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POVERTY IN ZAMBIA: ASSESSING THE IMPACTS OF TRADE LIBERALISATION IN THE 1990S[1]

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1. INTRODUCTION

Zambia is one of the poorest countries in sub-Saharan Africa and there is evidence that suggests that living standards worsened during part of the 1990s. There is evidence, using national poverty lines, that poverty increased between 1991 and 1996 by 20% among the those below a food-only poverty line and by 16% among those below a general poverty line (McCulloch et al, 2001). In 1996 an estimated 73% of the population lived on less than a dollar a day (World Bank 2000). Between 1996 and 1998, the last year for which comparable household survey is available, there have been reductions in poverty, although not sufficient to offset the rise between 1991 and 1996. The increase in poverty between 1991 and 1996 occurred during a period of fairly extensive economic reforms, including a stabilisation programme, reforms of agricultural marketing, privatisation, trade liberalisation and public sector reform. Given this, it is not implausible that the rise in poverty was caused by one or more of these policies, singly or in combination. Equally likely though is that not everyone will have been affected in the same way, that there will have been winners and losers from the reforms. The aim of this background paper is to summarise some of the key features of the changes in poverty between 1991 and 1998, disaggregating the findings by geographical location and other socio-economic categories. The paper will also summarise some of the essential features of the reforms in the 1990s and set out a number of alternative approaches for analysing the impacts of these reforms on poverty. Some preliminary results are then presented to motivate discussion.

[1] This paper is a background paper for a larger project assessing the impact of trade reform on household poverty dynamics, funded by DFID as part of its Globalisation and Poverty Research Programme. It draws heaviliy on earlier work by McCulloch at IDS with Bob Baulch and Milasoa Cherel-Robson. The authors are grateful to Patricia Justino and Hugh Waddington for assistance with the Zambian data.

2. MEASURING POVERTY IN ZAMBIA[2]

Zambia is one of the few sub-Saharan African countries to have implemented a series of national household surveys over the 1990s. The first survey, a Social Dimensions of Adjustment (SDA) Priority survey, funded by the Norwegian government with technical assistance from the World Bank, was conducted by the Zambian Central Statistics Office between October and November 1991. This 1991 SDA is nationally representative covering all nine provinces and both urban and rural areas and contains data on household demographics, education, health, housing, economic activities, access to infrastructure and public utilities, agriculture, employment, incomes, expenditures, assets and anthropometrics. The 1991 SDA provides a useful bench-mark of living standards in Zambia, coming as it does at the beginning of the reform period. In 1993 a second SDA was conducted, similar in content and design to that of 1991, but between April and June – harvest time – rendering this second survey strictly incomparable with the 1991 survey (Republic of Zambia, 1997). In 1996 a Living Conditions Monitoring Survey (LCMS) added a section on coping strategies, migration, political participation and work by children to the SDA topics. A second LSMS was conducted in 1998. Table 1 summarises some of this information.[3]

TABLE 1: ZAMBIAN HOUSEHOLD SURVEYS IN THE 1990S

Survey	Reference Period[1]	Sample Size (households)
1991 SDA	October/November	9,886
1993 SDA	April/June	10,121
1996 LCMS	October/December	11,752
1998 LCMS	November/December	16,800

Notes: [1] Two week recall period for food, one month recall for other expenditures. Recall periods for education expenditures vary between surveys. [2] A household is defined as a group of people sharing a dwelling, and cooking and eating together.

Because of changes to the way in which data on incomes were collected, consumption expenditure is the only available monetary indicator of living standards, although even this is subject to inconsistencies across the four surveys. The most serious seems to be the omission of consumption of own produced food in 1991, although an attempt to impute this has been conducted (see Cherel-Robson and McCulloch 2000 for details of this and other problems).

[2] This section draws heavily on McCulloch et al (2001).

[3] All the surveys used a sampling frame drawn from the 1990 Census of Population and Housing , with a three stage sample selection process of Census Supervisory Areas, Standard Enumeration Areas (stratified on the basis of housing coats in urban SEAs and agricultural activity in rural SEAs) and

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Nominal household expenditures are deflated to December 1998 *kwatcha* using the national consumer price index and normalised by the Latham (1965) equivalance scale, an age and gender specific scale with adult males aged 30-59 the reference category (shown in the Appendix). McCulloch et al (2001) provide the following estimates of real monthly per adult equivalent consumption expenditure for each year.

