 US Midterm elections, namely punishing the party of the incumbent government - the Democrats - particularly in its voting shares.

Keywords: Heterogenous Inflation, Race, 2022 US Midterm Elections, Voting Behaviour, Incumbent

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Race, Inflation and Voting Behaviour:

The 2018 and 2022 Midterm Elections

One of the most widely asked questions in politics and policy is “What moves voters?”. How do they form a decision on who to vote for in an election? Is it possible to predict outcomes?

Political Economy has tried to answer these questions observing the world through the lens of Economics. Economic voter theory is one such attempt at an explanation: the idea that the economy represents a central factor for the voter’s decision on who to elect - and particularly, that the current state of the economy will be central to determining re-election of the incumbent (Lewis-Beck and Nadeau 2010). To illustrate this, in 2020, in the United States, 79% of American voters stated that the economy was a very important topic for them to determine how they would vote (Pew Research Centre 2020).

Inflation is an economic indicator that, at least in its aggregate form, is very salient and accessible to the average American voter as the Fed regularly publishes updates on the CPI (Consumer Price Index) - an aggregate measure of the price of the average American’s consumption basket. Furthermore, unexpected volatility or higher rates of inflation have the power to wreak great economic harm which is directly felt by Americans in their daily lives.

It is therefore reasonable to assume that measures of inflation can have a significant impact on the voter’s behaviour come election day (Pethokoukis, 2022). And indeed, over the years that Economic Voting has been researched, ample evidence has been found to support the hypothesis that there is a robust link between inflation and how voters cast their ballot on election day (Palmer and Whitten, 1999; Carlsen, 1999; Chappell, 1990; Carlsen, 2000; Chappell and Veiga, 2000). Even more telling is the result of the Reuters/Ipsos survey

(2022) for the Midterm polling in 2022: 29% of respondents stated they believed that inflation was the most important problem facing the US today and 45% felt their personal financial situation was weaker than a year ago as a result (Sullivan and Slobin, 2022).

It is however of utmost importance to stress that inflation affects people in different ways: it is heterogenous in its effects. The CPI gives us an aggregate measure of inflation, but it is highly unlikely that most Americans will all experience this same rate of price change (Sablik, 2021). The idea that inflation affects people differently is not a new one: there have been studies on how age, gender and income can affect how inflation affects individuals (Detmeister, Lebow and Peneva, 2016; Bruine de Bruin et al., 2010; Meyler and Reiche., 2021). However, another, and less explored dimension of how inflation may affect people differently is through the lens of race: between Non-White and White groups in the US.

There is increasing evidence that on average, Non-Whites and Whites consume and spend differently, which means that inflation will affect these groups differently. In the US this stems from a divergence in income by ethnicity, with Non-White populations' income trailing that of White earners', but also a difference in reliance on state subsidies. Differences in education and culture also contribute to differential consumption patterns. For example, on average, Black households will spend a higher proportion of their income on food, energy and rent than White households – these are all consumption goods that typically have the quickest rising prices (Horwich, 2022). This means that on average, Black households will feel the pain of inflation more acutely than White households - and therefore will perceive the state of the economy more negatively.

Consequently, during times of high inflation of consumer goods such as rent, food and petrol, Non-White household bundles will be disproportionately affected, and it follows that communities with high percentages of Non-White households will likely exhibit voting

behaviour that punishes the incumbent. With inflation once again, after decades of political insignificance, having been one of the most prominent topics on the agenda for the Midterm elections, it is opportune to now study the dynamics of voting behaviour in the face of heterogenous inflation. This Thesis will analyse the relationship between inflation, race and voting behaviour - taking advantage of the 2022 US Midterm Elections to test a possible link empirically. The hope is that insight will be used to better predict election outcomes and inform policy decisions regarding inflation.

Literature Review

In order to place the case study within a framework and context, an extensive literature review was conducted. Literature relevant to the case study can broadly be divided into 2 categories: Material on the relationship between inflation and voting behaviour, and literature concerning heterogenous inflation.

The first category is composed by writings from the 1980s and 90s, where in the face of the oil crises of 1973 and 1981, research was largely focussed on the relationship between inflation, unemployment, and economic voting. Authors such as Rogoff, Sibert, Alesina and Rosenthal (Rogoff and Sibert 1988; Rogoff 1990; Alesina and Rosenthal 1995) modelled the relationship between macroeconomic variables and voting behaviour. The predominant outcome of analysis at the time was that voters would evaluate the incumbent based on their competence - which was measured by their ability to reduce unemployment without causing high inflation (Carlsen 2000). However, this analysis was conducted under the assumption that inflation is a by-product of economic policy - an endogenous economic variable for which the blame is generally shifted to the incumbent party regardless of whether justified or not. More recently, this trade-off between inflation and unemployment in economic policy may not be quite as clear-cut, especially regarding the accountability of the incumbent government.

As Anderson (2000) shows in his study, political context matters for voters punishing the incumbent in times of poor economic performance - in particular, how clear accountability is regarding economic performance. The author finds that sociotropic economic effects - that people vote based on the economy at large, rather than just their personal economic situation - trump egocentric ones. They also find that where accountability is simple and there are limited alternative voting options, economic assessments made by the voter will have a stronger impact on their voting behaviour (Anderson 2000).

Hence it is also important to refer to other, more recent studies on how inflation may be affecting voting behaviour.

