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Abstract:

Applying bootstrapped quantile regression to the Russian Longitudinal Monitoring Survey (RLMS) data, we examine the channels through which individuals experience and seek to cope with changes in consumption. We find that married individuals living in small households, with educated heads in urban areas are better equipped to smooth consumption. Investigating the impact of idiosyncratic shocks, we find that the labour market is an important transmission mechanism allowing households to smooth their consumption but also exposing them to risk, mainly through job loss. Outside of pension payments the formal social safety net does not facilitate consumption smoothing, thus heightening the importance of informal coping institutions. It transpires that both support from relatives/friends and home production act as important insurance mechanisms for the most vulnerable.

Key Words: Russia, economics, vulnerability, consumption smoothing, quantile regression.

JEL Codes: I31, P20

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Non-technical summary:

The process of economic transition in the countries of the post-socialist world has produced a wealth of literature on the socioeconomic consequences of reforms. In particular, for Russia, there have been a number of studies reporting the extent and incidence of ‘low welfare’. However, relatively little of this literature has addressed the manner in which populations, faced by aggregate economic shocks, actually experience and respond to the changing economic environment in which they find themselves. The wider economics literature meanwhile has developed and refined theoretical frameworks and appropriate datasets necessary to understand more about household behaviour under risk. In this paper we contribute to the expanding literature by furthering our understanding of how economic shocks play out in the largest of the so-called ‘transition’ countries.

Applying the conventional consumption smoothing framework to the data of the Russian Longitudinal Monitoring Survey we seek to better understand how shocks to income are transferred into changes in consumption and how the ability and means to smooth consumption differs both across households as well as across the consumption change distribution. In particular, we ask: 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 1990s and early 2000s. 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 and to inequality and well being.

We find that, in terms of characteristics that ease vulnerability, married individuals living in small households, with educated heads, in urban areas are better

equipped to smooth consumption. We then investigate the impact and role of idiosyncratic shocks and coping strategies as they pertain to (i) the labour market, (ii) the formal social safety net and (iii) informal support networks. We find that the labour market is an important transmission mechanism allowing households to smooth their consumption but also exposing them to risk through job loss, wage arrears and unpaid leave. Outside of pension payments the formal social safety net does not facilitate consumption smoothing, thus heightening the importance of informal coping institutions (and of the need for policy reform). It transpires that both support from relatives/friends and home production act as important insurance mechanisms for the most vulnerable. Most notably, the latter is only true for urban households. In contrast with previous findings, it would seem that regardless of its historical, political and social roots, the garden plots and dachas, often romanticized in Russian literature do provide a means by which *urban* Russians are able to cope with economic fluctuations. We finish by stressing the important policy lessons for Russia's developing market economy.

1. Introduction

The increased availability of longitudinal data at the household level alongside advances in econometric techniques has spurred interest in the dynamics of income and consumption in the context of theoretical models of household behaviour under risk. Much of this interest has been focused on developing countries and the emerging consensus, that those suffering from low absolute levels of well being also suffer from welfare fluctuations, has produced a concentration of research seeking to understand the concept of economic ‘vulnerability’ (see Kamanou and Morduch (2004), Kochar (1995), Ravallion and Chaudhuri (1997), Townsend (1994)). In this paper, in applying quantile regression techniques to longitudinal data from a transition economy (Russia), we investigate how shocks to income are transferred into changes in consumption and how the ability and means to smooth consumption differs across households and across the consumption change distribution.

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. Moreover, while

the years since 1998 have seen the implementation of some important economic reforms alongside rapid economic growth, as Gaidar (2006) argues, a dramatic change in world commodity prices alongside a relaxing of economic policy could quite plausibly see the return of major economic instability in Russia.

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 experiencing asset depreciation. The particular responses that these shocks evoke 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 6 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.

[TABLE 1 HERE]

These preliminary observations prompt a number of questions defining 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 and to inequality and well being.