TABLE 2. MEAN REAL PER ADULT EQUIVALENT CONSUMPTION EXPENDITURE

	1991	1996	1998
National	43,870	34,780	46,515
	(4,985)	(2,487)	(1,941)
Urban	69,713	53,898	55,847
	(4,528)	(2,606)	(3,189)
Rural	22,311	25,218	40,885
	(950)	(1,306)	(1,221)

Notes: All expenditures are monthly and expressed in December 1998 *kwatcha*. Figures in parenthesis are standard errors.
Source: McCulloch et al, 2001, Table 2.

The results begin to suggest that the rise in aggregate poverty reported in the introduction is much more nuanced. Although mean national expenditure per equivalent adult fell by 21% between 1991 and 1996, and urban expenditures by a similar proportion, rural expenditures increased by 13%.[4] Between 1996 and 1998 rural expenditures continued to grow, resulting in 1998 expenditure levels 83% higher than in 1991.[5] Urban expenditures grew by just under 4%, with the result that by 1998 urban expenditure levels were 20% below those of 1991. The rise in rural living standards and fall in urban living standards led to a dramatic reduction in the urban-rural gap. The aggregate, national picture therefore disguises very different changes in living standards that took place within the country.

In order to examine poverty changes in Zambia we use two poverty line defined by the Zambian Central Statistical Office calculated using the cost of basic needs. The cost of a food basket necessary to maintain the nutritional requirements of an average Zambian family provides a lower poverty line of K32,232.85 per adult equivalent per month in December

households. All the analysis presented from McCulloch et al (2001) uses the survey weights to corrected for both clustering and stratification.

[4] The change in rural expenditures between 1991 and 1996 is not statistically significant but the larger fall in urban expenditures is statistically significant.

[5] This change was statistically significant.

1998 prices. A further 30% was added to this to account for non-food basic needs giving an upper poverty line of K46,286.50 per adult equivalent per month in December 1998 prices.[6]

We show the Foster, Greer and Thorbecke class of poverty measures (Foster et al, 1984) for both poverty lines, along with their standard errors, estimated by McCulloch et al (2001) in Table 3 below. The story of differing changes in urban and rural living standards is clearly illustrated.

For the country as a whole poverty, as measured by all measures and both poverty lines, rose between 1991 and 1996 then fell between 1996 and 1998. [7] In rural areas between 1991 and 1996 there was little change in the incidence of poverty, at around 90% for the upper poverty line and 81% for the lower poverty line, but there were large falls in the other two poverty measures, the poverty gap and squared poverty gap, suggesting that although there was little change in the proportion of the rural population that were poor, the bottom tail of the rural expenditure distribution became more compressed. In contrast, urban poverty rose between 1991 and 1996, by all measures and both poverty lines, suggesting that not only were greater proportions of the urban population were poor but that the bottom tail of the urban expenditure distribution became more dispersed.

Between 1996 and 1998 rural poverty fell, for all measures and both poverty lines, to levels below those of 1991, while urban poverty rates only fell slightly to levels significantly higher than in 1991. Once again we see that the urban-rural gap narrowed over the period.

TABLE 3: POVERTY ESTIMATES IN ZAMBIA, 1991-1998

	1991	1996	1998
National			
Upper Poverty line K47,158			
Headcount (%)	69.6	80.0	76.1
	0.48	*0.37*	*0.33*
Poverty gap (%)	42.2	46.0	40.6
	0.38	*0.29*	*0.24*
Squared Poverty Gap (%)	31.0	31.2	26.1
	0.34	*0.26*	*0.20*
Lower Poverty line K32,840			
Headcount (%)	57.5	66.7	60.5
	0.51	*0.43*	*0.38*
Poverty gap (%)	32.8	33.8	28.2

[6] Both of these poverty lines are significantly lower than the US$1-a-day (1985 in PPP terms) international poverty line of K140,642 which yields poverty headcounts in excess of 90%.

[7] The only exception is squared poverty gap which, using the lower food-only poverty lie, fell throughout the decade.

