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The Effect of Hyperinflation on Asset Inequality in Zimbabwe

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Abstract

The objective of this study is to assess the shifts in asset inequality during the hyperinflation period in Zimbabwe. The analysis is a comparison of two economic eras, the pre-hyperinflation and hyperinflation periods. Evidence from various international studies shows a positive correlation between hyperinflation and household income inequality. It is therefore of particular pertinence to empirically assess this relationship in the Zimbabwean context, where inflation reached 231 million percent in 2008.

In the analysis, asset access variables from the Zimbabwe Demographic and Health Survey are used to construct an asset index for households. Using the Uncentered Principal Component Analysis method of Banerjee A. (2010), the asset index is created and it is used as a proxy for household wealth. To assess the changes in asset inequality over the years, various measures are applied and compared between the two periods. Results from the Gini Coefficient, Coefficient of Variation, General Entropy Indices and the Palma Index show a decrease in asset inequality on a national level. Upon disaggregation, it is evident that the decrease in asset inequality is mainly among rural households. Otherwise, their urban counterparts experience an increase in asset inequality during the hyperinflationary period.

Keywords: Inequality, inflation, asset index, Zimbabwe

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Introduction

It is vital to know the nature of the wealth distribution in Zimbabwe country over the hyperinflationary period. Using the Sen's capability approach, this paper will meet the third objective of this thesis; that of measuring the effect of hyperinflation on inequality. A persistent theme in Zimbabwe's economic history is inequality in income and thus standard of living. Using per capita income as a measure of living standard, ZIMSTAT (2003)[2], compute a Gini Coefficient of 0.64, which signified an increase in inequality since 1995 when the Gini coefficient was 0.59. These Gini coefficient values reflect very high levels of inequality in the country. There are many probable explanations for this wide income gap, the most apparent being spatial differences. It is evident that there exists a gap between the urbanized elite and the majority of the nation's citizens in the rural areas who live from hand to mouth. This is attributable to the inherited enclave[3] structure of the Zimbabwean economy with its highly centralized business activity. There is minimal economic activity outside the two central business districts of Harare and Bulawayo, yet these cities house only 20 percent of the population. It therefore makes sense that these few people involved in productive (non-agricultural) labour have access to more resources than the majority, hence inequality. Gender also contributes to the income gap as the majority of the urban households are headed by males. Malaba (2006), shows that historically, poverty has been more prevalent among female headed and rural households.

Regardless of the reason, inequality exists in Zimbabwe and this third paper will investigate the incidence and sources, from a multidimensional perspective. Of these three papers, this is the most significant contribution as there is no study similar to this one, done for Zimbabwe. The closest was the Gender Inequality Index (GII) by the United Nations Development Program (2013) in their Human Development Report. The dimensions of the GII are reproductive health, economic activity and empowerment. The Oxford Poverty and Human Development Initiative (2015) constructs the multidimensional poverty index and then measures inequality of the index using the positive multiple of variance method, adopted from Seth, S. and Alkire, S. (2014). Both studies are cross-sectional. From its national household surveys, ZimSTAT runs poverty profiles but the inequality sections tend to be skeletal as they only construct the one-dimensional Gini Coefficient. On an international level, studies have been done to relate income inequality with inflation but this paper adds the multidimensional aspect.

Multiple measures of inequality will be used for the analysis. However, they will be based on the asset wealth index, instead of income. As a result, the multidimensional Gini Coefficient, Coefficient of Variation, and Theil Indices will be used to analyze the effect of inflation on inequality in Zimbabwe, from 1994 to 2010.

[2]ZimSTAT, (2003). "Poverty Assessment Study Survey 2003 Main Report"

[3]According to Kanyenze, G., Kondo, T., Chitambara, P., and Martens, J. (2011) in their book, "Beyond the Enclave", the enclave/dual economy consists of two sectors. The formal sector is the one where capitalist production occurs and involves less than 20 percent of the nation's labour. Coexisting with the formal, is the informal sector which is based on pre-capitalist activities like subsistence farming and engages the rest of the labour force participants in unproductive labour

Literature Review

The relationship between inequality and inflation has been explored by many, with the majority concluding that inflation is regressive to inequality. As aforementioned in the previous chapter, inflation is deemed to be a negative tax with much of the burden being borne by the individuals at the bottom of the income distribution. It therefore results in a wider income gap. For instance, Blinder and Esaki (1978) regress the income share of individuals on to macroeconomic variables like unemployment and inflation. Interestingly, they find that the middle class are unaffected by inflation. However, the income share of the highest quintile increases by the amount that the share of the lowest quintile decreases. This is evidence of a widening income gap.

For the Philippines, Blejer and Guerrero (1990) analyze income shares in relation to inflation and find that there exists a negative relationship between inflation and the share of income for the bottom four quintiles and a positive relationship with the top quintile. The largest negative effect was on the second quintile. Similar results are found by Cutler and Katz (1991) in their paper entitled "Macroeconomic Performance and the Disadvantaged". Only the top quintile has a positive relationship with inflation, making it obvious that inflation affects the poor more than the rich. This observation is further confirmed by Adelman and Fuwa (1992), who find a significantly positive relationship between inflation and inequality in their cross-sectional analysis of 41 countries.

Upon finding similar results in their study of Brazil, Cardoso et al. (1995) explain that inflation increases inequality in four ways. First, perfect indexation is rarely a reality but there is more perfect indexation for the rich since part of their income comes from indexed financial assets. Second, the inflation tax reduces disposable income, which wipes out the savings of the middle class and pushes them below the poverty line. The result is a wider income gap and higher poverty rates. Third, inflation disadvantages all income earners as it causes oscillations in income, making consumption smoothing difficult. This is more serious for vulnerable households that do not have safety nets. The Brazilian data shows that variations in inflation and unemployment explain 30% or more of all variation in inequality. The authors conclude that recessions worsen income distribution because of the effect on unemployment as the unskilled workers are the first to lose their jobs.

Bulir and Gulde (1995) execute cross-section and time-series tests. In the former, the authors apply an extension of the Kuznets model and find that the pure inflation rate as well as inflation variability have a strong positive effect on the Gini Coefficient. In the time series analysis, the authors apply the Blinder and Esaki model, which is a slight modification of the Schultz model. They find no overall predictable pattern but it was evident that inflation is a regressive tax in lower income countries that have unsophisticated financial markets. To add to these findings, Bulir (2001) studies a panel of 75 countries over 22 years and applies the Kuznets model. Results show that inflation increases income inequality, with the strongest effect being in hyperinflationary countries. Hyperinflation increases the Gini Coefficient by 8 points. However, the impact of inflation has a kink, with rates below 8 percent, having no effect on inequality.