There have been a number of studies reporting the extent and incidence of ‘low welfare’ in transitional Russia¹, including some relating to the 1998 financial crisis, but few have studied how the Russian population experiences and responds to periods of

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

economic crisis and thus little is known of vulnerability in Russia. 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 for urban residents. Manning and Tikhonova (2004), employing a sociological approach, investigate the notion of social exclusion in Russia around the time of the financial crisis. They identify both key individual household characteristics that ‘predetermine’ the response of the household and the importance of informal networks in attenuating social exclusion.

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 a time period characterised by enormous macroeconomic turbulence – namely, the 1998 financial crisis and subsequent period of rapid recovery.

The way different individuals experience and react in periods such as this is an important policy question so we provide the first comparison for Russia of the effects of and responses to income fluctuations across the conditional distribution of consumption changes. In this, we apply Quantile Regression Methods (QRM) as proposed by Koenker and Bassett (1982). Further, as suggested by a growing literature (see Hoddinott (2006) and references therein), 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. 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 pertaining to home production with those of Clarke (2002). That is, we are concerned with the ability of Russian households to smooth fluctuations in their *cash* spending.

Applying bootstrapped quantile regression to data from the Russian Longitudinal Monitoring Survey (RLMS) we examine the channels through which individuals experience and seek to cope with changes in income. In so doing we reveal something of the nature of economic vulnerability in contemporary Russia. In terms of characteristics

that ease vulnerability, we find that married individuals living in small households, with educated heads, in urban areas are better equipped to smooth consumption. We then investigate the impact and role of idiosyncratic shocks and coping strategies as they pertain to (i) the labour market, (ii) the formal social safety net and (iii) informal support networks. We find that the labour market is an important transmission mechanism allowing households to smooth their consumption but also exposing them to risk through job loss, wage arrears and unpaid leave. Outside of pension payments the formal social safety net does not facilitate consumption smoothing, thus heightening the importance of informal coping institutions. It transpires that both support from relatives/friends and home production act as important insurance mechanisms for the most vulnerable. Most notably, the latter is only true for urban households. In contrast with previous findings, it would seem that regardless of its historical, political and social roots, the garden plots and dachas, often romanticized in Russian literature do provide a means by which *urban* Russians are able to cope with economic fluctuations. 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 wellbeing. 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 or, more simply, the World Bank (2000) defines it as “the likelihood that a shock will result in a decline in well-being”. Hoddinott and Quisumbing (2003) identify three empirically realisable categories of vulnerability measurement consistent with this concept:

- a) Vulnerability to expected poverty (an ex ante measure) i.e. a positive probability that a household will fall below the ‘poverty line’ in some future period. Chaudhuri et al (2001), Pritchett et al (2001) and Mansuri and Healy (2000) all undertake work in this spirit.
- b) Vulnerability as low expected utility (an ex post measure) 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 alternative ex post assessment of welfare loss arising from the onset of an economic shock (Glewwe and Hall (1998), Maloney et al (2004) 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 or the inability to effectively manage risk when subjected to shocks. Risks to economic well being come in many different guises. On the one hand aggregate or covariant shocks, such as earthquakes, harvest failures or the closure of the factory in a single company town, typically affect all households within a community or region. In 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.

In any event, in our framework, without effective risk management tools, shocks in whatever form, impose a welfare loss to the extent that they are associated with a fall in consumption. That is, 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. 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, therefore 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) as well as the final outcome (change in welfare).

To obtain an estimable form of this concept of vulnerability we take observed consumption as our proxy for welfare, and consider how far individuals are able to smooth consumption. 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 to briefly review the standard problem of consumption optimisation in a model *with* complete insurance (Deaton 1997).

