Development Economics
Homework 3

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Q1. Consumption insurance tests

1.1 Individual insurance

In order to do a consumption insurance test, we run the following regression

$$\Delta \ln c_{it} = \beta_i \Delta \ln y_{it} + \phi_i \Delta \ln \overline{C_t} + \epsilon_{it} \tag{1}$$

where c_{it} and y_{it} are the residuals for consumption and income after controlling for personal characteristics, region and time. β_i indicates the opposite of the degree of personal consumption insurance, that is, the higher β_i is, the less consumption insurance takes place, since when it is zero, it implies that consumption does not vary with income, *i.e.*, the person has indeed consumption insurance. ϕ_i indicates the degree of consumption insurance through the community, what can be understood as the degree of redistribution that the person benefits from.

If there exists full consumption insurance, we would expect that $\beta_i = 0$ and $\phi_i = 1$. In figure 1 we observe that β has some variation across individuals, its distribution peaks at zero and that the tails become thin when $|\beta| > 1.5$, which implies that many of them have very high personal consumption insurance ($\beta \approx 0$). In table 1, the mean and the median tell us that even if both are close to zero, they have relatively high values, so consumption insurance is not fully obtained.

In figure 1 we also observe that ϕ has more variation and it not centered at zero, but slightly above. The values of the mean and median of table 1 suggest that there is some "redistribution" going on at the regional level, although this would probably be higher had we data at a more precise level (village, county...).

