Vulnerability to welfare change during economic shocks:

Evidence from the 1998 Russian crisis

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July 2002

Abstract: Using changes in consumption as a proxy for 'vulnerability' we identify the characteristics associated with vulnerability around the time of the 1998 Russian financial crisis. In addition, we examine the role of formal and informal safety nets in preserving individual well being. We apply quantile regression techniques in order to identify the characteristics associated with vulnerability across the two periods. Amongst those most vulnerable during the crisis were, less educated individuals living in urban areas, in households containing greater numbers of pensioners. Furthermore, we found that increases in home production and help from relatives acted to decrease vulnerability, especially amongst those suffering the largest changes in consumption. Following the crisis, amongst the least vulnerable were, better educated individuals, resident in urban areas, able to increase home production, and in receipt of improved pension payments and child benefits.

Key Words: Russia, vulnerability, safety nets, recovery, quantile regression.

JEL classification: I31, P20

1. Introduction

On August 17th 1998 the Russian government announced a partial default on its domestic debt, sending shock waves reverberating across the economy and bringing to an end two years of relative economic stability. The effects were immediate and devastating. The exchange rate plummeted by 300%, inflation touched 70%, unemployment increased to a high of 13.7%, real wages fell by 30% and GDP plunged by almost 5% for the year[1]. In the aftermath of this collapse the future of the Russian economy was spoken about in apocalyptic terms and the prospects for Russia' population looked bleak. Yet, within months, developments deviated from the worst case scenario to such an extent that 1999 and 2000 witnessed growth rates of 5.4 percent and 8.3 percent respectively, taking output levels above the pre-crisis levels.

In this paper we investigate the impact that this, apparently short-term, shock had on the constituent elements of the population and, in so doing, reveal the nature of *economic vulnerability* in Russia. There have been a number of studies reporting the extent and incidence of poverty in transitional Russia[2], but to date there has been little analysis of which socio-economic groups are most *vulnerable* to changes in the economic environment. To our knowledge, only Lokshin and Ravallion (2000) have analysed the welfare effects of the 1998 financial crisis. They classified households on the basis of their poverty status (below or above the poverty line in 1996 and 1998) and, using both objective (income to poverty line ratios) and subjective (individual perceptions) welfare measures, identified the characteristics of those most affected by the crisis. In each case they assayed the joint distributions of their welfare measure in order to assess both the degree and depth of poverty as well as the extent of churning amongst various categories of poverty. They also attempted to capture the role of the social safety net by simulating the joint distribution net of any change in transfers. Our approach is different. Our main concern is to capture both the effects on economic well being of the rapid deterioration in socio-economic conditions in Russia, and the capability of individuals to respond to those

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[1] See table 1 for precise details regarding the macroeconomic environment.
[2] See for example, Braithwaite (1999), Feder (2000), Falkingham (2001)

changes during and after the financial crisis of 1998. We measure vulnerability as the change in consumption expenditure and apply quantile regression methods (QRM) to explain vulnerability at various points in the distribution of economic 'shocks'.

Amongst the most vulnerable, we identified less educated individuals living in urban areas, in households with greater numbers of pensioners. Increases in home production and help from relatives served to lower vulnerability especially for those suffering the largest negative changes in consumption. Following the crisis, better educated individuals, in urban areas, with greater numbers of children, able to increase home production, and in receipt of increased pension payments and child benefits were less vulnerable.

The paper proceeds as follows. Section 2 examines the concept of vulnerability and defines the vulnerability measure applied in this paper. Section 3 presents the econometric framework and methodology. Section 4 specifies the model to be tested, describes the data and discusses the empirical results. Finally, section 5 concludes the paper.

2. Defining Vulnerability

Recently there has been a proliferation of studies incorporating the term "vulnerability". Yet, despite this, there is no clear definition of what it means to be vulnerable. In this section we provide an organising framework for discussions of vulnerability[3] and, within that structure, define the particular interpretation applied in this paper.

Dictionary definitions[4] of the state of vulnerability as being 'at risk', 'likely to fail', 'susceptible', 'unprotected' and '(financially) weak' illuminate the complex

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[3] We draw on the recent work by Alwang, Siegel and Jorgensen (2001).
[4] Collins English Dictionary.

multi-dimensional nature of vulnerability. However, such definitions suggest a decomposition of vulnerability into three core elements: (i) the risk itself (ii) susceptibility and resilience[5] to the risk and (iii) the ensuing outcomes. That is, vulnerability begins with an exposure to risk arising from some event or combination of events. These risks then have multiform effects on individuals according to their susceptibility and resilience i.e. different individuals are able to respond to and manage risk with varying degrees of success. This combination of risk, susceptibility and resilience produces an outcome and this outcome is a function of the magnitude and nature of the risks *and* the responses to them. Hence, conceptually, the individual is vulnerable *from* the risk but *to* the outcome. It should be clear from this discussion that vulnerability, in a general sense, is an on going dynamic concept evolving for each individual as events occur, and risks, responses and outcomes change. The challenge for applied practitioners is to usefully operationalise these concepts in order to facilitate measurement.

The range of events resulting in risk is broad, encompassing factors as diverse as, loss of income, poor health, exposure to crime, social exclusion and many others - all of which impact substantially on the well being of individuals and households. However, for the purposes of this paper we concentrate on measurable aspects of *economic* vulnerability and attempt to address the core elements described above. In so doing, two issues arise relating to the implementation of meaningful measurements.

First, given the dynamic nature of vulnerability and the constant evolution of risks and responses, different elements of vulnerability can be captured by *ex-ante* as opposed to *ex-post* approaches to measurement. The second issue concerns the tangled relationship between vulnerability, poverty and economic shocks. Before defining *our* measure of vulnerability we address these issues in turn.

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[5] Susceptibility is the propensity for an individual to experience a welfare loss as a result of an event whilst resilience, on the other hand, reflects the individual's capacity to withstand and recover from the event.

- *Ex-ante* versus *ex-post* approach

In a world of constant change, a desirable property for a vulnerability measure is that it should enable *ex-ante*, forward looking, probabilistic statements to be made regarding 'outcomes'. Specifically, this encapsulates the view that *current* vulnerability is a function of the probability of certain *future* states occurring. Papers by Chaudhuri, Jalan and Suryahadi (2001), Pritchett, Suryahadi and Sumarto (2001) and Mansuri and Healy (2000) provide examples of such measures. They define vulnerability in terms of the probability of experiencing poverty at some future date given current characteristics. These studies use cross-sectional data and base their measure on estimates of the variance of inter-temporal consumption levels. This approach explicitly accounts for all of the vulnerability elements: risk (proxied by macroeconomic variables), susceptibility and resilience (proxied by household characteristics), and outcomes defined (in the case of Pritchet et al) as the probability of falling below a pre-defined poverty line.