	0.37	*0.29*	*0.23*
Squared Poverty Gap (%)	23.5	21.2	16.6
	0.32	*0.23*	*0.17*
Rural			
Upper Poverty line K47,158			
Headcount (%)	88.3	90.5	86.3
	0.54	*0.41*	*0.38*
Poverty gap (%)	61.8	57.4	50.4
	0.54	*0.39*	*0.32*
Squared Poverty Gap (%)	48.4	40.9	33.9
	0.55	*0.38*	*0.29*
Lower Poverty line K32,840			
Headcount (%)	81.0	81.1	73.8
	0.66	*0.54*	*0.48*
Poverty gap (%)	51.7	44.7	37.1
	0.59	*0.42*	*0.32*
Squared Poverty Gap (%)	38.9	29.2	22.6
	0.56	*0.36*	*0.26*
Urban			
Upper Poverty line K47,158			
Headcount (%)	47.2	62.1	59.3
	0.66	*0.60*	*0.54*
Poverty gap (%)	18.6	26.6	24.4
	0.34	*0.34*	*0.29*
Squared Poverty Gap (%)	10.0	14.7	13.1
	0.23	*0.25*	*0.21*
Lower Poverty line K32,840			
Headcount (%)	29.3	42.2	38.3
	0.60	*0.61*	*0.54*
Poverty gap (%)	10.1	15.2	13.4
	0.26	*0.28*	*0.24*
Squared Poverty Gap (%)	5.1	7.6	6.5
	0.17	*0.18*	*0.15*

Source: McCulloch et al (2001)

Hence the poverty story in Zambia is rather more subtle than the simple national estimates suggest. Rural areas experienced growth over the whole period, but most strongly between 1996 and 1998 while urban areas experienced a decline between 1991 and 1996 followed by a more modest recovery in the late 1990s.

3. ECONOMIC REFORMS IN ZAMBIA IN THE 1990S

Since Independence in 1964, Zambia has undergone a series of policy reforms followed by reversals. Endowed with substantial mineral deposits, a rising copper price and substantial agricultural resources, the new Republic began with liberal political and economic policies aimed at developing infrastructure and services, but within ten years had adopted a much more state-interventionist set of policies, with import substitution, price controls of all major commodities and a gradual nationalisation of manufacturing, agricultural marketing and

mining. By the early 1980s, after the oil shocks of the 1970s, the collapse in copper prices, and poor economic growth, the Zambian government introduced the first structural adjustment program between 1983 and 1985, only to then abandon it in 1987 after widespread discontent. A second adjustment plan was eventually agreed with the IMF in 1989, removing all price controls on consumer goods, except temporarily for maize (the staple of most Zambian households). When prices of high grade maize meal were eventually increased, by over 100 percent the following year, riots in Lusaka and the Copperbelt led the Zambian government to request the IMF to postpone further reduction of maize meal subsidies. Its refusal led to end of international financial support to Zambia. By the end of the 1980s Zambia was suffering from declining living standards, declining social indicators, escalating inflation and economic recession.

After the elections in 1991 the government[8] began a program of major wide-ranging economic reforms in four key areas: stabilisation, agricultural maize marketing, trade and industrial policy and privatisation. Mwanawina (2003) provides a fuller account of these changes, as do World Bank (1994, 1996), White and Edstrand (1998) and others, as well as summarised by McCulloch et al (2001). We present here McCulloch et al's (2001) summary table of the key changes in the 1990s.

TABLE 4. MAJOR POLICY REFORMS AND EXTERNAL EVENTS 1989-1998

Year	Stabilisation Policy and Key Events	Agricultural Price and Marketing Reforms	Trade Reform	Parastatal Reform and Privatisation
1989	Decontrol of all consumer prices (except maize)	Abolition of national maize marketing board		
1990	Policy Framework Paper agreed with IMF	De-monopolisation of agricultural marketing; maize meal subsidy withdrawn leading to food riots.		
1991	IMF suspends disbursements in June – inflation soars; Election of MMD in October.		Removal of most export controls; removal of ban on maize exports	
1992	Introduction of Treasury Bill Financing; decontrol of borrowing and lending rates; introduction of "bureau de change" for	Severe drought; removal of mealie meal subsidy; removal of fertiliser subsidy	Simplification and compression of tariff rates; increase in the tariff preference	

[8] The Movement for Multi-Party Democracy (MMD) elected in October 1991.

	exchange rate determination.		for goods from COMESA	
1993	Introduction of cash budgeting	Failed attempt to reform agricultural marketing		Privatisation Act passed; Zambia Privatisation Agency formed
1994	Capital account liberalisation	Launch of the Agricultural Credit Management Programme		
1995		Privatisation of the milling industry; launch of WB agricultural sector investment programme.	Removal of 20% uplift factor applied to import values.	Dissolution of ZIMCO
1996	MMD win elections but UNIP boycott elections			Acceleration of privatisation programme
1997	Donors withdraw balance of payments support			
1998	Copper price adversely affected by East Asian crisis	Droughts in south and excessive rain in north attributed to El Niño.		Negotiations on ZCCM sale fall through.

