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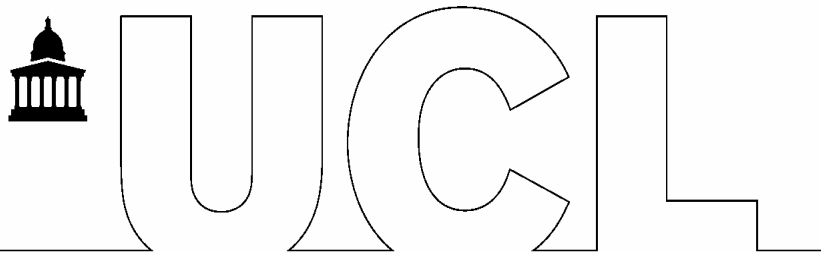

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Revisiting Consumption Smoothing and the 1998 Russian Crisis

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1998 Russian Crisis*

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Applying quantile regression techniques to Russian data we investigate the channels through which individuals experience changes in their well being. We find that married individuals in non-rural households with university-educated heads are less vulnerable to severe welfare shocks. For the most vulnerable individuals the labour market plays a key role in transmitting the effects of aggregate shocks through the unemployment channel whereas those individuals able to maintain their employment status are more able to cope with economic shocks. While increases in pension payments help individuals to cope with shocks, it transpires that vulnerable individuals rely more broadly on the support of relatives and the produce of their garden plots and dachas.

JEL classification: I31, P20

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1. Introduction

The 1998 Russian financial crisis culminated in the virtual collapse of the commercial banking sector, a 400% devaluation of the exchange rate, a rapid surge in inflation, rising unemployment, declining household incomes and a sharp drop in the value of real wages. In this context, prospects for Russia's beleaguered households looked bleak. Yet, within months, developments deviated from the worst-case scenario to such an extent that 1999 witnessed a 5.4% GDP growth rate and the years subsequent have all produced growth in excess of 4%. Looking beneath this macroeconomic data, suggestive of a deep, though short-lived crisis, we discover a diversity of microeconomic experiences and a range of important policy lessons.

Individuals and households experience and react to economic shocks in diverse ways. To the individual the shock may take the form of job loss, a decline in real wages, the accumulation of wage arrears, being sent on enforced unpaid leave or even having the value of ones capital assets eroded. The particular responses that these shocks elicit will depend partially on the transmission mechanism through which the shock is experienced and partially on the range of institutions, networks and personal resources available to the individual to smooth the potential welfare loss. In Russia these resources include, formal systems of state support (e.g. pensions, social security etc), formal and informal engagement with the labour market, as well as in informal 'coping' mechanisms either rooted in Soviet tradition (e.g. home production) or emerging spontaneously in response to the economic environment (e.g. borrowing capital).

The particular response garnered is determined by the set of resources available to the individual and their household and this in turn varies in concert with the economic cycle. Table 1 provides

an overview of the composition of household income marking out the relative importance of different income sources. In so doing it is suggestive of both how Russians are likely to experience shocks (changes in labour market or benefit income) and of how they are going to seek to cope (benefits, relatives and home production). Interestingly, even following 5 years of continued income growth, 'home production' in Russia still accounts for a relatively large proportion of household income, and seems to be a 'coping' institution with significantly more importance than in other middle income countries. These preliminary observations prompt a number of questions: How vulnerable are Russian households to negative economic shocks? Through what mechanism will they feel them? Which individuals and households are most vulnerable and why? Which institutions serve to facilitate welfare smoothing in the face of economic uncertainty?

[TABLE 1 HERE]

These issues are the core focus of this paper. Specifically, how did fluctuating cash incomes translate into household expenditure? In what ways did individuals experience and respond to the fluctuating economic conditions? What are the characteristics associated with those most at risk and those least able to adapt? Do individuals exploit the market economy, the state welfare system or informal support networks to facilitate coping with shocks and in what ways? In addressing these questions we reveal something of the nature of *economic vulnerability* in Russia during the late 1990's and early 2000's. Understanding economic vulnerability is important, not least because it speaks to many of Russia's most pressing policy concerns, ranging from social security reform and targeting, to regional reform, to human capital formation and the development of labour market institutions, to rural and agricultural reform.

There have been a number of studies reporting the extent and incidence of 'low welfare' in transitional Russia[1], including some relating to the 1998 financial crisis but few have studied how the Russian population experiences and responds to periods of economic crisis. Lokshin and Ravallion (2000), examining the welfare effects of the 1998 financial crisis, find that it was not felt only by those poor prior to 1998 but impacted upon individuals across the income distribution. Analysing the effects of changes in the distribution of social welfare spending they find that social policy was "on balance, poverty reducing". They interpret this as evidence of effective welfare targeting. Offering a counter-view, Lokshin and Yemtsov (2004) conclude that the formal social safety net was of little value to most Russians. Skoufias (2003) has a different emphasis, finding that, in the face of shocks, households complement standard insurance strategies such as reduction of non-food expenditure, adjustment of labour supply and increased borrowing, with participation in more informal risk sharing arrangements within their local communities. Clarke (2002) argues that, rather than forming part of an informal insurance strategy, the use of home production is a culturally embedded practice and has no impact on cash spending.

We draw on and extend this developing literature in a number of ways. As in Skoufias (2003), we analyse observed changes in consumption (our proxy for welfare) but focus explicitly on the effects of a major generalised economic downturn – namely, the 1998 financial crisis. The way different individuals experience and react to shocks such as this one is an important policy question so we compare the effects of and responses to the crisis across the distribution of consumption changes. In this, we apply Quantile Regression Methods (QRM) as proposed by Koenker and Bassett (1982). Further, we take as our unit of analysis the individual, rather than

the household, enabling us to account for both household and individual characteristics while still controlling for the fact that individuals typically live and share resources within a household structure. That is, we control for the fact that one individual's wellbeing can fall as a consequence of a 'shock' experienced by another individual in the same household. We are also more explicit than previous studies in treating observed changes in consumption as a function of the net effect of both the idiosyncratic shocks experienced by individuals as well as the risk management strategies they employ to cope with such shocks. This contrasts with Skoufias (2003) who concentrates on the likelihood of using various coping strategies rather than the explicit contribution they make to consumption smoothing. Unlike previous studies our measure of consumption excludes any imputed cash value attributed to home production thus allowing us to compare our results with those of Clarke (2002) on the effects of home production.

