An Economic Analysis of the 1997 Amhara Land Redistribution in Ethiopia

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Abstract

In 1997, there was a land redistribution in Ethiopia that only affected the Amhara region, one out of four agriculturally based regions in the country. This paper seeks to measure those effects and compare across regions the crop production output generated by households. The main variable we seek to evaluate is the interaction term of Amhara and Post, signaling whether a household is in the Amhara region and if it is after the land redistribution. We find this variable to be not statistically significant. Our robustness check includes another key policy of land certification for households, which was enacted at three different periods for the Tigray, Amhara, Oromiya, and Southern Nations, Nationalities and Peoples Region. We find that our same interaction term is again not significant with the inclusion of the certification variable. Though it implies that land redistribution had a minimal or no effect on crop production output, there are important caveats that must be taken into consideration regarding the results such as other important reforms that occurred in Ethiopia.

Keywords— Ethiopia, Amhara, Land-Redistribution, Difference-in-Difference, Tenure-Insecurity

Acknowledgments

1 Introduction

One of the biggest discussions in the field of economics is how to efficiently promote economic growth in developing countries. There have been numerous discussions regarding opening up markets, having a great deal of aid or none at all, devaluing a country's currency to promote export growth, and much more (Banerjee & Duflo, 2012). One of the main arguments pushed by Hernando De Soto is that strong property rights will help developing countries overcome their poor economic growth. Secure property rights incentivizes households or individuals to invest in their land and produce more output. The context of this is very pertinent in developing nations as a fair share of economic production comes from agriculture. Broader literature such as the infamous Acemoglu, Johnson & Robinson (2001) paper looks at the historical importance of colonial policy and its implications on institutional strength; thus, providing a theory as to why African nations are of lower-income and development. Theoretically, having strong property rights would allow agriculturally based nations to produce more. Even with these arguments for property rights, others do not hold the disposition that property rights are of importance in development. In the developing world where agriculture is one of the largest economic production centers for employment, numerous issues inhibit its growth. A lack of technological materials such as tractors, irrigation, fertilizers and much more make it very difficult for farmers to produce efficiently (Meemken & Bellemare, 2019). In addition, most households are subsistence-based and not producing for profit, thus skewing incentives and productive allocation. Production is further circumvented by a lack of tenure security and property rights. The main theory behind a lack of tenure security is that individuals or households will produce or invest less if they feel their property rights are ill-defined or insecure.

This brings us to the low-income country of Ethiopia where agriculture dominates the nation like many other developing countries. 70% of the working population is involved in agriculture and contributes to around 42% of Ethiopia's GDP (Cheru et al., 2019). Tenure security is ill-defined as property is not held by the individual or household but is considered public property that technically cannot be sold or exchanged (Adenew & Abdi, 2005). This constraint of not having private property, theoretically, disincentives households to produce at their maximum output. Output can also be

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further reduced if households suffer from land redistribution as they feel their land can be taken away from them at any time. Ethiopia has dealt with land redistributions from 1975-1989 and particularly in 1997 in the region of Amhara, which will be the focus of this thesis.

This literature looks at the effects of the 1997 Amhara land redistribution. The uniqueness of this land redistribution in Ethiopia is that it only happened in the region of Amhara. The three other agricultura-dominated regions of Tigray, Oromiya and Southern Nations, Nationalities, and People's Region (SNNPR) suffered no land redistribution immediately before or any time after the Amhara region. Within this context, the long-term effects of the redistribution can be evaluated in comparison to the other three regions through a difference-in-difference model. We look at whether this land redistribution had a causal negative effect on crop production output in the Amhara region compared to Tigray, Oromiya and SNNPR. This paper implores the theoretical belief that weak property rights through land redistribution would negatively affect output.

The data used to evaluate this theory is the Ethiopian Rural Household Survey (ERHS) which collected data from 1994-2009 of around 1477 households from four regions of Ethiopia (Tigray, Amhara, Oromiya, and SNNPR). This data is panel data that looks across years and has household characteristics such as real consumption, number of oxen owned and crop production outputs. Through a difference-in-difference framework as done in Card and Krueger (1994), I assess the data's crop production output before and after the redistribution across regions through a linear regression and fixed effect model, with year and household fixed effects. The goal of this thesis is to measure the effect of this policy and compare it to three other agriculturally-based regions in Ethiopia that did not have such a policy. I hypothesize is that those that were based in the Amhara region suffered from higher tenure insecurity and would therefore have less crop production from their land compared to the other regions of Tigray, Southern Nations, Nationalities, and People's Region (SNNPR), and Oromiya.

The long-term effects of the 1997 Amhara land redistribution have yet to be measured and this paper seeks to answer this question. The main coefficients that I focus on are whether a household is based in the Amhara region, whether a data point is before or after the redistribution, and an interaction term between those two variables. I find that the effect of the land redistribution is not

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statistically significant for Amhara households and it seems that redistribution had a minimal to no effect on crop production output. In our robustness check including stratified land certification, we conclude with the same statistical results.

This paper is organized as follows: Section 2 provides background information on land tenure and a contextual understanding of Ethiopia. Section 3 looks at the existing literature on tenure insecurity & crop yields and how this paper contributes to the literature. Section 4 looks at the variables used from the ERHS data and the methodology utilized. Section 5 looks at the main regression analysis and interpretation. Section 6 looks at robustness checks and issues/fallouts of this methodology and data. Section 7 further discusses the caveats of our results and the lack of effects of redistribution on crop production output. Lastly, section 8 concludes.