Ex-post measures of vulnerability place greater emphasis on susceptibility, resilience, and observed outcomes. That is, certain individuals may be more or less susceptible to risk and more or less able to respond effectively in the face of risk and this is something that we observe *ex-post* through their propensity to experience specific outcomes. Hence, less vulnerable individuals are characterised as low susceptibility/high resilience individuals and vice versa. Glewwe and Hall (1998) and Cunningham and Maloney (2000), for Peru and Mexico respectively, provide such *ex-post* analysis. In particular, using consumption measures, they observe changes in well being at the time of an economic shock, analysing both the association with household characteristics, and the role of 'coping mechanisms'. Essentially, these studies investigate the relationship between household characteristics and '*historical* consumption variability' (i.e. vulnerability *to* changes in consumption arising *from* the changing economic circumstances) and as such do not enable *ex-ante* predictions to be made. Nevertheless, given the turbulent macroeconomic environments in both Peru and Mexico at the time of the studies, these historical measures provide the following: i) evidence of which groups are vulnerable to market induced outcomes during major economic crises; ii) potentially useful proxies of *ex-ante*

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vulnerability; and iii) insights into the issues of susceptibility and resilience. Such results are important since the specified socio-economic characteristics are fundamental determinants of the susceptibility and resilience components of the vulnerability definition.

- Vulnerability, poverty and economic shocks

Regardless of whether a particular vulnerability measure is ex-ante or ex-post, a further salient issue relates to the relationship between vulnerability and poverty. In an economic crisis, substantial numbers of people at the lower end of the income distribution face heightened risks of experiencing poverty. Echoing this concern, some studies prefer to weight more heavily declines in well being at the lower end of the income scale[6]. However, it does not follow automatically that vulnerability and poverty are two sides of the same coin. In fact, both those who are currently poor, and those who are not currently poor, may prove 'vulnerable to poverty'. Moreover, those experiencing the largest declines in welfare at the time of the crisis (i.e. those most 'vulnerable to negative outcomes arising from the economic crisis') are not necessarily the most 'vulnerable to poverty'.

- Our Vulnerability measure defined

Taking into account the above taxonomy of vulnerability measures (i.e. the measure can be *ex-ante* or *ex-post* and, within each, can be formulated as 'vulnerability to poverty' or 'vulnerability to some specified negative outcome') and the associated discussion, we now present our approach to the measurement issue. The main concern, in this paper, is to capture the effect on economic well being of the rapid deterioration in socio-economic conditions in Russia, *including* the ability of individuals to respond to those changes, during and after the financial crisis of 1998. Following Glewwe and Hall (1998), and Cunningham and Maloney (2001) our preferred measure of well being is consumption

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[6] See for example, Cunningham and Maloney (2001)

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expenditure[7] and our measure of vulnerability is primarily captured by variability in well being. In terms of the definition, the *risk* exposure is the occurrence of the financial crisis and the consequent turbulence in the economy[8], *susceptibility* is a function of identifiable individual characteristics, *resilience* is the combination of these characteristics and the ability to utilise mechanisms to limit the impact of the risk, and the *outcome* is the variability in consumption (well-being). That is, individuals are said to be vulnerable *from* the crisis *to* consumption change. Note two potential limitations regarding our approach. First, by construction, our measure is *ex-post* and hence captures *historical vulnerability* rather than permitting probabilistic *ex-ante* statements to be made. Second, it does not weight more heavily those 'in poverty'. Despite these caveats we believe our approach has merit for the following reasons. First, not only does our measure reflect the incidence of vulnerability at the time of a significant economic crisis in Russia, but also acts as a useful proxy for economic vulnerability *per se*. Second, our approach incorporates elements of susceptibility and resilience *regardless* of poverty status. Not only is this an important element of the vulnerability definition but, in the Russian context, where there are high levels of poverty churning across much of the income distribution, to place too much emphasis on a fixed poverty line would be to neglect important aspects of vulnerability. In addition, applying QRM techniques enables us to distinguish correlates of vulnerability for individuals experiencing different degrees of 'shock'.

3. Econometric Framework and Methodology

We adopt the Glewwe and Hall (1998) reduced form approach,

$$\ln(C_{it}) = \beta^c{}_t + \beta_t X_i + \delta_{1i} + \rho_i + \delta_{2i} A_{it} + \varepsilon_{it} \tag{1}$$

in which consumption of individual i at time t (C_{it}) is specified as a linear function of exogenous household and individual characteristics (X_i), rates of time preference (δ_i), risk

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[7] We have also used changes in income levels and discuss them only when they are relevant. For ease of exposition, we do not report them but they are available from the authors upon request.
[8] Of course, it is not possible to isolate the risks faced by individuals to those *only* arising from the crisis.

aversion (ρ_i), a constant (β^c_t) and a random disturbance (ε_{it}). Note, in order to capture the effect of time on consumption, we incorporate a term interacting rate of time preference and individual age (A_{it}).

OLS estimates of equation (1) will be biased if there is any correlation between the observed and unobserved variables. One way of confronting this issue (and also that of measurement error) is to apply instrumental variable techniques. However, in the absence of appropriate instruments, an alternative methodology, exploiting the panel nature of the data, involves taking differences and treating δ_i and ρ_i as fixed effects[9]. This results in

$$\ln(C_{it+1}/ C_{it}) = \beta_0 + (\Delta\beta)X_i + \Delta\varepsilon_{it} \tag{2}$$

where $\beta_0 =(\Delta\beta^c + 2\delta_{2i})$ and Δ indicate changes between t_{+1} and t. Individuals with high values of a characteristic for which $\Delta\beta$ is negative are relatively vulnerable. Note that estimates of equation (2) are identical to the difference in separate, year by year, OLS estimates of equation (1). Hence, the benefits derived from utilising panel data are not in the form of reduced bias in our estimates of $\Delta\beta$; rather, the benefits accrue from increased efficiency in the estimates.

A further problem with the estimation of equation (2) arises from the potential endogeneity of some of the explanatory variables. Individuals are frequently rendered more or less vulnerable as a consequence of choices made in the past. For example, individuals may select occupations with one set of expectations about the future only to find that by the time they receive the pay-off for such choices, the economic environment has changed and hence the pay-off has changed. Such choices are potentially *endogenous* to the processes determining well being. Re-specifying the consumption equation as

$$\ln(C_{it}) = \beta^c_t + \alpha_t N_{it} + \beta_t X_i + \delta_i + \rho_i + \delta_2 A_{it} + \varepsilon_{it} \tag{3}$$

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[9] We recognise that risk aversion and/or rates of time preference might have shifted as a result of the Russian economic shock. However, this entails a more complex model and we leave it for further research.

where N_{it} represents any endogenous variable and, as before, taking differences over time we can attenuate the problem of endogeneity bias and treat the endogenous variable as predetermined. That is,

$$\ln(C_{it+1}/ C_{it}) = \beta_0 + \Delta\beta X_i + \Delta\alpha N_{it} + \Delta\varepsilon_{it} \tag{4}$$

Rather than relying on traditional OLS methods, we apply QRM, as proposed by Koenker and Bassett (1982), to equation (4). OLS characterises the changes in consumption only at the mean of the distribution and is not robust to the presence of outliers or non-normal error distributions. Quantile regressions are estimated by minimising the asymmetrically weighted sum of the absolute errors (except, of course, for the median regression estimator) and offer a much more complete view of the effects of the explanatory variables on the location, scale and shape of the distribution of the vulnerability measure. 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. We estimate the 10th, 25th, 50th, 75th and 90th quantiles.