Using data from the Russian Longitudinal Monitoring Survey (RLMS) we reject the complete insurance model and examine the channels through which individuals experience and seek to cope with economic fluctuations. We find that married individuals in non-rural households with university-educated heads are less vulnerable to consumption shocks, particularly at the lower end of the distribution. Investigating the manner in which individuals experience shocks the importance of the labor market is manifest. For individuals facing the largest welfare losses, entering unemployment is particularly harmful, while those maintaining employment are protected to a greater extent. Individuals receiving new wage arrears or being sent on unpaid leave are only more vulnerable at the top end of the consumption change distribution. In examining how individuals and households seek to cope with economic shocks, we find that increases in pension payments help the most vulnerable, but that other social security payments

do not ease vulnerability. It transpires that individuals also depend on help from relatives and that the garden plots and dachas, often romanticized in Russian literature, do provide a real means by which Russians cope with shocks but *not* a means by which they can ultimately prosper. We finish by stressing the important policy lessons for Russia's developing market economy.

The paper proceeds as follows. Section two discusses the concept of vulnerability employed and the theoretical model within which our empirical strategy is anchored. Section three outlines the econometric specification and data. Section four presents our findings and section five concludes the paper.

2. The concept of vulnerability and the theoretical framework

The recent proliferation of research pertaining to 'economic vulnerability' is suggestive of the complex, multi-dimensional nature of vulnerability. There is no absolute consensus regarding the measurement of vulnerability but conceptually there is agreement that vulnerability refers to a loss of welfare arising from the realisation of a risk and the subsequent unravelling of associated but uncertain consequences. Hoddinott and Quisumbing (2003) identify three empirically realisable categories of vulnerability measurement consistent with this concept:

a) Vulnerability to expected poverty i.e. a positive probability that a household will fall below the 'poverty line' in some future period. Chaudhuri, Jalan and Suryahadi (2001), Pritchett, Suryahadi and Sumarto (2001) and Mansuri and Healy (2000) all provide such examples.

b) Vulnerability as low expected utility with respect to a given benchmark. Ligon and Schechter (2003) measure vulnerability as the difference between the utility associated with some certainty-equivalent consumption and the expected utility defined according to realized consumption.

c) Vulnerability as uninsured exposure to risk provides an *ex post* assessment of welfare loss arising from the onset of an economic shock (Glewwe and Hall (1998), Cunningham and Maloney (2000) and Lokshin and Ravallion (2000) all offer analysis using this approach).

In this paper we utilise the latter empirical category centring on the observed effects of uninsured risk exposure. Risks to economic wellbeing come in many different guises. On the one hand economy-wide or aggregate shocks, such as earthquakes or harvest failures, typically affect all households within a community or region. By way of contrast the effects of individual or idiosyncratic shocks, such as job loss or illness, are likely confined to a particular individual or household. The distinction however is not clear-cut. Dercon (2002) argues that, in practice, the majority of shocks experienced by individuals include elements of both aggregate and idiosyncratic shocks. He goes on to argue that being able to identify the type of shock is an important tool in mitigating the consequences. For example, the pooling of risk within a community can, in principal, insure against idiosyncratic shocks but, faced by community wide shocks or non-insured idiosyncratic shocks, some form of external support is required.

Individuals are exposed to 'risky' events outside of their direct control but which impact upon their welfare. Faced by these risks, they respond in an effort to limit (attenuate) the negative (positive) effects of the event. As the event unfolds, their *ex post* position reveals the extent of

their vulnerability over a given period. That is, the observed outcomes (e.g. changes in welfare), as a function of the magnitude and nature of both the risks themselves *and* the responses they elicit, suggest something about an individual's economic vulnerability. Since different individuals are able to respond to and manage risk with varying degrees of success, any measure of vulnerability should incorporate the risk itself (idiosyncratic or aggregate), the management of that risk (how individuals respond) and the observed outcome (change in welfare) from that risk.

Taking observed consumption as our proxy for welfare, our version of vulnerability can be interpreted as one relating to consumption smoothing. Specifically, individuals unable to smooth their consumption, when faced by the occurrence of shocks, are more vulnerable, regardless of whether the shock is aggregate or idiosyncratic. In this context it proves instructive, as in Skoufias (2003) and Dercon and Krishnan (2003), to briefly review the standard problem of consumption optimisation in a model *with* complete insurance (Deaton 1997).

Take a community of households, all facing the same uncertainty about the state of the world. Combining to provide an optimal mutual insurance scheme, each household is assigned ex-ante an insurance value congruent with their relative wealth and utility. The optimisation problem facing the community reduces to identification of the set of individual household consumption levels that maximises the sum of the socially weighted inter-temporal expected utility per household. With appropriate assumptions about the nature of the utility function, it can be shown that, once the state of nature is realised, changes in consumption depend only on net changes in the state of nature $(\Delta \ln \xi_t^*)$ and changes in a time variant 'taste' parameter of the household,

($\Delta \ln \theta_t^h$) (itself treated as a mean zero error term, ε_t^h). That is, if all members of the household are identical, then the growth of per capita consumption is the same for all households, namely:

$$\Delta \ln(c_t^h / n_t^h) = -\rho^{-1} (\Delta \ln \xi_t^* - \Delta \ln \theta_t^h) = -\rho^{-1} \Delta \ln \xi_t^* + \varepsilon_t^h \qquad (1)$$

The main empirical prediction of this complete insurance model is that, after controlling for the change in aggregate resources, the growth of per capita household consumption should not be positively influenced by changes in household income flows. Given moral hazard and imperfect information, it is hardly surprising that the empirical evidence soundly rejects this extreme hypothesis of complete consumption insurance. This being so, shocks to income may still affect consumption even in the presence of informal and formal risk sharing arrangements.