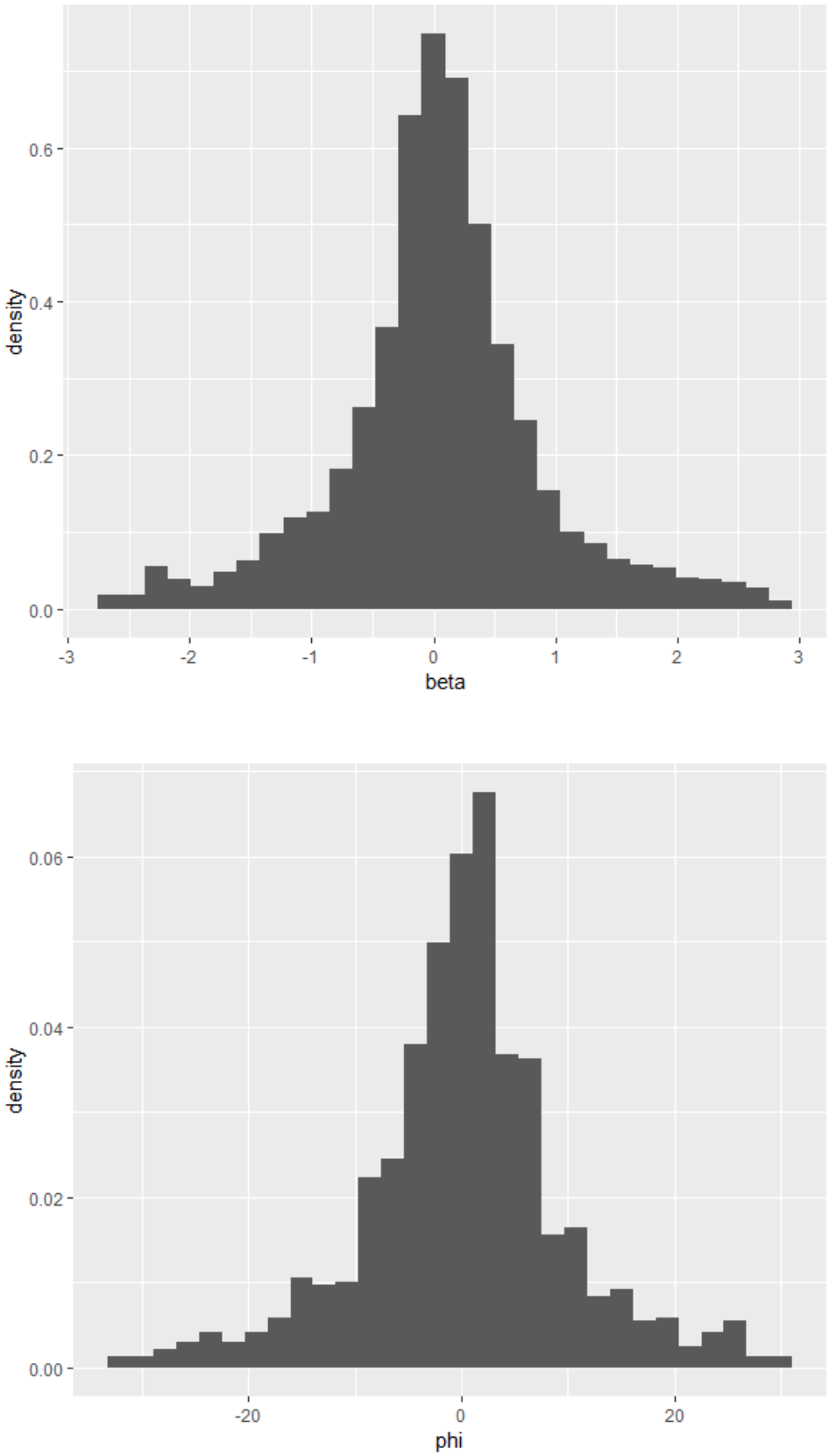

Figure 1: Distribution of β and ϕ

	β			ϕ		
	Urban	Rural	Total	Urban	Rural	Total
Mean	0.129	0.130	0.054	0.601	-1.902	0.190
Median	0.061	0.059	0.056	0.385	0.516	0.480

Table 1: Consumption insurance tests

We can't fully support the idea of full risk sharing given that, even if there is redistribution at the regional level, this is not too high and, besides, we saw that income does affect the level of consumption, although only to a small extent.

1.2 Insurance and income

Tables 2 and 3 present the degree of insurance by income levels and the distribution of income by degree of insurance. There is no clear pattern observed, and this is likely caused by the high level of noise of the data and the estimation strategy, but nevertheless we can focus on the extremes of the distribution. We see that households with lower income tend to have higher consumption insurance than those with higher income, and this fact is corroborated when we check it by degree of insurance levels, where those with higher consumption insurance have a lower income in mean and median.

Quintile	1	2	3	4	5
Mean	0.030	0.081	0.070	0.043	0.044
Median	0.043	0.086	0.015	0.065	0.063

Table 2: Consumption insurance tests by income quintile

Quintile	1	2	3	4	5
Mean	1418.4	1372.8	1613.0	1431.8	1350.6
Median	876.3	835.6	950.0	884.6	866.7

Table 3: Income by consumption insurance quintiles

This is telling us that households with lower income are more able to smooth out consumption, or at least more concerned about consumption smoothing. Alternatively,

this could also mean that poorer households don't react to positive shocks in income and when they get a negative shock, they are helped out by the community, as it was seen in class.

1.3 Aggregate insurance

When we look at the aggregate level and test for risk sharing pooling the data of all households, we can see that results are similar to those calculated at the individual level by checking table 4. Both the values for ϕ and β are now higher (and statistically significant), meaning that variation across households does help in estimating the parameters but these don't really differ from the ones obtained before. When we aggregate we see that there is more redistribution but less personal consumption insuring, but this can come from the fact that now we are not checking at the individual level, so we are losing the individual fixed effects and, thus, incurring in an omitted variable bias.

	Urban	Rural	Total
β	0.076^*	0.054^*	0.061^*
	(5.708)	(7.422)	(10.874)
ϕ	0.135	0.701^*	0.537^*
	(0.951)	(3.761)	(5.985)
obs.	853	3957	5860

t-statistics in parenthesis. * means significant at 0.1%

Table 4: Equation 2 regression results

1.4 Insurance and rural vs. urban areas

The results for the first part are shown in table 1. Given that now we are reducing the sample, and that regressions are very noisy, we get some estimates that are higher (and maybe too high) than those obtained in part 1 for the mean, which might be driven by some extreme values product of the noise. Thus, focusing mainly on the median, we see that there is slightly higher consumption insurance at the rural level, although the difference is negligible, and that in the rural areas redistribution is much bigger than in cities. This last difference is remarkable, and goes in line to what we interpreted in part 3, since in villages there is a higher community support to those suffering economic difficulties.

It is also interesting to see that in the urban areas, as seen in figure 2, people are much more concentrated around a zero-level redistribution gains (ϕ) than those in rural areas, what implies that villages are more heterogeneous in these terms than cities. Also, the level of personal consumption insurance is less disperse in the cities than those found in the rural areas, but the difference is not as big.