4. Estimation Results

4.1. Empirical Specification

Using QRM, we estimate equation (4) for the period either side of the 1998 crisis. Before assessing the vulnerability results, we first discuss our selection of exogenous and endogenous variables.

As explained in section 2, we proxy the 'vulnerability' arising from economic shocks as the difference in (log) consumption between two periods. For the purposes of empirical estimation we take the least controversial view of exogeneity. That is, first, we include variables that are indisputably exogenous – namely, age (and age squared) and gender. To these, we add educational attainment, settlement type and region. In principle, these latter three variables change in response to economic fluctuations and thus might be

considered as endogenous. In practice, we observe very little of this in our data, and therefore classify them as exogenous.

Aside from the exogenous variables, there are a number of more obviously endogenous variables, influencing individual vulnerability, which we ought to incorporate into the analysis. First, we consider that the composition of the household is an important characteristic. The proportion of dependants – young and old - influences vulnerability through its impact on, the origins and diversity of income, labour market flexibility, and the costs of childcare or healthcare. Similarly, occupation and labour market attachment, which respond to the evolving economic environment, are treated as endogenous. Lastly, the Russian 'coping mechanisms' – home production, the drawing down of assets, inter-household transfers, support from other organisations and the formal social safety net – are clearly endogenous. Agricultural production for personal consumption (or sale) has always formed a significant part of the resources of Russian households. Even in the urban areas and metropolitan cities many households have access to either a 'kitchen garden' or a '*dacha*' and this has proved an integral part of the coping mechanism for many Russian households[10]. Most Russians lack access to formal credit and insurance markets and thus, to the extent that credit is available to smooth consumption, it is more likely to take the form of inter-household or charitable transfers. Aside from these more informal methods of facilitating consumption smoothing, we examine the role of the formal social safety net by incorporating controls for pensions, social security payments and child benefit. With respect to social safety nets, Lokshin and Ravallion (2000) report substantial changes in the targeting of social welfare spending in Russia following the crisis. This could enhance the ability of the unemployed, the elderly and households with large numbers of children to withstand significant falls in income and to maintain their consumption levels.

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[10] See Clarke et al (2001) and Seeth et al (1998) for a more detailed discussion of these issues.

4.2. The Data

To investigate these issues we utilise data from rounds VII (1996), VIII (1998) and IX (2000) of the Russian Longitudinal Monitoring Survey (RLMS). The RLMS is a series of nationally representative surveys of the Russian Federation providing detailed information on a range of socio-economic and demographic variables.

We use a balanced panel of 2,242 households, containing 3,935 adults over 18 years of age. Our unit of analysis is the individual and our dependent variable is defined as the per capita change, between two years, in the log of equivalised consumption[11]. We adopt the officially calculated, Russian Ministry of Labour, subsistence minimum that uses an equivalence factor for children of 0.9 and for pensioners, deemed to have lower nutritional requirements, of 0.63. We make no scale adjustment on the grounds of household size[12].

Most of our regressors are qualitative variables. We split the education variables into categories for, university, technical and medical, complete high school, incomplete high school plus professional training, incomplete high school plus vocational training, and incomplete high school alone. We differentiate urban, rural-agricultural and rural non-agricultural settlement types. Russia's great regional diversity is reflected through controls for, Moscow and St Petersburg, North and North Western, Central and Central Black Earth, Volga-Vyatski & Volga Basin, North Caucasus, The Urals, Western Siberia and Eastern Siberia and The Far East. The role of household composition is captured by the equivalised dependency ratio, which in turn is dissaggregated to capture the distinct effects of children and pensioners. Occupation is controlled for by incorporating categories for, managerial and professional, non-manual, manual, unskilled, workers on

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[11] In order to reflect the effects of consumption smoothing we present the results based on consumption vulnerability rather than income vulnerability. That is, households are better able, through utilisation of savings and other resources, to smooth consumption than income. Nevertheless, the results based on income measures are broadly consistent with those presented here.

[12] Braithwaite (1999), using RLMS data, tests for scale economies in Russian households and concludes "*that there are no significant economies of scale in consumption*".

leave, and categories for both retirement age and non-retirement age individuals outside of the formal labour force. Labour market attachment is approximated as the number of hours of paid work, per equivalent worker, in the household. The 'coping mechanisms' are captured by measuring the equivalised value of capital and assets, home production, help from relatives, transfers from non-government organisations and three, similarly measured social security variables – pension payments, child benefit payments and unemployment, fuel and rental subsidies. To measure the effects of pre-shock characteristics on vulnerability we include the coping variables as valued at the base year as a reflection of initial access to certain resources. However, notwithstanding the importance of this, the real relevance of coping mechanisms is that individuals are able to draw upon them more heavily during crises. For example, households with access to 'garden plots' may choose to expand their production from such plots during the following growing season. Hence, in addition to initial conditions, we include a variable reflecting *changes* in the utilised value of the 'coping mechanisms' whilst retaining controls for the initial conditions. Descriptive statistics for this sample are presented in table 2 and formal definitions are contained in the appendix.

4.3. The Results

Vulnerability during the crisis - The Exogenous Regressors

Table 3a presents the regression results after applying OLS and QRM on changes in consumption from the most vulnerable (largest fall in consumption (10th quantile)) to the least vulnerable (90th quantile). Notice that the effect of the regressors varies considerably across the consumption change distribution indicating that the traditional OLS method is not appropriate for analysing changes in consumption.