Lewis-Beck and Nadeau (2010) maintain that voters do in fact punish or reward the incumbent based on past economic performance variables, inflation being one of them. And as Anderson (2000), they find evidence of sociotropic voting. Robertson (1983) already found robust evidence in the 1980s that incumbent governments pay dearly in popularity when inflation or unemployment rise under their watch. The idea that inflation plays an important role in elections is also supported by Chappell and Veiga (1998), whose strongest finding in their study of elections in European countries from 1960-1997 was that voters punish increases in inflation, especially when these surpass the regional average. They link the fact that inflation seems to be a stronger reason for voters to punish the incumbent than low GDP growth to inflation being perceived as not only undesirable, but also controllable through government policy (Chappell and Veiga 1998). The idea that inflation is punished more because it is perceived as controllable is supported by Powell and Whitten (1993), who found that economic voting is dependent on the political context. In particular, the ideological image of the government and the clarity of where political responsibility lies are central to understanding economic voting (Powell and Whitten 1993). Both De Neve (2013) and Palmer and Whitten (1999) find that it is the effect inflation has on incomes that influences voting

behaviour - on the one hand through penalising unexpected inflation more due to its greater effect on real wages (Palmer and Whitten 1999), and on the other hand putting more trust into right leaning governments to deal with inflation (de Neve 2013).

Verstyuk (2003) and Carlsen (2000) also find evidence of voters associating expertise in dealing with specific economic problems with differing parties. In particular, as already mentioned above, voters tend to associate better management of unemployment with the Left, and management of inflation with the Right (Verstyuk 2003; Carlsen 2000). Carlsen (2000) specifically finds evidence of a negative impact of unemployment on right leaning governments' popularity - and a positive or neutral impact of inflation.

Timing when people are asked about their opinion on inflation and governance can be of essence - for example, Chappell (1990) found that on average when asked for polls, voters ranked inflation as more important, but come election day, on average GNP growth was more important to voters than inflation. Furthermore, inflation caused by increased spending in an election year was found to have effects on voting behaviour, especially when these effects persisted beyond the first year of the incumbent's term (Carlsen, 1999).

More recently, a discussion on heterogenous inflation has begun to emerge in the literature - fuelled by the increasing evidence that inflation does not affect everyone in the same way.

Back in 2001, Bryan and Venkatu found that different demographic groups perceived different rates of inflation (Bryan and Venkatu 2001). They found that on average, female, Non-White, young and very old groups perceived inflation to be higher than actual CPI (Bryan and Venkatu, 2001), even when using demography adjusted CPI. Bryan and Venkatu (2001) found that the gap between CPI and perceptions of inflation sometimes differed immensely between different demographic groups: of particular interest for this study, White populations in the US perceived inflation as 5.6% whereas Non-White populations perceived inflation as 7.9%

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when CPI was in fact 3.1%. Race as a factor in inflation perception has not been researched as much, which makes the finding of Bryan and Venkatu (2001) even more relevant.

More recently, evidence has been building that not only do perceptions of inflation differ between demographics, but so does actual inflation. Sablik (2021) for example finds that when accounting for differences in characteristics, households can experience variation in inflation of up to 9 percentage points.

Multiple studies have concluded that CPI as a measurement of aggregate inflation is highly unlikely to accurately capture inflation experience at a household level (Braun and Lein 2020; Sablik 2021; Horwich 2022). Heterogenous inflation can be found when for example comparing households of different socioeconomic status - in particular, low-income households experience inflation more acutely due to being unable to substitute to cheaper consumption goods when already consuming goods in the lowest price category (Horwich 2022). This is exacerbated by the fact that low-income households spend a larger fraction of their income on food, rent and gas - all goods that are typically more volatile in price (Braun and Lein 2020).

Similar trends can also be seen when comparing households based on race - to an extent also as race correlates with income. Lee, Macaluso and Schwartzman (2022) and Horwich (2022) find that Black households are typically hit harder by inflation because their characteristic consumption bundles are more exposed to price fluctuations of rent, food, and petrol: They find that consumption baskets adjusted for average Black household consumption patterns are 8% more volatile than for White households. Nordvik (2022) also reveals in his study that it is particularly in countries with high ethnic heterogeneity that inflation causes a redistribution of wealth from the bottom to the top - with the ethnicity typically at the top of the income scale being much better hedged against inflation, whilst other ethnic groups are not. Though still modest in its size, there is a growing body of literature on heterogenous inflation

supporting the conclusion that demographics do matter when it comes to inflation effects. And the literature also includes numerous studies that support the notion that inflation can be an important factor in how people cast their ballot come election day. This is relevant for this case study as it supports the direction of this research - that different experiences of inflation based on race may impact voting behaviour of individual ethnic groups. This is particularly relevant as historically, there are distinct trends in how different ethnic groups cast their ballot. 26% of White registered voters identify as Republican leaning and 26% as Democratic, whilst for Asians, Hispanics, and Blacks, voting trends have been heavily in favour of Democrats, the most evident in Black populations where 87% of registered voters identify as Democratic leaning (Pew Research Center 2016). It is the expectation that inflation trends in the lead up to the 2022 elections will cause voters to punish the incumbent government, particularly amongst the worst affected ethnic groups despite historic party loyalty. Though race is the focus of this Thesis, age will also be included in the model as there are likely informative interactions between the two demographic paradigms. To the best of the authors knowledge, no such research has yet been conducted. This study adds to the literature by looking at heterogenous inflation as a potential driver of voting behaviour in different ethnic groups.

Data

In order to examine the impact of heterogenous inflation on voting behaviour, this study uses data from different sources and combines the datasets to build a district level, race-weighted measure of perceptions of inflation. A more detailed explanation of how this measure is built follows below in the Methodology section. One crucial data source for district level demographic data, such as a breakdown of race and age of the district population, is the recently conducted 2021 American Community Survey 1-Year Estimates. The 2020 County Business Patterns Survey gives data on socioeconomic factors at a district level. Both data

sources can be obtained by state and congressional district from the United States Census Bureau website. Voting share by party and congressional district data was also used from the 2018 Midterm elections, which was obtained from the Harvard Dataverse, and the 2022 Midterm election data was collected from the Reuters Online website. Due to the time constraints of this study, election 2022 data was collected on the 24.11.22 - the district voting share was only collected if over 90% of the ballots in that district had been counted. At that point in time, not all districts had reached the 90% counted threshold, hence not all district data points are used in this study. Data was also collected from Ballotpedia regarding new legislative measures on voting ballots both for the 2018 and 2022 election. Finally, an average of regional inflation (average of June, July, and August) both for 2018 and 2022 was also utilised, obtained from the Bureau of Labor Statistics. Regions were divided into Southeast, West, Northeast and Mid-West. Which regions states belong to can be seen in the appendix (Appendix 2).