Take a community of households (v), all facing the same uncertainty about the state of the world. Combining to provide an optimal mutual insurance scheme, each household (h) 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. Assuming an isoelastic utility function (where ρ is the relative risk aversion coefficient), 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:

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

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, for Russia (see below) and elsewhere, 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 investigate the impact on consumption changes 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

Defining $\Delta \ln(C_t^{hv})$ as the change in log consumption per capita of household h , in community v , during time period t (i.e. between round t and $t-1$), D_t^v as the survey round/community interaction dummy controlling for community wide aggregate shocks and Δy_t^{hv} as the change in log income per capita of household h , in community v , during time period t . Further, let $S(i)_t^{hv}$ capture the idiosyncratic shocks experienced by the household and X^{hv} be all household or household head characteristics such as education and gender, representing the household ‘taste parameters’ from equation (1). Denoting δ , γ , β and λ as parameters to be estimated and $\Delta \varepsilon_t^{hv}$ as a household-specific error term picking up changes in the unobservable components of household preferences, most empirical specifications of equation (1) take one of the following forms (Hoddinott and Quisumbing (2003)), differing only in their representation of shocks:

$$\Delta \ln(C_t^{hv}) = \alpha + \sum_i \lambda_i D_t^v + \beta S(i)_t^{hv} + \gamma X^{hv} + \Delta \varepsilon_t^{hv} \quad (2)$$

or

$$\Delta \ln(C_t^{hv}) = \alpha + \sum_i \lambda_i D_t^v + \beta \Delta y_t^{hv} + \gamma X^{hv} + \Delta \varepsilon_t^{hv} \quad (3)$$

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 $S(i)_t^{hv}$ term separately while capturing covariant shocks

in the D_t^v term. 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_t^{hv} poses problems in terms of measurement error and endogeneity bias, prompting the use of instruments to proxy for income. However, since the idiosyncratic shocks themselves are the only obvious instruments, the advantage of using (3) over (2) becomes less clear. Moreover, 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.

Our strategy, using longitudinal Russian household data from a period incorporating the 1998 financial crisis, is to implement a version of equation (2) including both idiosyncratic shocks and household coping strategies. We control for the impact of the regionally variable aggregate shock, through the community-time interaction dummy, but our proxy for the idiosyncratic income shock from equation (3) speaks 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 give rise to 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 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 analysis², we estimate the 10th, 25th, 50th, 75th and 90th quantiles³.

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

² See Bradbury et al (2001) for a discussion regarding the use of the individual or the household as unit of analysis.

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

these important questions, but our data provides a strong indication that during this period there was a large, significant fall in mean incomes as well as the widespread occurrence of idiosyncratic shocks and changes in the utilisation of formal and informal coping strategies (see table 1) and is therefore well suited to investigating consumption smoothing.

Total consumption expenditure is defined as the sum of *cash* expenditures on all reported food and drink, expenditures on tobacco, clothing, fuel, services, rent and utilities and other non-food purchases, excluding purchases of durables and luxury goods⁴. To account for the variance in nutritional needs within households we equivalise our consumption measure using the Russian Ministry of Labour equivalence factor of 0.9 for children and 0.63 for pensioners⁵.

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 at the start of the period, 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 settlement type in which the household resides. To capture the

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 without equivalising and find little qualitative change in our key results.

aggregate shock we include a community (primary sampling unit) - time interaction dummy reflecting the downturn between the 1996 and 1998 observations.

Our idiosyncratic shocks consist of two qualitative labour market dummy variables for wage arrears or unpaid leave, and for unemployment. These variables assume a value of one where the individual experiences the phenomena in round t , when they didn't in round $t-1$, and 0 otherwise⁶. Finally, our household level response or 'coping' variables include changes in the value of home production, capital and assets, inter-household transfers, transfers from charitable organizations and the formal social safety net⁷. In order to better test Clarke's conjecture that increases in home production do not impact upon cash expenditure we create separate variables for home production increases in urban and non-urban areas⁸. 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'⁹. Table 2 contains definitions and descriptive statistics of the variables used in this study.

⁶ 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. Instead we combine it with 'unpaid leave' to try and capture informal labour market mechanisms resulting in 'shocks' to income.

