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The Microeconomic Impact of Financial Crises:

The Case of Bulgaria

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Abstract

The existing literature on international financial crises has tended to focus on macroeconomic aspects, such as weaknesses in macroeconomic fundamentals and self-fulfilling expectations. More recent work has sought to fill in the gap in the microeconomic impact of financial crises. This paper utilizes a longitudinal household survey dataset for Bulgaria to examine changes in consumption expenditure from the year 1995 to 1997, during which time the economy experienced a financial crisis. Its primary finding is that the crisis had differential impacts on different groups in society, and these groups are represented in terms of both their asset and production dimensions as well as by their socioeconomic and demographic dimensions.

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I. Introduction

Beginning with the seminal work of Krugman (1979), the international finance literature on currency crises – and financial crises more generally – has tended to focus on the macroeconomic aspects of these phenomena. For instance, Krugman's work emphasized the need for a central bank to monetize a growing fiscal burden, leading to an exhaustion of reserves and an inevitable balance of payments crisis. In contrast to the fundamentals-based story of Krugman, the game-theoretic model presented in Obstfeld (1994, 1996) allows multiple equilibria to arise due to lack of credibility. More recent literature (such as Caballero & Krishnamurthy 2001; Chang & Velasco 2001; and Aghion, Bacchetta & Banerjee 2001) has attempted to reconcile these disparate strands by stressing how liquidity constraints, implicit bailout guarantees, and sticky nominal prices may lead to bank failures and as a result impose real costs on the economy, in addition to generating a currency collapse.

While the macroeconomic aspects surrounding financial crises have been well explored, both theoretically and empirically, the microeconomic impact of such crises has only recently received greater attention. One key feature of these micro-level studies is the emphasis on the differential impact that financial crises impose on the consumption expenditure and labor supply decisions of various groups in society. For example, McKenzie (2003) examines the impact of the 1995 peso crisis on households in Mexico, and finds that, while the effects of the crisis were widespread, these differed across households, leading to varying adjustment mechanisms implemented to adapt to the aggregate shock. Similarly, Frankenberg, Smith & Thomas (2003) consider the effects of the Asian financial crisis on the well-being of Indonesian households; they likewise find tremendous diversity in the effects of the shock. Some households (notably, net food producers) experienced a welfare improvement due to the shock, while for many others the crisis was devastating. Alem & Townsend (2003), using household/small business data from Thailand, study the pre- and post-crisis consumption and investment responses to idiosyncratic risk. Their results support the idea that regional, occupational, and wealth differences matter in determining the net impact of the crisis. Finally, it is notable that not all studies necessarily imply differential impacts due to crises. McKenzie (2004) looks at the 2002 Argentinean financial crisis using panel urban household data, testing for changes in labor-related variables such as nominal wages, workforce participation, and hours worked. In contrast to the above findings, the large aggregate fall in real wages in Argentina was evenly spread over all sectors of the economy, such that the distribution of nominal incomes remained largely constant.

This paper seeks to contribute to the small but growing empirical literature on the microeconomic impact of financial crises. It utilizes a longitudinal household survey data set to examine differences

in consumption expenditure and income changes between the years 1995 and 1997, differentiating these changes by various demographic and socioeconomic characteristics, as well as by household production, assets and wealth variables. Given that Bulgaria experienced a systemic crisis at the end of 1996, the economic environment provides an ideal natural experiment which we exploit to establish trends that hint at the varying impact of the crisis on different groups in Bulgaria.

To our knowledge, there has been no systematic study of the microeconomic impact of the 1996 financial crisis in Bulgaria. Indeed, studies of the financial crisis in Bulgaria remain few and far between. Barlemann, Hristov & Nenovsky (2002) examine the role of moral hazard in the banking sector, which they argue eventually spilled over into a twin banking and currency crisis. The paper seeks to place the crisis in the context of the so-called "third generation" crisis models, but the focus is primarily on macroeconomic determinants such as government debt, banking system indicators, and various other macroeconomic indicators. In their recent study on the post-crisis reestablishment of credible nominal anchors, Berg, Jardis, Stone & Zanello (2003) establish stylized facts for ten (recent) financial crises, including Bulgaria. *Inter alia*, they argue that a hard peg – via a currency board – was a successful strategy for reining Bulgaria's financial system, which was in considerable disarray at the time of the crisis. This inference is also supported in the case study on the Bulgarian crisis by Ghosh, Gulde & Wolf (2002, pp. 126-131).