The data is considered for Democratic and Republican candidates by individual congressional districts. However, for the sake of comparability, only districts that had a candidate running from both parties in 2018 and 2022 were considered. This results in 606 observations (303 Republican District candidates, 303 Democratic District candidates).¹

This Thesis will explore the effects of inflation on voting behaviour by investigating Democratic voting shares from 2022 and 2018 (*Demvoteshare*), Republican voting shares in 2022 and 2018 (*Repvoteshare*), Congressional seats won by both parties in 2022 and 2018 (*Demseat* and *Repseat*), and the difference in voting shares received by both parties in 2022 and 2018 (*RepDemfrac*). Both *Demvoteshare* variables are the fraction of votes that the

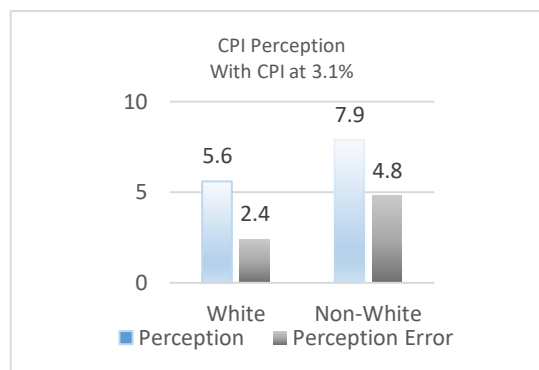
¹ It is also important to point out that there are missing observations in the census data for the state of North Carolina. The Census Bureau did not collect district boundaries for the 117th Congress, in keeping with the practice of not collecting the session which aligns with the decennial census (US Census Bureau, My Congressional District: North Carolina, <https://www.census.gov/mycd/?st=37&cd=01>). Due to the missing census data, the state of North Carolina was excluded from this study.

Democratic candidate received in a district, whilst both *Repvoteshare* variables are the fraction of votes the Republican candidate received in a district. The *Demseat* and *Repseat* variables are dummy variables coded as 1 if the party candidate won the seat, and 0 if they did not win the seat. *RepDemfrac* is the Republican fraction of votes minus the Democratic fraction in each district. It is the goal of this Thesis to examine the change in voting behaviour, both of voting shares and seats won, and to see if the swing is sufficient to significantly alter seat allocation.

Methodology

The main independent or explanatory variable that this study will be focussing on is a district level, race-weighted measure of perceptions of inflation, here named *Raceinflation*. The construction of this variable is based on the paper of Bryan and Venkatu (2001) where perceptions of inflation for different demographics in the US were studied and where the authors found significant differences in perceptions of CPI (Consumer Price Index) within different race demographics. Regarding the race demographic, Bryan and Venkatu (2010) found that when real CPI was at 3.1%, Non-Whites perceived inflation as 7.9%, whereas Whites perceived inflation as 5.6% (Appendix 1). This translates to a perception error of 4.8 and 2.5 respectively. See the below graph for illustration:

Table 1: CPI Perceptions (Bryan and Venkatu, 2001)



This difference in perception is used to construct the heterogenous inflation variables.

Raceinflation is constructed as follows:

$$\begin{aligned} \text{Raceinflation} = & [\text{fracwhite} \cdot (\text{inflationbyregion} + 2.5)] \\ & + [(1 - \text{fracwhite}) \cdot (\text{inflationbyregion} + 4.8)]^2 \end{aligned}$$

What is then used in the model is the fraction of inflation rather than percentage inflation (Raceinflation divided by 100). Raceinflation18 is constructed using regional inflation data from 2018 and Raceinflation22 is constructed using regional inflation data from 2022.

The specification is a linear model which aims to explain the effects of Raceinflation on voting behaviour. There will be two variations of the model: one for the 2018 election data and one for the 2022 election data, whereas the 2018 model will be regressed on the 2018 dependent variables Demvoteshare18, Repvoteshare18, RepDemfrac18, Demseat18 and the 2022 model will be regressed on the 2022 dependent variables Demvoteshare22, Repvoteshare22, RepDemfrac22 and Demseat22.

The model is as follows:

$$\begin{aligned} \text{Demvoteshare}(\text{Repvoteshare}, \text{Demseat}, \text{Repseat}, \text{RepDemfrac}) = & \\ \alpha + \beta_1 \cdot \text{Raceinflation} + \beta_2 \cdot \text{Ballotmeasure} + \beta_3 \cdot \text{Incumbent} + \beta_4 \cdot \text{IsMale} & \\ + \beta_5 \cdot \text{InequalityIndicator} + \beta_6 \cdot \text{Meanhouseholdincome} + \beta_7 \cdot \text{Unemployed} & \\ + \beta_8 \cdot \text{Black} + \beta_9 \cdot \text{Asian} + \beta_{10} \cdot \text{HispanicorLatin} + \beta_{11} \cdot \text{frac15_25yrs} & \\ + \beta_{12} \cdot \text{frac25_54yrs} + \beta_{13} \cdot \text{frac55_64yrs} + \epsilon & \end{aligned}$$

The model will also control for inequality, household income in the district and unemployment. An inequality indicator was constructed from available socioeconomic census data, as illustrated in the below equation:

$$\frac{(\text{Meanhouseholdincome} - \text{Medianhouseholdincome})}{\text{Medianhouseholdincome}}$$

² fracwhite: fraction of district population that is white

Unemployment is the fraction of unemployed residents within each district, and mean household income is the mean household income by district in dollars.