2 Background

In the last 46 years, Ethiopia's land tenure has changed drastically. Due to the three regime changes and their differences in economic policies, a brief description of each regime's land policy is necessary to understand the setting of this paper. Traditionally, Ethiopia's land tenure was based off the main concepts of *rist* & *gult*, two simultaneous land rights where *rist* was the hereditary ownership of land and *gult* was the collecting of tribute/taxation from said land (Haile et al., 2005). Tenancy was also high, especially in the southern areas of Ethiopia due to re-conquests by the imperial Ethiopian government in the late 19th century. There was also the general inability to acquire or retain land due to multiple complications. When the imperial regime was overthrown by the Marxist-Leninist regime of *Derg* in 1974, landholdings were seized from those with multiple properties, and were redistributed to equalize land across all of Ethiopia. The proclamation issued "prohibited private ownership of land, transfers of land by sale, lease and mortgage, as well as the hiring of labor" (Holden & Yohannes 2001). There was a maximum allocation of land where a household could not have more than 10 hectares of farmland and family size was the main standard for how much a family had to lose or gain. The basis of land quality, the land capacity for operational value and other factors contributing to the value of the land were delegated to the new creation of Peasant

Associations (PA), which became the smallest administrative unit in the Ethiopian government.

As a result of these enormous changes in land tenure, this led to numerous tenants becoming new owners of land as the original owners had their holdings taken away. One of the main reasons for the demand of land redistribution was because landlessness was high due to Ethiopia's growing population. Another difficulty encountered was that during the Derg regime, one could not hire labor or rent out land, thus further limiting the market of farming and labor employment. Land redistribution would start in 1975 but would cease in 1989 when the Derg took a more market-based policy towards land. The *Derg* would be overthrown in 1991 by a new force called the Tigrayan People's Liberation Front (TPLF) originating in northern Ethiopia and the region of Tigray. Since both the *Derg* and TPLF were Marxist-Leninist based, both followed the same policies of land ownership being part of the state instead of private ownership by the people. Land was still viewed as the collective property of the state and its administration of it was delegated to the regional states. Any Ethiopian who chooses to take farming up as their way of life is a guaranteed right, but the same policy adopted by Derg where the sale, exchange, and mortgage are all prohibited still exists in Ethiopia (Ali et al., 2011). Due to property being public, individuals feel that their land can still be taken at any time through expropriation or absentee holdings. The land rental market exists but there are complications with the incentives. For example, in Tigray, if an individual is absent from their land for more than two years, even if they are paying taxes or taking care of the property, the government can seize their property (Haile et al., 2005). There are also issues of corruption, nepotism, and taking advantage of individuals in weak positions. The patriarchal nature of Ethiopian society also puts women at a disadvantage, though there have been policies that have tried to mitigate these effects (Teklu, 2005). With all of these persisting issues, the idea of land redistribution was not sought from a policy standpoint for the TPLF and the general Ethiopian peasants but would be carried out regardless in 1997 in the region of Amhara.

The 1997 land redistribution in Amhara was not one based on rigorous economic policy that sought to get rid of inequality in landholdings (Ege, 1997). Land redistribution in Ethiopia had stopped occurring in Ethiopia in 1989. It seemed that the new ruling party of the TPLF had no interest in enacting such policies that emulated the previous regime of *Derg*. Talks started to occur

regarding redistribution in 1996 and were held in great secrecy to the general peasantry. As a result, the redistribution was not one consulted amongst those who would be affected by the policy but through the hands of the government. Eventually, the policy was enacted in the beginning months of 1997 and was based on punishing those that were supporters or members of the previous regime of the *Derg*. This meant taking land away from upper officials or those that were scarcely involved in the politics of the *Derg* and giving it to those not deemed part of the *Derg*. The effects of this policy from a non-economic basis were to build a new group of peasants that supported the new regime and negatively affected the past. Ironically, it was not hard to find people of the same family or friend groups getting the opposite ends of the stick with some gaining what the other had lost. Though generalizations can be made about who benefited and who suffered, there were still anomalies that did not fall under these categories that benefited or lost from the redistribution. In addition, it seemed that women and children gained from the redistribution and those of the older generation suffered.

In addition to land redistribution, the Ethiopian People's Revolutionary Democratic Front (EPRDF) also enacted a land certification process across the four regions. This policy sought to solve numerous issues such as dealing with land tenure insecurity, strengthening land documentation, and allowing for easier transfers of property. It also sought to decentralize the land administration responsibilities that were heavily dominated by the central government during the Derg regime (Girma and Giovarelli, 2013). The enactment of land certification was stratified across regions. Tigray was the first region to implement certification in 1998-99, followed by Amhara and Oromiya in 2002-03 with the Southern Nations, Nationalities, and Peoples' Region (SNNPR) in 2005 (Deininger et al., 2008). As of March 2010, the certification program had registered most of the rural land in Tigray (97%), Amhara (87%), Oromiya (85%), and SNNPR (84%). Land certifications varied across regions in terms of processes and what constituted certified land. For example, the Tigray region did not require both husband and wife names to certify land whereas the Amhara, Oromiya, and SNNPR all required both heads of the household.