Nevertheless, as mentioned earlier, these studies have either been largely case-study in nature, or have looked at more macroeconomic aspects of the crisis.[1] Therefore, we view our results as an important addition to the existing body of knowledge. Our primary finding is in line with the theme of most earlier micro-level work: Financial crises exert differential impacts of different groups. For Bulgaria, we find that ethnicity, educational level, and employment sector are the key determinants of consumption and income changes, with a somewhat smaller influence from particular asset classes.

The rest of the paper is organized as follows. Section II reviews the events leading up to, and immediately following, the 1996/97 financial crisis in Bulgaria. Section III provides two simple theoretical models that rationalize how consumption expenditure and income may differ across

[1] The one paper (to our knowledge) that examines a slightly more microeconomic question (Avramov & Sgard 1996) focuses on the earnings of firms in different sectors of the economy, and how microeconomic indiscipline in these different clusters contributed to macroeconomic instability. Their paper, therefore, differs from ours since we are more interested in the consumption and income response of households. Moreover, the aim of their paper was to establish linkages between firm-level weaknesses and the financial crisis, whereas in our study we are more concerned with the impact of the financial crises on microeconomic behavior.

different groups in society. This is followed by the empirical study, which is the core of our paper (Section IV). A final section concludes.

II. The 1996/97 Bulgarian Financial Crisis

The Republic of Bulgaria is located in South Central Europe, and was a communist nation for most of the post-World War II period. In 1989, Todor Zhivkov, then the head of the Bulgarian Communist Party, relinquished control, and the nation began its transition toward a market-based economy. This transition, however, was far from smooth: Economic changes were slow through the early 1990s, and these changes were generally uneven. In February 1991, the Bulgarian government implemented an IMF-supported liberalization and stabilization program; this was followed by three further stabilization attempts (in 1992, 1994, and 1996). The partial and half-hearted nature of structural reforms,[2] coupled with an ineffectual prudential and regulatory framework, led to repeated bank runs that required constant central bank intervention (through massive liquidity injections). Concomitantly, fiscal deficits rose dramatically. Together, the financial sector fragility and macroeconomic instability set the stage for a full-blown twin crisis, which began in late 1996 and continued to ravage the economy through early 1997.

The banking crisis had a significant impact on the macroeconomy. Domestic and foreign debt/GDP, at 39 and 73 percent in 1995, rose to 60 and 243 percent in 1996, before falling to 16 and 91 at the end of 1997 (helped in part by galloping inflation). In the first quarter of 1997, the Lev/USD exchange rate depreciated from 487 to 1,588 Lev/USD. This depreciation was accompanied by an annualized inflation rate of almost 500 percent in January 1997, which soared to a hyperinflationary 2000 percent in March. The crisis also had a real dimension: Output contracted by more than 16 percent in real terms, and tax revenues soured, falling by 63 percent in the first quarter. Real wages were even more sensitive, falling by a third in the episode. However, employment was relatively shielded, falling only by about 4 percent. Aggregate inequality levels fell marginally after the crisis: The Gini coefficient for 1993 was 34.3, and this fell to 34.1 in 1998.

In order to arrest soaring prices and restore macroeconomic stability, Bulgaria opted for the hard peg and introduced a currency board on July 1, 1997. This institutional arrangement – formally written into a new central bank law – set the exchange rate at 1,000 Lev to 1 DM. While there were initial

[2] Bulgarian restructuring lagged that of its transitioning neighbors. Fischer & Sahay (2001) estimate a cumulative liberalization index for the period 1989-1994 that places Bulgaria at 1.4; contrast this to other Central and Eastern European transition economies such as Croatia (2.5), Hungary (2.6), Poland (2.4), and Slovenia (2.6). For the period 1995-1997, Bulgaria (4.1) continued to lag behind these countries (6.1, 6.5, 6.2, and 6.2, respectively).

reservations concerning the sustainability of the board due to the weaknesses of the banking system, Bulgaria's continued inflation woes effectively resolved these objections; the balance sheet of banks gradually improved as inflation led to the erosion of the real value of liabilities, and depreciation similarly resolved the problem of insufficient reserves.