Firstly, it is apparent that human capital variables only explain vulnerability amongst those suffering the most severe shocks. Amongst these individuals, those with less than university education (excluding those with vocational qualifications) were particularly vulnerable to declines in consumption compared to the median predictions for those with similar characteristics. For example, those with high school education or less suffered

additional declines in consumption of more than 20%/10% at the 10th/25th quantiles compared to those with university education. However, for those at the 90th quantile, enjoying increased consumption, it would appear that there are negative returns to university education. This suggests that those individuals able to increase consumption are aided in doing so by virtue of some unobserved variables, not held by university graduates, rather than by traditional human capital measures. In terms of settlement type, OLS estimates predict that individuals residing in urban areas endure an approximately 20% greater fall in consumption than those in rural areas. Once more, the QRM results reveal significant heterogeneity in the effects of urban residence across the distribution of shocks. The 'penalty' for urban residence, not significant at the 10th quantile, then increases from around 11% at the 25th quantile to 35% at the 90th quantile. In terms of regional diversity, individuals residing in the Volga region, Western Siberia, Eastern Siberia and the Far East were considerably less vulnerable, across the distribution (with the exception of the 25th quantile), than those living in Moscow and St. Petersburg. Of the remaining variables, age did not have a significant influence on vulnerability at any part of the distribution, whilst being male was beneficial for those suffering the largest declines in consumption.

Vulnerability during the crisis - The Endogenous Regressors

We add each set of endogenous variables separately in order to further reduce the possibility of endogeneity bias and multicollinearity. The estimates are presented in table 3b. In general, the results, relating to the exogenous coefficients remain robust to each of the new specifications[13].

The OLS results exploring the relationship between dependency ratios and vulnerability show that individuals in households with higher 'dependency ratios' were more vulnerable but not significantly so. The QRM regressions indicate that higher dependency ratios were in fact significantly associated with increased vulnerability at the median and

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[13] For ease of exposition, in this table, we only report the estimated coefficients of the endogenous variables. Full reports of the econometric results are available from the authors upon request.

75th quantiles of the distribution. Further disaggregation reveals that, aside from those experiencing the largest and smallest shocks, it is actually the presence of pensioners that increases vulnerability. The effect of higher proportions of children did not significantly exacerbate negative shocks though did severely restrict consumption growth at the 90th quantile.

The impact of occupational classification[14] on consumption vulnerability is weak. We find some evidence that, amongst the groups encountering the largest shocks, those employed as managers or professionals were less vulnerable compared to the base category of working age non-participants. This may reflect the superior ability to smooth consumption, and access alternative income resources of more senior, highly qualified professionals. Of more interest are the results from incorporating a proxy for labour market attachment which indicate that, amongst those suffering severe consumption declines, those in households with a stronger attachment to the labour market were less vulnerable.

Moving on to the 'coping mechanisms'; individuals at the 10th and 25th quantiles were better placed to withstand the shock through their greater initial use of home production prior to the crisis. Interestingly though, amongst those faring most favourably, greater previous use of home production increased vulnerability. Thus, access to home production served as an important resource, facilitating consumption smoothing, for those in real trouble but did not provide additional impetus for those doing well during the crisis. Higher previous levels of assets, help from relatives or help from organisations are all negatively signed but generally insignificant. There is no evidence that, following the crisis, individuals who had previously enjoyed greater assets or informal support were

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[14] We would have liked to investigate whether or not workers in distinct industrial sectors varied in their degree of vulnerability. Unfortunately the RLMS does not record such information. It is worth noting though that occupational categories displayed a higher association with income vulnerability. Indeed, amongst those suffering the most severe income shocks, retired individuals were less vulnerable; whilst, at the median and 75th quantiles, non-manual and manual workers were actually more vulnerable than individuals of working age outside of the labour force.

able to draw upon these resources to smooth consumption. If anything, initial reliance on such resources actually intensified vulnerability. In terms of the effects of social security payments on vulnerability, child benefit payments were an important source of relief for individuals undergoing the largest consumption declines; but once again, for those faring better in the crisis child benefit payments acted as a brake on consumption growth. Similarly, individuals in households receiving higher pension payments were more vulnerable amongst those at and above the median quantile. This latter finding may capture the effect of the 1996 election, prior to which, the pension payments for many powerful constituencies were upgraded and arrears repaid. Such short-term boosts did not engender significant consumption growth two years later when the government's budgetary restrictions were more binding.

Finally, controlling for initial conditions, we examine the effects of *changes* in the utilisation of the formal and informal coping mechanisms. In terms of initial conditions the results remain substantially as before with just one or two noteworthy exceptions. Initial access to home production now has a more emphatic negative effect on vulnerability across the distribution. Consequently, for those suffering large shocks, an additional unit of home production is associated with at least a 5% fall in vulnerability. Correspondingly, for individuals undergoing increased consumption, the greater vulnerability associated with previous home production is less substantial with the inclusion of the additional controls. Somewhat more starkly, for those in receipt of greater amounts of child benefit, the positive association with vulnerability is more pronounced. Indeed, for the hardest hit, child benefits no longer acted as a buffer, whilst for the least hard hit, the size of the disadvantage increased markedly.

Turning now to the *changes*, the OLS results suggest that each additional unit of home production resulted in a 10% lower decline in consumption. The quantile regression results suggest that this effect was distributed relatively evenly across the distribution but was slightly stronger for those hardest hit. The OLS results also indicate that those able to increase help from relatives were less vulnerable during the crisis. Interestingly though, the QRM results suggest that this effect was only significant for those experiencing the

most considerable shocks. It would appear that informal social networking mechanisms provided a safety net of the last resort for the hardest pressed individuals. The same cannot be said of returns to capital or support from non-governmental organisations. The formal social safety net failed to aid those individuals experiencing the most extreme consumption changes. Indeed, increases in social security payments or child benefits were largely inconsequential across the distribution of shocks. Increased pension payments, however, did afford an important safety net for those in the inter-quartile range of the distribution.

In précis, the estimates relating to vulnerability between 1996 and 1998 indicate that, for those experiencing severe shocks, vulnerability was lowered by; residence in specific regions and settlements, possession of a university education, employment in managerial/professional occupations, being male *and* having access to home production and support from relatives.

Vulnerability during the Recovery - The Exogenous Characteristics

Table 4 presents the vulnerability estimates for the recovery period, 1998-2000. The OLS regressions indicate that the human capital variables do not help explain consumption changes. However, the QRM results intimate that, amongst those faring least well during the recovery, as in the first period, more educated individuals had a clear advantage over those with vocational education or incomplete high school. Both sets of results indicate that opportunities for increasing consumption were heavily concentrated in urban and rural non-agricultural areas and this effect was particularly pronounced amongst those experiencing large gains in consumption. Just as individuals in urban areas were more susceptible to the initial downturn so too were they able to recover following the crisis. This suggests that, for many people, the decline in well being associated with the crisis may indeed have been transient. In terms of specific regional trends, those located in the Far East and Eastern Siberia, who had been less vulnerable when the crisis struck, were also substantially *more* vulnerable in the period that followed. In stark contrast to the pattern observed for urban areas Russia's most easterly region appears to have become

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isolated from the wider economic cycle. The north and north-west recovered particularly well throughout the distribution and, amongst those experiencing the very largest increases in consumption, those in Western Siberia had a 40% advantage over those living in Moscow and St. Petersburg. This latter finding probably reflects the increased wealth associated with the booming oil and gas industries in parts of Western Siberia.

