

Development Economics HWK 3

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Question 1: Consumption Insurance Tests

1. Individual insurance in log-level changes

3. same coefficients across households

Figure 1 shows the distribution of the estimates of household-level parameters. Both parameters are centered at zero with high density. Complete markets theory requires that the individual consumption must follow aggregate consumption and not any other individual characteristic. Then according to the model specification, in order to be fully insured, ϕ_i needs to be equal to 1 and β_i should be equal to 0.

However, the data from Uganda suggests that households are not fully insured against consumption risks. While the estimates of β_i are close to zero for most households, implying that changes in consumption do not depend much on the changes in income, most ϕ_i in this case is also close to zero. For some households the changes in consumption are either positively or negatively correlated with the aggregate consumption. Although most estimates are clustered around zero, the ratios of β_i across households still vary, implying that full risk-sharing is not achieved.

The mean and median of the parameters and the estimates from pooled OLS are shown in Table 1. The OLS estimates imply that the changes in household consumption depend very little on changes in income and aggregate consumption. The mean of ϕ is 0.66, but the median is very close to zero. Thus the distribution is right-skewed and there are more households that are positively affected by aggregate consumption.

2. Relationship between insurance and household income

Table 2 and 3 summarize the mean and the median of different income groups. The mean of β first decreases and then increases with income. In terms of absolute value, the top 20 percent and 40 percent

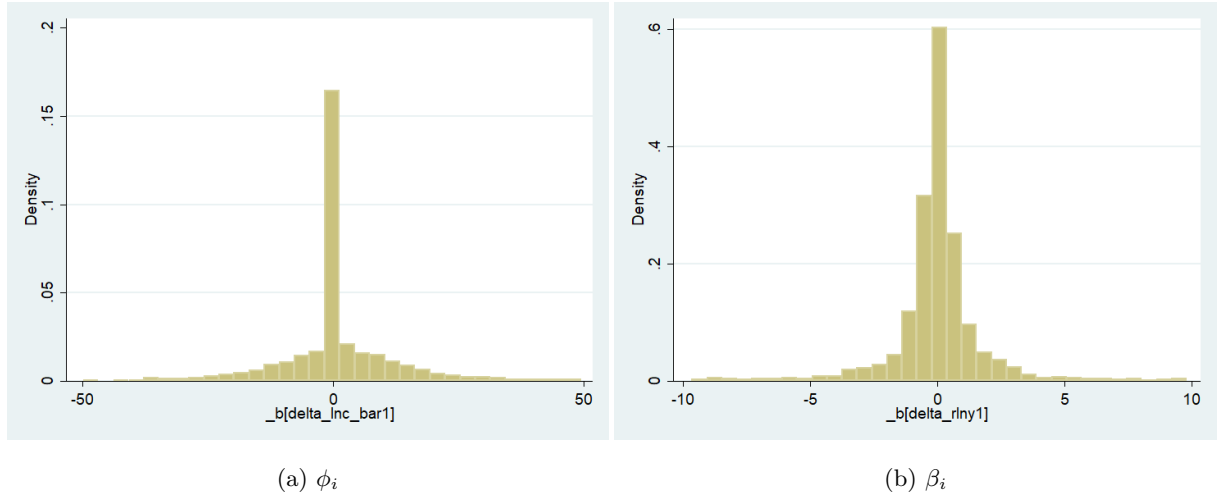


Figure 1: Distribution of parameters

Table 1: Summary Statistics

	Mean	Median	OLS
β	-0.08	0.02	0.0436
ϕ	0.66	0.00	0.1260

groups are affected least on average by the change in income, which suggests that the higher the income, the better households insure against risks. The top 20 percent group also has the highest correlation with aggregate consumption (ϕ), which could be resulting from their high contribution to the aggregate income.

Table 4 shows the average income of households in different groups of $|\beta|$. Here the difference of income across most-insured and least-insured is very small, suggesting that the insurance against consumption risk is irrelevant with income.

4. Separating urban and rural

Figure 2 shows the distribution of β and ϕ for urban and rural areas. In sub-figure (a) the estimates for both areas are centered at zero, but the variation of β is larger in urban area, implying that the

Table 2: Mean across income quantiles

	0.20	0.40	0.60	0.80	1.00
β	0.46	0.43	-1.22	-0.24	0.25
ϕ	2.14	4.06	-8.58	2.00	4.16