Ethiopia's agricultural production is focused in four regions: Amhara, Tigray, Oromiya, and Southern Nations & Nationalities People's Region (SNNPR). These four regions have similarities

Figure 1: Timeline of Policy and Survey Rounds
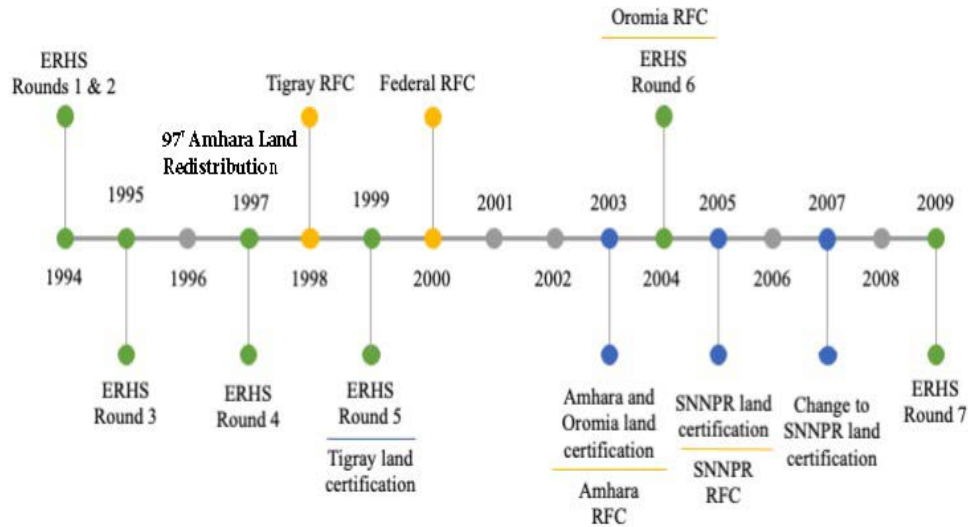
and differences in what crops they produce or the fertility of the land. Yet, a cross-comparison across these regions is viable as crops such as barley, maize, wheat, chat, ensete, black teff, coffee, sorghum, and white teff can all be converted into real values and their respective totals per household in all four regions. This paper tries to scrape the bottom of the barrel by answering this question by evaluating redistribution and crop yields. In addition, peasant land has been a big question as to the economic viability and use of rights for the last 50 years in Ethiopia. One of the most important questions to answer is regarding peasant households as they are still the backbone of the Ethiopian economy and way of life. It is vital from a policy standpoint that robust analysis on redistribution or anything involving peasants should be deeply evaluated.

3 Literature Review

There is a fair amount of literature on tenure insecurity and its effects on investments and output production in agriculture in Ethiopia. Measurements of tenure insecurity can either be through perceptions of property rights of households, or whether a particular household has been affected by redistribution. We will look at four literatures focusing on Ethiopia and how my research relates

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and contributes to the existing studies. The first paper focusing solely on the Amhara region by Benin & Pender (2001) measures the effects of the 1997 Amhara land redistribution by assessing the short-term effects of the redistribution. Holden & Yohannes (2002) estimated the effect of perceived redistribution in the Southern Nations, Nationalities, and People's Region (SNNPR). Deininger & Jin (2006) also evaluate tenure security by assessing transfer rights and how it affects investment in trees and terraces across all regions in Ethiopia. Lastly, Ali et al. (2011) do a paper very similar to Deininger & Jin (2006) that evaluates the SNNPR's property rights through tenure security, transfer rights, and investments in coffee (long-term), chat (short-term), and eucalyptus trees (short-term). We will also briefly look at the broader literature on investments/agricultural productivity and land tenure in other developing nations.

The results that each of these papers finds have similar and differing conclusions to the effects of redistribution or tenure security for households. In the Amhara region, the redistribution of land had a beneficial effect on inputs & productivity (crop yields), but no major effect on investments and management in the short-run (Benin & Pender, 2001). Measuring the perceived effects of land redistribution in SNNPR came to the main conclusion that a lack of investment was more due to site-specific differences and namely resource poverty that deterred investment into land rather than redistribution (Holden & Yohannes, 2002). When comparing the effects of redistribution across all four regions, results concluded that a household experiencing a land redistribution directly or indirectly showed a higher propensity to invest in trees. Ones that expected a future redistribution would lead to a decrease in investment in terraces, and lastly, being able to transfer rights leads households to invest in terraces (Deininger & Jin, 2006). Lastly, another study focusing on the SNNPR evaluates short-term versus long-term investments depending on their ability to transfer property rights. It finds that if households have full transfer rights, around 10% more of a household's land would be allocated to long-term investments; thus, more secure property rights would lead to more long-term investment in their land (Ali et al., 2011).

Literature on land tenure and investments/agriculture productivity outside of Ethiopia also conclude with similar findings. Kriuki et al. (2008) find in Kenya that parcels with land titles in addition to other factors such as fertilizers, education status, and group participation play a

role in having a higher efficiency for agricultural production. As in Ethiopia, Ugandan farmers enhance tenure security by growing certain crops such as coffee and only land fallow on their more secure properties. Yet, tenure security had no effect on coffee production (Place & Otsuka, 2010). In Ghana, a lack of tenure security displays a large decrease in land investment and agricultural productivity (Goldstein & Udry, 2008). A comparative paper on land tenure and agricultural productivity in Africa conclude that the general literature has mixed results and that further improvement on research methods can hopefully conclude with external validity (Place, 2009).