⁷ We additionally ran the estimates with 'initial levels' of the coping variables and find that all results hold.

⁸ 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.

⁹ 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

[TABLE 2 HERE]

4. Results

Prior to presenting our results it is worth briefly reflecting again on the complexity of empirically capturing vulnerability. Hoddinott and Quisumbing (2003) discuss potential problems stemming from endeavours to empirically assess vulnerability. Besides having an operational definition of vulnerability, a related problem is how to classify shocks and their impact across individuals and households. A further problem concerns the endogeneity associated with attempts to identify the drivers of consumption change.

In part, we address the first problem through our use of quantile regression techniques that enable us to examine the full conditional distribution of consumption changes and to identify differences in the vulnerability ‘experience’ at different parts of the distribution. In order to assess and limit the possibility of endogeneity bias we take a number of precautionary steps¹⁰. We initially estimate our OLS and quantile regressions based only on the taste shifter variables before adding other explanatory variables in a step-wise manner to explore the impact their inclusion has on the estimated coefficients and standard errors. On no occasion do the qualitative results change in our stepwise addition of coping strategy and idiosyncratic shock variables¹¹.

¹⁰Practical estimation and inference methods for instrumental quantile regressions are complex and subject matters of recent research. See for example Chernozhukov and Hansen (2006).

¹¹For ease of exposition, the results of the regressions are not reported in the paper but available upon request.

Firstly, we estimate equation (3) to test the covariance of income and (cash) consumption changes, we find 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) which we report in table 3.

[TABLE 3 HERE]

The pooled OLS indicates that males, individuals in households with 3 or more children, those entering unemployment or experiencing another labour market shock are more vulnerable to negative consumption changes. On the other hand, being married, having a higher level of education, being in non-rural areas, finding a job and experiencing increases in household pension payments, capital, help from relatives or home production reduces consumption vulnerability. These results are intuitively expected and consistent with those found for other countries (see Glewwe and Hall (1998), Mansuri and Healy (2000) and Maloney et al (2004) – human capital, residence in urban areas, access to formal and informal safety nets and the labour market all attenuate vulnerability.

We now turn to the results from applying quantile regression techniques. As expected, 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 10th (90th) quantile refers to the largest decreases (increases) in consumption and that a positive estimated coefficient

is interpreted as offsetting negative consumption changes hence implying that individuals endowed with that characteristic are less vulnerable.

Looking first at 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 10th and 50th quantiles provide some limited evidence that older individuals are more vulnerable toward the lower end of the distribution i.e. among those experiencing negative consumption shocks. The (OLS) observation that males are more vulnerable seems to be driven by an association with consumption increases – indeed, at the 25th quantile, being male attenuates vulnerability. 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, becoming less strong and ultimately of negative sign as we progress through the distribution.

Our household type indicators lend some support to the ‘family unit’ thesis in revealing interesting differential affects across the consumption change distribution. The presence of children in households has a positive impact on vulnerability among those most affected by consumption falls but the effect is by no means linear. For households with 3 or more children, the impact is negative across the distribution and significantly so at the 50th quantile. We interpret these results as evidence that larger and younger

households are potentially more adaptable in the face of shocks up to some point, at which children become ‘costly’.

In terms of human capital, the OLS estimates indicate that households with university-educated heads are less vulnerable in aggregate. The QRM results show that this effect is driven by those individuals able to smooth or marginally increase consumption. A similar finding pertains to ‘complete high school’ education. That is, there is little evidence that education in contemporary Russia is important for those suffering the biggest falls in consumption. On the contrary, human capital of this sort only proves useful for those experiencing positive shocks. This finding is suggestive of an interesting reinterpretation of the ‘Schultz hypothesis’ (Schultz, 1975) that more educated households are more adaptable in the face of economic problems. In Russia, it would seem that being endowed with human capital does indeed reduce vulnerability but the effect is not even along the consumption change distribution.

