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How Does Household Consumption in Ethiopia Vary along Ethnic Lines During the Election Years? A Comparison Between the Democratic and Non-Democratic Eras

Abstract

This paper investigates the impact of ethnicity and political factors on household consumption in Ethiopia during democratic and non-democratic eras. Using household survey data, we examine the variations in consumption between coethnic and non-coethnic households. Our results indicate that ethnicity and political factors have significant effects on household consumption. However, we find no significant impact of democracy on household food security, regardless of whether the households are coethnic or non-coethnic. These findings contradict earlier studies, which suggested that the Tigray nation would be favored. Moreover, household controls had little influence on consumption compared to the main predictors. This implies that household controls and consumption are weakly correlated or independent of one another. Therefore, external factors may be the primary drivers of household consumption in Ethiopia.

1 Introduction

1.1 Political Overview

Ethnic federalism is an institutionalized feature of Ethiopia's post-authoritarian state order. After the country's first democratic elections in 1995, the Prime Minister promoted ethnic federalism to fight poverty and facilitate the equitable distribution of national wealth. This institutional setting led to the creation of ten semi-autonomous ethnic-based regions (Mulugeta, 2012). The paper aims to investigate whether ethnic federalism has contributed to ethnic favoritism in resource allocation, thereby affecting households' food security. Specifically, we examine the variations in household consumption along ethnic lines during election years.

Ethnicity and politics are intertwined in Ethiopia, with political parties organizing along ethnic lines and championing an ethnicized federal state. During the Ethiopian People's Revolutionary Democratic Front's (EPRDF) rule from 1995 to 2018, Ethiopia was a federal parliamentary republic with a dominant-party system. Although the country had a multi-party system, the EPRDF was the dominant party, and the opposition faced significant challenges, including limited access to media and restrictions on freedom of assembly (Mulugeta, 2012). The EPRDF was a coalition comprising three ethnic parties (Tigray, Amahara, Oromo) and one multiethnic (Southern nations - SNNP) party, with Tigray, politically dominant since 1995, comprising only 6% of the population (Teshome, 2014).

Elections were held in 1995, 2000, 2005, 2010, 2015, and 2018. While the level of democracy in Ethiopia is a matter of debate, it is generally agreed that the period of 2000-2005 was more

democratic than the period of 2010-2018. Human Rights Watch identifies 2010 as the year when democracy fell apart (Abink, 2013). Some scholars, however, argue that democracy's erosion in Ethiopia was a gradual process, characterized by state violence, and gradual power centralization (Habtu, 2014; Temesgen, 2017). During the 2000-2005 period, the country had a multi-party system, and opposition parties were allowed to participate in elections. However, they still faced restrictions on their political freedoms, and the 2000 and 2005 elections were marred by allegations of fraud and vote rigging. The 2010-2018 period was marked by a more authoritarian regime. The 2010 elections were widely criticized for being neither free nor fair, and the government's response to criticism and dissent was characterized by repression and extreme restrictions on political freedoms (Gagliardone, 2012). The government passed laws aimed at limiting freedom of assembly and expression, and opposition leaders were subjected to arrest, harassment, and intimidation.

1.2 Food Security in Ethiopia

Studies have shown that Ethiopia's food insecurity is primarily caused by low agricultural productivity, recurrent droughts, and high levels of poverty. Gebremedhin et al. (2018) found that households belonging to non-dominant ethnic groups were more likely to be food insecure. The Ethiopian government has implemented various policies and programs aimed at improving food security, such as the Productive Safety Net Programme (PSNP), which provides cash and food transfers to the most food-insecure households. However, evaluations of these programs have shown mixed results in terms of their effectiveness in reducing food insecurity. Tefera (2019) found that the PSNP had a positive impact on food security in ethnic regions with high levels of poverty but had no impact in regions with lower levels of poverty.

1.3 Research Gap and Objectives

The Political Economy Framework and Political Accountability Framework suggest that democratic institutions can have a positive impact on economic growth and social cohesion. Empirical evidence from Burgess et al.'s study on ethnic favoritism in Kenya's road-building expenditures supports this theory by showing that democratic institutions can reduce ethnic favoritism in public spending. However, the impact of ethnic relations and ethnic federalism on food security during election years remains underexplored in the literature. Moreover, little is known about the effect of political campaigns on food security. To address these gaps, this paper aims to examine the variations in household consumption along ethnic lines during election years in Ethiopia, comparing democratic and non-democratic eras. By doing so, this study will contribute to the ongoing debate on the impact of political institutions on economic development and household welfare, particularly in a context where ethnicity plays a significant role in politics and policy-making.

Furthermore, the Political Violence Framework highlights the impact of political violence on household consumption, which can have lasting effects on economic activity, property destruction, forced displacement, and social networks and trust. In the context of Ethiopia, where political instability and ethnic conflicts have been prevalent, it is essential to investigate the effect of political violence on household welfare and food security. The paper will contribute to the ongoing debate on the impact of political institutions on economic development and household welfare, particularly in a context where ethnicity plays a significant role in politics and policy-making.

1.4 Hypotheses

Based on the findings of Burgess et al. on road-building in Kenya, it was observed that coethnic favoritism decreases during democratic periods due to institutional and societal constraints. However, the hypothesis for Ethiopia differs from these findings. It is hypothesized that Ethiopia would favor the four coethnic groups with the EPRDF during democratic election years to ensure their support at the ballot. This could be in the form of increased redistribution or greater social insurance in their areas. In an undemocratic setup, the government would not require incentivization of co-ethnics to win elections, leading to less clarity of ethnic favoritism.

The main factor driving increased fairness during democratic periods is the strength of institutions that prevent the enactment of rules and policies that are biased. However, the democratic system in Ethiopia is less advanced than in Kenya, leading to weaker institutions and less accountability of the prime minister. This implies that coethnic support is necessary to maintain power. Additionally, Ethiopia is governed by a political party rather than an individual, making it easier to enforce desired policies despite checks and balances. Hence, increased bias is anticipated during democratic years.

Furthermore, studies have shown that stronger political institutions can lead to greater accountability and less ethnic favoritism in the distribution of resources. However, in contexts with weaker political institutions, ethnic favoritism is more likely to be prevalent, as observed by other authors. Therefore, it is expected that higher overall consumption will occur during democratic years.

2 Data

2.1 Data Sources

This study uses data from two main sources: the Ethiopian Socioeconomic Survey (ESS) from 2011-2019 and the Household Income, Consumption, and Expenditure Survey (HICES) from 2004-2005 and 1999-2000. These surveys provide a wealth of information on household member characteristics, household expenditure by consumption groups, and income.

The ESS is a nationally representative survey that collects data on a wide range of socioeconomic variables, including household and individual demographics, income, expenditures, assets, and access to services. The survey is conducted annually by the Central Statistical Agency of Ethiopia and provides data for both urban and rural areas.