Using multiple measures of inequality, Fereirra and Litchfield (2001) conduct a descriptive analysis of the relationship between inflation and inequality in Brazil. The authors find that the Coefficient of Variation, Gini Coefficient and the Theil Indices all increase over the inflationary years of 1981 to 1994. Inequality drops when the stabilization policy – Plano Real – is implemented in 1994. Graphs and correlation coefficients show that inequality and inflation move together. Location is also a determinant

as the decomposition of static inequality reveals that the urban population is three times richer than the rural population. Not only is there inequality between the locations but within the poor areas, inequality levels are high.

As if to summarize the literature on this topic, Bittencourt (2009) uses data from Brazil and establishes that extreme inflation, combined with incomplete indexation and imperfect financial adaptation, has a significantly regressive impact on inequality. Inequality levels escalated in the hyperinflationary years and the share of earnings for the top 20 percent of the distribution increases with inflation while the opposite is true for the bottom 20 percent. The top quintile was the only one which was positively correlated with inflation. The rest of the correlation matrix reveals positive relationships between inflation and the Coefficient of Variation and the Gini Coefficient. The Fixed Effects and Random Coefficients – Generalized Least Squares regression methods are used for a dynamic analysis of the relationship and Bittencourt finds that lagged inequality, inflation and past inflation are positive and significantly related to inequality. Further proving the fact that inflation increases inequality but that inequality is also persistent by nature.

Based on this body of literature, it is evident that inflation exacerbates inequality and this study investigates if a similar outcome holds in Zimbabwe where inflation became hyper from 1999 until it reached a peak of 231 million percent in July 2008.

Methodology

Following Wittenburg and Leibbrandt (2014), the UCPC wealth index is applied to the Gini coefficient formula. The structural model for the Gini is:

$$G'(W) = \left[1 - \Sigma_{i=1}^{n}\left(\frac{2\tau_i - 1}{n^2}\right)\right] w_i \quad (1)$$

$G'$is the multidimensional Gini index which is based on Wi,for i=1….N households. Wi is the wealth indicator constructed by taking a weighted average of household assets and characteristics. This is the general Kolm (1977) inequality index formula which measures the distance between the mean welfare level and the equally-distributed-equivalent-welfare. Significantly different here is the fact that the weights are non-negative, due to the use of the first Eigen vector which is positive. As a result, Wi distribution is in the realm of non-negative real numbers. If this distribution of wealth indicators Wi is equal, then, $G'(W) = 0$.

Dividing the assets by their mean makes the Gini *scale independent* (the axiom of ratio scale invariance), which is a necessary condition so that the inequality level is not altered by population size. The second axiom that is satisfied by this inequality measure is that of *mean independence*, such that doubling the asset ownership across the distribution does not affect rank. Third is *symmetry* which implies that the inequality measure is neither altered by other attributes of the household, nor other households in the sample. In other words, if two households were to swap identical assets, there will be no change in the measure of inequality. Fourth is the axiom of *statistical testability*. This is the quality which enables assessment of changes in the inequality index over time. Fifth is the *continuity axiom* where the inequality index is continuous because it is a direct mapping of a continuous asset / wealth index onto the non-negative orthant. Next is the, 'weak uniform Pigou-Dalton Majorization', an extension of the *Pigou-Dalton Transfer Sensitivity* axiom which postulates that a transfer of wealth from the rich to the poor should decrease inequality (and vice versa). The index also satisfies the '*weighted attributes under unidirectional comonotonicity*' as well as the *correlation increasing majorization* axioms. Finally, the basic axioms postulated by Weymark (1981) of *monotony* and *ordering* are hereby ensured as well.

The other inequality measure applied are the Theil or General Entropy Indices (GE). These indices meet the aforementioned axioms. The general formula is given by:

$$GE(\alpha) = \frac{1}{\alpha(\alpha-1)}\left[\frac{1}{N}\sum_{i=1}^{N}\left(\frac{y_i}{\bar{y}}\right)^{\alpha} - 1\right] \quad (2)$$

Where $\bar{y}$ is the mean asset index (income, normally).

The values of GE measures vary between 0 and infinity. Zero represents an equal distribution, while higher values represent higher levels of inequality. The parameter $\alpha \in [0,1]$ is the weight given to distances between wealth levels of households in the wealth distribution. GE(1) is Theil's T index with the following formula:

$$GE(1) = \frac{1}{N}\sum_{i=1}^{N}\left(\frac{y_i}{\bar{y}}\right)\ln\left(\frac{y_i}{\bar{y}}\right) \quad (3)$$

On the other hand, GE(0) is Theil's L index with the following formula:

$$GE(0) = \frac{1}{N}\sum_{i=1}^{N} ln\left(\frac{\bar{y}}{y_i}\right) \quad (4)$$

These will be used on a national level then decomposed by locality and province. In these categories, inequality within and between will also be determined.

The third inequality measure applied to the asset index is the Coefficient of Variation (CV) which is a ratio of the standard deviation to the mean. In a single variable scenario such as this one, the CV describes the dispersion of the asset index variable without depending on its measuring unit. Higher CV values imply greater dispersion in the distribution of wealth.

Finally, the most recent measure of inequality herein applied is the Palma Index. This is the ratio of the income share of the top 10 percent to that of the bottom forty percent. The direct implication is that the index does not capture the full distribution of the wealth index, making it more a measure of income concentration. In this particular context, income is replaced by the asset index. So, the Palma Index is a measure of asset wealth concentration in this context. According to Palma (2014b), empirical evidence shows that changes in inequality are mainly determined by the richest 10 percent and the poorest 40 percent. The middle population represent 50 percent of the Gross National Income in any country. Cobham, et. al (2015) explain that the divergence in the shares of the top 10 and bottom 40 percent is due to the centrifugal force. Then, it is the centripetal force which leads to the convergence in the income share appropriated by the middle 50 percent. There is relative stability in the middle 50 percent. An advantage of the Palma Index is that it addresses the fact that the Gini is over sensitive to the middle while it tis in insensitive to the top and bottom of the distribution. In addition, it is less technical than the Gini and thus easy to interpret for the policy makers.

These various formulas are used to measure asset inequality for Zimbabwean households and thus show the changes that occurred in the hyperinflationary season. In all cases, the analysis is conducted at a national level and then disaggregated by province and household type, in terms of whether it is located in a rural or urban setting.