Vulnerability during the Recovery - The Endogenous Characteristics

Table 4b presents the results from each of the 'endogenous regressions'. Turning first to the effects of household composition; from the median through to the 90th quantile, the dependency ratio increases vulnerability significantly and at an increasing rate, with each additional equivalised dependent lowering consumption by around 20% for those sustaining the strongest recovery. Hence, households containing a greater proportion of 'dependants' were less likely to experience large consumption increases. Further disaggregation of the dependency ratio implies that, at the 10th, 25th and median quantiles, the children's dependency ratio actually aids the recovery significantly. In contrast, at the median and above, increased presence of elderly household members limits the growth in equivalised consumption. Recalling the results covering the crisis period, greater numbers of pensioners were associated with larger welfare declines between 1996 and 1998. It would seem that, during both the crisis and the recovery, households with more pensioners were particularly vulnerable but *not* amongst those doing most badly.

Moving now to occupational categories. For those individuals experiencing the smallest recovery, manual and unskilled workers were less vulnerable, and those 'on leave' were more vulnerable than those outside of the labour force. For those enjoying the largest recovery, managers and professionals and the retired were disadvantaged. That is, our findings suggest that, amongst those at the margins of economic revival, the labour market did provide a potential road to recovery. Indeed, when we look at the effects of labour market attachment, those at the 10th quantile recovered significantly more whilst those at the median and 75th quantiles recovered significantly less. Hence, those enjoying the most substantial welfare gains following the crisis did not appear to make such gains through increased formal labour market participation.

In terms of the coping mechanisms, it is informative to note that individuals in households with a higher previous reliance on home production were disadvantaged during the recovery. Combined with the results from table 3, these results connote that, households having access to home production, benefited when the going got tough, but that they weren't in a more favourable position to prosper as the economic environment improved. At the median, 75th and 90th quantiles, those holding greater amounts of capital during the crisis were also at a disadvantage during the recovery as resources were either used up or had their values wiped out by the crisis. Those leaning more heavily on relatives at the peak of the crisis were more vulnerable, at the 25th and 50th quantiles, during the recovery. Of the formal social safety net variables, only the pension payments were a significant indicator of vulnerability. Across the distribution, individuals in households with higher initial receipt of pension payments were disadvantaged in the recovery period - further evidence that pensioners were among Russia's more vulnerable at this time.

The above results are largely robust to the inclusion of the '*change*' variables. Also, the QRM results for the '*change*' variables are broadly consistent with those of the OLS regressions in suggesting that, across the recovery distribution, those managing to increase their levels of home production and capital have a greater propensity to increase their consumption, though the effect is stronger amongst the more vulnerable. Once more, informal transfers from relatives and other organisations did not appear to play a role, during the recovery. Help from relatives acted as a coping mechanism for the hardest hit during the decline but was not a route to recovery during the upturn. However, government social spending did help to facilitate recovery. Indeed, for those at the 25th quantile, experiencing an increase in help from relatives was associated with greater consumption vulnerability. Apart from for those enjoying the largest consumption growth, increases in both pension and child benefit payments acted to lower vulnerability following the crisis. This may bespeak the dual tendency since 1998 for the budgetary sector both to repay the pension arrears accrued in the nineties and to upgrade the real value of pension and child benefit payments following the financial crisis.

In sum then, during the period of economic recovery, at various points of the distribution lower vulnerability was associated with having more than basic or vocational education, living in urban areas or the North/North-west, having greater proportions of children in the household, being employed in manual or unskilled work, having less previous reliance on pension payments but having been able to have increased home production, and pension or child benefit receipts.

It is clear that some factors (e.g. home production) eased or exacerbated vulnerability throughout the period whilst other factors (e.g. urban residence) played roles specific to either the crisis or the recovery. To examine the more persistent effects of the economic crash on vulnerability we performed similar regressions for changes in (log) consumption between 2000 and 1996. This has the additional benefit of easing comparison between the crisis period and the whole period since the initial conditions are the same[15]. Where we previously observed a consistent relationship over time (e.g. home production, pensions) the results are somewhat sharper, whereas for factors (e.g. urban residence), which are negative in the first period and positive in the second period, the effect of the new regressions is to net out the impact and support our thesis that for such constituencies the crisis was indeed a short-term crisis. By disaggregating the period we actually see this more clearly. There are though a couple of points worth noting. First, households having higher dependency ratios are more likely to experience consumption increases as the positive effect of the children outweighs the negative effect of pensioners. Second, the effects of occupational affiliation are much more clearly defined.

Aside from those experiencing the largest recovery, those in managerial/professional, and manual occupations were less vulnerable, whilst, amongst those experiencing the smallest recovery, workers in unskilled occupations were less vulnerable.

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[15] For ease of exposition, the econometric results are not presented in the paper but are available upon request from the authors. For a more detailed analysis, see Gerry (2002).

5. Conclusions

This paper set out to identify the characteristics associated with individual vulnerability around the period of the, seemingly short-term, 1998 Russian economic crisis. In particular we sought to catalogue the extent to which the Russian 'coping mechanisms' increased individual resilience to economic change both prior to and following the economic crisis. We used QRM to investigate these issues across the entire distribution of consumption changes.

Our analysis reveals a number of interesting findings. First, it would seem that for many Russians the financial crisis was indeed a short-term phenomenon. In particular, individuals living in urban areas suffered greatly when the crisis struck but, as the economy recovered after 1998, it was those in urban areas who were able to increase consumption most vigorously. However, parts of Russia, most notably the Volga region and Eastern Siberia and the Far East, were largely isolated from both the crisis and the recovery. Whilst 'missing' the crisis may not seem a bad idea, if this observation is indicative of a growing lack of social and economic cohesion across the Federation, policy makers should pay especial heed. This trend is further borne out by the rapid recovery of those living in Western Siberia - an area rich in oil and gas to the north and heavy industry to the south.

Secondly, our data suggests that more educated individuals were more resilient when faced with large consumption falls, both before and after the crisis. This 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 more educated individuals are more adaptable in situations of rapid change.

We also investigated the relationship between the labour market and vulnerability and found that amongst the individuals experiencing the most extensive changes in consumption, those in households with higher levels of labour market attachment were less vulnerable. This reflects the fact that such households maintain a superior capacity to

smooth consumption, perhaps due to their larger and more diversified sources of income. Occupational affiliation only has a role in explaining vulnerability during the upturn. For those undergoing the slowest recovery, being a manual or an unskilled worker was a help and for those recovering the most, being a manager or professional or being retired actually hindered the revival.