The HICES, on the other hand, is a periodic survey conducted by the same agency, but with a focus on the income, consumption, and expenditure patterns of households. The survey has been conducted twice, first in 1999-2000 and then again in 2004-2005, and provides a more detailed picture of household income and expenditure over time.

Together, these two surveys provide a rich source of data for this study, allowing for a detailed examination of the impact of coethnicity and democracy on household welfare in Ethiopia. The analysis will draw on a wide range of variables from both surveys, including household size, composition, income, consumption, and access to services.

2.2 Data Cleaning and Processing

The surveys used in this study obtained measures of food expenditure through household surveys. In particular, the Ethiopian Socioeconomic Survey (ESS) and Household Income, Consumption, and Expenditure Survey (HICES) collected data by asking households about their food consumption and expenses over a specific period of time, usually one week or one month. This method allowed for the collection of data on both the quantity and type of food consumed, as well as the cost of obtaining it.

To convert the nominal values of food expenditure into real values, the consumer price index (CPI) and food price index (FPI) from the Central Statistical Agency of Ethiopia were used. These indexes were obtained from the agency's website and cited in the appendix. The nominal value of household food expenditure was divided by the CPI and FPI, respectively, and then multiplied by 100 to obtain the inflation-adjusted food values.

The ESS data used in this study was weighted to adjust for differences in the probability of selection and response rates among different groups in the sample. The weighting method incorporated the sample design, non-response, and population benchmarks to produce estimates that were representative of the target population. By using the survey weights, the results of this study were made as unbiased as possible.

To prepare the data for analysis, missing values were handled using mean and mode imputation for missing consumption values, education level, and occupation. However, mean imputation can introduce bias if missing data are not missing at random. Therefore, checking for systematically

missing values, such as the sex of the individual, was done by comparing survey years. However, this method had limitations due to differences in the surveyed households. Missing household IDs were handled using listwise deletion to remove useless observations.

To reduce bias caused by missing observations and match the sample with population demographics, survey weights were applied. Additionally, Winsorizing was used to handle outliers and reduce the impact of extreme values on the analysis. Winsorizing involves replacing extreme values with a specified percentile value to reduce the effect of outliers on statistical results. By applying these cleaning and processing techniques, the data used in this study was made more robust and reliable for the analysis of household consumption in Ethiopia.

3 Research Design

This study aims to test the hypothesis that coethnic groups receive preferential treatment during election years compared to non-coethnic groups. To achieve this, a difference-in-difference (DID) quasi-experimental design will be employed. The DID method allows us to compare the change in per capita food consumption between coethnic and non-coethnic regions during election years in both the democratic and non-democratic eras. This design helps to isolate the treatment effect of coethnicity from other time-varying or region-specific factors that may affect household vulnerability.

The sample selection process involves selecting five national election years: 2000, 2005, 2010, 2015, and 2018 in Ethiopia. The regions in Ethiopia are divided into two groups: coethnic and non-coethnic regions. The four regions where the dominant ethnic group is the same as the ruling

coalition party in that election year will be categorized as coethnic regions. The remaining regions will be categorized as non-coethnic regions.

The model will be estimated in three stages. First, a simple difference-in-differences model will be estimated as shown in Equation 1.0. Second, the model will be estimated using time dummies (fixed effects) as shown in Equation 2.0. Third, the model will be estimated using region dummies (fixed effects) as shown in Equation 3.0.

Model 1: Simple Difference-in-differences Model

Equation 1.0:

$$\log(y)_{it} = \beta_0 + \beta_1 * \text{Democratic}_t + \beta_2 * \text{Coethnic}_i + \beta_3 * \text{Coethnic}_i * \text{Democratic}_t + \varepsilon_{it}$$

Equation 1.1:

$$\begin{aligned} \log(y)_{it} = & \beta_0 + \beta_1 * \text{Democratic}_t + \beta_2 * \text{Coethnic}_i + \beta_3 * \text{Coethnic}_i * \text{Democratic}_t \\ & + \beta_4 * \text{Sex_Head}_i + \beta_5 * \text{Marital_Head}_i + \beta_6 * \text{Educ_Head}_i + \beta_7 * \text{HH_SIZE}_i + \varepsilon_{it} \end{aligned}$$

Model 2: Difference-in-differences with Time Fixed Effects

Equation 2.0:

$$\begin{aligned} \log(y)_{it} = & \beta_0 + \beta_1 * 2005 + \beta_2 * 2010 + \beta_3 * 2015 + \beta_4 * 2018 + \beta_5 * \text{Coethnic}_i \\ & + \beta_6 * \text{Coethnic}_i * 2005 + \beta_7 * \text{Coethnic}_i * 2010 + \beta_8 * \text{Coethnic}_i * 2015 \\ & + \beta_9 * \text{Coethnic}_i * 2018 + \varepsilon_{it} \end{aligned}$$

Equation 2.1:

$$\begin{aligned}\log(y)_{it} = & \beta_0 + \beta_1*2005 + \beta_2*2010 + \beta_3*2015 + \beta_4*2018 + \beta_5* \text{Coethnic}_i \\ & + \beta_6*\text{Coethnic}_i*2005 + \beta_7*\text{Coethnic}_i*2010 + \beta_8*\text{Coethnic}_i*2015 \\ & + \beta_9*\text{Coethnic}_i*2018 + \beta_{10} \text{Sex_Head}_i + \beta_{11} \text{Marital_Head}_i + \beta_{12} \text{Educ_Head}_i \\ & + \beta_{13} \text{HH_SIZE}_i + \varepsilon_{it}\end{aligned}$$

Model 3: Difference-in-differences with Region Fixed Effects

Equation 3.0:

$$\begin{aligned}\log(y)_{it} = & \beta_0 + \beta_1*\text{Tigray}_i + \beta_2*\text{Oromo}_i + \beta_3*\text{SNNP}_i + \beta_4*\text{Amhara}_i + \beta_5* \text{Democratic}_t \\ & + \beta_6*\text{Democratic}_t*\text{Tigray}_i + \beta_7*\text{Democratic}_t*\text{Oromo}_i + \beta_8*\text{Democratic}_t*\text{Oromo}_i \\ & + \beta_9*\text{Democratic}_t*\text{Amhara}_i + \varepsilon_{it}\end{aligned}$$

Equation 3.1:

$$\begin{aligned}\log(y)_{it} = & \beta_0 + \beta_1*\text{Tigray}_i + \beta_2*\text{Oromo}_i + \beta_3*\text{SNNP}_i + \beta_4*\text{Amhara}_i + \beta_5* \text{Democratic}_t \\ & + \beta_6*\text{Democratic}_t*\text{Tigray}_i + \beta_7*\text{Democratic}_t*\text{Oromo}_i + \beta_8*\text{Democratic}_t*\text{Oromo}_i \\ & + \beta_9*\text{Democratic}_t*\text{Amhara}_i + \beta_{10} \text{Sex_Head}_i + \beta_{11} \text{Marital_Head}_i \\ & + \beta_{12} \text{Educ_Head}_i + \beta_{13} \text{HH_SIZE}_i + \varepsilon_{it}\end{aligned}$$

where:

- $\log(y)_{it}$, the natural logarithm of the annual per capita household food consumption in region i and year t is the main outcome variable of interest.
- Democratic_t is a binary variable that takes a value of 1 for the years 2000 and 2005 and 0 for the post-2010 non-democratic era.