Asset Inequality Changes During Hyperinflation

In this section, the asset inequality results are explained. As seen in table 1 and figure 1, asset inequality rates are very high in Zimbabwe, with Gini Coefficient (Gini henceforth) values above 0.8 in most cases. This is true before and during hyperinflation. On a national level, during hyperinflation, the Gini declined by 2.68 percent during the hyperinflationary period. This implies a decrease in asset inequality over that time. The same is true for the general entropy indices and the Palma Index. This makes sense because of the redistributive nature of hyperinflation. In monetary policy, hyperinflation is used as a redistributive tool because it leads to a natural transfer of money from savers to the borrowers. In the extreme Zimbabwean situation, lenders were heavily penalized. For example, those who had 10-year mortgages were able to clear them within a year. It is the unanticipated change in prices that results in wealth redistribution.

The urban asset inequality story was similar to what occurred on a national level, as there was a decrease as well. A study of the changes in asset ownership reveals the source for this shift in inequality. Summary statistics of asset and access variables show a decrease in quality in the various asset categories. In terms of the so called 'white goods', there was an 11 percent decrease in the ownership of radios. On the other hand, ownership of televisions increased by 58 percent, which is only a third of the increase that occurred in rural households. Then, there was a 6 percent increase in the ownership of refrigerators and only one percent for vehicles. Apart from the increase in televisions, these shifts were not significant.

Much of the decrease in urban asset inequality is attributable to the decrease in access to public goods. The breakdown of infrastructure had a negative effect on the asset holdings of urban households. A preliminary study shows that there was a 51 and 36 percent decrease in the households that had carpet and wooden floors respectively. In the Zimbabwean society, these flooring materials are used in more affluent homes. The decrease thus implies a decline in living standards for the elite in the urban areas. In addition, water purification plants became inefficient and municipality maintenance routines became irregular during the hyperinflation period. As a result, the usage of piped water in homes decreased by 9 percent. Also, 77 percent fewer urban households used community taps. This led to the digging of boreholes by many households in order to prevent the consumption of contaminated water. Conjoint with the water problem was the sanitation problem which even led to the cholera outbreak of 2008 (WHO, 2008). The summary statistics show that there was a 4 percent decrease in the usage of flush toilets in urban households. On the contrary, inferior toilet facilities became more common. In particular, the usage of Blair toilets increased by 83 percent and there was a 425 percent increase in the households that reported to have no toilets. So, not only did the decline in access to public services decrease the asset wealth gap among the urban households, but the alternative options like boreholes also became equalizers as they were acquired by households across the wealth distribution. The asset changes analysis shows that there was a 1040 percent increase in the ownership of boreholes. This implicates all households, those who were previously accessing municipal water along with the ones who could not afford. As a result, asset inequality decreased among urban households.

Both table 1 and figure 2 show that the story was different in the rural areas where asset inequality increased. This is justifiable given the type of assets that increased in quantity in the rural areas. Generally, the electric appliances are the ones that increased in quantity in rural households. For

example, the ownership of televisions increased by 152 percent, fridges increased by 70 percent and electricity itself increased by 82 percent. The increase in electricity was due to the government's rural electrification program which made electricity accessible to households in rural areas. However, usage was dependent on affordability. A fee was paid for a household to connect electricity to their homestead. As a result, not all rural households used electricity and the related appliances. Therefore, the availability of electricity made asset inequality more pronounced in Zimbabwe's rural areas. An increase in rural asset inequality, is evident in figure 2 and the same is true for predominantly rural provinces[4] as well.

Table 1: Asset inequality shifts, 1994 - 2010

	National	**Pre-Hyperinflation 1994 – 1999**	**Hyperinflation 2005 – 2010**	**Percentage Change (%)**
Gini	0.90	0.93	0.90	-2.68
GE(0)	2.27	2.85	2.27	-20.35
GE(1)	2.66	3.21	3.05	-4.93
CV	620.44	841.17	739.84	-12.05
Palma Index	0.23	0.24	0.23	-6.63
	Rural			
Gini	0.88	0.89	0.90	0.98
GE(0)	1.84	2.05	2.05	0.38
GE(1)	3.28	3.67	3.72	1.48
CV	1123.73	1679.25	1198.01	-28.66
Palma Index	0.22	0.23	0.24	6.81
	Urban			
Gini	0.82	0.87	0.84	-3.42
GE(0)	1.50	1.84	1.61	-12.47
GE(1)	1.94	2.42	2.36	-2.72
CV	386.39	492.07	491.12	-0.19
Palma Index	0.23	0.25	0.22	-9.88
	Male			
Gini	0.89	0.92	0.90	-1.51
GE(0)	2.19	2.64	2.25	-14.76
GE(1)	2.59	3.07	2.99	-2.46
CV	593.02	793.45	700.50	-11.71
Palma Index	0.23	0.24	0.23	-6.17
	Female			
Gini	0.91	0.95	0.90	-5.09
GE(0)	2.38	3.26	2.25	-30.94
GE(1)	2.78	3.54	3.11	-12.00
CoVar	670.96	960.20	807.04	-15.95
Palma Index	0.23	0.25	0.23	-8.47

[4] See Table A2 and Figure 5 in appendix.