My paper will follow the general pattern displayed in the literature above by analyzing tenure security through land redistribution and crop production output. It will also use the same data set as Ali et al. (2011), have a comparison across regions such as in Deininger & Jin (2006), and will focus on the Amhara region as in Benin & Pender (2001). It will discuss the other possibilities that might lead to differences across regions that have nothing to do with redistribution as in Holden & Yohannes (2002). Evaluating the differences between the current literature available and what my paper plans to contribute is that it will introduce two new evaluations to the economic literature on tenure insecurity in Ethiopia. First, it will measure the effects of land redistribution in the Amhara region compared to the other three regions, which have yet to be evaluated. Secondly, one of the drawbacks of the literature is that it does not cover the long-term of effects land redistribution. My paper seeks to look at those long-term effects and draw conclusions over 15 years in Ethiopia, specifically the Amhara region. Where my paper does lack in comparison to the existing literature is that I will not evaluate the effects of land redistribution on investments.

4 Data and Empirical Strategy

As mentioned, the dataset for this thesis comes from the Ethiopian Rural Household Survey (ERHS) gathered by the International Food Policy Research Institute (IFPRI), Oxford University, and Addis Ababa University. The panel data started in 1989 with only 450 households and excluded the Tigray region due to war. By the time of the next round of surveying in 1994, which included the Tigray region, the survey expanded to 1477 households across 15 different villages in the country. The

Figure 2: ERHS Sites (1994-2009)
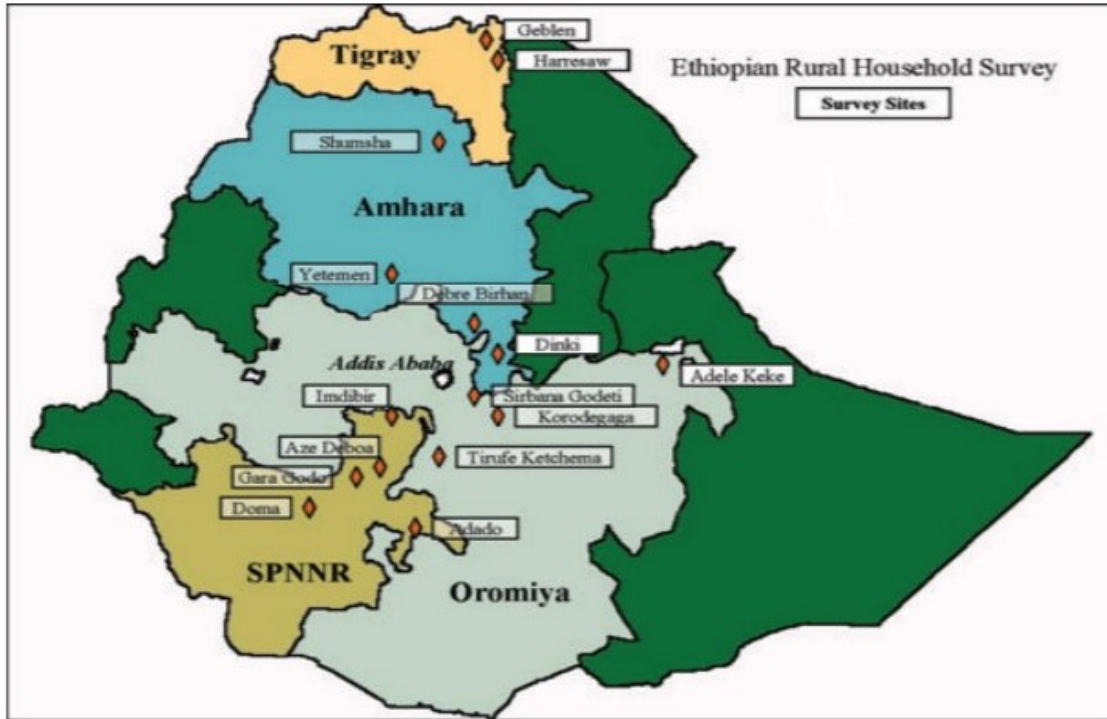
surveying rounds occurred in 1994 (Round 1), 1994-95 (Round 2), 1995 (Round 3), 1997 (Round 4), 1999 (Round 5), 2004 (Round 6, and 2009 (Round 7) (Dercon and Hoddinott, 2011). Gathering conclusive data let alone analysis out of 15 villages in Ethiopia is a challenging task as there is great variety in regions and sub-regions in terms of production. Though this is the case, the data is still a fair representative sample that can be utilized for economic analysis of Ethiopia across 15 years.

Attrition is relatively low for this data set as it is 8 percent from 1994 to 1999, 5.2 percent from 1999 to 2004, and 4.89 percent from 2004 to 2009. This is only about 1.2 percent per year from 1994 to 2009 (Dercon and Hoddinott, 2011; Kumar and Quisumbing, 2013). Kumar and Quisumbing (2013) assert that it is not necessary to correct for attrition in their analysis because apart from the household size and whether the household owns any oxen, attrition between 2004 and 2009 is not statistically significantly correlated with any household characteristics. Due to only some households producing crops or data gaps, our total production output variables have around 8,075

Figure 3: Summary Statistics

VARIABLES	(1) Count	(2) Mean	(3) Standard Deviation
Household Size	8,908	5.84	2.87
Total Consumption	8,858	108.04	96.38
Real Monthly Consumption Per Capita	8,837	19.25	21.51
Food Consumption	8,870	86.66	79.99
Poor Household (0 to 1)	8,837	0.437	0.496
Plot Area of Household (Hectares)	8,377	1.406	1.507
Nominal Livestock Value	8,624	486.98	789.99
Nominal Livestock Value, Lagged	8,644	493.06	802.17
Tropical Livestock Units	8,594	2.646	3.216
Tropical Livestock Units, Lagged	8,627	2.732	3.294
Total Number of Oxen Owned	7,207	0.604	0.981
Household Owns Oxen (0 to 1)	7,207	0.353	0.478

Note*: Consumption and livestock values are in 2020 USD prices.

data points. The production output also varies due to missing data, for example, black teff and chat are not represented in the first four rounds and chat, enset and coffee are not represented in the last round. The data covers a period from 1994-2009, with observations before and after the redistribution in 1997. Due to it being panel data, we can observe the changes over a year variable for our production output. Lastly, each household has a unique household ID that allows us to increase our data points significantly.