The model also includes variables typically associated with explaining voting behaviour: whether the candidate is the incumbent (coded as 1 if the candidate is the incumbent, 0 if not), the candidate is male (1 if male, 0 if female), and whether there are legislative measures on the ballot - a proposal of state-wide legislation change that is voted either Yes or No as part of the election ballot (1 if the state has ballot measures, 0 if the state does not). Controls for age - fractions of population aged 15-25, 26-54, 55-64yrs - and race - Hispanic, Black, Asian - are also included. These too are all variables associated with how inflation is perceived, and with voting behaviour. The following table presents summary statistics of the described variables of the model:

Table 2: Summary Statistics

	Observations	Mean	Standard Deviation	Minimum	Maximum
BallotMeasure18	606	0.749	0.434	0.000	1.000
BallotMeasure22	606	0.733	0.443	0.000	1.000
Demseat18	606	0.239	0.427	0.000	1.000
Demseat22	304	0.434	0.496	0.000	1.000
Demvoteshare18	304	0.496	0.149	0.032	0.868
Demvoteshare22	304	0.472	0.160	0.105	0.905
Incumbent18	606	0.325	0.469	0.000	1.000
Incumbent22	606	0.411	0.492	0.000	1.000
Inequalityindicator	606	0.350	0.085	0.159	0.840
IsMale18	606	0.715	0.452	0.000	1.000
IsMale22	606	0.685	0.465	0.000	1.000
Meanhousehold incomedollars	606	99709.680	28158.970	51961.000	239456.000
RepDemfrac18	302	-0.010	0.299	-0.736	0.683
RepDemfrac22	302	0.061	0.292	-0.810	0.705
Repseat18	606	0.244	0.430	0.000	1.000
Repseat22	302	0.450	0.498	0.000	1.000
Repvoteshare18	302	0.485	0.150	0.121	0.815
Repvoteshare22	302	0.517	0.154	0.095	0.841
frac15_25yrs	606	0.129	0.017	0.079	0.197
frac25yrs_54yrs	606	0.386	0.033	0.291	0.530
frac55yrs_64yrs	606	0.131	0.014	0.085	0.163
Raceinflation18	606	0.062	0.007	0.050	0.080
Raceinflation22	606	0.120	0.008	0.101	0.138
Asian	606	0.078	0.093	0.002	0.805
Black	606	0.100	0.110	0.005	0.624
Hispanic	606	0.161	0.149	0.010	0.811
Unemployed	606	0.030	0.009	0.010	0.063

The following table presents the correlations of the independent variables of the model:

Table 2: Correlations Table

	Ballot Measure18	Ballot Measure22	Incumbent18	Incumbent22	Inequality	IsMale18	IsMale22	Mean Income	frac15_25yrs
Ballot Measure18	1.000								
Ballot Measure22	0.321	1.000							
Incumbent18	0.093	0.085	1.000						
Incumbent22	0.035	-0.003	0.000	1.000					
Inequality indicator	-0.095	0.086	-0.059	-0.015	1.000				
IsMale18	0.005	-0.043	0.025	0.082	-0.048	1.000			
IsMale22	0.050	-0.009	0.016	0.025	-0.081	0.303	1.000		
Mean household income dollars	0.029	0.028	-0.054	-0.001	0.233	-0.060	-0.005	1.000	
frac15_25yrs	-0.041	-0.036	0.009	0.007	-0.223	0.021	0.050	-0.256	1.000
frac25yrs_54 yrs	-0.013	-0.004	0.049	0.028	0.099	-0.106	-0.097	0.359	-0.117
frac55yrs_64 yrs	0.009	0.022	-0.021	-0.045	0.045	0.059	0.051	0.002	-0.404
Raceinflation18	0.198	0.190	0.045	0.051	0.060	-0.091	-0.024	0.295	-0.012
Raceinflation22	0.143	0.004	0.068	0.048	0.116	-0.022	-0.032	-0.166	0.055
Asian	-0.096	-0.117	-0.007	0.023	0.108	-0.091	-0.064	0.618	-0.192
Black	0.007	-0.044	0.060	0.051	0.155	0.072	0.019	-0.184	0.007
Hispanic	-0.079	-0.009	0.067	0.114	0.021	-0.120	-0.101	0.025	0.124
Unemployed	0.016	0.071	0.060	0.038	0.152	-0.039	0.007	0.244	-0.099

	frac25yrs_54 yrs	frac55yrs_64 yrs	Raceinflation18	Raceinflation22	Asian	Black	Hispanic	Unemployed
frac25yrs_54yrs	1.000							
frac55yrs_64yrs	-0.564	1.000						
Raceinflation18	0.460	-0.467	1.000					
Raceinflation22	0.273	-0.419	0.354	1.000				
Asian	0.436	-0.170	0.358	-0.004	1.000			
Black	0.115	-0.170	0.064	0.506	-0.047	1.000		
Hispanic	0.266	-0.407	0.643	0.324	0.157	-0.090	1.000	
Unemployed	0.406	-0.166	0.570	0.011	0.378	0.035	0.400	1.000

From the Correlations Table it can be gathered that there are no major concerns of collinearity. There are some stronger correlations between the race and age controls, however, the correlation is only stronger than 0.5 or -0.5 between *frac25_54yrs* and *frac55_64yrs*, in this case -0.5643, and between *Asian* and *Meanhouseholdincome* (0.6175). The correlation between the age and race controls is expected due to them being coded as fractions of the total population - if one fraction increases, the others will necessarily decrease to an extent and vice versa.

Having laid out the model and given basic summary statistics, we now move on to results section.