Table 3: Median across income quantiles

	0.20	0.40	0.60	0.80	1.00
β	0.00	0.07	0.02	0.02	0.03
ϕ	0.00	0.00	0.00	0.00	0.00

Table 4: Average income of households across quantiles of $|\beta|$

	0.20	0.40	0.60	0.80	1.00
lny_bar	6.689	6.686	6.795	6.692	6.731

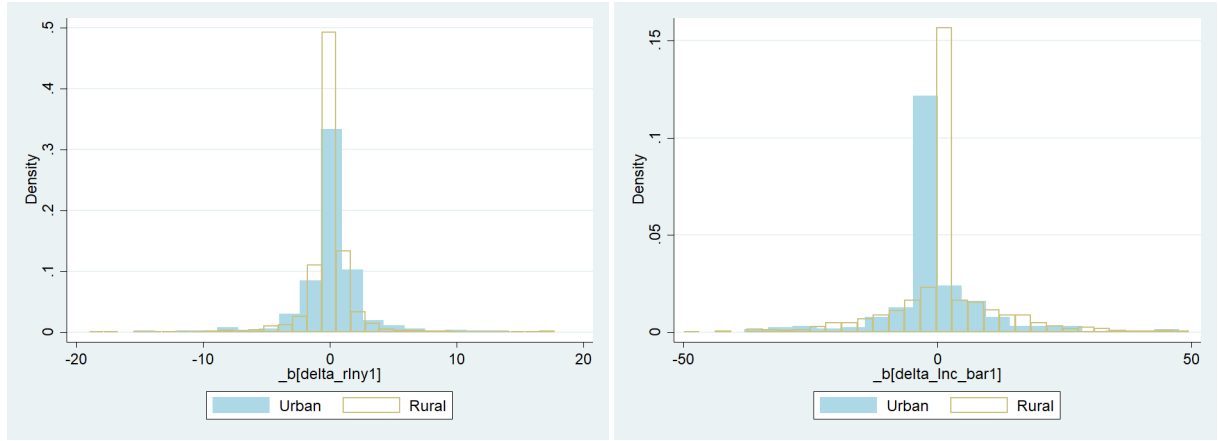
consumption change in urban is affected more by the income change. From (b) we can see that ϕ in rural area are centered at the right side of zero, while in urban area the mode of estimates are on the left side of zero. Thus in rural areas the change in consumption is positively correlated with aggregate consumption, making rural areas more insured than urban in Uganda.

The summary statistics in Table 5 also suggest that the median, rather than the mean captures better the insurance characteristics. Due to the existence of extreme values (results from miscalculation, original data, etc.) the mean is largely affected by the median is not. The OLS estimates tell a similar story with the distribution figures.

Table 6 summarizes the mean estimates in different income quantile groups of urban and rural areas. In urban area the high income groups (0.6, 0.8, and 1 quantiles) have smaller absolute value of β , thus more insured against income change. But in rural area the bottom income group (bottom 20 percent) is more insured. Also urban consumption change depends less on aggregate consumption pattern than the rural across all 5 groups. In general in both areas the change in consumption of lower income households is more correlated with aggregate change.

Table 7 shows the median estimates in different income quantile groups of urban and rural areas. Here the medians of ϕ for all groups in rural and urban are zero, implying that in general most households are not fully insured against risks and their consumption change is almost irrelevant with aggregate consumption fluctuation. On the other hand, $|\beta|$ in urban areas are larger than those of rural. Then we may conclude that urban areas are also less insured against income shocks, though the magnitudes are quite small and close to zero for top and bottom income groups. The median income households are less insured in this case.

Table 8 shows the mean income across different quantiles of $|\beta|$ in urban and rural areas. From the first



(a) β_i

(b) ϕ_i

Figure 2: Distribution of parameters in urban/rural areas

Table 5: Summary statistics: urban and rural

		Mean	Median	OLS
Urban	β	0.28	0.11	0.072
	ϕ	-0.01	0.00	-0.017
Rural	β	1.57	0.00	0.041
	ϕ	10.29	0.00	0.194

row we conclude that the most-insured group (bottom 20 percent) has the lowest mean income and the least-insured has the highest mean income. Thus the high income households are actually less insured against change in income for urban areas. However, the mean income pattern is reversed in rural area, where the top-insured group also has the highest mean income among all groups. The statistics in this table seem to be contradicting with the results in previous Table 6.

Table 6: Mean in different income quantile groups of urban and rural

Mean		0.20	0.40	0.60	0.80	1.00
Urban	β	-0.33	1.38	0.07	0.24	-0.09
	ϕ	-2.41	-2.08	1.67	2.38	0.04
Rural	β	-0.02	-2.73	0.15	10.81	-0.15
	ϕ	2.14	-7.86	0.61	58.29	-0.70

Table 7: Median in different income quantile groups of urban and rural

Median		0.20	0.40	0.60	0.80	1.00
Urban	β	0.02	0.21	0.16	0.04	0.01
	ϕ	0.00	0.00	0.00	0.00	0.00
Rural	β	0.00	0.04	0.00	0.00	0.00
	ϕ	0.00	0.00	0.00	0.00	0.00

Table 8: Mean income of different quantiles of $|\beta|$ in urban and rural

		0.20	0.40	0.60	0.80	1.00
Urban	lny_bar	6.71	6.90	6.86	6.85	6.93
Rural	lny_bar	6.81	6.71	6.75	6.64	6.53