Source: McCulloch et al (2001) Table 1.

Analysing the impacts on poverty of this far-reaching programme of reforms is a difficult task but it is possible to make some suggestions. First consider the reforms of the maize sector between 1991 and 1996. The removal of pan-territorial and pan-seasonal maize pricing and the removal of maize-meal subsidies in urban areas is likely to have benefited net maize producers those close to line of rail or road while harming those farmers in more remote areas. Similarly urban consumers are likely to have most harmed by the removal of the maize meal subsidy. The removal of the fertiliser subsidy, and subsidies on other inputs, in 1992, is most likely to have harmed larger farmers. Privatising the maize mills in 1995 led to an increase in lower-cost hammer-mills, reducing processing costs for farmers and cheaper maize for consumers. Lifting the ban on maize exports is likely to also have benefited larger producers and/or those close to roads and railways.

McCulloch et al (2001) show that although rural poverty increased very slightly between 1991 and 1996, poverty rates among medium and large-scale farmers fell slightly (perhaps the effect of higher producer prices and lower producer costs was offset by higher input prices), poverty among non-agricultural households rose by 17% and among small farmers (who may be net consumers of maize) rose by just under 2%. Urban poverty rates, as shown above, all increased between 1991 and 1996, and for all of the urban strata but the largest increases were

among the low-cost housing urban strata, which may have higher budget shares of maize meal.

This reduction in the bias against agricultural production of maize continued after 1996 as the private sector emerged to replace public provision of agricultural inputs and services. Hence the rural agricultural sector experienced strong growth in the 1990s leading to a reduction in poverty for the rural sector as a whole, most significantly for large farmers, but a rise among non-agricultural households.

Urban areas though are likely to have been adversely affected by the reforms, not just in maize but of parastatals and broader trade liberalisation exposing the private sector to increased competition. Rising inflation in the early 1990s, higher consumer prices of mealie meal over the 1990s plus wide-privatisation of parastatals and the decline of the mining sector, contributed to rising urban poverty rates between 1991 and 1996. Employment levels in parastatals fell by a third between 1992 and 1996, contributing most of the decline in formal sector employment (McCulloch et al, 2001). Real average earnings of the formal sector rose between 1992 and 1995 then declined slightly in the second half of the 1990s. This aggregate trend is also the same for those employed in central government and in the private sector but those in parastatals and in local government experienced continued increases after 1995.

Hence changes in food prices as well as in employment and real wages are part of the story of poverty changes in Zambia. But so too are events outside the realm of policy makers. The severe drought of 1992 and 1998 and excess rainfall in 1998 are also likely to have negative effects impacts on poverty, either exacerbating the already negative effects of higher consumer prices or input prices or tempering the gains of those benefiting from higher producer prices and lower processing costs.

4. ANALYSING THE IMPACTS OF REFORM ON POVERTY

This preliminary but suggestive analysis of the impacts of reforms on poverty tie in well with the set of transmission mechanisms suggested by Winters (2000), namely prices, wages and employment, with the outcomes varying by personal characteristics such as age and gender. This paper now builds on the empirical insights provided by McCulloch et al (2001) and the theoretical framework of Winters (2000).

There are a number of methods that could be pursued to try to analyse these impacts on poverty econometrically with the available household survey data. Unfortunately, unlike the cases of China and Vietnam for which panel data is available, the Zambian household surveys contain no panel element and are simply repeated independent cross-sections. [9] This section outlines some of the methods available to us, discussing the advantages and disadvantages of each, before presenting some very preliminary results of one method.