Placing this framework in the context of the large fluctuations in income experienced in Russia, we are prompted not only to test for the effects of the 1998 financial shock on changes in consumption but also to examine the effects of formal and informal coping mechanisms directed at offsetting the negative consequences of falling incomes *and* at identifying the idiosyncratic shocks through which different individuals may actually experience income shocks.

3. Econometric specification and data

Most empirical specifications of equation (1) take one of the following forms (Hoddinott and Quisumbing (2003)), differing only in their representation of shocks:

$$\Delta \ln (C_{hvt}) = \alpha + \Sigma_i \lambda_i D_{vt} + \beta_i S(h)_{hvt} + \gamma X_{hvt} + \varepsilon_{hvt} \qquad (2)$$

or

$$\Delta \ln (C_{hvt}) = \alpha + \Sigma_i \lambda_i D_{vt} + \beta \Delta y_{hvt} + \gamma X_{hvt} + \varepsilon_{hvt} \qquad (3)$$

In these specifications, $\Delta \ln(C_{hvt})$ is the change in log consumption for household *h*, in community *v*, at time *t.* D_{vt} is the survey round/community interaction dummy controlling for community wide aggregate shocks. Δy_{hvt} is the change in income of the household. S_{hvt} captures the idiosyncratic shocks experienced by the household and X_{hvt} are all fixed household or household head characteristics such as education and gender, representing the household 'taste parameters' from equation (1).

The assumption underlying equation (3) is that changes in household income proxy all the idiosyncratic shocks experienced by the household, so that β captures the extent to which such shocks impact upon consumption. In contrast equation (2) includes each idiosyncratic shock in the S_{hvt} term separately. Hoddinott and Quisumbing (2003) discuss the practical implementation of adopting either approach. An obvious problem with equation (2) is the difficulty of empirically identifying the full range of idiosyncratic shocks experienced. Equation (3), through its income proxy, provides a possible escape route. However, relying on Δy_{hvt} poses problems in terms of measurement error and endogeneity bias, prompting the use of instruments to proxy for income. However, we are brought full circle, since the idiosyncratic shocks themselves are the only obvious instruments and so the advantage of using (3) over (2) becomes less clear. Furthermore, the relationship between income and consumption may reflect the adoption of coping strategies rather than community level pooled insurance. Indeed Skoufias (2003), applying OLS to both specifications for Russian data, found that the β coefficient in (3) was positive and statistically significant, *and* that idiosyncratic shocks negatively affected changes in consumption while positively influencing the likelihood of adopting a coping strategy.

Revisiting household data around the time of the Russian financial crisis we implement a version of equation (2). We control for the impact of the regionally variable aggregate shock but our proxy for the idiosyncratic income shock from equation (3) talks to our conceptual understanding of vulnerability. That is, since observed welfare outcomes depend on the *net* effect of shocks experienced *plus* strategies employed to cope with such shocks, we incorporate both the idiosyncratic shocks themselves *and* the coping responses that the shocks elicit and apply QRM to our specification. Quantile regressions are estimated by minimising the weighted sum of the absolute errors and so are robust to the presence of outliers and non-normal error distributions. They offer a more complete view of the effects of the explanatory variables on the location, scale and shape of the distribution of our vulnerability measure. In other words, there is a great deal of churning underlying any average such that findings of zero correlation, at the mean, between two variables are perfectly consistent with strong and pervasive causal relations elsewhere in the distribution. Since our purpose is to understand the entire distribution of 'vulnerability', a good characterisation of the conditional distribution can be obtained by estimating a set of 'representative' quantiles. Clustering by household id, and therefore enabling the individual to be the unit of analysis, we therefore estimate the 10^{th}, 25^{th}, 50^{th}, 75^{th} and 90^{th} quantiles[7].

Our data is drawn from rounds VII (1996), VIII (1998) and IX (2000) of the Russian Longitudinal Monitoring Survey (RLMS), a series of nationally representative surveys of the Russian Federation providing comprehensive information on a range of socio-economic and demographic variables. We use an unbalanced panel containing 2,558 households, with observations on 9,125 adults over 18 years of age. Needless to say, the timings of data collection for the RLMS do not fit seamlessly with the incidence of the 1998 crisis. In particular, our pre-

crisis observation is in late 1996 and our post-crisis observation is in late 1998, arguably before the full effects of the crisis had filtered through the economy. Nevertheless, not only is this the only data with which to address these important questions, but our data provides a strong indication that during this period there was a large, significant fall in mean incomes (see table 1).

Total consumption expenditure is defined as the sum of expenditures on all reported food and drink, the value of food eaten outside of the home, expenditures on tobacco, clothing, fuel, services, rent and utilities and other non-food purchases, excluding purchases of durables and luxury goods. To account for the variance in nutritional needs within households we equivalise our consumption measure using the Russian Ministry of Labor equivalence factor of 0.9 for children and 0.63 for pensioners.

Our explanatory variables are defined along two dimensions. They can be 'taste shifter', shock or response variables and they can be individual or household level variables. As individual 'taste shifters' we include controls for age, gender and marital status; at the household level we control for the highest educational achievement of the household head, for the demographic composition of the household, and for the region and settlement type in which the household resides. We also include a control capturing the poverty status of the household in the previous round since we might expect that wealthier households might experience larger welfare losses (gains) during downturns (upturns) compared to those with low starting positions. To capture the aggregate shock we include a dummy variable for the incidence of the shock.

Our idiosyncratic shocks consist of three qualitative dummy variables for wage arrears, unemployment and unpaid leave that take a value of one where the individual experiences the phenomena in round *t,* when they didn't in round *t-1*, and 0 otherwise. Finally, our household level response or 'coping' variables include levels and changes in home production, capital and assets, inter-household transfers, transfers from charitable organizations and the formal social safety net. In order to test Clarke's hypothesis that increases in home production do not impact upon cash expenditure we create separate variables for home production increases in urban and non-urban areas. Following a similar logic to that motivating inclusion of 'enter into unemployment' as one of the idiosyncratic shocks, we also include an individual level dummy variable – 'enter work' – as an idiosyncratic 'coping mechanism'. Table 2 contains definitions and descriptive statistics of the variables used in this study.