The aftermath of the crisis, aided by the currency board, is a success story in exchange-based stabilizations. Annual inflation fell to 13 percent by mid-1998, and by the end of that year, the CPI recorded a mere 2 percent in year-on-year terms. Interest rates followed south; the real interest rate – a massive 1066 percent in October 1996 – was a respectable 5.6 percent in October 1997, and this fell a further 34 basis points in the following year.

In many ways, the Bulgarian crisis is a prototypical example of a "third-generation" type twin financial and banking crisis (Barlemann, Hristov & Nenovsky 2002), with moral hazard and fundamental weaknesses exacerbated by implicit (and later explicit) government guarantees of private debt. This led to credibility problems experienced by the central bank, which made expectational shifts more tenuous. The financial sector problems that led to the crisis may also be credibly explained by specific institutional developments, as argued in Ganev (2003). These include agents' learning processes concerning the nature of economic interactions, the administrative capacity of states, and the behavior of different elites and its subsequent impact on the institutional environment.

III. Household Consumption Responses to Financial Crises

In this section, we will consider two highly-stylized alternative models of household decision-making under uncertainty, in the context of an idiosyncratic shock ω (such as a financial crisis). For simplicity, we will assume optimal intratemporal resource allocation within households,[3] and focus on the intertemporal allocation problem. In each model, household heterogeneity is inspired by a different mechanism. In the first model, household *preferences* are assumed to differ systematically according to (exogenous) demographic and socioeconomic characteristics. Crises enter as liquidity shocks, which lead to differential changes in household consumption. In the second model, households possess the same felicity, but each household is also a small producer of a single good, and they differ on this *production* dimension. A financial crisis is a price shock to the household's

[3] Note, however, that this need not be the case, especially for developing countries. See Browning and Chiappori (1998) for an excellent overview of the underlying theory and empirical evidence on the efficiency of intra-household resource allocations.

produced good, and to the extent that consumption cannot be smoothed through asset sales, this leads to changes in consumption decisions.

These two alternative characterizations allow us to capture two potential explanations of household decision-making in a financial crisis. This distinction is ideal, because we are able to take the models to the data, in order to ascertain which theory is more plausible. If we find that household demographic and/or socioeconomic characteristics are key determinants of consumption changes, then the first model is supported. If, however, production and asset variables feature, then we have established greater support for the latter model.

Preference Heterogeneity

Consider an economy of *I* households, each with expected instantaneous utility given by

$$U^i(c) = E_t \sum_{s=t}^{\infty} \beta^{s-t} u^i\left(c_s^i\right), \tag{1}$$

where c_s^i is consumption of goods by household *i* at time *s*, and β is the subjective discount rate, which does not differ across households. Each household faces a flow budget constraint:

$$a_{s+1}^i = (1+r)a_s^i + y_s^i - c_s^i, \tag{2}$$

where b_s^i, y_s^i and c_s^i are the levels of assets, endowments, and consumption of household *i* at time *s*, respectively, and *r* is the interest rate.[4]

By solving the dynamic program, we obtain a standard intertemporal consumption Euler in the presence of uncertainty:

$$u'\left(c_t^i\right) = E_t u'\left(c_{t+1}^i\right) \qquad \forall i \in I, \tag{3}$$

where we have assumed, for simplicity, that $\beta(1 + r) = 1$. Now, we assume a specific form of a linear-quadratic utility function, given by

$$u^i(c;x) = x^i c^i + \frac{\left(c^i\right)^2}{2}, \tag{4}$$

[4] Again, households in developing economies are more likely to face borrowing and other liquidity constraints that may complicate the consumption decision (Rosenzweig & Wolpin 1993). We abstract from such issues here, as it would unnecessarily complicate the model without adding significant insight to the concerns at hand, while acknowledging the potential for such extensions in future work.

where x^i a multiplicative factor representing the set of household demographic and socioeconomic characteristics that influences utility, and is not dependent on c^i. These characteristics could include, *inter alia*, average levels of household education, overall household health levels, and household composition. This is not as implausible as it sounds: For example, one can well imagine a highly-educated household with two parents and an only child having different preferences over, say, consumption of alcoholic beverages than a low-education extended household with four adults and six children.