Results

We start with the results from the Linear Regressions for *Demvoteshare18*, *Demvoteshare22*, *Demseat18* and *Demseat22*:

Table 3: Results Linear Regressions Democrat Data

	Demvote share18		Demvote share22		Demseat18		Demseat22	
	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value
Raceinflation	0.979	0.542	-2.770	0.007	-6.509	0.086	-4.482	0.117
BallotMeasure	0.027	0.079	0.015	0.197	0.124	0.002	0.022	0.471
Incumbent	0.002	0.884	0.171	0.000	-0.005	0.898	0.805	0.000
IsMale	0.014	0.268	0.006	0.582	-0.082	0.024	-0.002	0.936
Inequalityindicator	-0.063	0.381	-0.006	0.950	-0.184	0.414	-0.038	0.874
Meanhousehold income	0.000	0.000	0.000	0.002	0.000	0.015	0.000	0.537
Unemployed	6.379	0.000	2.309	0.022	9.485	0.000	5.269	0.035
Black	0.220	0.009	0.250	0.012	0.438	0.011	0.272	0.168
Asian	0.004	0.964	-0.067	0.506	0.388	0.187	0.066	0.770
HispanicorLatin	0.038	0.495	0.078	0.139	0.728	0.000	0.123	0.417
frac15_25yrs	0.764	0.126	-0.318	0.423	1.157	0.326	-0.654	0.481
frac25yrs_54yrs	1.500	0.000	0.722	0.018	1.450	0.049	0.385	0.590
frac55yrs_64yrs	1.814	0.050	-0.442	0.515	3.510	0.067	-0.066	0.963
constant	-0.850	0.006	0.326	0.211	-1.198	0.048	0.357	0.505
R-Squared	0.554		0.674		0.196		0.788	

The main variable of interest, heterogenous inflation, coded here as *Raceinflation*, has a different effect on Democratic voting shares in 2018 than in 2022. In 2018, the *Raceinflation* coefficient is 0.979, and has a positive but insignificant effect on *Demvoteshare*. In 2022, we see *Raceinflation* has a negative coefficient, -2.77, and is significant at the 10% level. This implies that heterogenous inflation has become a stronger, more significant, and negative influence on Democratic voting shares in 2022 as opposed to 2018, even after controlling for race. If we consider *Raceinflation* in the *Demseat* regressions, *Raceinflation* follows a slightly different story. In 2018, *Raceinflation* seems to have a strong negative and significant effect on *Demseat*, though the overall model has a much lower R-squared at 0.1956 than the R-squared of all the other Democrat regressions with R-squared values over 0.5, which implies that this model is not particularly good at capturing the data trends of Democratic seats won in 2018. For Democratic seats won in 2022, *Raceinflation* is again strongly negative, but falls just short of statistical significance with a p-value of 0.117. This result implies that though heterogenous inflation seems to have a strong negative and statistically significant effect on the voting share received by Democratic candidates in 2022, it did not have a strong enough effect at a district level to significantly influence the seats that Democrats won. *Raceinflation* changed voting behaviour enough to affect Democratic voting shares at a district level, but maybe not enough to flip seats.

Moving on to controls of the *Demvoteshare* models, *BallotMeasure*, which tells us whether there were state-wide legislative measures to be voted on the election ballot, is positive and significant at the 10% level in 2018, but not significant in 2022 - it seems that ballot measures only had a small effect on Democratic voting shares in 2018, and no significant effect in 2022, which is potentially contradictory of comments made in the media leading up to the election. Incumbency did not play a significant part in determining voting shares for Democrats in

2018, but actually had a small, highly significant positive effect of 0.17 at a 1% significance level.

Whether the candidate was male and inequality levels seem to not have had a significant effect on Democratic voting shares, as neither variable is significant in this model.

Mean household income has a very small positive and significant correlation, albeit nearly zero.

Unemployed, as explored in the literature review, is typically an important contributor to Democratic voting, and here too has a strong positive and significant correlation on Democratic voting shares in 2018. In 2022, there is still a positive relationship, albeit much weaker than in 2022, and at a 5% significance level. This is in line with what was discussed in the Literature Review - the Democrats are seen as the party more able to deal with unemployment, but less trusted to deal with inflation - and so unemployment plays a less important role for Democratic voting shares as inflation is perceived as a greater problem in 2022 than in 2018. Voters seem to have been confronted with the trade-off between addressing unemployment and tackling high inflation.

Of the race controls, only the variable *Black* has a significant effect on Democratic voting shares, 0.22 in 2018, and 0.25 in 2022. Both *Asian* and *Hispanic* are not significant.

In terms of the age controls, the relationship between 15–24-year-olds is insignificant both in 2018 and 2022. There is however a significant relationship between 25- and 54-year-olds and the Democratic voting share. For 2018, the coefficient is 1.5, significant at 1% level, and 0.722 in 2022 at a 5% significance level - the effect is still positive but has weakened compared to 2018. For the age bracket of 55–64-year-olds, there is a significant positive effect in 2018 on Democratic voting shares which however becomes insignificant in 2022.

Regarding the controls of the *Demseat* models, there are some similar results - *Ballotmeasure*, *IsIncumbency* and *Inequalityindicator* have very much the same effects on *Demseat* as on

Demvoteshare. Unemployment is also very similar - it has a strong positive, statistically significant effect on *Demseat* in 2018, which is still significant in 2022, but slightly weaker as it goes from 9.485 to 5.269. What distinguishes unemployment here is that the effect in 2022 - 5.269 - is stronger in magnitude than *Raceinflation* (-4.482), which is different from *Demvoteshare*. This could indicate that when it comes to actual seats won by Democrats, unemployment remains a stronger factor - though a definitive statement cannot be confidently given seen as *Raceinflation* is just outside of statistical significance. Some more noticeable differences in the race controls are more evident: None of the race controls are statistically significant in 2022 when for voting shares, *Black* remained significant in 2022.

The same divergence can be seen in the age controls: again, none of the age controls are significant in 2022. It follows that race and age do not seem to be significant explanatory variables of Democratic seats won.