A fourth finding relates to the composition of the household. Households with higher proportions of pensioners were generally more vulnerable, particular in the mid-range of the distribution. In contrast, during the crisis, higher proportions of children in the household were only a burden for those suffering the least whilst, during the recovery, the presence of children actually reduced vulnerability substantially for all at the median or below.

We explored the role of social security payments and informal coping mechanisms in reducing vulnerability - both in terms of initial conditions and changes across time. In both periods individuals with a higher previous reliance on pension payments, were more vulnerable. Nevertheless, those able to increase pension were less vulnerable although, during the crisis, this did not aid those suffering the most. This combination of findings points towards; the repayment of pension arrears between 1998 and 2000, the effects of increased numbers in the household receiving a pension compared to the base year, and/or the improved indexing of pension payments following the crisis. Combined with the household composition results, the evidence suggests that individuals in households with more pensioners were more vulnerable throughout but that, following the crisis, increased pension payments were a significant factor in reducing vulnerability. Furthermore, we find that individuals in households receiving increases in child benefit payments enjoyed more robust recoveries at the 75th quantile and below. These findings concur with those of Lokshin and Ravallion (2000), that improved targeting of the safety net helped to prevent poverty.

In terms of the informal 'coping mechanisms', we observed that greater initial use of home production always accentuated vulnerability amongst those suffering the least, whilst amongst those enduring the largest consumption declines during the crisis, those with higher home production were less vulnerable. Furthermore, we found that in both periods, those able to increase home production experienced smaller welfare declines, particularly amongst the hardest hit. Clarke et al (2001) argued that, rather than being a response to economic incentives, the use of the dacha in Russia is a more culturally and historically deep-rooted phenomenon. Whilst this may be so, our data provides strong evidence that those with greater access to home production faced lower levels of economic vulnerability and hence the use of the dacha formed an integral part of the social safety net for certain groups during this period. Finally, during the crisis, the pain of those hit most severely was eased through the help of relatives, whilst recovery was propagated, for those at the 25th and 50th quantile, by increases in the value of their assets.

In conclusion, we have identified the continuing importance of both educational attainment and attachment to the labour market for limiting vulnerability. However, less optimistically, our findings suggest first, that there is some distance to travel before Russians will trust the welfare state to act as their ultimate safety net in hard times. Second, there is a growing lack of social and economic integration in the Russian Federation, exemplified most poignantly by the apparent isolation of certain sectors from the economic cycle.

Whilst this paper has gone some way to identifying the nature of vulnerability in Russia at the end of the 1990's, two obvious limitations of our analysis relate to the *ex-post* definition of vulnerability employed here and the equal weighting given to all parts of the income distribution. In future research we plan to empirically address the nature of *ex-ante* vulnerability in Russia and its relationship with poverty.

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Table 1: Key Indicators of the Russian economy: 1996 - 2000

Indicator	1996	1997	1998	1999	2000
GDP growth	-3.4	0.9	-4.9	5.4	8.3
Real income per capita (1995=100)	101.3	108.2	91.4	78.5	87.3
% of population below official subsistence	21.4	21.2	24.6	39.1	33.7
Inflation	21.8	11.0	84.4	36.5	20.2
Unemployment Rate (ILO%)	9.6	10.8	11.9	13.7	10.5
Employment (millions)	65.9	64.7	63.6	64.1	64.3
Real average monthly wage (Dec 1997=100)	91.8	96.1	83.2	64.9	78.4
Consumption of Goods and services (1995=100)	98.4	102.1	96.5	84.1	92.8
Rate of growth of Industrial Production	-4.5	2.0	-5.2	11.0	11.9
Rate of growth of (Fixed) Investment	-18.0	-5.0	-12.0	5.3	17.4
Rbl/$ end of year exchange rate	5.13	5.79	9.97	24.84	28.15
Federal Budget Balance (% to GDP)	-7.9	-6.7	-4.9	-1.7	2.5
Current Account Balance (% to GDP)	3.0	0.5	0.3	13.5	18.5

Source: Goskomstat; Russian Economic Trends November 2001

Table 2: Descriptive Statistics (standard deviation in brackets)

VARIABLES	1996	1998	2000
Adult equivalent consumption	3522.5	2705.1	3167.4
Log equivalent consumption	7.77 (.89)	7.53 (.85)	7.71 (.80)
Change log equiv consumption	-	-0.24	0.18
Demographic Variables			
Age	47.2 (16)	49.2 (16)	5102 (16)
Gender	0.40 (.49)	0.40 (.49)	0.40 (.49)
Dependency ratio	0.45 (.34)	0.46 (.35)	0.47 (.36)
Elderly dependency ratio	0.27 (.39)	0.30 (.40)	0.33 (.41)
Children dependency ratio	0.17 (.20)	0.16 (.20)	0.14 (.19)
Regional & Settlement variables			
Rural agricultural area	0.31 (.46)	0.31 (.46)	0.31 (.46)
Rural non-agricultural area	0.07 (.25)	0.07 (.25)	0.07 (.25)
Urban area	0.62 (.49)	0.62 (.49)	0.62 (.49)
Moscow & St.Petersburg	0.05 (.21)	0.05 (.21)	0.05 (.21)
North/North-Western	0.07 (.25)	0.07 (.25)	0.07 (.25)
Central & Central Black Earth	0.21 (.40)	0.21 (.40)	0.21 (.40)
Volga-Vyatski & Volga Basin	0.21 (.41)	0.21 (.41)	0.21 (.41)
North Caucasus	0.14 (.35)	0.14 (.35)	0.14 (.35)
The Urals	0.15 (.36)	0.15 (.36)	0.15 (.36)
Western Siberia	0.09 (.29)	0.09 (.29)	0.09 (.29)
Eastern Siberia & The Far East	0.08 (.27)	0.08 (.27)	0.08 (.27)
Education Variables			
University	0.15 (.36)	0.16 (.7)	0.17 (.38)
Technical & Medical	0.21 (.40)	0.21 (.41)	0.22 (.41)
Complete high school	0.35 (.48)	0.34 (.47)	0.32 (.46)
Vocational incomplete	0.05 (.22)	0.06 (.23)	0.06 (.24)
Professional incomplete	0.05 (.22)	0.05 (.23)	0.06 (.23)
Incomplete high school	0.19 (.39)	0.18 (.38)	0.18 (.39)
Occupation Variables			
Managerial & Professional	0.20 (.40)	0.21 (.41)	0.21 (.41)
Non-manual	0.07 (.26)	0.07 (.25)	0.06 (.25)
Manual	0.21 (.41)	0.18 (.38)	0.17 (.38)
Unskilled	0.08 (.27)	0.07 (.25)	0.06 (.23)
On leave	0.03 (.16)	0.02 (.15)	0.01 (.11)
Working age not working	0.16 (.37)	0.17 (.38)	0.16 (.37)
Retirement age not working	0.27 (.44)	0.30 (.46)	0.33 (.47)