[TABLE 2 HERE]

Before turning to our econometric estimates it is worth reflecting briefly on which categories of individual and household suffer the most significant consumption changes and how this relates to the poverty incidence for the particular category. Table 3 provides this snapshot of the distribution of welfare changes and of poverty incidence. It is clear from this that vulnerability and poverty are two distinct but related phenomena. Indeed, as one might expect, those previously in poverty are less vulnerable to consumption changes than those previously above the poverty line. More significantly, while pensioner households (type 2) face very low levels of poverty they are also vulnerable to consumption changes. Notwithstanding these observations, there are cases where the vulnerable appear to be poor and the poor vulnerable. Specifically, households with large numbers of children face remarkably high levels of poverty and also experience large average consumption declines. Similarly, unmarried individuals are both more

vulnerable and more prone to poverty. By way of contrast, although the correlation between changes in consumption and individuals in households with university-educated heads is not statistically significant at conventional levels, they appear to be less vulnerable and less likely to experience poverty. These simple correlations point to some interesting patterns but a more rigorous and multivariate treatment is needed to understand the nature of vulnerability across the distribution. We turn to this next.

[TABLE 3 HERE]

4. Results

We initially estimated equation (3) to test the covariance of income and consumption changes and find (but do not report) that, as in Skoufias (2003), β is positive and significant suggesting rejection of the complete insurance model. We then supplant income change with the combination of idiosyncratic shocks and household coping mechanisms and turn to our estimate of equation (2) detailed in table 4. The effects of the regressors vary substantively across the consumption change distribution indicating that the traditional OLS method is less informative than the QRM approach used here. In interpreting the tables note that the 10^{th} (90^{th}) quantile refers to the largest decreases (increases) in consumption and that a positive estimated coefficient is interpreted as offsetting negative consumption changes and hence implying that individuals endowed with that characteristic are less vulnerable.

[TABLE 4 HERE]

Looking briefly at our OLS results, from table 4, we find evidence that married females in non-rural households, headed by well educated individuals with few children are less vulnerable and that those already below the poverty line did not experience the largest consumption falls.

Unsurprisingly, we find that the macro shock had a major negative impact on consumption change but also that those individuals encountering the crisis through the experience of entering unemployment or wage arrears were also more vulnerable. When we look at the effects of 'coping' we observe that those able to increase their pension income, their capital income and income from relatives were less vulnerable. Interestingly, we also find that only individuals in urban areas increasing home production were helped in increasing their cash consumption, even when controlling separately for settlement type. The former result is an interesting contrast with that of Clarke (2002) who, finding no relation between home production and cash spending among urban households, argues that home production is a cultural legacy rather than a 'coping mechanism' for most Russians. Our results indicate that home production provides an important welfare buffer for Russia's urban households. Finally, the OLS estimates also detail the positive effects on welfare both of being in the labour market and of entering the labour market since the last observation.

In sum, the OLS regressions highlight the importance of the aggregate shock, of particular 'taste shifters' and of both idiosyncratic shocks and coping responses. To see how these effects vary over the distribution of consumption changes we now focus on the results of the quantile regressions.

Starting with the individual 'taste shifters', there are three findings of note. First, the changes in sign across the distribution and the marginally significant negative coefficient on age at the 25th quantile provide some limited evidence that older individuals are more vulnerable toward the lower end of the distribution. The OLS finding that males are more vulnerable seems to be

driven by consumption increases at the 90th quantile, suggesting that among those able to increase consumption the most, being male is a disadvantage. More concretely, toward the bottom of the distribution being married eases vulnerability, indicating that struggling individuals are able to manage resources more effectively as a family unit in order to stave off the worse effects of economic shocks. This effect is strong at the 10th and 25th quantiles.

In terms of human capital, it was clear from the OLS estimates, that households with university-educated heads are less vulnerable but the QRM results show that this effect arises because of the ability of these households to withstand the most severe consumption shocks. The other human capital variables are less straightforward to interpret. Among the households with the largest increases in consumption having a household head with complete high school education, technical/medical education or vocational education provides an advantage compared with basic education. However, in the lower quantiles the signs on these variables are negative, though never strongly significant. Despite this caveat, overall the education variables provide a degree of support for the 'Schultz hypothesis' (Schultz, 1970) that more educated households are more adaptable in the face of economic problems.

A further household characteristic we incorporate relates to the poverty status of the household in the previous round. What emerges is that, from the 25th quantile upwards, households below the poverty threshold in the previous round are less vulnerable to consumption changes during this period. That is, among the less vulnerable, being poor in the previous round is associated with bigger consumption increases since that round. Those already in poverty have low consumption by definition and therefore, *ceteris paribus*, it is no surprise that they are less vulnerable. Indeed,

this is perfectly consistent, with the finding of Lopez (2003) that (a) financial crises generally hit the non-poor more but that (b) this is of scant consolation in the face of rising poverty levels and declining growth. Nevertheless, it is indicative of substantial welfare churning.

Our household type indicators also reveal interesting differential affects across the consumption change distribution. Children in households increase vulnerability. The effect of having three or more children in the household is negative across the distribution, becoming significant at the 50^{th} quantile and increasing its effect thereafter. The effect of 1 or 2 children is also negative in the upper quantiles of the distribution. It would appear then that the presence of children can act as a brake on consumption smoothing but among the most vulnerable other factors are of greater import.

Turning now to our settlement type indicators, among those experiencing the biggest shocks, being in a non-rural area offers a clear advantage. On the contrary, urban dwellers were less likely to enjoy the biggest increases in consumption. This suggests that the opportunities on offer for welfare smoothing, and thus coping with the severest economic shocks, in urban areas are substantially greater than in rural areas.