- $Coethnic_i$ is a binary variable that takes a value of 1 for the four coethnic regions (Tigray, Amhara, Oromo, SNNP) and 0 otherwise.
- the interaction term between $Coethnic_i$ and $Democratic_i$ shows the treatment effect of being in a democratic era, which is the primary focus of this study.
- e_{it} is the error term.

To ensure robustness and reliability in our analysis, each set of regressions will incorporate controls for key household characteristics. Specifically, we will control for household size, sex, marital status, and educational level of the head of the household. These controls have been carefully chosen to ensure that they are not correlated with the treatment variables under consideration, namely *coethnicity*, and *democracy*. By doing so, we can isolate the treatment effect and estimate a causal effect with greater accuracy. This can be observed in equations 1.1, 2.1, and 3.1, which incorporate the aforementioned controls. This approach enhances the econometric validity of our analysis and allows us to draw more reliable conclusions regarding the impact of coethnicity and democracy on our outcome variables.

4 Results

4.1 Summary Statistics

The summary statistics presented in Table 1 provide valuable insights into the demographic and consumption patterns of households in Ethiopia. The data indicates that the majority of households consist of two adults and have over five members, which is typical of the Ethiopian population and ensures that the sample is representative. Additionally, the household head is

typically an adult between the ages of 25-39, indicating that this age group plays a significant role in household decision-making.

Moving on to consumption patterns, the data shows that there is an increase in the percentage of people in higher consumption quintiles from the democratic to the post-democratic period. This trend holds for both co-ethnics and non-coethnics, suggesting that economic growth has been relatively broad-based. Moreover, there is a decrease in the percentage of people in the lower income quintile, although the changes are less dramatic when comparing across different eras, as the data is measuring real income.

One striking observation is the proportion of rural and urban households in the sample. The earlier era, which used HICES data, primarily surveyed rural areas in 2000 and 2005, resulting in less than 25% of households being urban. In contrast, the post-democratic period, which used ESS data, shows that half of the households are urban. This difference needs to be taken into account in any regression analysis to avoid biased results.

4.2 Regression Results

The present study aims to investigate the impact of coethnicity on household consumption and how it is affected by the political regime change in a given region. The findings of our regression analysis reveal that coethnicity is a significant predictor of household consumption. Specifically, coethnic households exhibit significantly higher consumption per capita (170%-210%) than

non-coethnic households. This outcome is both economically and statistically significant, consistent with our hypothesis. (See Tables 1 and 2 in the appendix)

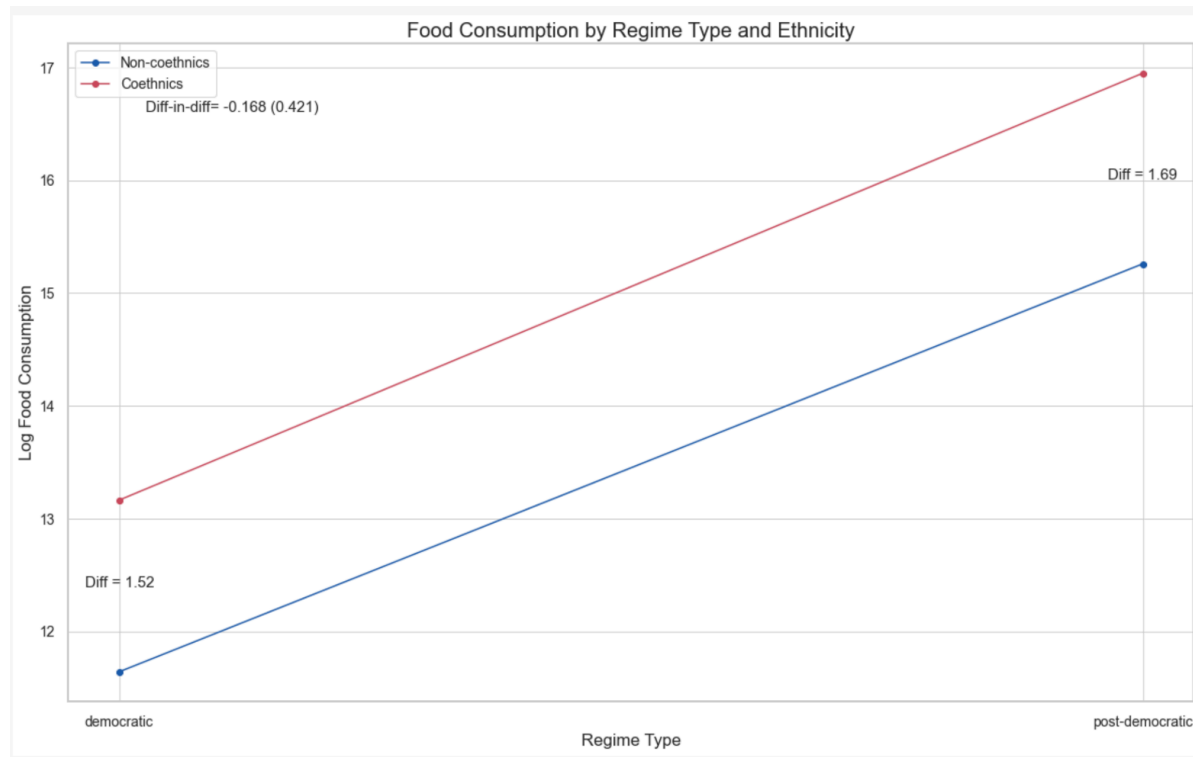


Figure 1: Simple difference-in-difference regression¹

Our analysis reveals an overall upward trajectory in household consumption for both coethnic and non-coethnic regions over time, with a considerable surge observed during the post-democratic period (the election year 2010 and beyond), as depicted in Figure 2. The rise in household consumption ranged between 35% and 50% on a year-on-year basis, as demonstrated in Table 2. Additionally, Figures 4 and 5 demonstrate that there was an increase in consumption across all administrative regions during the post-democratic period.

¹ All the regression visualizations are after controlling for household characteristics: Size of the Household, Sex, Marital Status, and Highest Educational Level of the Household Head

Despite the notable increase in household consumption during the post-democratic period, our analysis suggests that the impact of the political regime on household consumption did not vary significantly between coethnic and non-coethnic regions. Our findings are supported by Table 4, which reveals that controlling for other factors, per capita household consumption during the democratic period (2000, 2005) was 360% lower than in the post-democratic period. However, the results suggest that the interaction between the political regime and region did not have a statistically significant effect on the differential impact of coethnicity on household consumption across regions.