Figure 3 depicts the summary statistics of household size, total consumption, real monthly consumption per capita in USD, food consumption per household, whether a household is poor (1) or not (0), the plot area in hectares of a household, nominal livestock value, tropical livestock units, total oxen owned by a household and whether a household has an ox (1) or not (0). Due to data gaps, the number of observations of per characteristic varies.

4.1   Methodology

The methodology that will be utilized is difference-in-difference. The model will use a fixed-effects model and the otheris a simple regression set up as in Card & Krueger (1994) where we measure

the exogenous effect before and after the redistribution. The main regression model that we look at is:

$$Y_{ht} = \alpha + \beta(Amh * Post)_{ht} + \gamma Post_{ht} + Z_h + \delta_t + \epsilon_{ht} \tag{1}$$

where Y_{ht} is the dependent variable which represents the average amount of crop production output (in USD) depending on a certain household (h) and period of time (t). α is the constant/intercept which represents the possible relationship between crop production output and households that are not in the Amhara region and before the land redistribution in Amhara. β is the regression coefficient which represents the difference in means between the households in the Amhara region and after the redistribution versus those that are not. $(Amh * Post)_{ht}$ is a dummy variable that is 0 for households that are not in the Amhara region (control group) and if they are not in the post-period after 1997 and 1 for households in the Amhara region (treatment group) and those after 1997. γ_{ht} is the effect of the 1997 redistribution on all households, regardless of region placement. Z_h is the household fixed effect that controls for numerous differences across households (h) such as household size, land size, livestock, and consumption in the data. δ_t is a year fixed effect dummy variable that takes into account the differences across time (t) but is constant across households for each survey round. ϵ_{ht} is the error term.

Our other regression setup would be without household fixed effects and would only estimate the *Amh* and *Post* variable. This would look at Amhara households before and after the land redistribution in 1997.

$$Y_{ht} = \beta_1 + \beta_2 Amh_{ht} + \beta_3 Post_t + \beta_4(Amh * Post)_{ht} + \delta_t + \epsilon_{ht} \tag{2}$$

where Y_{ht} is the dependent variable which represents the average amount of crop production output (in USD) depending on a certain household (h) and period of time (t) β_1 is the constant/intercept that represents the mean crop production output before the redistribution. β_2 is the regression coefficient which represents the difference in means between the households in the Amhara region versus those that are not. Amh_h is a dummy variable that is 0 for the households

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that are not in the Amhara region (control group) and 1 for households in the Amhara region (treatment group). β_3 is the additional effect on mean crop production output after the redistribution. $Post_t$ is a binary variable that represents 0 if it is before the redistribution and 1 if it is after. β_4 is the additional effect on mean crop production output after the redistribution and if the household is in the Amhara region. ϵ_{ht} is the error term.

The outcome variable will be the amount of crop production output (in USD) across regions. The assumption is that a region that suffered from land redistribution would generate less output as owners would be less incentivized to produce. This is similar to one of the outcome variables measured in Benin & Pender (2001) which looked at average crop yields to measure the effect of redistribution. We have 9 main crop yields to evaluate: such as wheat, white teff, black teff, chat, barley, maize, sorghum, coffee and ensete. Due to the heterogeneity of crop yields in Ethiopia, which varies across regions, we have taken the total production value for each household. Values have been converted to USD and adjusted for inflation in 2020 real prices. Unfortunately, these nine crops are not the only ones produced in Ethiopia, but they are the majority crops produced across the four regions. Our main treatment variable will be whether a household is in the Amhara region and after the land redistribution. The variable is binary and takes the value of 1 if the household is in Amhara and if a household is post-redistribution and 0 if is not an Amhara household or pre-redistribution. This will answer my main hypothesis of whether Amhara households produced less as a result of the 1997 land redistribution.

Looking at our simplified OLS regression, our interpretation of each of the regression coefficients can be specified as such. We are finding the average causal effect of the 1997 Amhara land redistribution on crop production output or the average treatment effect on the treated (ATT). $[Y_{ht}|Amh_h = 0, Post_t = 0] = \beta_1$ is the mean crop production output in the three regions of Tigray, Oromiya, and SNNPR before the land redistribution in 1997. $[Y_{ht}|Amh_h = 0, Post_t = 1] = \beta_1 + \beta_3$ is the mean crop production output in the three regions after the land redistribution. $[Y_{ht}|Amh_h = 1, Post_t = 0] = \beta_1 + \beta_2$ is the mean crop production output in Amhara before the land redistribution. Lastly, $[Y_{ht}|Amh_h = 1, Post_t = 1] = \beta_1 + \beta_2 + \beta_3 + \beta_4$ is the mean crop production output in Amhara after the land redistribution in 1997. What this means is that our difference-in-difference

Figure 4: Total Production (in USD) by Region

Total Output Value (in USD 2020) by Region	(1) Count	(2) Mean	(3) Standard Deviation
Tigray	668	115.05	150.29
Amhara	2,404	474.14	530.90
Oromia	2,395	801.30	4,842.79
Southern Nations, Nationalities and Peoples Region (SNNPR)	2,608	376.94	850.97

estimate is the change in crop production output in Amhara minus the change in crop production output in the three other regions:

$$([Y_{ht}|Amh_h = 1, Post_t = 1] - [Y_{ht}|Amh_h = 1, Post_t = 0]) -$$

$$([Y_{ht}|Amh_h = 0, Post_t = 1] - [Y_{ht}|Amh_h = 0, Post_t = 1]) = \beta_4$$

(3)

Our regression also utilizes robust standard errors to account for differentiation or variance across outcomes for each observation of households.