We now scrutinize the impact of idiosyncratic shocks and coping responses. There is strong evidence that individuals entering unemployment pose a significant threat to household wellbeing among the most vulnerable households. That is, even controlling for all the modes of survival available to the household, when an individual enters unemployment s/he is unable to cope with severe shocks to consumption. During the late 1990's wage arrears were widespread

so it is interesting to observe that the occurrence of arrears was bad not only for the individual but also for the household. The effect of newly acquired wage arrears was a significant drawback only at the 75th quantile. This suggests that wage arrears acted as a brake on improving living standards, even by the late 1990's, but that other factors were more important for the most vulnerable individuals. Moreover, the problem of wage arrears remains important given that after five years of rapid growth, the 2003 RLMS survey shows that over 10% of workers are still in receipt of arrears and it is not clear whether the problem will re-emerge in the event of future economic disturbances. This factor speaks to the much under researched issue of why certain sectors of the population are unable to exploit the opportunities offered by expanding economies (Ravallion 2004).

With a similar logic, the less prevalent labor market institution to emerge in transitional Russia, that of 'unpaid leave', also acted as a restraint on improving wellbeing among those least vulnerable to shocks. Combined, these results are strongly suggestive of the important role that the labor market plays in transmitting wider economic shocks into the lives of individuals and their families.

We have seen how aggregate shocks are experienced, at least partially, by individuals through their interaction with the labor market but where do individuals and households turn in their efforts to maintain their levels of wellbeing? An obvious source of respite in developed economies arrives in the form of state benefits such as unemployment insurance, child benefit and pensions. In Russia, these institutions are somewhat underdeveloped and underfinanced so

we may expect that other 'coping mechanisms' – particularly those inherited from the Soviet legacy – transpire to be as or more important. This is indeed what we find.

We find that individuals in receipt of pension increases are less vulnerable in the central parts of the distribution. It is also clear that it is increases in pensions that help individuals cope rather than simply being in receipt of pensions. The latter is never a significant benefit and in fact is strongly negative at the 90^{th} quantile. The story regarding other forms of social security is somewhat different. We find no evidence that other forms of social welfare benefits cushion individuals against declining consumption. Therefore, despite being the second largest contributor to household income, changes in social welfare benefits do not appear to be sensitive to changes in consumption. A central target of any welfare system is to act as a buffer against shocks to wellbeing. We find no evidence that, outside of pension payments, the Russian benefit system acts as a safety net for Russian households.

With this mixed testimony on the formal state safety net in mind we turn now to less formal coping mechanisms. Starting with capital and assets it comes as no great surprise to observe that those with higher initial levels were ceded no particular benefit. During this period, the savings and asset-based resources of many Russians became almost worthless. Instead, it is those individuals managing to increase their capital and assets that are shown to be marginally less vulnerable and most strongly so in the lower half of the distribution. In terms of the widely reported informal networks of support the data is mixed. There is no sign in our data that help from charitable and other non-governmental organizations helps to cushion the blows to welfare imparted by economic shocks. Perhaps, these charitable organisations themselves suffer from

concurrent economic shocks. In addition, it seems likely – as indicated by the small contribution to mean income in this data – that most non-governmental organizations are targeting their support at the homeless and other disadvantaged categories falling outside of the mainstream represented by the RLMS sample. By way of comparison it is evident from our data that short-term shocks are buffeted in some circumstances through help received from relatives and friends. The quantile regression results provide evidence that those in receipt of *increased* support from relatives were less vulnerable at the lower end of the distribution. Personal networks matter in Russia.

There is powerful evidence stemming from our results concerning the role of home production. Clarke (2002) argues that, rather than being a specific coping response to economic hardship, the use of home production is predominantly a legacy of the Soviet system. While we do not dispute the relevance of the historical legacy we advance the argument that the utilization of home produce occurs in a way consistent with the principal of 'coping'. Notably, increasing home production, among *urban* households, eases vulnerability decreasingly across the distribution, helping those with the largest fall in welfare the most. For those in rural areas the same effect is not in evidence. In other words, home production in Russia offers urban households with their *dachas* a resource for coping with welfare shocks and allowing increased cash spending, independent of previous usage.

Finally, it is noteworthy that, just as the labor market acts as the funnel directing aggregate shocks towards the individual, it also provides an outlet through which the individual can contribute to household welfare. Those entering work since the previous round contributed to the

revival in consumption welfare of their household but only in the 50th and 75th quantiles. In contrast, those maintaining work status were less vulnerable across the lower and middle sections of the distribution. In short, holding on to your job was vital at the bottom of the distribution, whereas being able to acquire a new job was helpful among those suffering less.

5. Concluding Remarks

Using panel data from the RLMS, in this paper we set out to identify the nature of economic vulnerability in Russia in the late 1990's and early 2000's. We add to the existing literature both through our approach and our findings. Drawing on the theoretical and empirical literature, having rejected the complete insurance model of consumption smoothing, we supplant income changes with idiosyncratic shocks and individual and household 'coping' strategies. We conduct our empirical analysis at the individual level while making adjustment, through equivalence scales, for the fact that individuals live in households with whom they share resources and enjoy economies of scale. Finally, recognising that vulnerability is likely to have different correlates at different parts of the distribution, in addition to OLS, we employ a bootstrapped quantile regression approach, in which we 'cluster' to control for the fact that individuals live in common households.

The OLS estimates highlight the importance of the aggregate shock, of various household and individual level 'taste shifters' and of both idiosyncratic shocks and coping responses but we learn much more from examining the results using QRM. Our findings offer an important reminder of the complex relationship between poverty and vulnerability. Typically, as one would expect, the poor are not the most vulnerable to large changes in consumption. That said, there is

no escaping that certain characteristics (e.g. large numbers of children or less educated household heads) are common to both poverty and vulnerability. Indeed, we find that married individuals and individuals in households with educated heads are less vulnerable particularly at the lower end of the distribution. The latter finding mirrors those of Glewwe and Hall (1998) for Peru and Cunningham and Maloney (2000) for Mexico and offers support for the 'Schultz hypothesis' that with education comes resourcefulness. Our finding that the presence of children in the household is an impediment to consumption smoothing and growth is not good news for Russia in view of its declining population.