With regard to settlement type indicators, among those experiencing the largest decreases in consumption, being in a non-rural area offers a clear advantage. This indicates 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. The effect is strongest at the 10th quantile, reducing progressively across the consumption change distribution.

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. Although the 2003 RLMS survey shows that over 10% of workers are still in receipt of arrears, the effect of newly acquired wage arrears and unpaid leave was a significant drawback only at the 75th quantile although with the anticipated sign at all quantiles. Notwithstanding this, given how widespread wage arrears were in the 1990's, it is interesting to observe that the occurrence of arrears was bad not only for the individual but also for the household.

We have seen, at least partially, how aggregate shocks are experienced by individuals through their interaction with the labour market, but where do individuals and households turn to 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 were and remain 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.

We find that individuals in receipt of pension increases are less vulnerable across the consumption change distribution except at the 10th quantile, where the sign remains

positive. 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, though the sign is as we would expect. So, despite being the second largest contributor to household income, changes in social welfare benefits, outside of pension payments, 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 so it is of particular concern that the Russian benefit system seems ill equipped to perform the role of safety net. This provides important food for thought in the context of ongoing social welfare system reforms currently stalling under Vladimir Putin.

With this mixed testimony on the formal state safety net in mind we turn now to less formal coping mechanisms. During this period, the savings and asset-based resources of many Russians were wiped out but those individuals managing to increase their capital and assets are shown to be less vulnerable in general but not significantly so except at the 25th and 90th quantiles. In terms of the widely reported informal networks of support the data is mixed. There is no evidence that help from charitable and other non-governmental organizations helps to cushion the blows to welfare imparted by economic shocks although the sign is as expected¹³. 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. In contrast, 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

suggesting that, for the most vulnerable, personal networks are an important form of insurance.

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. Specifically, Clarke argues that home production had no impact on the money spending on food of urban households. While we do not dispute the relevance of the historical legacy we advance the argument that the practice of home production occurs in a way consistent with the principal of ‘coping’. Notably, increasing home production, among *urban* households facilitates smoothing of cash expenditure across the lower quantiles (10th, 25th and 50th). Comparing this with the interactive term for those in rural areas the same cannot be said since across the lower quantiles the sign is negative, though only significantly so at the 10th quantile. Aggregating the coefficients, we therefore find that, for the most vulnerable, home production is actually associated with significantly steeper falls in consumption. In other words, home production in Russia offers the more vulnerable *urban* households a means of coping with shocks and smoothing their consumption expenditure and thus welfare. In contrast, increasing home production in rural areas does not facilitate consumption smoothing and instead would appear to be an outcome foisted on those households experiencing the harshest consumption declines.

Finally, it is noteworthy that, just as the labour 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. Entering work (since the previous round) lowers vulnerability but it is only significant from the 50% quantile onwards.

5. Concluding Remarks

Using longitudinal data from the RLMS, we apply bootstrapped quantile regression techniques to investigate how shocks to income are transferred into changes in consumption and how the ability and means to smooth consumption differs across households and across the consumption change distribution. In so doing we reveal something of the nature of economic vulnerability in contemporary Russia.

We find that, among the most vulnerable, individuals who are married and live in households with one or two children are better equipped to smooth consumption than small households or those with 3 or more children. In contrast, more traditional measures of human capital show that education is a useful characteristic but not among those at the lower end of the distribution. The latter finding is not inconsistent with Glewwe and Hall (1998) for Peru or per se with the ‘Schultz hypothesis’, that with education comes resourcefulness, but it does flag up the value of the quantile regression approach.

Our most interesting and important results derive from our analysis of idiosyncratic shocks and coping strategies along three dimensions: the labour market; the formal social safety net; and informal support networks. Unsurprisingly we find that 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. Equally unsurprisingly, households containing individuals entering the labour market are well equipped to smooth consumption. The value of a well-functioning labour market is paramount.