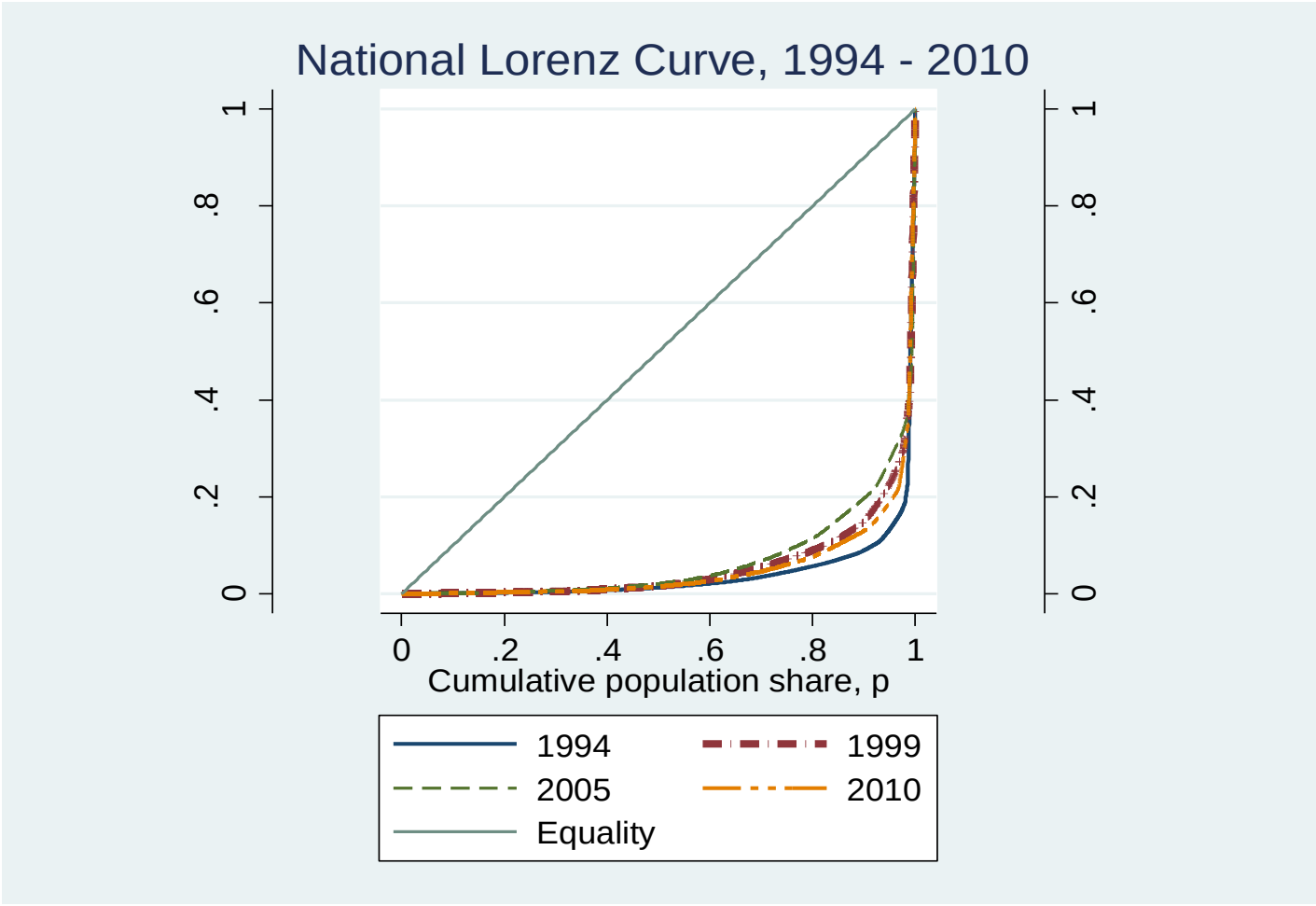

Figure 1: National Lorenz Curve

Source: Own calculations, Zimbabwe Demographic and Health Surveys, 1994 - 2010

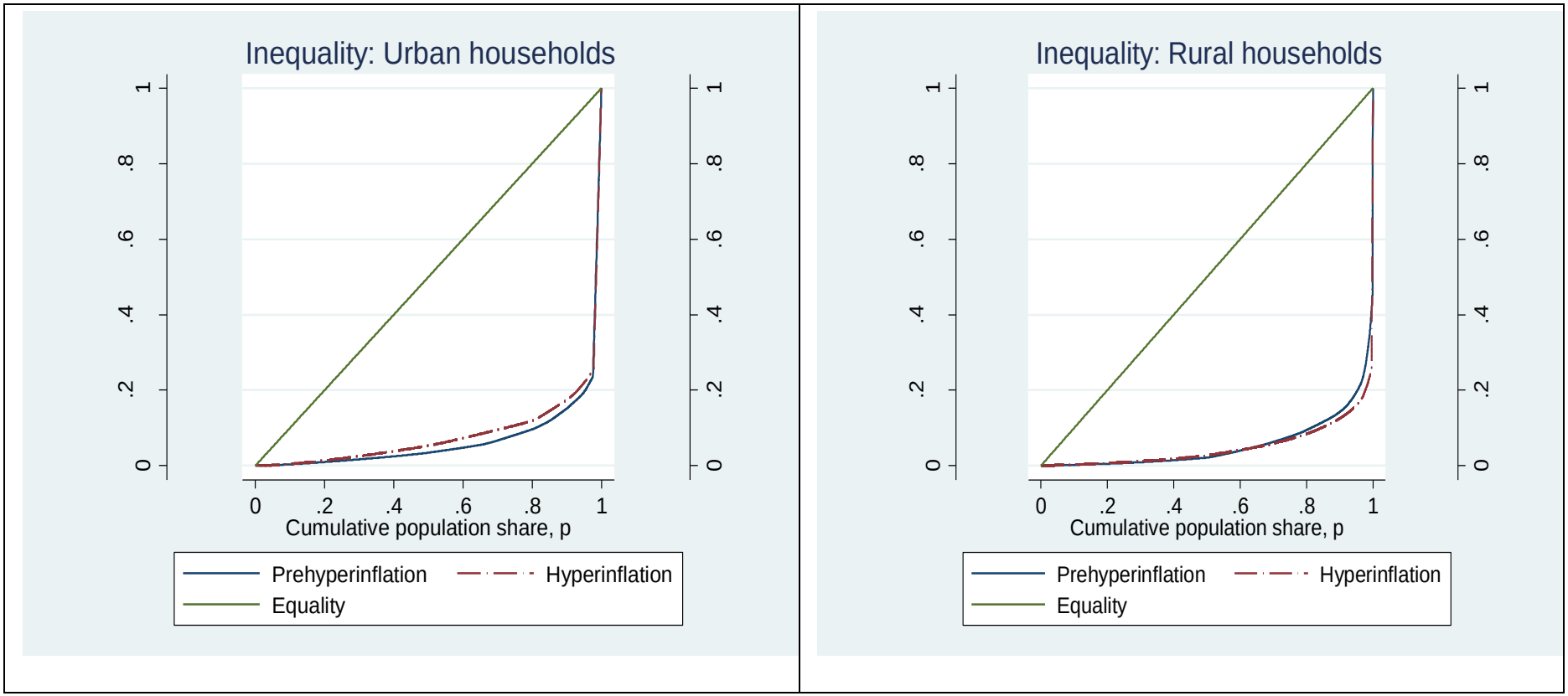

Figure 2: Intertemporal Lorenz Curves, by location

Source: Own calculations, Zimbabwe Demographic and Health Surveys, 1994 - 2010

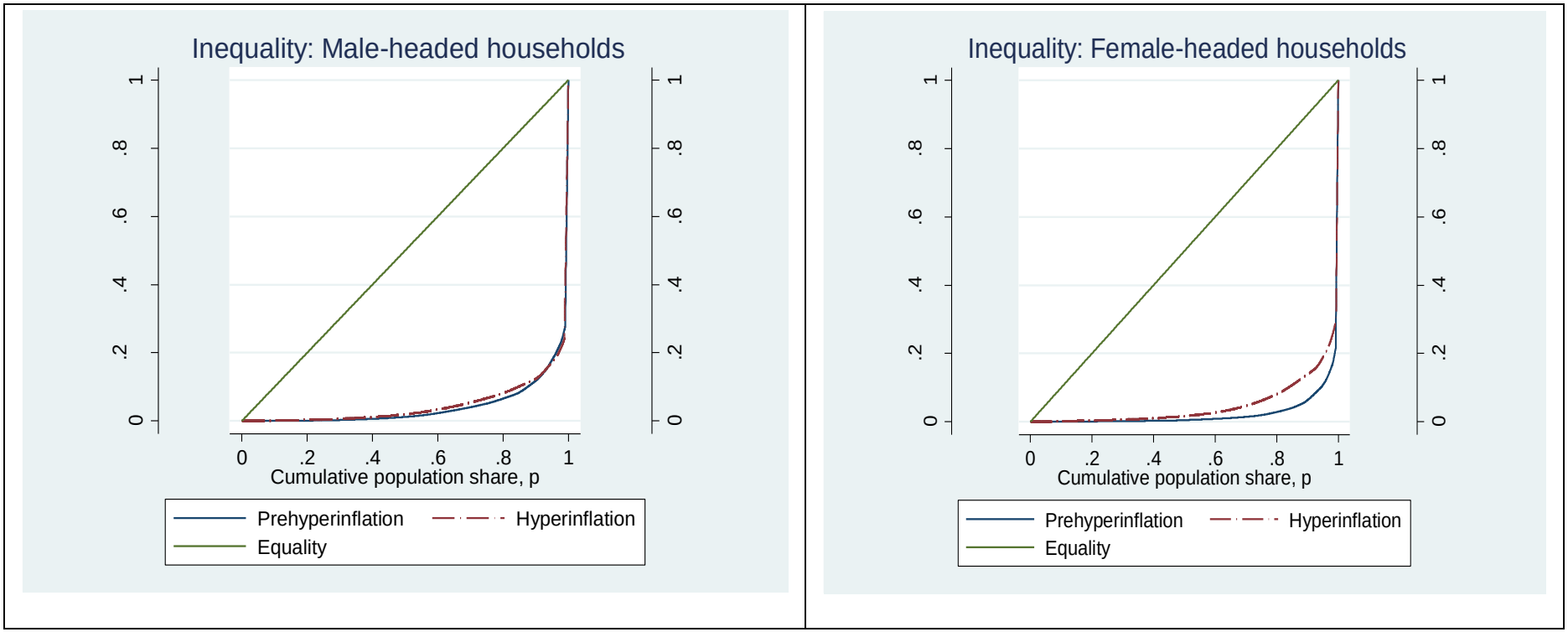

Figure 3: National Lorenz Curve

Source: Own calculations, Zimbabwe Demographic and Health Surveys, 1994 – 2010

Figure 2 shows higher levels of asset inequality among rural households that in the urban setting. The Gini coefficient for rural households was 0.88 and that for urban households was 0.82. Further analysis in table 2 shows that the difference in asset inequality between rural and urban households is mainly attributable to asset inequality within the groups. In particular, asset inequality between the two groups only accounts for 21.9 percent of total asset inequality. The rest is due to asset inequality within the groups. Figure 3 shows that the overall decrease in asset inequality households was a general phenomenon, regardless of whether the household head was male or female. Table 2 confirms that there was not much asset inequality between the gender groups, as 99 percent was within the groups. The same is true on a provincial level as well. Asset inequality is mainly attributable to the within group component.

Table 2: Inequality within and between sub-groups, 1994 – 2010

Urban/Rural	
Within-Group component	0.7271
	78.02%
Between-Group component	0.2048
	21.98%
Total Inequality (Theil T)	0.9319
	100%
Male/Female	
Within-Group component	0.9242
	99.17%
Between-Group component	0.0077
	0.83%
Total Inequality (Theil T)	0.9319
	100%
Provincial	
Within-Group component	0.7361
	78.98%
Between-Group component	0.1959
	21.02%