5 Results & Interpretation

As discussed in the methodology section, we have two main regressions we are running. First, we have the regular OLS with an Amhara household and the Post variable, and the second takes into account fixed effects. Our first regression shows that the first variable of whether a household is situated in the Amhara region is statistically significant at the 1% level. What this implies is that on average, Amhara households have an output of 106 USD less compared to households in Oromiya, Tigray, and SNNPR. Our next variable of Post Redistribution is also statistically significant at the 1% implying that after the 1997 Amhara land redistribution, households across regions produced

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Figure 5: Regression Results

VARIABLES	(1) OLS	(2) Fixed Effects
Amhara Household	-106.13***	
	(15.48)	
Post Redistribution	305.67***	328.46***
	(50.97)	(46.95)
Amh*Post	36.17	11.10
	(72.54)	(77.97)
Constant	397.66***	335.3***
	(19.10)	(46.95)
Observations	8,075	8,075
Mean of Total Production Output	510.08	510.08
	(30.10)	(30.10)
R-squared	0.004	0.004
Year Fixed Effects	Yes	Yes
Household Fixed Effects	No	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

305 USD more in crops compared to before the redistribution. Lastly, our Amhara*Post variable looking specifically at Amhara households after the redistribution is not statistically significant and has a value of 36, suggesting that Amhara households produce an additional 36 USD worth of crops compared to the other three regions. Our next equation with household and year fixed effects details a much larger effect of 328 USD in crop production compared to other regions and is statistically significant at the 1% level. Its interpretation holds the same as the OLS equation. Our main variable of Amh*Post variable has no statistical significance and has an effect of an Amhara household being better of by 11 USD in output. For both regressions, we see that our Amh*Post variable is minimally positive but holds no statistical significance and large standard errors.

In terms of the bigger picture this paper seeks to answer, we can briefly answer how tenure insecurity, as a result of land redistribution, would affect a household's crop output. The repercussions of the 1997 Amhara land redistribution seem to be minimal and contradict the findings by Benin & Pender (2001) that redistribution had positive short-term benefits. Since we are measuring

the long-term effects of the redistribution, this might be a possible reason why the results differ. This partially answers our question that land redistribution or tenure insecurity seems to have a minimal, non-statistical causal effect on crop production output. It does not fall in line with the main assumption that strong property rights play an important role in the incentive of production in households.

In terms of the bigger picture of Ethiopia, the aspect of land redistribution is a policy that has been rightfully not adopted. Since the 1997 Amhara land redistribution, no land redistribution has occurred in Ethiopia. It seems that without measuring the long-term effects of land redistribution in Ethiopia, the government decided that redistribution was not an ideal policy to improve households/peasant's conditions.

6   Robustness Checks

6.1   Land Certification

The first robustness check is due to other policy interventions that occurred in Ethiopia. When measuring household outcomes, especially crop yields, there can be numerous omitted variables. One policy that can be mitigated as a control is the land certification that occurred in multiple rounds in Figure 1. What land certification did was that households would have their households verified and documented by the regional governments. The aspect of this policy was not only for documentation of property or collecting taxes for the government, but also to ensure that households felt they had ownership of their property (Ayalew et al., 2021). Its basis was dealing with the perceived tenure insecurity that households face in Ethiopia. This paper does not look at the effects of the policy but takes into account that it could bias the coefficient estimates. In addition, land certification occurred in all four regions but at different periods. Tigray began certification in 1999, Amhara and Oromiya in 2003 and SNNPR in 2005.

We use the same OLS and fixed effect equations to take into account the stratified land certification process by adding the variable of *Cer*. We also add dummies for the Tigray (Tig) and

Figure 6: Regressions with Certification

VARIABLES	(1) OLS	(2) Fixed Effects
Amhara Household	77.56	
	(54.18)	
Post Redistribution	310.73	321.84
	(216.40)	(223.47)
Amh*Post	-11.90	-17.25
	(90.86)	(98.44)
Certification	3.85	21.15
	(188.92)	(197.85)
Constant	200.18***	335.09***
	(57.40)	(37.13)
Observations	6,533	6,533
Mean of Total Production Output	510.08	510.08
	(30.10)	(30.10)
R-squared	0.004	0.004
Year Fixed Effects	Yes	Yes
Household Fixed Effects	No	Yes
Regional Dummies	Yes	No

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Oromiya (Oro) region to control for geographical differences. Our interpretation of this variable would evaluate Amhara households after the redistribution and the effect of certification versus households that have received certification.

$$Y_{ht} = \alpha + \beta(Amh * Post)_{ht} + \gamma Post_{ht} + \phi Cer_{ht} + \psi Tig_{ht} + \eta Oro_{ht} + Z_h + \delta_t + \epsilon_{ht} \qquad (4)$$

$$Y_{ht} = \beta_1 + \beta_2 Amh_{ht} + \beta_3 Post_t + \phi Cer_{ht} + \beta_4(Amh * Post)_{ht} + \delta_t + \epsilon_{ht} \qquad (5)$$

Looking at our first regression including land certification and regional dummies, we see that our Amhara variable becomes positive and is no longer statistically significant. Suggesting that Amhara households produce more output compared to non-Amhara households by 77 USD. Our post variables both are still around the 300 USD mark but are no longer statistically significant.