When comparing all regression results, there seems to also be differences in how well the model captures the data. For the 2018 Democratic voting share, the R-squared is 0.5538, for the 2022 voting share, the R-squared is 0.6741 and for the *Demseat* results, R-squared is 0.1956 and 0.7876. Overall, it seems that the model has greater predictive power for 2022 dynamics where inflation, and hence heterogeneous inflation, is one of the main topics as opposed to 2018, where inflation was moderate and not a prime concern. So far, this is in line with what was expected and what was found in previous studies in the Literature Review.

We now move on to the results from the Linear Regressions of *Repvoteshare18*, *Repvoteshare22*, *Repseat18* and *Repseat22*:

Table 4: Results Linear Regressions Republican Data

	Repvote share18		Repvote share22		Repseat18		Repseat22	
	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value
Raceinflation	0.013	0.993	1.410	0.134	-0.937	0.797	0.000	0.757
BallotMeasure	-0.030	0.084	-0.015	0.266	-0.007	0.857	0.000	0.317
Incumbent	-0.002	0.900	0.159	0.000	-0.013	0.709	1.000	0.000
IsMale	0.032	0.059	0.011	0.404	0.250	0.000	0.000	0.725
Inequalityindicator	0.093	0.218	0.212	0.001	0.178	0.274	0.000	0.056
Meanhouseholdincome	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000
Unemployed	-6.517	0.000	-3.389	0.000	-10.761	0.000	0.000	0.000
Black	-0.143	0.054	-0.204	0.003	-0.198	0.195	0.000	0.001
Asian	-0.134	0.137	0.010	0.927	0.092	0.610	0.000	0.126
HispanicorLatin	-0.072	0.247	-0.027	0.581	-0.155	0.252	0.000	0.000
frac15_25yrs	-0.770	0.110	0.403	0.341	-2.238	0.064	0.000	0.488
frac25yrs_54yrs	-1.566	0.000	-0.512	0.148	-1.525	0.054	0.000	0.004
frac55yrs_64yrs	-1.933	0.034	1.012	0.119	-4.881	0.013	0.000	0.059
constant	1.755	0.000	0.461	0.074	2.190	0.001	0.000	0.007
R-Squared	0.526		0.643		0.201		1.000	

Again, here the main variable of interest is *Raceinflation*. For district-level Republican voting shares there is no significant effect from *Raceinflation*, although the 2022 coefficient is close to statistical significance with a p-value of 0.134. Though not statistically significant, the coefficient is positive, mirroring the *Demvoteshare* coefficient which was negative in 2022. *Repseat* both for 2018 and 2022 are far from statistical significance which further emphasises that there seems to be no statistical evidence with regards to the effect of heterogenous inflation on voting behaviour for Republicans. This does not directly negate the original hypothesis that the incumbent is punished for overseeing high inflation as the coefficients for *Raceinflation* are not negative and statistically significant. This is nevertheless a slightly unexpected result as there is considerable material in the literature that supports the notion of the political right - hence the Republican Party - being perceived as more adept at dealing with inflationary periods (de Neve 2013; Vertyuk 2003; Carlsen 2000). The expectation would

have been to find a coefficient that is positive and significant, mirroring the effect on the Democratic vote.

The race controls are not statistically significant except for the variable *Black* in both years, which has a small but negative effect on Republican voting shares.

Ballotmeasure seems to have played a more significant role in influencing voting shares in 2018, with a coefficient of -0.03 and statistically significant at the 10% level. In 2022 however, this does not seem to be the case, with *BallotMeasure* not being statistically significant for the 2022 data.

Incumbency on the other hand has grown in importance for Republican voting shares: whilst it was not statistically significant for the 2018 data, the 2022 coefficient is highly significant at the 1% level and shows a small positive effect of 0.15. Inequality has seen a similar trend: whilst not significant in 2018, it is in the 2022 data and favours Republican candidate voting shares.

Whether the candidate is male has lost explanatory power in 2022 as opposed to 2018 - though positive for both models, it is only significant at the 10% level for the 2018 data.

Mean household income has a very small negative yet significant effect on Republican vote shares in both years.

Unemployment mirrors the effects already seen for *Demvoteshare*: Unemployment has a strong and significant negative effect on Republican voting shares, though this effect halves in 2022 (-3.389) compared to 2018 (-6.517). Here, as in the Democrat data, it seems that in times of moderate inflation unemployment plays a more important role in determining the vote for Republicans, namely a negative one. This is consistent with the material discussed in the Literature Review that finds unemployment to be a positive driver for the Left and a negative one for the Right. However, in a time of increasing inflation, the importance of unemployment for the Republican vote diminishes. Higher inflation seems to change the

effect of unemployment on voting behaviour. The age controls share the dynamic of losing importance in determining Republican voting shares: for the 15–24-year-old bracket, there is statistical significance for a negative effect in 2018, however none for the positive coefficient in 2022. The 25–54-year-old bracket also loses significance for its negative effect in 2022 as opposed to 2018. For the 55–64-year-old bracket in 2018 there is a highly significant negative effect on Republican voting shares, however this effect is positive in 2022, though just outside of statistical significance with a p-value of 0.119.

Moving on to the *Repseat* controls, there are some similar results as with the *Repvoteshare* controls. The incumbent, male, inequality, and income variables all follow the same pattern as in the vote share data. There are however differences in *Ballotmeasure* - it was neither significant in 2018, nor 2022. Unemployment follows a similar trend as with the voting share data, except for the strength of the coefficient in 2018 (-10.76). The biggest differences are however to be found in the race and age controls. Though none of the race controls are significant in 2018, *Black* and *Hispanic* are both significant but have a very small negative effect on *Repseat* data. The age controls are all negative and significant in the 2018 data but lose strength in 2022 for the 25-54- and 55-64-year brackets (both close to zero whilst significant). The 15–25-year bracket loses significance in the 2022 data.

Comparing both the 2018 and 2022 model, R-squared values it seems, as with the Democratic data, that the 2022 models are better at capturing the data trends than the 2018 models.