We explored a key question regarding the mechanisms through which individuals experience macroeconomic shocks by focusing our analysis on a number of key labor market variables. Individuals entering unemployment faced heightened levels of vulnerability among those experiencing the severest consumption shocks even after allowing for household pooling of resources. Interestingly, the occurrence of wage arrears and unpaid leave did not result in the most vulnerable suffering but instead had significant negative impact on consumption growth among the less vulnerable.

Our results also provide empirical confirmation of a number of hypotheses regarding the issue of 'coping'. Those receiving pension increases are aided in their efforts to smooth welfare in the middle of the distribution but being in receipt of pensions *per* se is not enough to ward off the negative effects of economic downturns. Other forms of social security payments did not reduce individual economic vulnerability. Despite the relatively high weighting of benefit payments in Russian household incomes they are not the buffer that policy makers and households might

desire. Indeed, it transpires that the real welfare buffers lie in less formal institutions. Individuals in households managing to increase their capital and assets or in receipt of help from relatives were significantly less vulnerable in the lower half of the distribution. We also find intriguing evidence regarding the role of home production. It is clear that home production is an important resource for urban Russians. Equally clear is that its value in terms of 'coping' varies across the distribution. Increasing home production, for urban dwellers, aids the most vulnerable the most, and offers proportionately less help to the least vulnerable. Regardless of its historical, political and social roots *urban* Russians do use home production as a resource for coping with economic fluctuations and are likely to continue to do so. This contrasts with earlier findings.

Finally, our study returned to the labor market to ask whether, aside from its transmission of economic shocks, it might also provide a route to lower vulnerability. Indeed it does – those entering employment since the last round boosted welfare in the central part of the distribution, while those at the lower and central quantiles maintaining their employment status proved to be less vulnerable. The labour market is a vehicle for improving and protecting welfare levels within households.

In sum, the welfare of Russian households is affected by the occurrence of economic fluctuations in response to which they are able to protect themselves with varying degrees of success. While some prosper, others fail and Russia appears to be faltering in terms of social and economic cohesion. In this context, various policy messages emerge.

There are strong arguments for careful targeting and indexing of the social safety net provided by the state so that, as a priority, it provides a basis for offsetting welfare declines rather than propagating welfare increases. Leaving households to rely on home production and the help of relatives as short-term buffers does not represent efficient resource use nor lay the foundations for long-term prosperity. Yet no doubt some of these less formal institutions are reflective of long term path dependencies. Even so, it would appear that the current coping mechanisms provide short-run protection but are a constraint on long-run prospects so recognising institutional path dependencies and endeavouring to shape incentives is important. As important, if Russia is to halt its population decline, are policies designed to support families – most particularly those with more than one child.

More optimistic lessons derive from the labor market analysis. The labor market is the transmission mechanism through which individuals feel economic shocks but it is also a potential safety net from shocks and a route to increased wellbeing. Efforts to promote job creation and flexible, efficient labor markets should be supported. There is also much talk in Russia about the declining quality of the education system yet it is quite clear that households governed by heads with high levels of human capital are less vulnerable. Russia's educational heritage should be fought for.

The ability to smooth consumption is important, not only for its immediate buffering effect, but also because it enables individuals and households to pursue longer term strategies that may otherwise be deemed too risky. Currently, Russian's exploit a combination of formal, informal, market and non-market survival strategies but access to these is not strategically targeted or

distributed. This study points out the importance of risk influencing policies designed to lower economic vulnerability. Such policies relate to the labor market, the design of social security provision, the banking sector and the private insurance market.

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Endnotes

[1] See for example, Braithwaite (1999), Ovcharova et al (1998) Falkingham (2001) and Klugman (1997).

[2] See Bradbury, Jenkins and Micklewright (2001).

[3] The standard errors for the quantile regressions are bootstrapped, bias corrected and based on 100 repetitions for data clustered by household.

[4] A potential weakness of the RLMS consumption data is that it is based on recall over the previous week or month rather than on records kept. However, not only are the consumption levels consistent over time relative to reported income, but the information is collected at a similar time of year in each round and so, though we add a note of caution in interpreting our results, we see no reason to believe that any data deficiency is non-random.

[5] We have also tried with other equivalence scales and find little qualitative change in our key results.

[6] Note we also experimented with interacting the aggregate shock dummy with region; replacing region with community (PSU) dummies; and interacting the aggregate shock with community dummies. The results were qualitatively similar and are not reported here.

[7] We make no attempt to measure the level of accumulated wage arrears since the data doesn't identify exactly when the arrears accrued and therefore it is not possible to identify its value in real terms.

[8] Reproducing our estimates without 'levels' does not change the results qualitatively.

[9] Even in urban and metropolitan areas agricultural production for personal consumption (or sale) has always formed a significant part of the resources of Russian households. See Clarke (2002), Seeth et al (1998) and Pallot and Nefedova (2003) for a more detailed discussion.

[10] In view of the well-documented phenomenon of multiple job holding we experimented with an 'additional job' variable as a coping mechanism but found it not to be significant. We also broke down the 'work' variable into individual occupations and though other results remained robust to this alternative we felt that the story was really one of working or not rather than one of particular occupational affiliation. In addition, our procedure removes the problems associated with individuals changing occupation in response to the economic climate.

[11] Payment-in-kind was never a statistically significant variable and was excluded from the regression.