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The interaction term of Amhara*Post changes to having a negative effect and our land certification variables are positive but not statistically significant. This robustness check displays that our original regression is suffering from possible omitted variable bias. If this were not the case, then our interaction term of Amhara*Post should not be changing signs from positive to negative. In addition, our Post variable loses statistical significance.

6.2 Parallel Trends & Other Factors

The principal tenet of using the difference-in-difference model is to establish parallel trends. We assume that a certain policy or exogenous effect changes the outcome of one area compared to others and that without the effect, the trends of the treatment and control group would have remained the same. In the context of this paper, the parallel trends assumption would be that without the Amhara land redistribution of 1997, crop output would have the same trends across all four regions and that the only effect is from the redistribution. What is interesting is that when looking at the trends of crop output in Ethiopian households over our seven data points, we find that trends start to differ after 1995 rather than the 1997 Amhara redistribution. One possible explanation for this differentiation might be the regime change in Ethiopia at this time. In 1995, the Ethiopian People's Revolutionary Democratic Front (EPRDF) was officially appointed into parliament alongside a new form of government, economic and political policy. We can see in the figure that after 1995, output for Amhara households decreases slightly whereas non-Amhara households continue to increase substantially. What is interesting also is that after the Amhara redistribution, there is again an opposite change for Amhara and non-Amhara households where crop output decreases for non-Amhara and increases for Amhara households.

This brings into question the results and the evaluation this paper seeks to answer. Within the context of Ethiopia, evaluating certain effects in the nation are very difficult at times. In addition to a complete regime change in 1995 and a land redistribution in Amhara in 1997, there was a civil war the following year concentrated in the northern front of the region of Tigray and Eritrea. Ethiopia, historically and specifically from 1974 onward has witnessed massive social, political, and

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Figure 7: Total Output Value of Ethiopian Households
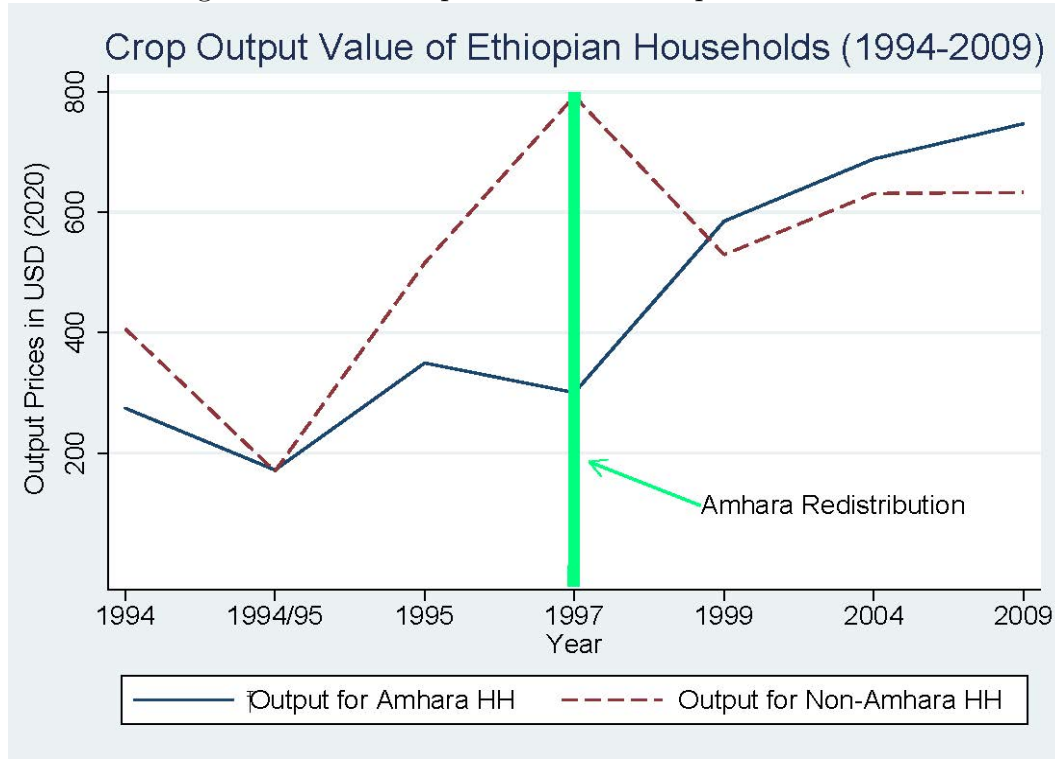
economic changes that have occurred within a few years of each other or even in the same year. This being stated, there are a lot of factors that can be contributed to changes to crop output in a country that is predominately agrarian. In this data set alone, there are other crops that households produce but no data regarding production output. In addition, missing data points for crop production output and also crop conversion rates into monetary value cannot be taken into account. Both of these factors can influence or bias our estimates positively or negatively. This makes the ability to evaluate certain policies with a limited dataset even more challenging and confounding at times. This paper has tried to push forward the effects of the Amhara land redistribution, but the overall results should be further verified and tested.