Now we move on to the results of *RepDemfrac18* and *RepDemfrac22*:

Table 5: Results Linear Regression Party Voting Share Difference

	RepDemfrac18		RepDemfrac22	
	Coefficient	P-Value	Coefficient	P-Value
Raceinflation	-0.203	0.945	4.245	0.021
BallotMeasure	-0.071	0.039	-0.031	0.222
Incumbent	-0.006	0.827	0.289	0.000
IsMale	0.065	0.047	0.024	0.369
Inequalityindicator	0.249	0.093	0.598	0.000
Meanhouseholdincome	0.000	0.000	0.000	0.000
Unemployed	-13.074	0.000	-6.909	0.000
Black	-0.292	0.047	-0.366	0.011
Asian	-0.230	0.177	0.280	0.119
HispanicorLatin	-0.115	0.343	-0.075	0.473
frac15_25yrs	-1.270	0.181	1.290	0.089
frac25yrs_54yrs	-3.062	0.000	-1.002	0.151
frac55yrs_64yrs	-3.440	0.051	1.196	0.328
constant	2.410	0.000	-0.215	0.650
R-Squared	0.531		0.629	

For the main variable of interest, *Raceinflation*, the results are in line with the findings from the Democrat data. For the 2018 data, *Raceinflation* is not statistically significant, and with a p-value of 0.945 does not seem to have any explanatory power over *RepDemfrac*. However, the 2022 results tell another story: The *Raceinflation* coefficient for 2022 is significant at the 5% level and positive (4.245). This strong positive effect of *Raceinflation* on *RepDemfrac* corroborates the findings for *Demvoteshare*: in 2022 the positive coefficient implies an increasing effect on the difference in vote share each party received. Due to the nature of the construction of the *RepDemfrac* variable (*Repvoteshare* minus *Demvoteshare*) this implies that *Raceinflation* increases the average difference in vote shares in favour of the Republican candidate. The fact that the 2018 coefficient is not significant is also in line with previous results: inflation was moderate in 2018 and hence there is no statistical evidence of an effect of *Raceinflation* on *RepDemfrac*.

Regarding the controls of the *RepDemfrac* results, the results here too mostly mirror the results already discussed for *Demvoteshare* and *Repvoteshare*. *Ballotmeasure* only has statistical significance in 2018 (-0.713, p-value of 0.039, favouring Democrats), but not in 2022. Incumbency becomes statistically significant at the 1% level in 2022 and has a positive coefficient of 0.289, favouring Republicans. *IsMale* only has a very small statistically significant positive effect in 2018 and fails to reach significance in 2022. Inequality however is significant in both years, at the 10% level in 2018 and the 1 % level in 2022, is positive (favouring Republicans), and becomes stronger in 2022. This is in line with what was seen with *Raceinflation*: inequality seems to be favouring Republicans. Mean income has a very weak negative statistically significant effect, marginally favouring Democrats. *Unemployed* also reflects the discussion above - Unemployment is highly significant at the 1% level and favours Democratic voting shares, though less in 2022 than in 2018, but remains higher in magnitude than *Raceinflation*. For the race controls, only Black is statistically significant - both for 2018 and 2022 *Black* is negative (favouring Democrats) and increases in strength in 2022. This is in fact slightly at odds with an increasing *Raceinflation* coefficient in 2022 but could imply that it is primarily the other Non-White ethnicities that are punishing the incumbent (Democrats), whereas the *Black* coefficient seems to be somewhat resistant to *Raceinflation*. Regarding the age controls, both the 25-54 and 55-64 age brackets are significant and negative in 2018, but lose significance in 2022. The 15-25 age bracket is not significant in 2018, but is statistically significant at the 10% level, and interestingly, positive in 2022. This is intriguing as young people typically voted Democrats in the 2022 Midterm elections (Enten 2022; Salam 2022; Simmons and Wines, 2022) and yet the coefficient for this age group favours Republicans. The age bracket is constructed out of census data, so the age bracket only tells us how large of a fraction of the total population this age bracket is made up of. If the coefficient is positive, it tells us that in districts where 15–25-year-olds take up a

higher fraction of the total population, Republicans on average are favoured in terms of the vote. This could imply that though young people vote Democrat, most young people don't vote at all - and this is in favour of Republicans.

Conclusion

This study set out to explore the relationship between race-based heterogeneous inflation and voting behaviour using the 2022 US Midterm elections as a case study. The motivation for this study was due to new and extensive evidence having been published about inflation affecting people differently, in particular the differences in perception of inflation between races (Bryan and Nadeau, 2001). The study set out to answer the question as to whether these differences in perception would affect voting behaviour, with the hypothesis that US Congressional districts where larger parts of the population perceive inflation as higher are most likely to see a larger swing away from the incumbent.

To answer this question, demographic data from the recent American Community survey, regional inflation data from the Bureau of Labor Statistics and election data from both the 2018 and 2022 Midterm elections was used. A new variable was constructed - *Raceinflation* - to measure heterogeneous inflation at district level based on the perception biases found by Bryan and Nadeau (2001), and the fraction of the district population that is White and Non-White. Using this variable, the relationship between heterogeneous inflation and voting shares received by each party, the seats they won, and the difference in voting share received by each party at district level was examined.

And indeed, the results showed robust evidence that heterogeneous inflation did in fact have an effect on voting behaviour. Heterogeneous inflation played an important role in reducing the Democratic voting share at a district level, whilst there was no statistical evidence for any

effect in 2018. Interestingly, though the effect on the Democratic voting share was evident, there was not enough evidence for a distinct effect on the seats won by Democrats.

There was also no evidence that heterogeneous inflation had a direct effect on Republican voting shares or seats won.

However, the results from the difference in voting shares received by both parties showed strong statistically significant evidence that heterogeneous inflation hurt the Democrats and favoured Republicans, reinforcing the results from the Democratic data.