Total Inequality (Theil T)	0.9320
	100%

Source: Own calculations, Zimbabwe Demographic and Health Surveys, 1994 – 2010

Note: Theil T is now transformed by dividing the values by ln(N). The sample size for the pooled dataset, used to compute the inequality statistics, is 31,394 households.

Conclusion

This study is an assessment of changes that occurred in asset inequality during the hyperinflation period in Zimbabwe. Results from the Gini Coefficient, Coefficient of Variation, General Entropy Indices and the Palma Index show a decrease in asset inequality on a national level. Upon disaggregation, it is evident that the decrease in asset inequality is mainly among rural households. Otherwise, their urban counterparts experience an increase in asset inequality during the hyperinflationary period. In addition, the changes are mainly attributable to within group inequality.

Appendix

Table A1: **Asset Inequality: UCPC Index, Zimbabwe 1994 – 2010**

	Mean Wealth	Wealth Share	Gini Coefficient	Theil T GE(0)	Theil L GE(1)
NATIONAL					
Overall	1.61	1.00	0.89	2.27	2.66
1994	1.68	1.00	0.92	2.58	2.99
1999	1.47	1.00	0.89	2.22	2.55
2005	1.32	1.00	0.87	2.01	2.48
2010	1.93	1.00	0.90	2.32	2.61
RURAL					
Overall	0.48	0.18	0.88	1.84	3.28
1994	0.27	0.10	0.81	1.40	2.84
1999	0.32	0.11	0.83	1.52	2.91
2005	0.28	0.14	0.80	1.33	2.38
2010	0.91	0.29	0.92	2.28	3.42
URBAN					
Overall	4.19	0.82	0.82	1.50	1.94
1994	5.41	0.90	0.86	1.93	2.19
1999	4.14	0.89	0.81	1.41	1.86
2005	3.38	0.86	0.77	1.21	1.82
2010	4.30	0.71	0.82	1.54	1.88
MALE					
Overall	1.96	0.69	0.89	2.19	2.59
1994	2.18	0.76	0.91	2.45	2.85
1999	1.86	0.70	0.87	2.07	2.42
2005	1.50	0.70	0.85	1.89	2.35
2010	2.37	0.64	0.90	2.36	2.64
FEMALE					
Overall	1.43	0.31	0.91	2.38	2.78
1994	1.39	0.24	0.94	2.79	3.40
1999	1.59	0.30	0.92	2.52	2.83
2005	1.08	0.30	0.89	2.17	2.73
2010	1.66	0.36	0.89	2.25	2.52