Tables

Table 1: The Russian context

Variable	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
GDP Growth (%)	-12.6	-4.1	-3.6	1.4	-5.3	6.4	10.0	5.1	4.7	7.3
Unemployment (%)	8.1	9.5	9.7	11.8	13.3	12.6	10.4	8.7	7.9	8.4
Inflation (%)	308	197	47.7	14.7	27.7	85.7	20.8	21.5	15.8	12.3
Exchange Rate (%)	3550	4640	5555	5863	21*	24.6	28.2	30.1	31.8	29.4
Consumption (R)	10.7k	8835	7987	n/a	6063	n/a	6737	7861	8255	8561
Income (R)	9439	7091	6831	n/a	5401	n/a	6273	7517	8561	9398
% wage	40.8	42.1	39.1	n/a	36.2	n/a	41.6	46.5	47.6	45.5
% benefits	28.5	28.9	23.7	n/a	26.7	n/a	27.6	28.9	28.7	28.3
% relatives help	5.8	5.5	7.8	n/a	7.0	n/a	6.5	6.0	5.9	6.3
% capital income	2.1	1.6	1.8	n/a	1.7	n/a	1.5	1.1	1.1	1.2
% home prod.	17.1	15.3	18.0	n/a	21.0	n/a	15.7	9.8	10.3	9.6
Real wage/hour (R)	29.7	24.5	24.3	n/a	15.7	n/a	18.1	24.7	27.1	26.7
Wage Arrears (%)	29.6	28.9	44.6	n/a	54.5	n/a	21.3	17.6	15.5	13.6
Unpaid leave (%)	10.0	5.2	6.4	n/a	6.6	n/a	2.5	2.4	2.4	2.2

Notes: R = figures from the RLMS data (there was no RLMS data collected in 1997 or1999). All non % figures given in real 1992 roubles.

* Prior to re-denomination the 1998 exchange rate had depreciated to 6,225.

Table 2: Definition of variables and descriptive statistics

Variable	Definition	Mean and standard deviation
Change in consumption	Change in log consumption	-.030 (.932)
	between 1996 and 1998	-.342 (.913)
	between 1998 and 2000	.266 (.850)
	percentage positive	48.9
Gender	Gender (1 = male; 0 = female)	.408 (.491)
Married	Married (1 = married; 0 = unmarried)	.629 (.483)
HH characteristics		
Education of head		
University	University educated head	.080 (.272)
Tech & Med	Technical/medical education	.094 (.292)
Complete high	Complete high school	.178 (.383)
Incomplete high	Incomplete high school with vocational	.057 (.231)
Base	Incomplete high school maximum	.051 (.221)
Household type		
House type 1	No children, working age household	.294 (.455)
House type 2	No children, pensioner only household	.191 (.393)
House type 3	One child household	.300 (.458)
House type 4	Two child household	.172 (.377)
House type 5	Three child household	.044 (.204)
Poverty in t-1	HH was in poverty in previous round (RLMS subsistence definitions)	.357 (.479)
Dwelling		
Urban	Urban settlement dwelling	.647 (.478)
Rural	Rural settlement dwelling	.306 (.452)
PGT (base)	Rural non-agricultural dwelling	.068 (.251)
Regions		
Region 1 (base)	Moscow and St. Petersburg	.051 (.220)
Region 2	North and north-western	.068 (.252)
Region 3	Central and Central Black Earth	.212 (.409)
Region 4	Volga-Vyatski and Volga Basin	.200 (.400)
Region 5	North Caucasus	.144 (.351)

Region 6	The Urals	.156	(.363)
Region 7	Western Siberia	.091	(.287)
Region 8	Far East and Eastern Siberia	.077	(.266)
Aggregate shocks			
Shock	Dummy for change between 96 and 98	.487	(.500)
Idiosyncratic shocks			
Enter unemployment	Unemployment in 1998 but not in 1996	.059	(.236)
New arrears	Wage arrears in 1998 but not in 1996	.073	(.260)
New leave	Unpaid leave in 1998 but not in 1996	.022	(.146)
Coping mechanisms			
Pension	HH log pension in 1996	2.54	(3.35)
Social security	HH log sum of child and unemployment benefits, stipends, fuel and apartment benefits in 1996	1.39	(2.24)
Capital	HH log sum of assets, investments, rents and bonds in t-1	.124	(.900)
Home	HH sum of home production (livestock and wildfowl sales, plus cash and non-cash values of home produced goods) consumed and sold (where consumed is valued at local prices) in t-1	3.69	(2.75)
Relatives	HH cash and in kind support from friends and relatives (where in kind is valued at local prices) in t-1	1.26	(2.46)
Organisation	Support from other organisations in t-1 e.g. NGO's, charities etc	.136	(.894)
Work	Individual in work in 1996	.572	(.495)
Enterwork	Individual enters into formal work since t-1	.065	(.247)

Table 3: Vulnerability and poverty

Variable	Consumption change	Poverty incidence %
Male	-.0332**	31.78
Female	-.0275**	31.30
Married	-.0246**	29.93
Not married	-.0386**	34.16
Education of head		
University	.0079	19.13
Tech & Med	-.0023	27.69
Complete high	-.0032	39.94
Incomplete high	-.0281	27.19
Base	-.0857*	26.35
Household type		
House type 1	-.0119	31.13
House type 2	-.0471*	8.08
House type 3	.0041	35.72
House type 4	-.0523**	44.71
House type 5	-.2194***	55.67
Not in poverty	-.1134***	21.62
In poverty	.1206***	49.28
Dwelling		
Urban	-.0273**	28.71
Rural	-.0748***	36.49
PGT (base)	.1359***	37.01
Work Status		
Work in t-1	-.0211*	32.55
Not work in t-1	-.0403***	30.24

***/**/* statistically significant correlation at 10/5/1% level; poverty incidence based on the RLMS regional poverty lines; sample size = 9,125

Table 4: Aggregate and idiosyncratic shocks, coping responses and the labour market