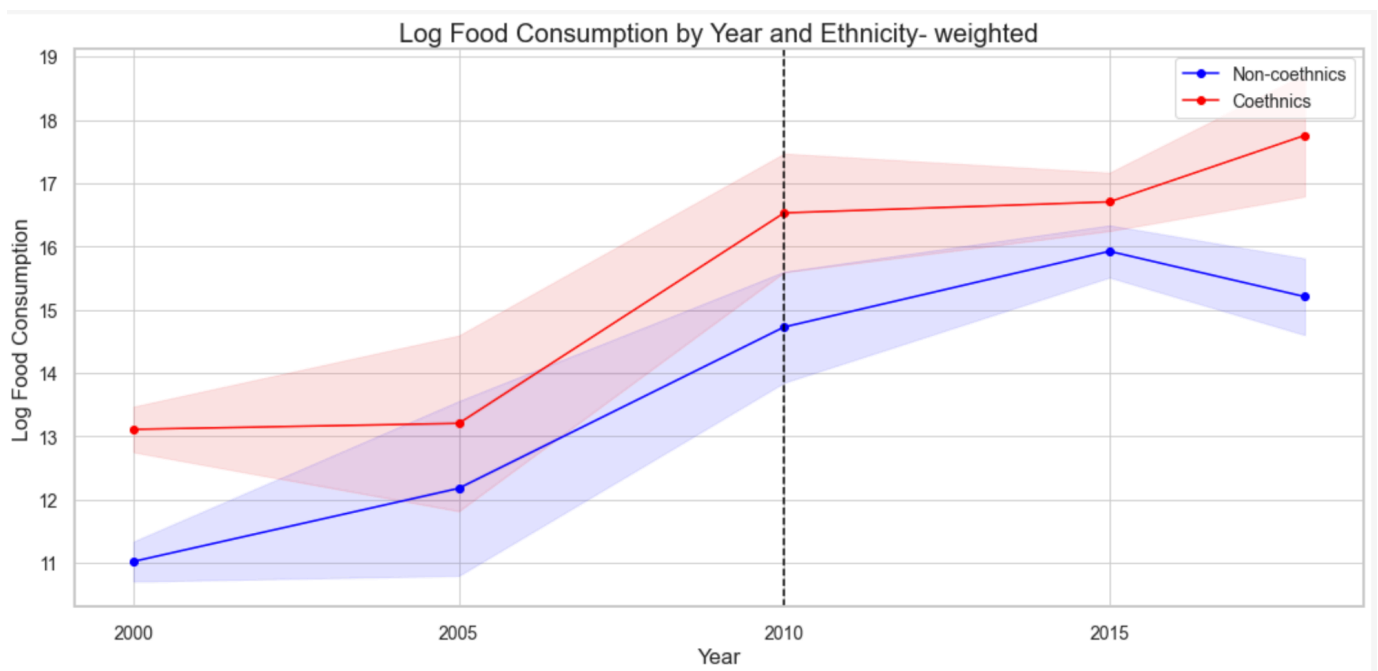


Figure 2: Difference-in-difference regression with Time Dummies

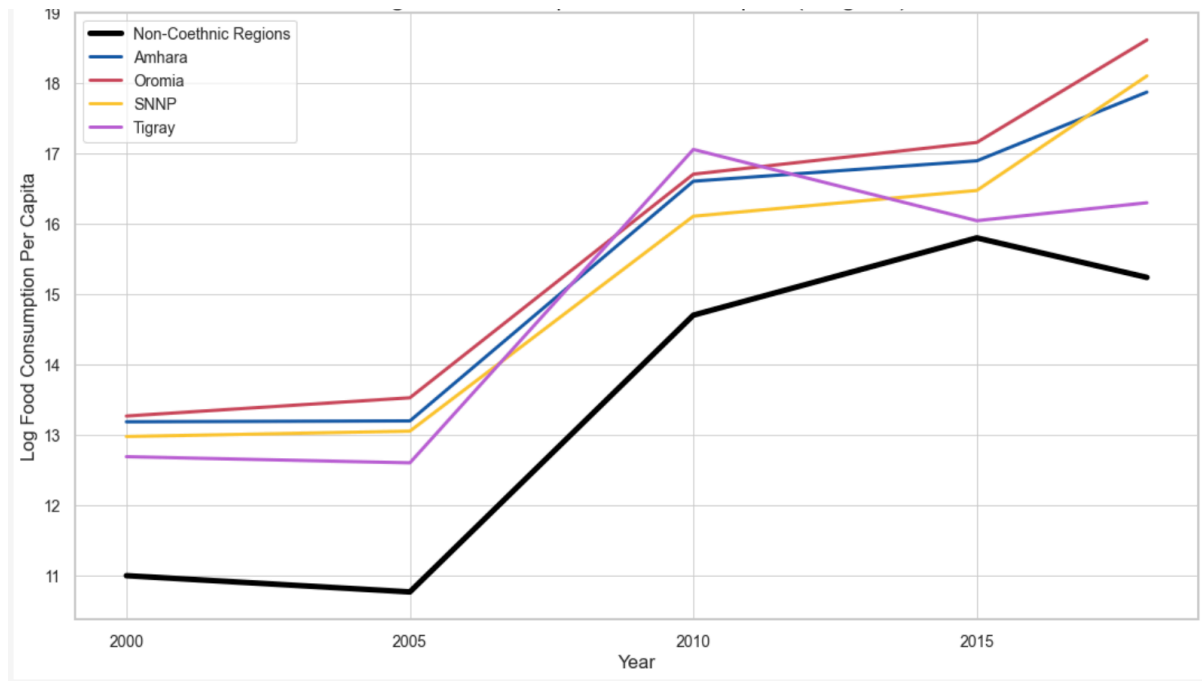


Figure 3: Annual Household Consumption per Capita by Region

Our results suggest that being of the same ethnicity as the ruling party EPRDF had a 17% lower impact on household consumption during the democratic era than in the non-democratic era, as presented in Table 2. However, this difference was not statistically significant, indicating that the effect of coethnicity on food consumption did not vary between the democratic and post-democratic eras.

Additionally, Table 3 supports this finding by demonstrating that the effect of coethnicity on per capita food consumption did not vary significantly across years, except for 2015. These results contradict our hypothesis that households in coethnic regions would have higher consumption during the democratic period due to preferential treatment.