The first method is one that tries to overcome the problem of the lack of panel data by creating a pseudo-panel. In this method groups of "like" households are created and changes in their living standards over time are analysed. The method is adopted by cohort studies, particularly in labour economics, where individuals are grouped by age (possibly gender and other attributes) and the cohort is compared with other cohorts over time. The advantages of this method is that it allows the researcher to make statements about changes that occur to different types of similar households over time but it involves loss of information on the variation within "like" groups. In the Zambia case it is not obvious how the population should be partitioned. Possible partitions, given the data that is available to us, include

- the strata used by the sampling frame, i.e. low, middle and high cost housing areas in urban areas, and small, medium and large farmers and non-agricultural households in rural areas
- geographical locations, such as province and district incorporating data on distances to markets/towns/roads/railways
- employment sector (in urban areas) and main agricultural output (rural areas)
- age, gender

A second method is to estimate a simple OLS equation of living standards (i.e. per adult equivalent monthly expenditure) of either the whole sample, or urban and rural areas separately. Regressions could be estimated for each survey year, and differences between years decomposed in a Oaxaca-style decomposition. The advantage of this method over the pseudo-panel method is that complete information is retained, but the method assumes that the relationship between expenditures and the set of explanatory factors is uniform across the whole expenditure distribution. It is likely that this is not the case, particularly for those above and below the poverty line.

[9] To be more precise, there was a small panel of urban households created for the 1991 and 1993 surveys but it is not possible to link the two sets of households into the data sets.

A third alternative method to the continuous regression method is limited dependent variable analysis. Estimating probit and logit models with a dependent variable would allow us to talk about the marginal effects on the probability of being poor of a number of different explanatory variables, which has much intuitive appeal, but involves imposing what is usually an arbitrary poverty line to divide the sample and loses information on the underlying welfare indicator. Probits/logits can be estimated for each year and similar decomposition exercises conducted.

The final method under consideration is quantile regression analysis. This has many advantages over both the previous methods as it allows the effects of the explanatory variables to vary over the expenditure distribution. Quantile regression estimates may be more efficient than OLS estimates, and the median regression results are more resistant to outliers than OLS. Quantile regressions can also be decomposed over time.

We begin our econometric analysis using the simplest method, OLS estimation of an expenditure regression., for urban and rural areas separately, using the 1998 survey data. The dependent variable is the natural logarithm of per adult equivalent monthly expenditure and the set of explanatory variables is as follows:[10]

- location: provincial dummies
- strata: low, middle, high cost housing for urban areas, small, medium and large farmers and non-agricultural households for rural areas
- age in years, age in years squared, gender of household head
- education of household members: mean male education in years and mean female education in years, dummies for missing male and female grades
- household size, proportion of household members aged less than 15 or over 50
- an illness dummy if anyone in the household was sick in the 3 months prior to the survey
- occupation, sector, employment status, formal sector dummies
- reason for leaving previous job
- district level rainfall and squared; inter-temporal standard deviation of rainfall (from monthly data for 36 meteorological stations from the Zambian Meteorological office)
- distance to a number of services and infrastructure, including food market, input market, post office, school, health facility, police station, hammer mill, bank, public transport

[10] All data comes from the 1998 LCMS Zambian household survey unless otherwise stated.

Our initial specification reported here includes all the above variables. The complete outputs (from STATA) are shown in Tables A2 and A3 in the Appendix but we summarise the key statistically significant results here. Few coefficients however are statistically significant, possibly because our sample size is so reduced by missing data on the large number of explanatory variables.

In urban areas, our preliminary results suggest the following:

- Households in high-cost areas had higher living standards than other urban strata. This is consistent with poverty estimates that show this strata to have the lowest poverty rates of all urban areas
- Larger households had lower living standards, even once we adjust expenditures for adult equivalence.
- Higher mean male education levels were associated with higher living standards.
- Households with a head (or other working adult if the head is inactive) employed in a professional, technical or related occupation, or in sales, had higher living standards relative to the omitted category of production and related.
- Households with a head (or other working adult if the head is inactive) employed in mining or quarrying had much lower living standards relative to the reference category of agriculture, forestry and fisheries.
- Among reasons for leaving previous job, a business closing was associated with a lower living standard than the reference category of wages too low, but retirement represented an improvement in living standards compared those who left because wages were too low.
- Among the distance variables, only the distance to a police station was significant: living closer to a police station was however associated with a higher standard of living.

In urban areas, province, gender, age, female education, illness, most of the employment dummies, and almost all of the distance coefficients were not statistically significant.