Table A2: Asset Inequality, by province: UCPC Index, Zimbabwe 1994 – 2010

	Mean Wealth	Wealth Share	Gini Coefficient	Theil T GE(0)	Theil L GE(1)
MANICALAND					
Overall	0.87	0.07	0.90	2.10	3.06
1994	0.43	0.03	0.87	1.80	3.15
1999	0.42	0.04	0.84	1.62	2.71
2005	1.17	0.11	0.90	2.22	2.96
2010	1.22	0.09	0.90	2.15	2.96
MASHONALAND CENTRAL					
Overall	1.28	0.07	0.92	2.41	3.27
1994	0.21	0.01	0.63	0.77	0.98
1999	0.29	0.01	0.69	1.00	0.94
2005	0.34	0.03	0.77	1.23	1.92
2010	3.47	0.15	0.94	3.11	2.87
MASHONALAND EAST					
Overall	0.67	0.04	0.87	1.84	2.65
1994	0.24	0.01	0.75	1.16	1.45
1999	0.48	0.03	0.84	1.67	2.47
2005	0.84	0.06	0.87	1.90	2.69
2010	0.87	0.42	0.88	1.98	2.68
MASHONALAND WEST					
Overall	0.72	0.04	0.81	1.56	2.29
1994	0.68	0.04	0.85	1.71	2.67
1999	0.75	0.04	0.85	1.77	2.79
2005	0.72	0.05	0.78	1.45	2.00
2010	0.73	0.04	0.79	1.43	2.00
MATEBELELAND NORTH					
Overall	0.55	0.02	0.88	1.94	2.72
1994	0.17	0.01	0.71	1.00	1.11
1999	1.06	0.03	0.91	2.33	3.14
2005	0.59	0.03	0.89	2.12	2.56
2010	0.44	0.01	0.82	1.60	2.24
MATEBELELAND SOUTH					
Overall	0.55	0.02	0.85	1.94	2.72
1994	0.51	0.01	0.89	1.96	3.64
1999	0.26	0.01	0.70	1.01	1.02
2005	0.63	0.02	0.83	1.61	2.32
2010	0.69	0.02	0.87	1.81	2.85
MIDLANDS					
Overall	1.07	0.08	0.88	2.09	2.78
1994	0.84	0.06	0.89	2.04	2.99
1999	1.36	0.09	0.90	2.27	3.03

2005	1.07	0.11	0.88	2.08	2.64
2010	1.02	0.06	0.87	1.97	2.57
MASVINGO					
Overall	1.06	0.06	0.93	2.54	3.36
1994	0.33	0.02	0.85	1.64	2.98
1999	1.41	0.08	0.93	2.70	2.92
2005	0.55	0.05	0.88	1.93	3.16
2010	1.75	0.09	0.95	2.94	3.35
HARARE					
Overall	4.83	0.44	0.83	1.61	1.93
1994	6.68	0.58	0.87	2.07	2.10
1999	4.62	0.50	0.81	1.40	1.78
2005	3.72	0.37	0.79	1.35	1.89
2010	4.70	0.37	0.83	1.64	1.86
BULAWAYO					
Overall	4.70	0.17	0.80	1.40	1.83
1994	6.80	0.23	0.86	1.98	2.09
1999	4.77	0.18	0.81	1.40	1.83
2005	3.25	0.17	0.72	1.00	1.53
2010	4.85	0.13	0.79	1.32	1.69