Table 2 Continued

Other Variables			
Labour market attachment	68 (62.5)	61 (61)	61 (62)
Log equiv capital and assets	0.42 (1.6)	0.46 (1.7)	0.41 (1.6)
Log equiv home production	4.12 (2.7	4.34 (2.8)	4.18 (2.8)
Log equiv help from relatives	1.26 (2.5)	1.04 (2.2)	1.21 (2.4)
Log equiv other informal transfers	0.13 (.89)	0.15 (.88)	0.15 (.9)
Log equiv social security payments	0.43 (1.4)	0.71 (1.7)	0.93 (1.8)
Log equiv pension payments	2.68 (3.46)	3.45 (3.4)	4.14 (3.3)
Log equiv child benefit payments	0.86 (1.9)	0.39 (1.3)	0.56 (1.4)
Log equiv Δin capital & assets	-	0.04 (2.1)	-0.05 (1.9)
Log equiv Δin home production	-	0.22 (1.8)	-0.16 (1.9)
Log equiv Δin help from relatives	-	-0.22 (2.8)	0.17 (2.7)
Log equiv Δin informal transfers	-	0.01 (1.2)	0.0 (1.2)
Log equiv Δin pensions payments	-	0.77 (3.1)	0.69 (2.4)
Log equiv Δin social security pay	-	0.28 (1.8)	0.22 (1.9)
Log equiv Δin child benefit pay	-	-0.47 (2.0)	0.17 (1.7)
Sample Size – Adults	*3,935*	*3,935*	*3,935*
Sample Size – Households	*2,242*	*2,242*	*2,242*

Table 3a: Vulnerability - the 'exogenous' regressors

	OLS	Quantile Regression				
		10th	25th	50th	75th	90th
Age	.002	.017	.006	.005	-.003	.004
Age squared	-.000	-.000*	-.000	-.000	.000	-.000
Gender	.029	.066*	.039	.018	.013	.028
Basic	-.045	-.222**	-.145**	-.034	.010	.135*
Basic + vocational	.034	-.226	-.026	.079	.086	.254*
Basic + professional	-.010	-.280**	-.135	.125	.067	.262**
High School	-.055	-.283**	-.097**	-.049	.034	.108**
Technical & Medical	-.032	-.176**	-.062	-.005	-.025	.109**
Urban	-.199**	-.037	-.117**	-.157**	-.196**	-.342**
Rural non-agricultural	.138	.055	.052	.129	.143*	.310
North/North-west	-.058	.165	-.117	-.139**	-.083	.060
Central & central black earth	.115	.291	.077	.136**	.097	.101
Volga-Vyatski & Volga Basin	.183**	.301*	-.021	.154**	.221**	.289**
North Caucasus	.120	.166	-.085	.103	.071	.265**
The Urals	.103	.326*	-.021	.051	.020	.124
Western Siberia	.219**	.143	-.000	.289**	.270**	.416**
Eastern Siberia & the Far East	.324**	.447**	.118	.160**	.301**	.472**
Constant	-.230	-1.67**	-.719**	-.297**	.372**	.565*
Observations	*3935*	*3935*	*3935*	*3935*	*3935*	*3935*

Notes: Base dummies are University, rural and Moscow and St. Petersburg
*   All OLS significance tests are based on Huber/White/Sandwich variance estimates*
*   * Denotes statistically significant at the 10% level and ** at the 5% level.*

Table 3b: Vulnerability - the 'endogenous' regressors

	OLS	10th	25th	50th	75th	90th
Size and Dependency						
Dependency Ratio	-.091	-.101	-.093	-.139**	-.101**	-.138
Elderly Dependency Ratio	-.124**	-.135	-.133*	-.165**	-.146**	-.074
Children' Dependency Ratio	-.001	.044	.035	-.073	-.005	-.275**
Occupation Variables						
Managerial & Professional	.005	.092**	.015	-.072	-.034	.014
Non-manual	.006	.029	.041	-.060	-.014	.033
Manual	.051	.110	.068	-.028	.013	-.034
Unskilled	.045	.109	.065	-.014	.039	-.086
Leave	-.021	-.072	.032	.011	-.040	-.129
Non-working age retired	.040	.033	.074	-.011	-.001	.042
Household labour market attachment						
Labour market attachment	.001	.001**	.001**	.000	.000	.000
Previous use of coping mechanisms						
Capital and Assets	-.018	-.026	-.036**	-.003	-.012	-.012
Home Production	-.014*	.021**	.015**	-.009	-.025**	-.062**
Help from Relatives	-.006	-.014	-.009	-.002	.001	-.012*
Other informal transfers	-.033	-.058	-.019	-.026*	-.019	.003
Previous use of formal social safety net						
Social Security Payments	-.005	.005	-.014	-.005	-.003	-.000
Pension Payments	-.016**	.000	-.005	-.014**	-.027**	-.034**
Child Benefit Payments	.002	.030*	.010	.001	-.012	-.031**
Change in coping mechanisms						
Capital and Assets	-.011	-.015	-.021*	-.001	-.010	-.003
Home Production	.016**	.067**	.052**	.014**	-.004	-0034**
Help from Relatives	.008	.015	.009	.008	.008	-.000
Other informal transfers	-.042	-.052	-.025	-.046**	-.054	-.032
Δ Capital and Assets	.009	.018	.010	.012	.008	.016
Δ Home Production	.101**	.117**	.108**	.097**	.089**	.079**
Δ Help from Relatives	.015*	.045**	.026**	.005	.006	.004
Δ Other informal transfers	-.009	-.028	-.014	-.012	-.016	-.029
Change in the social safety net						
Social Security Payments	-.004	-.004	-.020	.004	.010	.013
Pension Payments	-.005	.008	.005	-.003	-.022**	-.034**
Child Benefit Payments	-.004	.014	.006	-.011	-.027*	-.049**
Δ Social Security Payments	.002	-.013	-.011	.004	.006	.010
Δ Pension Payments	.018**	.012	.017**	.019**	.013**	.003
Δ Child Benefit Payments	-.009	-.021	.001	-.016*	-.016	-.021

Notes: *The occupational base dummy is 'non-working working age' adults.*
      All OLS significance tests are based on Huber/White/Sandwich variance estimates
      Each group of variables has been regressed in turn after including all the 'exogenous' regressors
      * Denotes statistically significant at the 10% level and ** at the 5% level.