	OLS	Q10	Q25	Q50	Q75	Q90
Age	-.0008	-.0017	-.0019**	-.0011	.0013	.0012
	(.0006)	(.0011)	(.0009)	(.0008)	(.0008)	(.0011)
Gender	-.0429**	-.0224	.0376	-.0104	-.0353	-.0783**
	(.0165)	(.0319)	(.0247)	(.0191)	(.0238)	(.0323)
Married	.0462**	.0887**	.0801**	.0149	-.0062	.0131
	(.0192)	(.0415)	(.0294)	(.0240)	(.0266)	(.0351)
University	.0727**	.1469**	.0218	.0556	.0328	.0795
	(.0278)	(.0584)	(.0396)	(.0378)	(.0361)	(.0545)
Tech & Med	.0327	-.0397	-.0463	.0161	.0542	.1299**
	(.0270)	(.0601)	(.0384)	(.0351)	(.0474)	(.0518)
Complete high	.0322	-.0339	-.0520*	.0081	.0701**	.0684*
	(.0224)	(.0454)	(.0328)	(.0240)	(.0322)	(.0374)
Incomplete high	.0526	-.0207	-.0943*	-.0121	.0255	.1797**
	(.0372)	(.0667)	(.0546)	(.0444)	(.0496)	(.0724)
In poverty in t-1	.2014**	.0628	.0903**	.1686**	.2474**	.3242**
	(.0309)	(.0535)	(.0433)	(.0368)	(.0410)	(.0566)
House type 1	.0062	-.1199	-.0713	.0273	.0092	.0527
	(.0350)	(.0856)	(.0513)	(.0459)	(.0521)	(.0709)
House type 3	-.0015	.1018	.0210	-.0094	-.0462	-.1084*
	(.0315)	(.0832)	(.0475)	(.0389)	(.0528)	(.0606)
House type 4	-.0349	.1385	.0301	-.0252	-.1002*	-.1790**
	(.0372)	(.0905)	(.0524)	(.0465)	(.0643)	(.0749)
House type 5	-.2022**	-.0856	-.1869	-.2360**	-.2075**	-.3031**
	(.0769)	(.1246)	(.1453)	(.0963)	(.1024)	(.1627)
Urban	.0553*	.3401**	.1939**	.0293	-.0425	-.1650**
	(.0293)	(.0687)	(.0499)	(.0358)	(.0448)	(.0671)
PGT	.1841**	.2516**	.2374**	.1451*	.1852*	.1385
	(.0577)	(.1130)	(.0781)	(.0861)	(.1103)	(.1104)
Shock	-.5923**	-.6730**	-.6451**	-.5830**	-.5367**	-.4956**
	(.0329)	(.0544)	(.0421)	(.0356)	(.0400)	(.0493)
Enter unemployment	-.1130**	-.1227**	-.1726**	-.0663	-.0500	-.0910
	(.0394)	(.0616)	(.0569)	(.0543)	(.0431)	(.0653)
New arrears	-.0627*	.0338	-.0242	-.0375	-.0816*	-.0607
	(.0378)	(.0781)	(.0439)	(.0358)	(.0504)	(.0549)
New leave	-.0609	-.0171	.0768	-.0320	-.1606**	-.1425
	(.0556)	(.1161)	(.0628)	(.0545)	(.0636)	(.1207)
Pension	.0011	.0042	.0082	.0010	-.0077	-.0199**
	(.0049)	(.0115)	(.0063)	(.0060)	(.0067)	(.0089)
Δ pension	.0179**	.0174	.0157*	.0160*	.0158*	.0069
	(.0068)	(.0110)	(.0089)	(.0082)	(.0092)	(.0114)
Social	.0111	.0171	.0152	.0099	.0043	-.0137
	(.0070)	(.0141)	(.0111)	(.0091)	(.0114)	(.0131)
Δ social	.0060	.0087	.0103	.0112	.0034	-.0110
	(.0063)	(.0130)	(.0083)	(.0073)	(.0078)	(.0104)
Capital	.0057	.0339	.0078	-.0092	.0041	.0257
	(.0176)	(.0418)	(.0214)	(.0194)	(.0240)	(.0303)
Δ capital	.0323**	.0520*	.0350**	.0156	.0124	.0375
	(.0151)	(.0309)	(.0173)	(.0132)	(.0220)	(.0274)

Home	.0075	.0178*	.0119	-.0019	.0105	.0143
	(.0047)	(.0091)	(.0084)	(.0055)	(.0068)	(.0098)
Δ home	.0184**	.0243**	.0209**	.0157*	.0168**	.0140
	(.0071)	(.0018)	(.0095)	(.0088)	(.0083)	(.0105)
Δ rural_home	-.0116	-.0652*	-.0163	-.0129	.0111	-.0019
	(.0172)	(.0334)	(.0224)	(.0157)	(.0148)	(.0258)
Relatives	.0063	.0184	.0047	.0028	.0105	.0096
	(.0058)	(.0114)	(.0081)	(.0067)	(.0078)	(.0112)
Δ relatives	.0123**	.0300**	.0155**	.0082	.0108	.0036
	(.0061)	(.0104)	(.0065)	(.0057)	(.0079)	(.0086)
Organisations	-.0178	.0025	-.0176	-.0279	-.0062	.0295
	(.0180)	(.0465)	(.0218)	(.0225)	(.0318)	(.0302)
Δ organisations	.0068	.0084	.0003	.0020	.0113	.0171
	(.0155)	(.0308)	(.0184)	(.0176)	(.0209)	(.0247)
In work in t-1	.0551**	.0670*	.0626**	.0416*	.0405*	-.0087
	(.0219)	(.0410)	(.0279)	(.0237)	(.0253)	(.0351)
Enter work	.0899**	.0438	.0543	.0718*	.1206*	.0760
	(.0399)	(.0789)	(.0569)	(.0431)	(.0639)	(.0589)

Quantile regressions clustered by family id., standard errors in parentheses; sample size = 9,125.
** (*) Variable significant at 5% (10%) or significant in bias corrected bootstrap estimates where bias is below 25%.

Omitted categories are: 'Basic education only'; 'Households with working age adults but no children'; 'Rural' and 'Moscow/St. Petersburg'.

Constant and regional dummies were also included but not reported. Apart from the constant (in some quantiles), these other variables were found not to show significant patterns, though those in Moscow/St. Petersburg do less well at the 90th quantile. Full results are available from the authors on request.