Source: Zimbabwe Demographic and Health Surveys

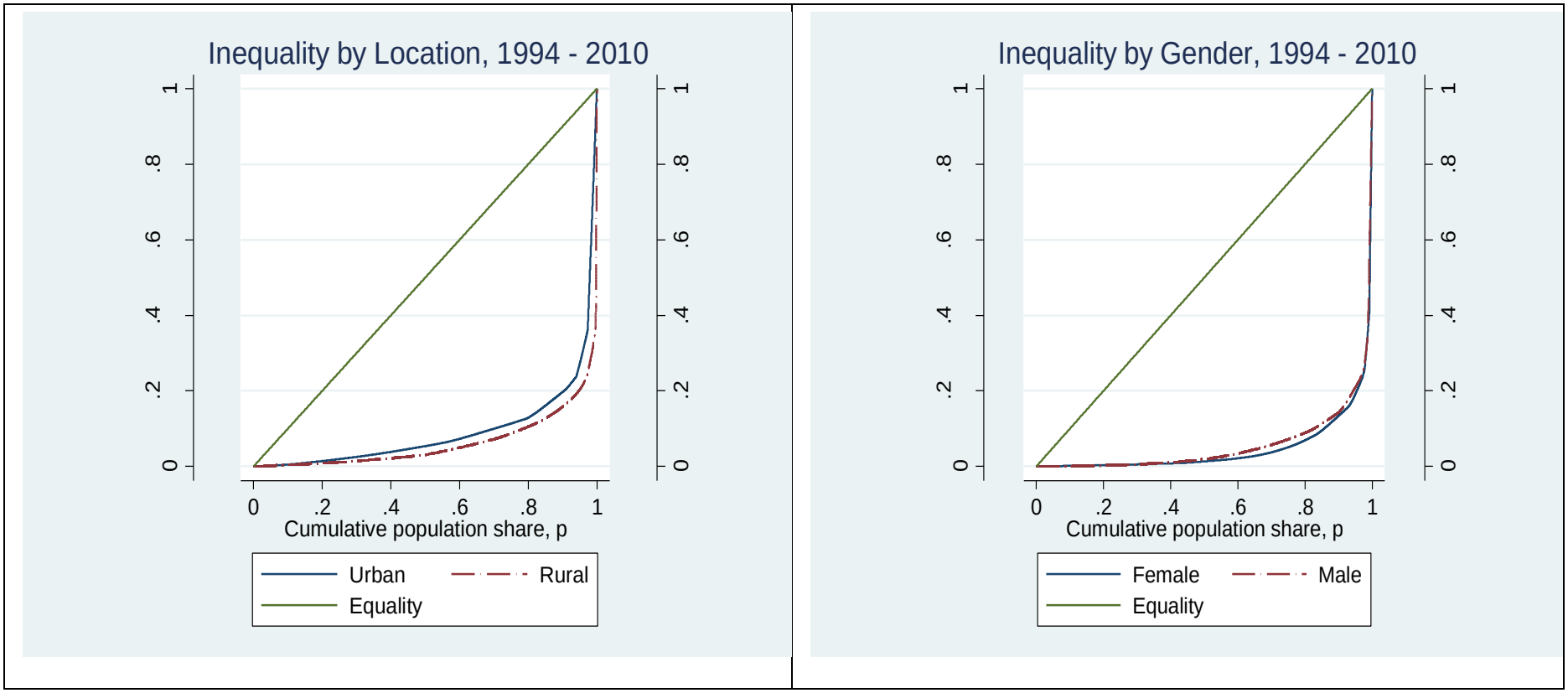

Figure 4: National Lorenz Curve, by location and gender

Source: Own calculations, Zimbabwe Demographic and Health Surveys, 1994 - 2010

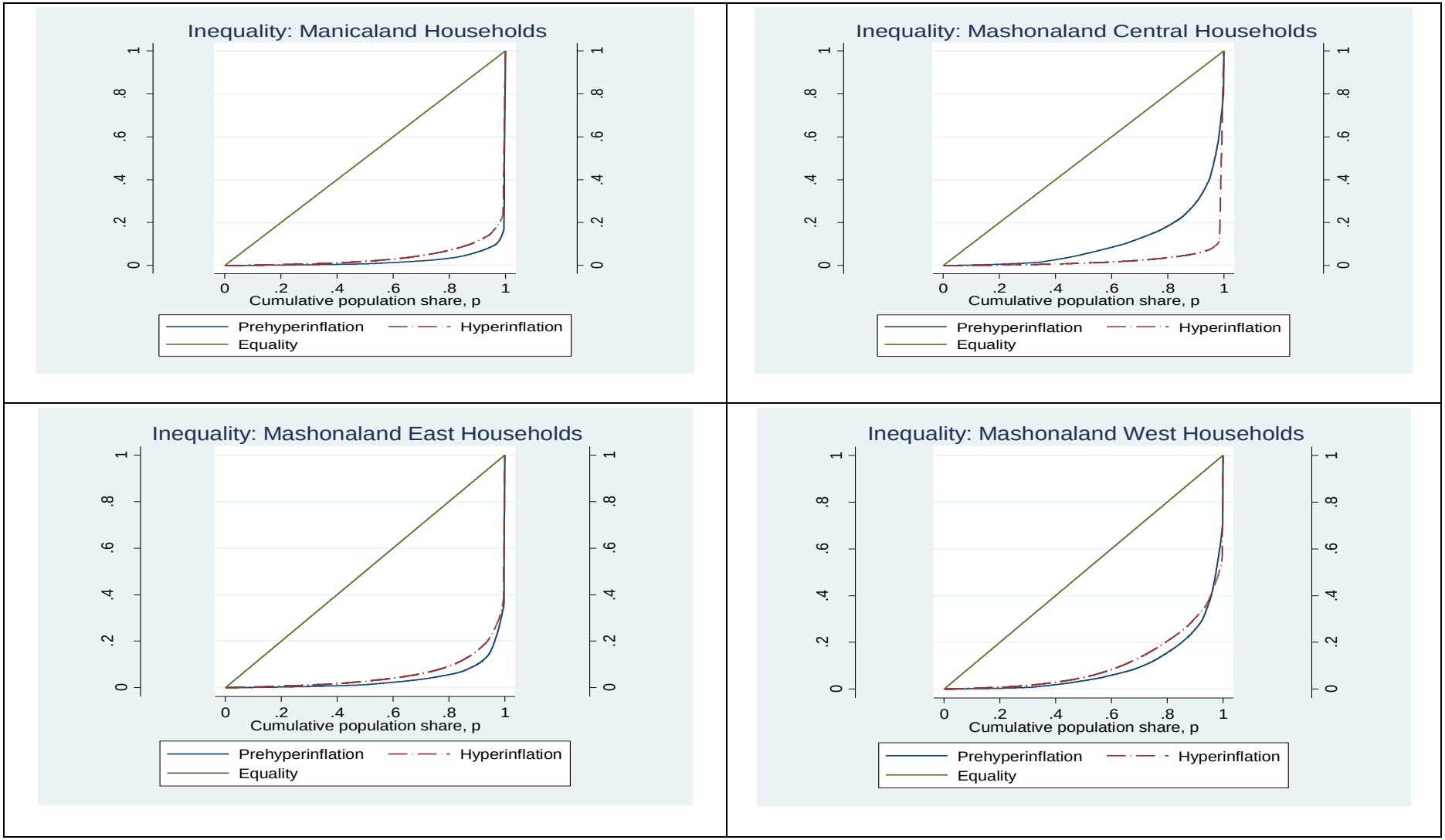

Figure 5: National Lorenz Curve, by province

Source: Own calculations, Zimbabwe Demographic and Health Surveys, 1994 - 2010