With social security reform currently stalling in Russia, this is an opportune time to contemplate the role played by the social safety net. On pensions, we find that individuals in receipt of pension increases are less vulnerable across the consumption change distribution except at the 10th quantile, where the sign remains positive. This is reassuring and perhaps a reminder of the ongoing political power that the pensions lobby maintains in contemporary Russian society. The story regarding other forms of social security is less comforting since we find no suggestion that these forms of social welfare benefit (including childcare allowances, unemployment benefits and disability benefits) cushion individuals against declining consumption.

It would seem that for those most in need of support access their welfare insurance through informal institutions. First, personal networks are shown to be important for the most vulnerable.

Those in receipt of increased support from relatives were better able to smooth consumption at the lower end of the distribution. Taken together, this provides support for the findings of Manning and Tikhonova (2004) regarding social exclusion. Specifically, the social resources available to many Russians serve an important role but in the absence of an effective social welfare safety net what becomes of those unable to access social networks.

Of equal importance for many Russians – urban and rural – is their capacity for home production. Most notably, and distinct from earlier findings (Clarke, 2002) increasing home production, among *urban* households, allows the most vulnerable to smooth their cash spending. 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. In contrast, increasing home production in rural areas does not facilitate consumption smoothing and instead would appear to be the only option available. Perhaps this suggests an important difference between a ‘coping’ strategy and a ‘survival’ strategy. Urban Russians use their garden plots as part of the former, while for rural Russians they lie at the heart of the latter. This merits further investigation.

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. 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 multiple children.

More optimistic lessons derive from the labour market analysis. The labour 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 well being. Efforts to promote job creation and flexible, efficient labour 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 better equipped to prosper. 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 coping strategies but access to these is not strategically targeted or distributed. This paper speaks to the importance of risk influencing policies designed to lower economic vulnerability. Such policies relate to the labour market, the design of social security provision, the banking sector and the private insurance market.

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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 or 1999). 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(base)	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)
Dwelling		
Urban	Urban settlement dwelling	.647 (.478)
Rural (base)	Rural settlement dwelling	.306 (.452)
PGT	Rural non-agricultural dwelling	.068 (.251)
Aggregate shocks		
Shock	Dummy for change between 96 and 98	.487 (.500)
Idiosyncratic shocks		
Enter unemployment	Unemployment in t but not in $t-1$.059 (.236)
Arrears/Leave	Wage arrears or unpaid leave in t but not in $t-1$.073 (.260)
Coping mechanisms		
Δ Pension	Change in household log pension since $t-1$.683 (2.68)

Δ Social	Change in household child plus other social benefits since <i>t-1</i>	.100 (2.56)
Δ Capital	Change in household log sum of assets, investments, rents and bonds since <i>t-1</i>	-.012 (1.15)
Δ Home	Change in household 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) since <i>t-1</i>	.041 (1.98)
Δ Relatives	Change in household cash and in kind support from friends and relatives since <i>t-1</i>	-.044 (2.73)
Δ Organisation	Change in household support from other organisations since <i>t-1</i> e.g. NGO's, charities etc	-.012 (1.15)
Enterwork	Individual enters into formal work since <i>t-1</i>	.065 (.247)

Table 3: Aggregate and idiosyncratic shocks, coping responses and the labour market