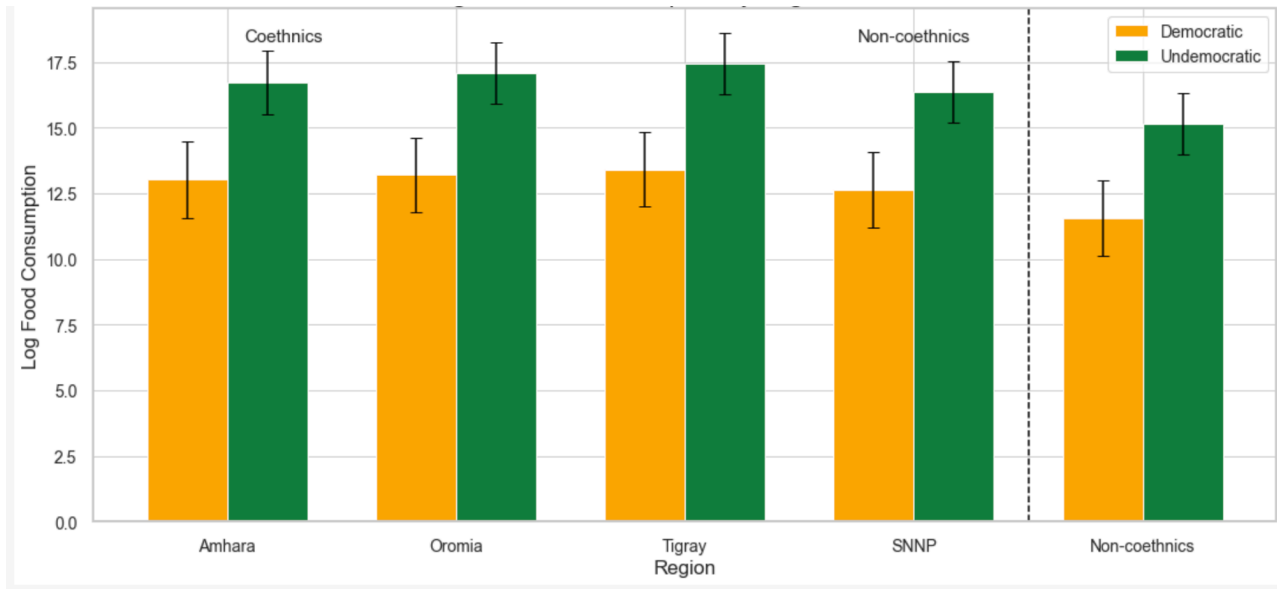


Figure 4: Difference-in-difference regression with Region Dummies

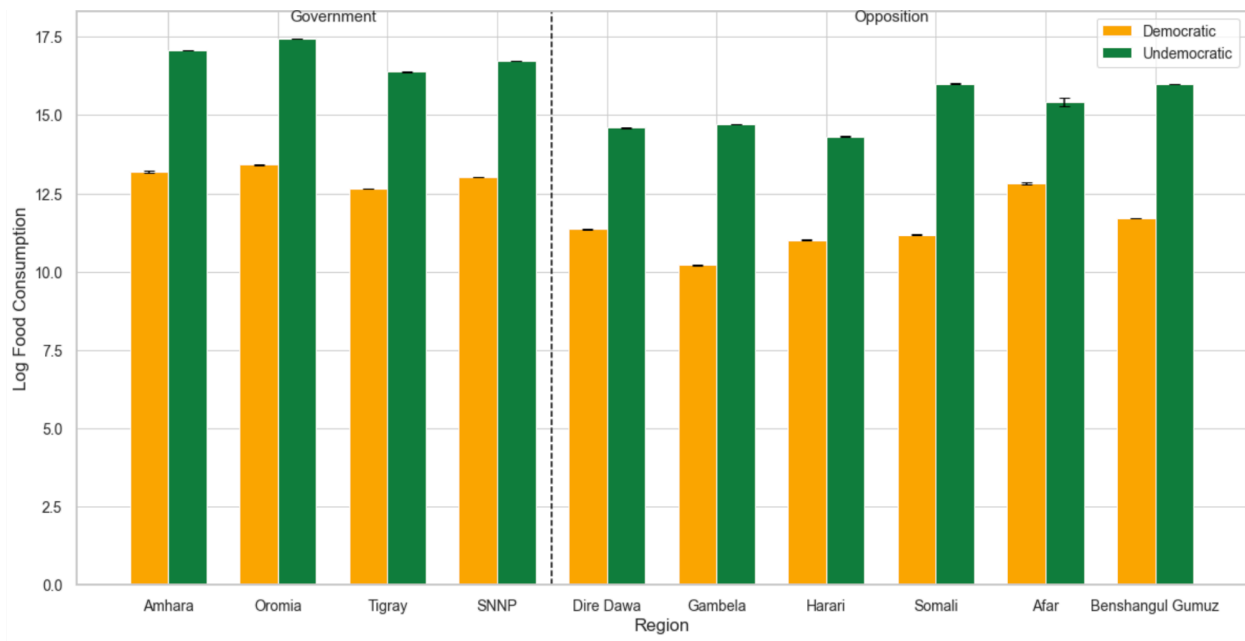


Figure 5: Average Household Consumption per Capita, per Time Period

Nevertheless, the lack of difference in the effect of democracy on household per capita consumption supports the literature that questions the legitimacy of democracy in Ethiopia

during any given year. Human Rights Watch designates 2010 as the year when democracy collapsed, and Ethiopia shifted to an authoritarian regime. However, local scholars contend that the erosion of democracy in Ethiopia was a gradual process and that the country had failed to develop robust democratic institutions between the first election in 1995 and the onset of the degradation of democracy (Habtu, 2013; Temesgen, 2019). Therefore, the findings diverge from those of Burgess et al., whose research was conducted in Kenya, where democratic institutions had been established for over three decades. The impact of a democratic government may take some time to materialize, and this could explain the absence of a significant difference in the effect of democracy on household consumption in Ethiopia.

During all election years, political freedoms were restricted, and the government used state violence to maintain its grip on power. Moreover, election years were also faced with severe droughts, and more tensions arose over the government's distribution of food aid. There were reports of discrimination against certain ethnic groups, especially the Afar people, who were allegedly denied access to water resources and grazing lands. Figure 6 in the appendix supports these claims. In 2000 and 2005, the Afar people were said to receive less aid than other groups, leading to tensions between different ethnic groups.

Although this study found that the consumption levels in the four regions coethnic with the Ethiopian People's Revolutionary Democratic Front (EPRDF) - Tigrayans, Amharic, Oromo, and Southern Ethiopians - were higher than in other regions, this pattern did not align with public opinion reports and other scholars' findings. The Tigrayan-led government was accused of favoring Tigrayans in government and military positions, leading to ethnic protests and clashes

in different regions. Despite the Tigrayan region's consumption levels being lower than other coethnic regions (see figures 3-5), there were claims of the government prioritized Tigray in the distribution of food aid.

In 2018, the appointment of a new Prime Minister, Abiy Ahmed, led to accusations of favoritism towards his own tribe, the Oromo. However, the findings do not support this claim, as the Oromo region had consistently recorded the highest consumption levels. Therefore, it is not possible to attribute the high consumption in 2018 solely to the appointment of an Oromia Prime Minister.