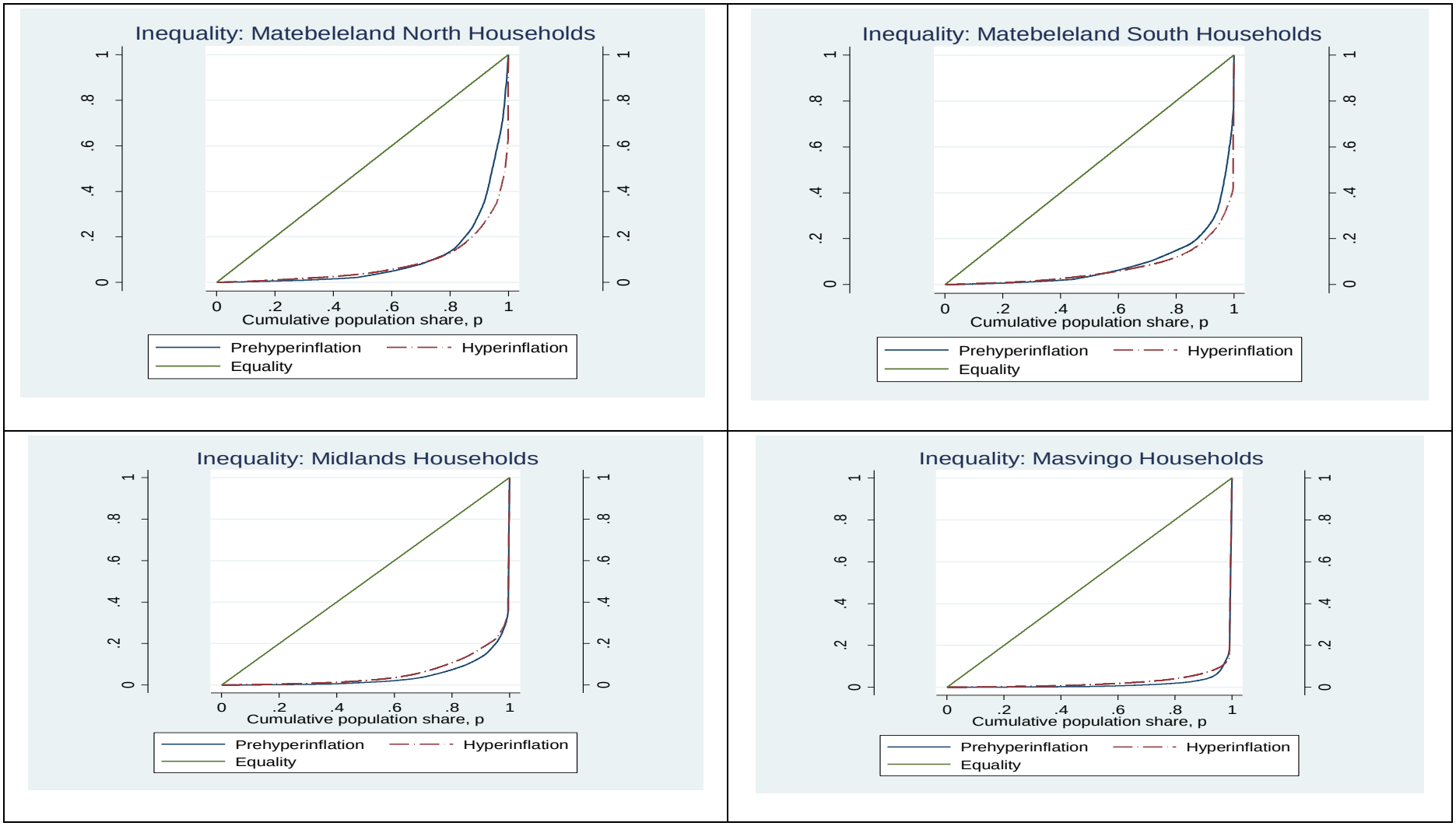

Figure 5: National Lorenz Curve, by province

Source: Own calculations, Zimbabwe Demographic and Health Surveys, 1994 - 2010

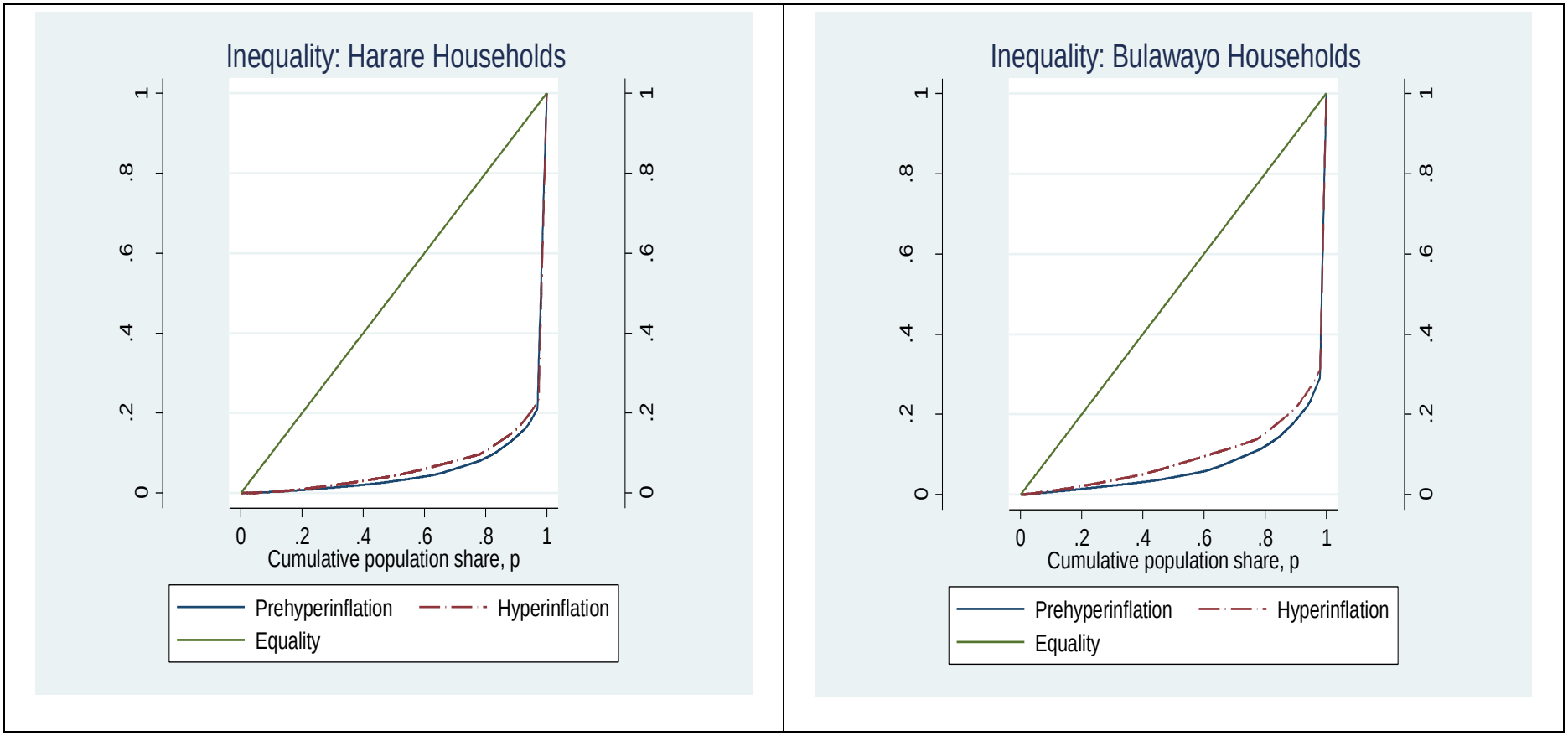

Figure 5: National Lorenz Curve, by province

Source: Own calculations, Zimbabwe Demographic and Health Surveys, 1994 - 2010

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