	Quintile	1	2	3	4	5
Urban	Mean	0.001	0.062	0.302	0.140	0.140
	Median	0.026	0.006	0.182	0.073	0.073
Rural	Mean	0.096	0.233	0.118	0.161	0.046
	Median	0.036	0.123	0.007	0.101	0.051

Table 5: Consumption insurance tests by income quintile

	Quintile	1	2	3	4	5
Urban	Mean	1799.2	1575.4	2059.0	1639.2	1995.6
	Median	936.3	992.2	1042.4	962.4	1147.2
Rural	Mean	1410.6	1342.3	1395.5	1408.3	1233.7
	Median	824.8	837.6	906.2	888.9	816.2

Table 6: Income by consumption insurance quintiles

Finally, by looking at tables 5 and 6, we observe again no monotonic pattern given the even higher amount of noise in the estimation (now it has even fewer observations), so we focus on the extremes, that is, top and bottom 20%. Here it is interesting to note that the pattern observed for the total sample reverts when looking only at the rural level: Those who have higher income also benefit from higher consumption insurance, while this is not the case in urban areas. This might have its roots in the fact that the richest people in a village are the chief and their closest people, and since they have access to the common resources, they can ensure that they get enough consumption before distributing to the rest.

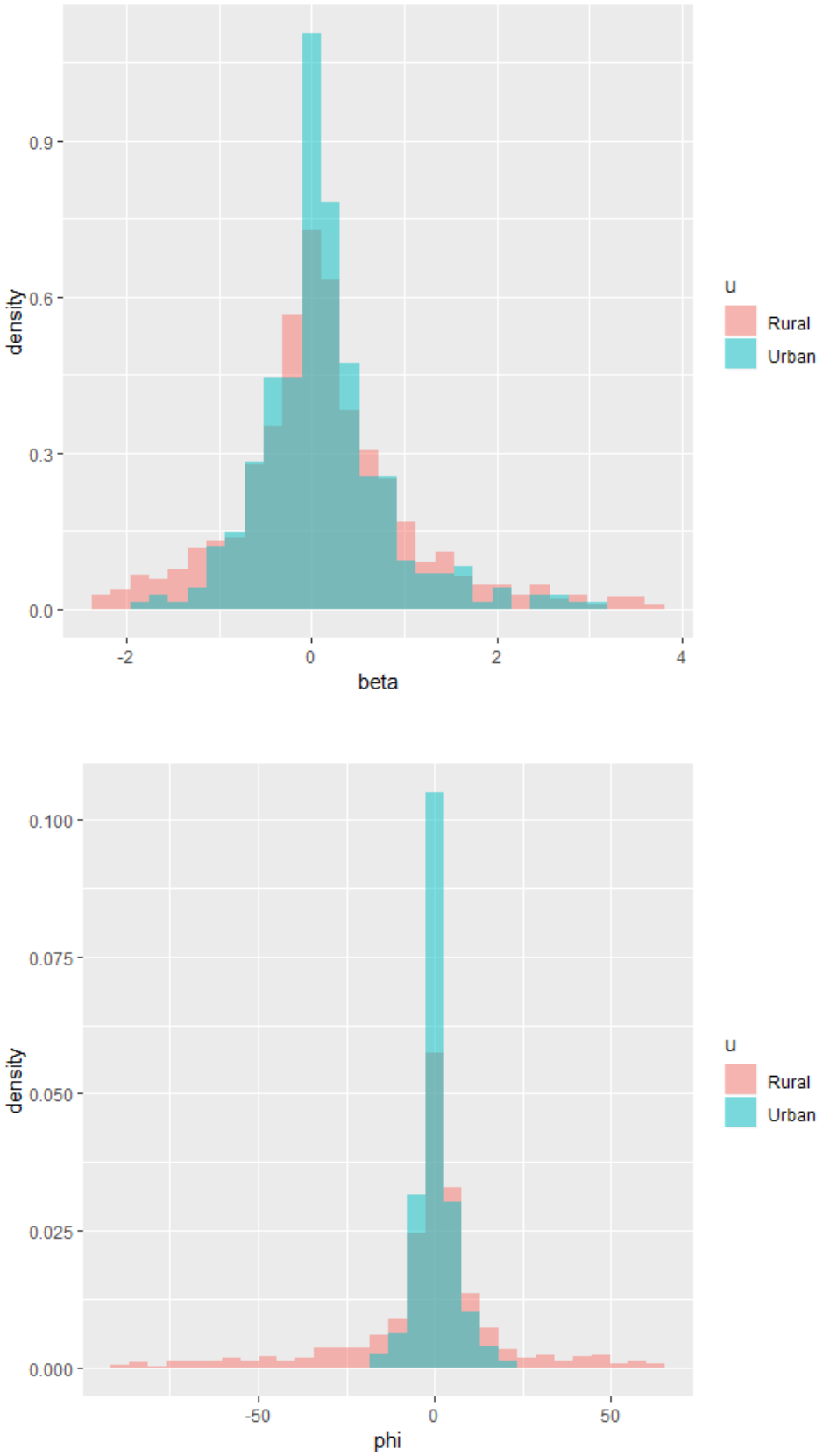

Figure 2: Distribution of β and ϕ