	OLS	Q10	Q25	Q50	Q75	Q90
Age	-.0009 (.0006)	-.0018* (.0011)	-.0010 (.0008)	-.0017* (.0008)	.0001 (.0008)	.0005 (.0010)
Gender	-.0428*** (.0162)	-.0026 (.0282)	.0444* (.0202)	-.0293* (.0184)	-.0569** (.0208)	-.0867** (.0326)
Married	.0401** (.0179)	.0742* (.0373)	.0624** (.0239)	.0137 (.0205)	-.0082 (.0214)	-.0432 (.0384)
University	.0636** (.0271)	.0195 (.0488)	.0136 (.0334)	.0569* (.0290)	.0568* (.0324)	.0852 (.0490)
Tech & Med	.0385 (.0268)	-.0158 (.0512)	-.0409* (.0307)	.0333 (.0316)	.0466 (.0405)	.1188 (.0699)
Complete high	.0494** (.0217)	-.0038 (.0352)	-.0420* (.0282)	.0421* (.0229)	.0605** (.0250)	.0857* (.0371)
Incomplete high	.0565 (.0367)	-.0744 (.0724)	-.0566 (.0451)	.0430 (.0388)	.0567 (.0426)	.1019* (.0654)
House type 1	-.0262 (.0324)	-.0583 (.0768)	-.0121 (.0466)	.0132 (.0404)	-.0343 (.0441)	.0010 (.0696)
House type 3	.0271 (.0306)	.1265* (.0663)	.0664 (.0416)	.0227 (.0349)	-.0199 (.0381)	-.0521 (.0618)
House type 4	.0096 (.0354)	.1519** (.0730)	.0987* (.0500)	.0298 (.0432)	-.0061 (.0496)	-.0972 (.0695)
House type 5	-.1577* (.0829)	-.1883 (.1329)	-.2249 (.1486)	-.2020** (.0936)	-.1149 (.0859)	-.0916 (.0266)
Urban	.1392*** (.0492)	.4957** (.1292)	.3087** (.0736)	.1466** (.0611)	-.0888 (.0648)	-.2105** (.1024)
PGT	.2505*** (.0662)	.2964** (.1166)	.2596** (.0884)	.2429** (.0778)	.2051* (.1067)	.1080 (.1468)
Shock	-.6155*** (.0335)	-.6693** (.0572)	-.6569** (.0401)	-.5991** (.0370)	-.5647** (.0377)	-.5680** (.0550)
Enter unemployment	-.1054*** (.0398)	-.1275** (.0620)	-.1446** (.0522)	-.0652 (.0649)	-.0414 (.0438)	-.0706 (.0627)
Arrears/Leave	-.0717** (.0346)	-.0511 (.0537)	-.0255 (.0423)	-.0635 (.0340)	-.0850** (.0374)	-.0827 (.0526)
Δ pension	.0228*** (.0061)	.0095 (.0098)	.0123* (.0078)	.0222** (.0070)	.0224** (.0077)	.0257** (.0096)
Δ social	.0024 (.0055)	-.0095 (.0103)	.0041 (.0062)	.0060 (.0054)	.0029 (.0062)	.0031 (.0087)
Δ capital	.0356*** (.0134)	.0328 (.0287)	.0323* (.0151)	.0292 (.0155)	.0204 (.0138)	.0578** (.0164)
Δ home	.0179*** (.0069)	.0188* (.0119)	.0209** (.0094)	.0201** (.0093)	.0109 (.0068)	.0106 (.0097)
Δ rural_home	-.0105 (.0176)	-.0716** (.0258)	-.0210 (.0216)	-.0018 (.0169)	.0031 (.0176)	.0063 (.0268)
Δ relatives	.0103* (.0055)	.0149* (.0086)	.0118* (.0065)	.0032 (.0059)	.0012 (.0071)	.0096 (.0080)
Δ organisations	.0157 (.0133)	.0056 (.0203)	.0116 (.0131)	.0189 (.0138)	.0152 (.0165)	.0112 (.0171)
Enter work	.0893** (.0377)	.0373 (.0533)	.0466 (.0561)	.0755** (.0360)	.0757* (.0420)	.1158** (.0567)

Notes: Each quantile estimate, clustered by family id, includes additional controls for the Primary Sampling Unit (Community), changes in non-pension, social welfare benefits (never significant) and a constant; **/* indicate significance at 5%/1% respectively or significant in bias corrected bootstrap estimates where bias is below 25%; standard errors in parentheses; sample size = 9,125 (full). Omitted categories are: 'Basic education only' and 'Households with working age adults but no children'.

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