These results were also consistently supported by the dynamics of unemployment and the election results. Unemployment was found to be an important factor in boosting the Democratic vote and harming the Republican vote, but this effect was on average halved in 2022 as the importance of heterogeneous inflation increased. Here we can see the known economic voting trade-off: unemployment versus inflation.

Furthermore, though there was not enough evidence to make a definitive statement on how heterogeneous inflation affected the Republican vote, the dynamics of inequality were telling. Inequality was consistently found to favour Republicans - more so in 2022 than in 2018. Rising inequality is one of the outcomes of rising inflation and by extension, the positive effect of inequality for Republicans mirrors the negative effect of heterogeneous inflation on Democrats.

There were however also some elements to the results that would require further study but were outside of the scope of this Master's thesis.

The lack of statistical evidence for heterogeneous inflation effects on the Republican vote whilst there being such strong evidence for the Democratic vote is an area that would require further study. A possible explanation is that there were other elements in this election that were not captured in the ballot measure control specifically, such as abortion rights.

Another area where further study would be required is as to why heterogeneous inflation had a much more evident effect on voting shares, but not on seats won. Why did heterogeneous inflation not have a bigger impact on flipping seats?

There are some further limitations to this study to be addressed. The first one is the missing data points from the 2022 election data. In the interest of time and adhering to the Master's thesis deadline, election data had to be collected before more than 90% of all ballots were counted in all districts, and hence the data from those districts under the threshold were not included in the study.

Furthermore, Bryan and Nadeau (2001) only refer to racial differences in perception of inflation as White and Non-White. A more granular dissemination of the individual racial groups (White, Black, Hispanic, Asian) would have enhanced the quality of the constructed Raceinflation variable. Greater granularity in inflation data would also have been beneficial - district-level inflation data would have contributed to a more exact and accurate construction of heterogeneous inflation. It was outside of the scope of this study to address these data limitations due to the time constraints of the Master's Thesis and the resource limitations in accessing more granular data.

Nevertheless, robust evidence was found that heterogeneous inflation did in fact have an impact on the 2022 US Midterm elections, namely punishing the party of the incumbent government - the Democrats - particularly in its voting shares.

The fact that this effect is evident in the data is additional evidence for the importance of the societal impact of heterogeneous inflation. Heterogeneous inflation has had such a distinct impact on Americans that there is clear evidence for a change in voting behaviour. This study adds further weight to the argument that when it comes to tackling inflation, a one-size-fits all solution is not sufficient in the face of clear evidence of the existence of heterogeneous inflation.

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Appendix

Appendix 1: Inflation perceptions by Demography (Bryan and Nadeau, 2001)

**TABLE 1 MEAN INFLATION PERCEPTIONS AND EXPECTATIONS
BY SELECTED DEMOGRAPHIC GROUP**

	Perceptions ^a		Expectations		
	Mean	Standard deviation/skewness	Mean ^a	Standard deviation/skewness ^a	Percentage point deviation from reference group ^{b,c}
Full sample	5.9	10.6/4.2	5.4	9.3/4.5	–
Male	4.6	9.1/4.6	4.0	6.7/3.3	r
Female	6.9	11.5/4.0	6.4	10.7/4.4	1.0
White	5.6	9.9/4.5	5.0	8.5/5.5	r
Nonwhite	7.9	14.4/3.2	7.7	13.0/2.1	1.0
Single	6.7	11.7/3.2	6.0	10.3/2.5	–0.2
Married	5.4	9.7/5.4	4.9	8.3/7.2	r
Elementary school	8.7	12.6/2.7	7.4	11.4/1.8	1.1
Some high school	7.5	12.2/3.3	6.6	10.7/3.0	0.7
More than high school	4.8	9.0/5.7	4.4	7.8/7.1	r
Low income	9.2	14.5/2.4	8.4	13.7/2.8	1.1
Low-middle income	7.4	11.4/2.8	6.3	9.8/2.3	0.4
Middle income	6.0	9.7/3.5	5.3	8.3/2.7	r
High-middle income	4.7	8.5/4.9	4.4	6.9/2.6	–0.2
High income	4.7	9.8/6.9	4.4	8.4/9.0	–0.4
18–25 years old	6.8	11.2/2.5	6.4	10.4/1.9	0.6
26–35 years old	5.5	10.6/4.2	5.2	8.9/3.1	0.3
36–45 years old	5.6	10.3/4.1	5.4	9.3/3.2	0.2
46–55 years old	5.3	9.8/8.5	5.2	8.1/3.1	r
56–65 years old	6.0	11.0/3.3	5.3	8.5/3.3	–0.3
>65 years old	7.1	11.2/2.7	5.1	10.6/9.4	–0.5

Appendix 2: Average (June, July August) Regional Inflation States (U.S. Bureau of Labor Statistics)

South	West	Northeast	Mid-West
2018: 2.67%	2018: 3.6%	2018: 2.67%	2018: 2.33%
2022: 9.37%	2022: 8.4%	2022: 7.43%	2022: 8.73%
ALABAMA ARKANSAS DELAWARE FLORIDA GEORGIA KENTUCKY LOUISIANA MARYLAND MISSISSIPPI NORTH CAROLINA OKLAHOMA SOUTH CAROLINA TENNESSEE TEXAS VIRGINIA WEST VIRGINIA	ALASKA ARIZONA CALIFORNIA COLORADO HAWAII IDAHO MONTANA NEVADA NEW MEXICO OREGON UTAH WASHINGTON WYOMING	CONNECTICUT MAINE NEW HAMPSHIRE NEW JERSEY NEW YORK PENNSYLVANIA RHODE ISLAND	ILLINOIS INDIANA IOWA KANSAS MASSACHUSETTS MICHIGAN MISSOURI NEBRASKA OHIO SOUTH DAKOTA VERMONT WISCONSIN