In rural areas, our preliminary analysis yields the following, some of which are less intuitive:

- The Copperbelt and Central provinces had higher living standards than the omitted province of Lusaka, which is perverse given their higher (urban plus rural) poverty headcounts.
- Households with a head (or other working adult if the head is inactive) who worked most of the 12 months prior to the survey have *lower* living standards than others.

- The only sector with significantly lower living standards than those employed in agriculture are those employed in hotels and restaurants.
- Privatisation of the enterprise as the cause of the household head leaving their previous job is associated with significantly lower living standards, relative to those who cite low wages.
- Neither of the district level rainfall coefficients are significant but the standard deviation of rainfall level over 1970-1998 is *positively* associated with higher living standards.
- Distance to post office, health facility and bank are all positively associated with living standards (the further a household lives from one of the these the higher their p.a.e. expenditure) while distance to a hammer mill and markets for inputs (fertilisers, seeds etc) is negatively associated, i.e. households further away have lower living standards.

Again many variables had statistically insignificant coefficients: household size, age, gender, illness, education and most of the employment-related dummy coefficients are insignificant.

5. CONCLUSIONS

There is a danger of reading too much into this preliminary and unsophisticated analysis. Missing data has reduced the samples sizes so dramatically that inevitably some pruning must be done, but the extent of missing data raises the question of how much more sophisticated the analysis can be.

Nevertheless the results do suggest that the analysis is worth pursuing. We find that in urban areas, closure of businesses, possibly as a result of increased competition from abroad, or more lively domestic competition, suggesting that opening up of markets to international imports did have an effect. In rural areas, redundancies resulting from privatisation of parastatals had important impacts on living standards. Households further away from hammer mills and markets for inputs had lower living standards than those who had easier access, and hence lower costs. It would appear that from this preliminary analysis, redundancies in urban areas, and redundancies and remoteness in rural areas are the key factors in determining living standards in 1998. Whether these results bear up to closer scrutiny remains to be seen.

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APPENDIX

TABLE A1. ADULT EQUIVALENCE SCALE

Age (years)	Male Weight	Female Weight
0	0.33	0.33
1	0.46	0.46

2	0.54	0.54
3-4	0.62	0.62
5-6	0.74	0.70
7-9	0.84	0.72
10-11	0.88	0.78
12-13	0.96	0.84
14-15	1.06	0.86
16-17	1.14	0.86
18-29	1.04	0.80
30-59	1.00	0.82
60+	0.84	0.74

Source: Dercon, 1998.

TABLE A2. CONSUMPTION EXPENDITURE REGRESSION, 1998: URBAN AREAS

Dep Var: Ln(per adult equivalent monthly expenditure)	Coefficient	Robust Standard Errors	t-statistic	p-value
_Iprovince_1	0.0189	0.1733	0.11	0.914
_Iprovince_2	0.1824	0.3969	0.46	0.648
_Iprovince_3	-0.2326	0.1852	-1.26	0.216
_Iprovince_4	0.2505	0.7268	0.34	0.732
_Iprovince_6	0.8233	0.7009	1.17	0.247
_Iprovince_7	1.4920	1.2315	1.21	0.233
_Iprovince_8	-0.5660	0.3649	-1.55	0.129
_Iprovince_9	-0.4438	0.5358	-0.83	0.412
_Istratum_2	(dropped)			
_Istratum_3	(dropped)			
_Istratum_4	0.5410	0.1423	3.8	0
Headmal	0.0470	0.1670	0.28	0.78
Hhsize	-0.0478	0.0212	-2.25	0.03
sh014	-0.3975	0.3377	-1.18	0.246
sh51p	0.3810	1.1521	0.33	0.743
Agey	0.0652	0.0806	0.81	0.424
agey2	-0.0010	0.0010	-0.92	0.365
Sicki	0.0307	0.1406	0.22	0.828
Birth	0.1673	0.1537	1.09	0.283
Mhigrm	0.0387	0.0200	1.93	0.06
Mhigrf	0.0149	0.0254	0.59	0.56