Though land redistribution had been a dominant policy from 1974 until the late 1990s, it has been effectively removed from the discussion of land policy in Ethiopia. There have been numerous agricultural policies legislated, yet the effects are still not as profound as necessary. Another grave factor in Ethiopian development is the constant change in economic, political, and social policy.

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Conflict and war are endemic to the country and make it difficult to have solidified positive change as we have seen with a regime change, land redistribution, and civil war all spanning from 1995-2000. Currently, there is still an ongoing conflict in northern Ethiopia. It will be interesting to see what further policies are attributed to land tenure and economic growth in a country that still has 70% of its workforce based in agriculture

7 Caveats

Having statistical significance is not the most important goal in economic research, but it is important to explore why a variable is statistically significant or not. As the earlier section discussed, our main variable of interest of Amh*Post is not statistically significant and even changes signs with our robustness check of certification. We also witness the variables of Amhara and Post are statistically significant in the first regression set but in our robustness check, they are not statistically significant. We will explore two possible explanations as to why the results are such.

7.1 Politicized Land Reform

As mentioned in the Background section, the 1997 Amhara land redistribution was not a properly well thought out or well-executed economic policy. It was rather a politicized land reform that sought to punish members of the past regime of *Derg*. The goal of the redistribution seemed to be one that could create a new group of *cadres* for the EPRDF government and destroy the old (*Derg*) followers. Ege (1997) importantly states that:

> The current redistribution must be seen in a political context. It is not easy to see
> any economic motive for the reform, and not even concern with inequality can explain
> the design of the reform. The apparent motive, the only that can explain the facts
> presented in this report, seems to be a political project of establishing a class basis for
> the current regime, and to enter a new period in Ethiopian history (142).

The implications of such a politicized land reform create issues when evaluating the effects

of the reform. Ideally, any economic policy regarding land redistribution or tenure should be to solve land shortages, soil depletion, or other problems. Yet, when its main goal is to create a new political following, this alters the incentives and complicates such policies. Measuring the economic or coefficient estimates of such reforms as such can result in not being able to make certain inferences. This type of policy is not just relevant to Ethiopia, but to other nations as well. A recent paper detailing land reforms in India from 1957 to 1992 discusses how certain land policies were timed before elections to benefit the ruling party and garner more support (Philips, 2020). We can draw the same conclusions as in India for Ethiopia that this land reform was more so political than economic.

7.2   Time Frame and Other Reforms

Another caveat about our coefficients is a lack of precise estimation. We can see that our main variable of Amh*Post is a noisy estimate that has quite large standard errors. These noisy estimates make it difficult to draw any conclusions regarding our results. Possible reasons for such estimates could be the following. First, the Ethiopian Rural Household Survey (ERHS) has gaps in data not only on the household level, but also in terms of when the surveys were conducted. As mentioned earlier, data was obtained in 1994 (Round 1), 1994-95 (Round 2), 1995 (Round 3), 1997 (Round 4), 1999 (Round 5), 2004 (Round 6), and 2009 (Round 7). The first five rounds of data are within five years while the next two rounds are over 10 years. The issue with this type of panel data is that estimating effects after the land redistribution is difficult. We have a lack of general data that cannot even take into account or estimate the effects anywhere from 3 to 7 years after the redistribution. This brings into the discussion the issue of the data time frame. Not only are we missing critical years of evaluating the redistribution, but also the time period might be too short.

Furthermore, there were other agriculturally heavy-based programs in Ethiopia during this period. From 1994-2005, there was the Agricultural Development-Led Industrialization (ADIL) program that sought to transform peasant agriculture and improve rural industrialization. This was also supplemented by the Productive Safety Net Program which sought to protect many people

from shocks and risks. Ultimately, both programs fell short and were replaced in 2005 by the Plan for Accelerated and Sustained Development to End Poverty (PASDEP) which promoted a move away from subsistence agricultural and towards industrialization and value addition in agricultural products (Cheru et. al, 2019). These other major reforms in Ethiopia further convolute estimating the effect of one land reform when other major reforms are occurring at the same time.

8 Conclusion

Development in low-income countries is a challenging task that has a long road ahead of itself. One of the main claims in economic growth is that strong tenure security theoretically should result in the further advancement in a nation's economy. We have looked at the Amhara land redistribution of 1997 which tested this question in an important concept of development. We have found non-conclusive results of the effects of the Amhara redistribution with non-statistical coefficients and small changes to output values in Amhara households. Though cautious in concluding, we can imply that the redistribution had a minimal effect on overall crop production compared to the other three regions of Oromiya, Tigray, and the Southern Nations, Nationalities and Peoples' Region (SNNPR). When controlling for another key factor of stratified land certification, our coefficient switches signs indicating possible omitted variable bias with our original equation. There are other confounding factors in measuring the effects of the land redistribution in Ethiopia such as they might be politically biased, that there are other reforms such as ADIL and PASDEP occurring at the same time, and data issues. Taking these factors into account, we take our estimates and conclusions on the redistribution with a grain of salt.

Though land redistribution had been a dominant policy from 1974 until the late 1990s, it has been effectively removed from the discussion of land policy in Ethiopia. There have been numerous agricultural policies legislated, yet the effects are still not as profound as necessary. Another grave factor in Ethiopian development is the constant change in economic, political, and social policy. Conflict and war are endemic to the country and make it difficult to have solidified positive change in a still agriculturally dominated nation.

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