Surprisingly, our hypothesis, which anticipated higher overall consumption during democratic years, was not supported by our findings. Instead, there was a spike in consumption from 2005 to 2010, the year when democracy is said to have collapsed. This increase in consumption can be attributed to the government's efforts to increase agricultural productivity, expand irrigation, and promote better crop management practices to reduce the number of people facing chronic food insecurity. The federal government launched the Growth and Transformation Plan (GTP) in 2010, emphasizing food security with a focus on productivity and improving market access for smallholder farmers. As a result, the number of people requiring food aid fell significantly, from 15 million in 2005 to 5 million in 2010.

4.3 Controls

The results suggest that household controls, such as the size of the household, the sex, marital status, and the educational level of the head of the household, are not statistically or economically significant predictors of household food consumption compared to the main

predictors. This implies that these variables may not be sufficiently correlated with the treatment variable to have an impact on the estimated coefficients.

Comparing the difference-in-difference coefficient estimates between each set of regressions in Tables 2-4 shows no evidence of omitted variable bias. Using the simple DiD equations, as an example,

Equation 1.0:

$$\log(y)_{it} = \beta_0 + \beta_1 * \text{Democratic}_t + \beta_2 * \text{Coethnic}_i + \beta_3 * \text{Coethnic}_i * \text{Democratic}_t + \varepsilon_{it}$$

Equation 1.1:

$$\begin{aligned} \log(y)_{it} = & \beta_0 + \beta_1 * \text{Democratic}_t + \beta_2 * \text{Coethnic}_i + \beta_3 * \text{Coethnic}_i * \text{Democratic}_t \\ & + \beta_4 \text{ Sex_Head}_i + \beta_5 \text{ Marital_Head}_i + \beta_6 \text{ Educ_Head}_i + \beta_7 \text{ HH_SIZE}_i + \varepsilon_{it} \end{aligned}$$

If equation (1.1) includes relevant variables that are correlated with both the outcome variable (log of consumption) and the independent variables (coethnicity and democracy), comparing the difference-in-difference coefficient estimate (β_3) in the two regressions would show evidence of omitted variable bias. This is based on the Omitted Variable Bias (OVB) formula:

$$\text{Long: } Y_i = \alpha^l + \beta^l X_{li} + \varphi X_{2i} + \epsilon_i^l$$

$$\text{Short: } Y_i = \alpha^s + \beta^s X_{si} + \epsilon_i^s$$

$$OVB = \beta^s - \beta^l$$

However, Table 2 shows no evidence of omitted variable bias. This implies that individual and household characteristics are not strongly correlated with coethnicity with the ruling party and the state of democracy in Ethiopia.

Therefore, it is possible that the inclusion of relevant variables, such as access to resources, market conditions, political instability, and social exclusion, could potentially mitigate the omitted variable bias. These factors are considered root causes of food insecurity in Ethiopia, according to the political violence framework. These household characteristics may be too narrow to capture the complexity of the Ethiopian context. Therefore, by expanding the set of control variables and accounting for the complexity of the Ethiopian context, future research may provide more accurate estimates of the relationship between household consumption, coethnicity, and democracy in Ethiopia.

4.4 Robustness

In the previous section, we reported quasi-experimental (difference-in-differences) estimates. However, these estimates may be biased due to two major threats to identification. One of these threats is the parallel trends assumption. This assumption posits that there is no other factor besides the democratic status of the country that causes a difference in consumption levels between coethnic and non-coethnic regions. However, this assumption may not hold due to the unpredictable occurrence of droughts and famines, which are influenced by both climatic conditions and ethnic tensions. These occurrences vary year to year and by region and can exacerbate ethnic tensions, making the parallel trends assumption less robust.

Even after controlling for time and region-fixed effects in separate regressions (equations 2 and 3), the non-parallel trends bias may still exist. Therefore, a new model that incorporates region-specific time trends is necessary to test causality effectively. The region-specific time trends model can account for the time-varying and region-fixed effects of droughts and famines, which may not be entirely addressed in the previous regressions.

5 Conclusion

This study has examined the relationship between ethnic diversity and household consumption levels in Ethiopia, and the potential impact of democracy on household food security vulnerability. The findings suggest that household consumption is significantly higher in coethnic regions, including Tigray, Amhara, Oromia, and SNNP, compared to non-coethnic regions. Interestingly, these patterns do not support the prevailing argument that Tigray is favored over other regions in terms of consumption levels.

Furthermore, the study did not find any significant variation in the effect of democracy on household food security vulnerability across these regions. In other words, the democratization process in Ethiopia has not had a differential impact on food security outcomes for households living in coethnic versus non-coethnic regions.

The analysis also showed that household controls, such as the size of the household, the sex, marital status, and educational level of the head of the household, did not have significant effects on household consumption levels.

6 Limitations

This study faced several challenges that should be taken into consideration when interpreting its findings. One major challenge is that food expenditure is not a perfect measure of food insecurity since it does not account for calorie intake, which is the most effective way of measuring food insecurity. Furthermore, the variation in food culture across different regions means that calorie intake may differ, making it challenging to compare the results across regions. Another concern is the internal validity of the study, particularly for the year 2010. This is because some of the data used for that year is from 2011, which may introduce some bias into the results. Lastly, the fact that the surveys were conducted in different years with different households limits the comparability of the data, which may also impact the accuracy of the findings. Despite these challenges, this study provides valuable insights into the relationship between ethnicity, democracy, and food security vulnerability in Ethiopia.

Table 1: Balance on observable characteristics

	Democratic Period		Post- Democratic Period	
	Coethnics	Non-coethnics	Coethnics	Non-coethnics
Consumption Quintile				
1- Lowest	13%	17%	4%	8%
2	26%	58%	12%	35%
3	35%	12%	38%	35%
4	16%	9%	33%	17%
5- Highest	9%	3%	13%	5%
Earnings Quintile in 2 Prior Years				
1- Poorest	30%	32%	24%	29%
2	27%	25%	29%	25%
3	22%	18%	23%	21%
4	14%	13%	19%	20%
5- Richest	7%	11%	5%	4%
Age Group				
25-29	30%	27%	28%	26%
30-39	32%	30%	33%	33%
40-49	27%	27%	25%	27%
50-59	8%	12%	11%	11%
60+	3%	4%	3%	3%
Family Size				
1-2	4%	3%	7%	8%
3-4	28%	26%	33%	28%
5-6	42%	44%	38%	39%
7+	26%	27%	22%	25%
Married	78%	81%	70%	70%
Female	50%	46%	41%	39%
Urban	18%	23%	48%	50%
N	15,843	8,526	15,810	7,787

Notes: These statistics are based on the household level. *Female* is whether the household head identified as female. *Married* gives the proportion of households where the head was married/ had a common-law partner. *Urban* shows whether the household was in a rural/ urban area. The HICES dataset primarily surveyed rural areas, hence the difference observed. The consumption and income quintiles are based on the average levels in Ethiopia in each given time period.