Ihigrm		0.4549	0.1922	2.37	0.023
Ihigrf		0.1285	0.1645	0.78	0.439
wrk12	(dropped)				
_Inisco_0	(dropped)				
_Inisco_1		0.7311	0.3958	1.85	0.072
_Inisco_2		0.1415	0.2747	0.52	0.609
_Inisco_3		-0.2265	0.5614	-0.4	0.689
_Inisco_4		1.6495	0.3250	5.08	0
_Inisco_5		0.1486	0.2746	0.54	0.591
_Inisco_7		0.1575	0.2712	0.58	0.564
_Inisco_8		-0.0328	0.3340	-0.1	0.922
_Inisco_9		-0.0278	0.2496	-0.11	0.912
_Inisic_1		-0.6605	0.2670	-2.47	0.018
_Inisic_2		-0.1308	0.5550	-0.24	0.815
_Inisic_3	(dropped)				
_Inisic_4		-0.3129	0.4077	-0.77	0.447
_Inisic_5		-0.1335	0.4972	-0.27	0.79
_Inisic_6		-0.1647	0.5065	-0.33	0.747
_Inisic_7		-0.1659	0.4384	-0.38	0.707
_Inisic_8		-0.3961	0.5337	-0.74	0.462
_Inisic_9		-0.2147	0.5210	-0.41	0.682
_Iempstat_0	(dropped)				
_Iempstat_2		-0.8119	0.2255	-3.6	0.001
_Iempstat_3	(dropped)				
_Iempstat_4	(dropped)				
_Iempstat_5		-0.1662	0.2831	-0.59	0.56
_Iempstat_6	(dropped)				
_Iempstat_7		0.1277	0.2892	0.44	0.661
_Iempstat_8	(dropped)				
_Iempstat_9		0.2023	0.2391	0.85	0.402
Inf	(dropped)				
_Ireason_2		-0.0949	0.2054	-0.46	0.646
_Ireason_3		-0.3506	0.1779	-1.97	0.056
_Ireason_4		0.2718	0.2941	0.92	0.361
_Ireason_5		0.1015	0.4908	0.21	0.837
_Ireason_6		-0.1243	0.1498	-0.83	0.412
_Ireason_7		-0.4292	0.4484	-0.96	0.344
_Ireason_8		-0.2141	0.2199	-0.97	0.336
_Ireason_9		-0.0511	0.2443	-0.21	0.835
_Ireason_10		-0.2047	0.2791	-0.73	0.468

_Ireason_11		0.5795	0.3277	1.77	0.084
_Ireason_12		-0.2909	0.2367	-1.23	0.226
Tr		-1.6431	2.1541	-0.76	0.45
tr2		0.2949	0.8604	0.34	0.734
Sanr		-0.0020	0.0026	-0.75	0.456
Xfoma		0.0181	0.0919	0.2	0.845
Xpost		0.0091	0.0240	0.38	0.708
Xpscl		0.1222	0.1362	0.9	0.375
Xsscl		-0.0214	0.0208	-1.03	0.309
Xhfac		-0.0452	0.0519	-0.87	0.389
Xpolt		-0.1109	0.0508	-2.18	0.035
Xmill		0.0006	0.0044	0.14	0.886
Xiput		0.0069	0.0086	0.81	0.423
Xbank		-0.0025	0.0032	-0.76	0.449
Xrans		0.0225	0.0563	0.4	0.691
Xmfoma	(dropped)				
Xmpscl	(dropped)				
Xmsscl		1.2437	0.6291	1.98	0.055
Xmhfac	(dropped)				
Xmpolt	(dropped)				
Xmmill		-0.0166	0.2801	-0.06	0.953
Xmiput		-0.2849	0.2135	-1.33	0.189
Xmbank	(dropped)				
Xrans	(dropped)				
_cons		11.2510	1.4891	7.56	0

Notes: n=2094; R^2=0.5609, 42 clusters.

TABLE A3: CONSUMPTION EXPENDITURE REGRESSION, 1998: RURAL AREAS

Dep Var: Ln(per adult equivalent monthly expenditure)	Coefficient	Robust Standard Errors	t-statistic	p-value
_Iprovince_1	0.7015	0.4967	1.41	0.164
_Iprovince_2	1.3173	0.7597	1.73	0.089
_Iprovince_3	1.3842	0.3620	3.82	0
_Iprovince_4	0.5046	1.3483	0.37	0.71
_Iprovince_6	-0.5854	1.6997	-0.34	0.732
_Iprovince_7	-1.6455	2.5161	-0.65	0.516
_Iprovince_8	0.6298	0.5738	1.1	0.277
_Iprovince_9	0.7282	0.4674	1.56	0.125
_Istratum_2	0.0482	0.2300	0.21	0.835
_Istratum_3	(dropped)			