Table 4a: Vulnerability during recovery - the 'exogenous' regressors

	OLS	Quantile Regression				
		10th	25th	50th	75th	90th
Age	-.003	-.011	.001	-.003	-.001	-.007
Age squared	.000	.000	-.000	.000	-.000	.000
Gender	-.024	-.010	.002	-.007	-.020	-.043
Basic	.040	.066	-.043	.024	.010	.081
Basic + professional	.046	.263**	.011	-.019	-.025	-.012
High School	.054	.188*	-.016	.024	-.004	.020
Technical & Medical	.062	.169*	.021	.041	.034	-.074
University	.065	.219**	.005	.064	.013	-.007
Urban	.183**	.174**	.203**	.172**	.145**	.201**
Rural non-agricultural	.132*	.081	.185**	.193**	.212**	.222**
North/North-west	.212**	.231*	.240**	.155	.140**	.590**
Central & central black earth	.013	-.013	.010	.030	-.048	.054
Volga-Vyatski & Volga Basin	-.036	-.003	.006	-.048	-.130**	.053
North Caucasus	.115	.017	.206**	.130*	.073	.171
The Urals	.031	-.033	.085	.071	-.075	.075
Western Siberia	-.037	-.322**	-.056	-.019	-.012	.351**
Eastern Siberia & the Far East	-.229**	-.286**	-.211**	-.232**	-.307**	-.079
Constant	.117	-.670	-.458**	.097	.655**	1.13
Observations	*3935*	*3935*	*3935*	*3935*	*3935*	*3935*

Notes: Base dummies are basic with vocational, rural and Moscow and St. Petersburg
        All OLS significance tests are based on Huber/White/Sandwich variance estimates
        * Denotes statistically significant at the 10% level and ** at the 5% level.

Table 4b: Recovery - the 'endogenous' regressors

	OLS	10th	25th	50th	75th	90th
Size and Dependency						
Dependency Ratio	-.047	.093	-.002	-.060*	-.089*	-.228**
Elderly Dependency Ratio	-.126**	-.005	-.065	-.120**	-.149**	-.299**
Children's Dependency Ratio	.235**	.451**	.258**	.229**	.080	.051
Occupation Variables						
Managerial & Professional	-.033	.026	-.000	.018	-.087*	-.143*
Non-manual	-.010	.070	.053	-.043	-.124	-.095
Manual	.068	.186**	.126**	.016	-.065	-.011
Unskilled	.137**	.255**	.081	.052	-.002	.159
Leave	-.243**	-.500**	-.095**	-.118**	-.139	-.430
Non-working age retired	-.038	.071	.027	-.037	-.095	-.198**
Household labour market attachment						
Labour market attachment	-.000	.001*	-.000	-.001**	-.001**	-.000
Previous use of coping mechanisms						
Capital and Assets	-.026**	-.029	-.010	-.020**	-.024**	-.049**
Home Production	-.039**	-.022**	-.025**	-.036**	-.052**	-.082**
Help from Relatives	-.003	.016	-.012**	-.007*	-.007	-.012
Other informal transfers	-.013	-.045	-.027	-.011	-.017	-.015
Previous reliance on the social safety net						
Social Security Payments	.005	.016	.004	.007	.007	.005
Pension Payments	-.014**	-.019**	-.013*	-.013*	-.010	-.023**
Child Benefit Payments	.004	.013	.006	-.001	.005	.008
Change in coping mechanisms						
Capital and Assets	-.009	-.010	.007	-.004	-.016	-.022
Home Production	-.016**	.016	-.003	-.012*	-.034**	-.071**
Help from Relatives	.002	.006	-.020**	.001	-.001	.004
Other informal transfers	-.014	-.051	-.004	-.010	.007	.012
Δ Capital and Assets	.027**	.030	.034**	.022*	.010	.023
Δ Home Production	.073**	.083**	.081**	.088**	.060**	.043**
Δ Help from Relatives	.006	.013	-.012**	.003	.101	.023*
Δ Other informal transfers	.002	.012	.009	.003	-.006	.003
Change in the social safety net						
Social Security Payments	-.001	-.025*	-.012	-.007	.021*	.008
Pension Payments	-.012**	-.015**	-.001**	-.007**	-.012**	-.018**
Child Benefit Payments	.008	-.005	.009	.019**	.007	-.016
Δ Social Security Payments	-.002	.004	.001	-.004	-.007	-.007
Δ Pension Payments	.015**	.023**	.013*	.018**	.019**	.007
Δ Child Benefit Payments	.022**	.039*	.011	.028**	.018**	.002

Notes: *The occupational base dummy is 'non-working working age' adults.*
All OLS significance tests are based on Huber/White/Sandwich variance estimates
Each group of variables has been regressed in turn after including all the 'exogenous' regressors
* Denotes statistically significant at the 10% level and ** at the 5% level.

Appendix: Definition of variables

VARIABLES	DEFINITION
Dependent variable	Change in log of equivalised consumption per household member between two years.
Demographic Variables	
Age	Age in years
Gender	Male=1; Female=0
Dependency Ratio	Ratio of children and elderly to total household size (equivalised)
Elderly Dependency Ratio	Ratio of elderly to total household size (equivalised)
Child Dependency Ratio	Ratio of children to total household size (equivalised)
Regional& Settlement variables	
Rural agricultural area	Rural agricultural area
Rural non-agricultural area	Rural non-agricultural area
Urban area	Urban area
Moscow & St. Petersburg	Moscow & St. Petersburg
North/North-Western	North and North-Western
Central & Central Black Earth	Central & Central Black Earth
Volga-Vyatski & Volga Basin	Volga-Vyatski & Volga Basin
North Caucasus	North Caucasus
The Urals	The Urals
Western Siberia	Western Siberia
Eastern Siberia & The Far East	Eastern Siberia & The Far East
Education Variables	
University	Undergraduate or post-graduate qualifications
Technical & Medical	Technical & medical qualifications
Complete high school	Complete secondary education
Vocational incomplete	Incomplete secondary education with vocational
Professional incomplete	Incomplete secondary education with professional training
Incomplete high school	Basic high school only
Occupation Variables	
Managerial & Professional	Managerial & Professional
Non-manual	Non-manual
Manual	Manual
Unskilled	Unskilled
Leave	On some form of leave: paid, unpaid or maternity
Young not working	Working age adults outside of the formal labour force
Old not working	Retirement age adults outside of the formal labour force

Definition of variables continued

Other Variables	
Labour market attachment	Total hours worked per equivalent worker in household
Capital income in household	Real adult log equivalent income from property sales, rent, investment growth, insurance and alimony
Home production by household	Real adult log equivalent value of home production consumed, sold or given away
Help from relatives	Real adult log equivalent help received from friends and family
Other informal transfers	Real adult log equivalent of all other help received from charitable organisations
Social Security payments	Real adult log equivalent value of unemployment benefit, fuel payments and rental subsidies
Pension payments	Real adult log equivalent value of pension payments
Child benefit payments	Real adult log equivalent value of child benefit payments
Sample Size – Adults	*3,935*
Sample Size – Households	*2,242*