Table 2: Simple Difference-in-Difference Estimates of the Impact of Ethnicity on Household Consumption in Ethiopia During Election Years

	Log(Household Consumption)	
	(1)	(2)
Coethnic * Democratic	-0.173	-0.168
	-0.423	-0.421
<i>Controls</i>		
Age of Household Head		-0.002**
		-0.001
Sex of Household Head		0.073
		-0.048
Marital Status of Household Head		0.022
		-0.016
Highest Education Level of Household Head		-0.007
		-0.011
Household Size		-0.003
		-0.007
Constant	15.273	15.259
R-squared	0.88	0.88
N	46,582	46,582

Notes: Standard errors are reported in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Standard errors are robust to cluster correlation (cluster)

Table 3: Difference-in-Difference Estimates of the Impact of Ethnicity on Household Consumption in Ethiopia During Election Years Using Time Dummies

	Log(Household Consumption)	
	(1)	(2)
Coethnic * 2005	-1.062 (0.708)	-1.061 (0.708)
Coethnic * 2010	-0.284 (0.478)	-0.284 (0.479)
Coethnic * 2015	-1.307*** (0.235)	-1.307*** (0.234)
Coethnic * 2018	0.459 (0.491)	0.458 (0.490)
<i>Controls</i>		
Age of Household Head		-0.001 (0.001)
Sex of Household Head		-0.031 (0.028)
Marital Status of Household Head		-0.003 (0.002)
Highest Education Level of Household Head		-0.004 (0.005)
Household Size		0.003 (0.006)
Constant	11.022	11.0298
R-squared	0.915	0.915
N	46,582	46,582

Notes: Standard errors are reported in parentheses. * p < 0.05, **p < 0.01, *** p < 0.001
Standard errors are robust to cluster correlation (cluster). The reference year is 2000.

Table 4: Difference-in-Difference Estimates of the Impact of Ethnicity on Household Consumption in Ethiopia During Election Years Using Region Dummies

	Log(Household Consumption)	
	(1)	(2)
Tigray * Democratic	-0.111 (0.368)	-0.102 (0.363)
Amhara * Democratic	-0.246 (0.368)	-0.240 (0.364)
Oromia * Democratic	-0.395 (0.368)	(-0.393) (0.367)
SNNP * Democratic	-0.082 (0.368)	-0.080 (0.368)
<i>Controls</i>		
Age of Household Head		-0.012 (0.001)
Sex of Household Head		0.052 (0.042)
Marital Status of Household Head		0.021 0.016
Highest Education Level of Household Head		-0.011 (0.011)
Household Size		-0.005 (0.007)
Constant	15.1905	15.1777
R-squared	0.893	0.893
N	47,957	47,957

Notes: Standard errors are reported in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors are robust to cluster correlation (cluster). The average household of the non-coethnic region is used as the reference region.

Table 4.1: Difference-in-Difference Estimates of the Impact of Ethnicity on Household Consumption in Ethiopia During Election Years Using Region Dummies

	Log(Household Consumption)	
	(1)	(2)
Tigray * Democratic	-1.161*** (0.00)	-1.153*** (0.01)
Amhara * Democratic	-1.297*** (0.00)	-1.292*** (0.04)
Oromia * Democratic	-1.446*** (0.00)	-1.446*** (0.01)
SNNP * Democratic	-1.132*** (0.00)	-1.134*** (0.00)
Dire Dawa * Democratic	-0.656*** (0.00)	-0.656*** (0.00)
Gambela * Democratic	-1.896*** (0.00)	-1.892*** (0.01)
Somali * Democratic	-2.218*** (0.00)	-2.224*** (0.00)
Harari * Democratic	-0.720*** (0.00)	-0.716*** (0.00)
Benshagul * Democratic	-1.687*** (0.00)	-1.688*** (0.00)
<i>Controls</i>		
Age of Household Head		-0.001** (0.00)
Sex of Household Head		0.029 (0.03)
Marital Status of Household Head		0.021 (0.02)
Highest Education Level of Household Head		0.000 (0.01)
Household Size		-0.005 (0.00)
Constant	15.425	15.415
R-squared	0.930	0.931
N	47957.000	47957.000

Notes: Standard errors are reported in parentheses. * p < 0.05, **p < 0.01, *** p < 0.001. Standard errors are robust to cluster correlation (cluster). Afar administrative region is used as the reference region.

Figure 6: Annual Household Consumption per Capita by Region (Non-coethnics)

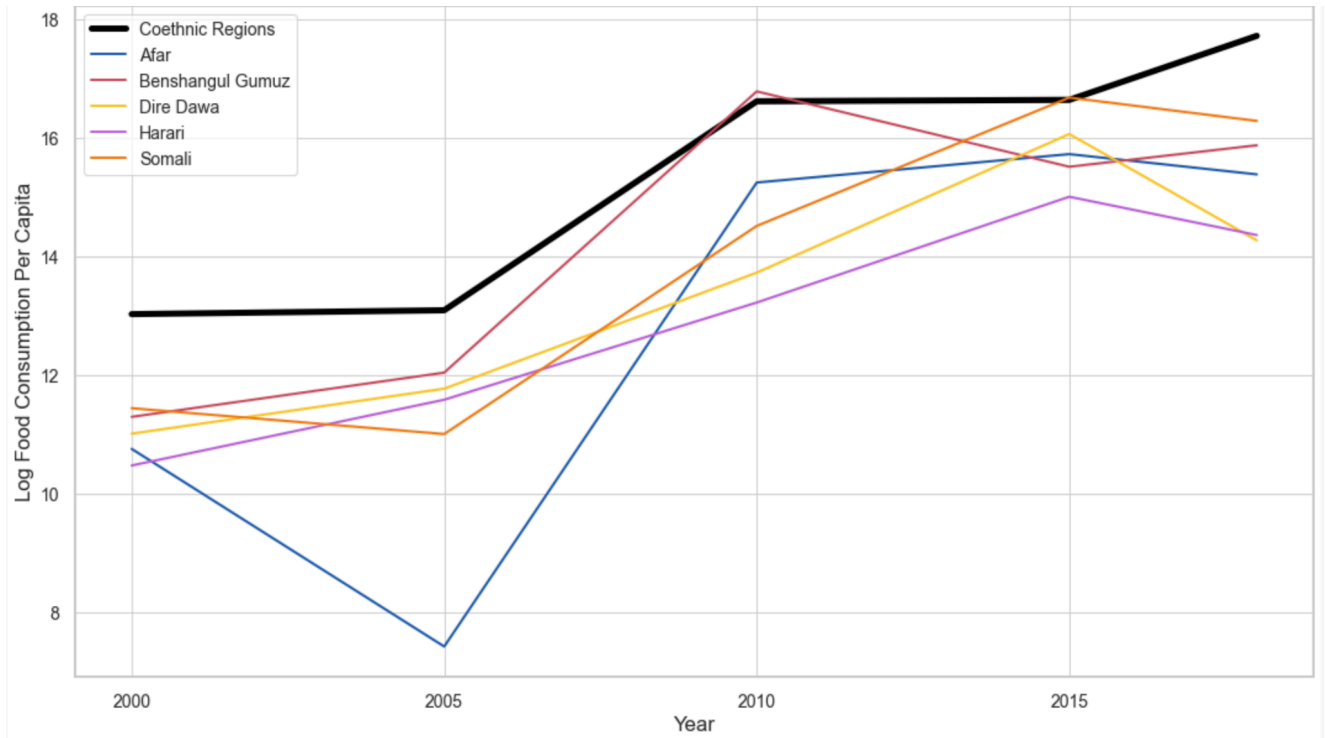


Table 2.1: Simple Difference-in-Difference Estimates of the Impact of Ethnicity on Household Consumption in Ethiopia During Election Year