_Istratum_4	(dropped)			
headmal	0.1749	0.4379	0.4	0.691
hhsize	0.0321	0.0390	0.82	0.414
sh014	-0.1241	0.5535	-0.22	0.824
sh51p	0.5616	0.5920	0.95	0.347
agey	-0.0344	0.0405	-0.85	0.399
agey2	0.0003	0.0005	0.6	0.554
sicki	0.2274	0.1894	1.2	0.235
birth	-0.1344	0.2617	-0.51	0.61
mhigrm	0.0855	0.0464	1.84	0.071
mhigrf	0.0163	0.0338	0.48	0.63
ihigrm	1.3470	0.7184	1.87	0.066
ihigrf	0.6947	0.4007	1.73	0.089
wrk12	-3.1253	0.6730	-4.64	0
_Inisco_0	0.1872	0.7853	0.24	0.812
_Inisco_1	(dropped)			
_Inisco_2	(dropped)			
_Inisco_3	(dropped)			
_Inisco_4	(dropped)			
_Inisco_5	-0.1768	0.9146	-0.19	0.847
_Inisco_7	1.1084	0.9931	1.12	0.269
_Inisco_8	0.4695	1.4374	0.33	0.745
_Inisco_9	-0.0443	0.5580	-0.08	0.937
_Inisic_1	-1.1626	1.2903	-0.9	0.372
_Inisic_2	-0.9269	1.2043	-0.77	0.445
_Inisic_3	(dropped)			
_Inisic_4	0.0561	1.1375	0.05	0.961
_Inisic_5	0.1753	0.7789	0.23	0.823
_Inisic_6	-1.4846	0.6146	-2.42	0.019
_Inisic_7	(dropped)			
_Inisic_8	(dropped)			
_Inisic_9	-0.2180	0.9510	-0.23	0.82
_Iempstat_0	(dropped)			
_Iempstat_2	(dropped)			
_Iempstat_3	(dropped)			
_Iempstat_4	(dropped)			
_Iempstat_5	0.4341	0.6482	0.67	0.506
_Iempstat_6	(dropped)			
_Iempstat_7	(dropped)			
_Iempstat_8	(dropped)			
_Iempstat_9	-1.8580	1.8527	-1	0.32
inf	(dropped)			
_Ireason_2	1.2582	0.8501	1.48	0.145
_Ireason_3	0.5460	0.7136	0.77	0.448
_Ireason_4	-2.1882	0.5368	-4.08	0
_Ireason_5	(dropped)			
_Ireason_6	0.0466	0.7506	0.06	0.951
_Ireason_7	0.3899	0.7550	0.52	0.608
_Ireason_8	0.1502	0.7577	0.2	0.844
_Ireason_9	0.0286	0.7669	0.04	0.97
_Ireason_10	0.0460	0.8215	0.06	0.956
_Ireason_11	-0.9993	0.8597	-1.16	0.25
_Ireason_12	-0.2243	0.6752	-0.33	0.741
tr	-1.7870	4.5818	-0.39	0.698

tr2	1.0468	1.7327	0.6	0.548
sanr	0.0072	0.0015	4.71	0
xfoma	-0.0028	0.0088	-0.31	0.755
xpost	0.0240	0.0083	2.87	0.006
xpscl	0.0325	0.0325	1	0.322
xsscl	0.0012	0.0054	0.22	0.83
xhfac	0.0274	0.0141	1.94	0.057
xpolt	-0.0067	0.0079	-0.85	0.4
xmill	-0.0485	0.0284	-1.71	0.093
xiput	-0.0141	0.0041	-3.48	0.001
xbank	0.0072	0.0038	1.9	0.063
xrans	0.0033	0.0079	0.42	0.674
xmfoma	-3.6151	3.0178	-1.2	0.236
xmpscl	(dropped)			
xmsscl	(dropped)			
xmhfac	(dropped)			
xmpolt	2.8675	1.1354	2.53	0.015
xmmill	(dropped)			
xmiput	1.0485	1.8212	0.58	0.567
xmbank	-1.0904	0.6919	-1.58	0.121
xrans	(dropped)			
_cons	11.3784	3.0653	3.71	0

Notes: n=175, R^2=0.5955, 55 clusters.