OLS Regression Results						
Dep. Variable:	vulnerability	R-squared:	0.880			
Model:	OLS	Adj. R-squared:	0.880			
Method:	Least Squares	F-statistic:	543.4			
Date:	Tue, 21 Mar 2023	Prob (F-statistic):	3.97e-10			
Time:	13:36:41	Log-Likelihood:	-47568.			
No. Observations:	46582	AIC:	9.515e+04			
Df Residuals:	46573	BIC:	9.523e+04			
Df Model:	8					
Covariance Type:	cluster					
	coef	std err	z	P> z	[0.025	0.975]
const	15.2592	0.343	44.472	0.000	14.587	15.932
Coethnic	1.6904	0.386	4.383	0.000	0.935	2.446
Democratic	-3.6166	0.425	-8.503	0.000	-4.450	-2.783
Coethnic * Democratic	-0.1678	0.421	-0.398	0.690	-0.993	0.658
Age_Head	-0.0018	0.001	-2.119	0.034	-0.003	-0.000
Sex_Head	0.0725	0.048	1.508	0.132	-0.022	0.167
Marital_Head	0.0217	0.016	1.365	0.172	-0.009	0.053
Educ_Head	-0.0065	0.011	-0.583	0.560	-0.029	0.015
HH_SIZE	-0.0025	0.007	-0.358	0.721	-0.016	0.011
Omnibus:	14964.583	Durbin-Watson:	0.009			
Prob(Omnibus):	0.000	Jarque-Bera (JB):	65001.128			
Skew:	1.528	Prob(JB):	0.00			
Kurtosis:	7.914	Cond. No.	356.			
Notes:						
[1] Standard Errors are robust to cluster correlation (cluster)						

Table 3.1: Difference-in-Difference Estimates of the Impact of Ethnicity on Household Consumption in Ethiopia During Election Years Using Time Dummies

OLS Regression Results						
Dep. Variable:	vulnerability	R-squared:	0.915			
Model:	OLS	Adj. R-squared:	0.915			
Method:	Least Squares	F-statistic:	-2.350e+14			
Date:	Tue, 28 Mar 2023	Prob (F-statistic):	1.00			
Time:	06:40:12	Log-Likelihood:	-39648.			
No. Observations:	46582	AIC:	7.933e+04			
Df Residuals:	46567	BIC:	7.946e+04			
Df Model:	14					
Covariance Type:	cluster					
	coef	std err	z	P> z	[0.025	0.975]
const	11.0298	0.152	72.726	0.000	10.733	11.327
2005	1.1546	0.703	1.643	0.100	-0.223	2.532
2010	3.6983	0.448	8.251	0.000	2.820	4.577
2015	4.8994	0.210	23.334	0.000	4.488	5.311
2018	4.1836	0.307	13.646	0.000	3.583	4.785
coethnic	2.0893	0.183	11.434	0.000	1.731	2.447
Coethnic * 2005	-1.0610	0.708	-1.498	0.134	-2.449	0.327
Coethnic * 2010	-0.2843	0.479	-0.593	0.553	-1.224	0.655
Coethnic * 2015	-1.3067	0.234	-5.584	0.000	-1.765	-0.848
Coethnic * 2018	0.4579	0.490	0.934	0.350	-0.503	1.419
Age_Head	-0.0007	0.001	-1.064	0.288	-0.002	0.001
Sex_Head	0.0307	0.028	1.083	0.279	-0.025	0.086
Marital_Head	-0.0028	0.002	-1.183	0.237	-0.007	0.002
Educ_Head	-0.0042	0.005	-0.813	0.416	-0.014	0.006
HH_SIZE	0.0034	0.006	0.591	0.554	-0.008	0.015
Omnibus:	9623.265	Durbin-Watson:	0.006			
Prob(Omnibus):	0.000	Jarque-Bera (JB):	47022.426			
Skew:	0.922	Prob(JB):	0.00			
Kurtosis:	7.563	Cond. No.	673.			

Notes:

[1] Standard Errors are robust to cluster correlation (cluster)

Table 4.2: Difference-in-Difference Estimates of the Impact of Ethnicity on Household Consumption in Ethiopia During Election Years Using Region Dummies

OLS Regression Results						
Dep. Variable:	vulnerability	R-squared:	0.893			
Model:	OLS	Adj. R-squared:	0.893			
Method:	Least Squares	F-statistic:	1.777e+05			
Date:	Tue, 28 Mar 2023	Prob (F-statistic):	2.14e-22			
Time:	07:04:23	Log-Likelihood:	-46787.			
No. Observations:	47957	AIC:	9.360e+04			
Df Residuals:	47942	BIC:	9.373e+04			
Df Model:	14					
Covariance Type:	cluster					
	coef	std err	z	P> z	[0.025	0.975]
const	15.1777	0.306	49.571	0.000	14.578	15.778
democratic	-3.6270	0.377	-9.632	0.000	-4.365	-2.889
Tigray	1.2054	0.297	4.057	0.000	0.623	1.788
Amhara	1.8942	0.297	6.370	0.000	1.311	2.477
Oromia	2.2670	0.298	7.601	0.000	1.682	2.852
SNNP	1.5549	0.298	5.214	0.000	0.970	2.139
Tigray * Democratic	-0.1021	0.363	-0.281	0.778	-0.813	0.609
Amhara * Democratic	-0.2399	0.364	-0.659	0.510	-0.954	0.474
Oromia * Democratic	-0.3930	0.367	-1.070	0.284	-1.113	0.327
SNNP * Democratic	-0.0796	0.368	-0.217	0.829	-0.800	0.641
Age_Head	-0.0012	0.001	-1.700	0.089	-0.003	0.000
Sex_Head	0.0523	0.042	1.233	0.218	-0.031	0.136
Marital_Head	0.0213	0.016	1.315	0.188	-0.010	0.053
Educ_Head	-0.0109	0.011	-1.021	0.307	-0.032	0.010
HH_SIZE	-0.0046	0.007	-0.708	0.479	-0.017	0.008
Omnibus:	19395.788	Durbin-Watson:	0.008			
Prob(Omnibus):	0.000	Jarque-Bera (JB):	123119.132			
Skew:	1.828	Prob(JB):	0.00			
Kurtosis:	9.946	Cond. No.	567.			

Notes:

[1] Standard Errors are robust to cluster correlation (cluster)

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