Differentiating (4) and substituting the result into (3) yields

$$x_t^i + c_t^i = E_t\left(x_{t+1}^i + c_{t+1}^i\right). \tag{5}$$

By exploiting the assumption that x and c are independent, this reduces to

$$E_t \Delta c_{t+1}^i \equiv E_t c_{t+1}^i - c_t^i = x_t^i - E_t x_{t+1}^i. \tag{6}$$

In order to proceed further, we need to make certain assumptions about the nature of x. In particular, we allow x to be affected by idiosyncratic shocks according to:

$$E_t x_{t+1}^i = \begin{cases} x_t^i & \text{if } \omega = 0 \\ a^i x_t^i & \text{if } \omega = 1, \end{cases} \tag{7}$$

where a^i is a liquidity shock to marginal utility – in the spirit of Diamond & Dybvig (1983). For example, the financial crisis may lead to varying emergency spending needs that are associated with drastic changes in education decisions (a child may be forced to drop out of school in order to provide additional financial support the family); these in turn lead to changes in consumption choices. Substituting (7) into (6) then yields two possible consumption responses. The first, without a shock ($\omega = 0$), is trivial: Households simply smooth consumption intertemporally following a Hall (1978)-style martingale:

$$E_t c_{t+1}^i = c_t^i. \tag{8}$$

However, with the crisis ($\omega = 1$), this becomes:

$$E_t \Delta c_{t+1}^i = \alpha^i x_t^i, \tag{9}$$

where $\alpha^i \equiv \left(1 - a^i\right)$. Equation (9) therefore rationalizes a differential response of household consumption that results from the different demographic and socioeconomic characteristics of households, as captured in x^i and a^i, respectively.

Technological Heterogeneity

Let the economy consist of *I* households, each endowed with a production technology given by

$$y^i = f^i\left(a^i, l\right), \tag{10}$$

where the output y^i of a household is a function of its specific production technology $f^i\left(a^i, l\right)$, which uses as inputs household-specific assets a^i and labor l. Households have a flow budget constraint given by

$$P^{ai}_{s+1} a^i_{s+1} = \left(1+r\right) P^{ai}_s a^i_s + P^i_s y^i_s - \overline{P}_s c^i_s, \tag{11}$$

where p^{ai} is the price of assets for household i, p^i is the price received by household i for its output, and $\overline{p}$ is the average price of consumption goods in the economy. Households continue to have lifetime utility defined by (1). The household's maximization problem is to maximize lifetime utility subject to (10) and (11); that is,

$$\max_{a_{s+1}, l_s} U^i\left(c\right) = E_t \sum_{s=t}^{\infty} \beta^{s-t} u^i \left[\frac{P^{ai}_{s+1}}{\overline{P}_{s+1}} \cdot \frac{\overline{P}_{s+1}}{\overline{P}_s} a^i_{s+1} - \left(1+r\right) \frac{P^{ai}_s}{\overline{P}_s} a^i_s - \frac{P^i_s}{\overline{P}_s} f^i_s\left(a_s, l_s\right) \right],$$

This yields the intertemporal consumption Euler

$$u'\left(c^i_t\right) = E_t \left[u'\left(c^i_{t+1}\right) \cdot \frac{p^{ai}_{t+1} + p^i_{t+1} f_a\left(a_{t+1}, l_{t+1}\right)}{p^{ai}_{t+1} \cdot \pi_{t+1}} \right] \qquad \forall i \in I, \tag{12}$$

where, again, we have assumed that $\beta\,(1 + r) = 1$, and $\pi_{s+1} \equiv \frac{\overline{p}_{s+1}}{\overline{p}_s}$, $p^i_{t+1} \equiv \frac{P^i_{t+1}}{\overline{P}_{t+1}}$, and $p^{ai}_{t+1} \equiv \frac{P^{ai}_{t+1}}{\overline{P}_{t+1}}$. With simple logarithmic utility $u^i\left(c\right) = \ln\left(c^i\right)$, (12) further reduces to

$$\Delta \ln c^i_{t+1} \equiv \ln E_t c^i_{t+1} - \ln c_t = \ln E_t \Phi^i_{t+1}, \tag{13}$$

where $\Phi^i_{t+1} \equiv \left[\frac{p^{ai}_{t+1} + p^i_{t+1} f_a\left(a_{t+1}, l_{t+1}\right)}{p^{ai}_{t+1} \cdot \pi_{t+1}} \right]$.

Financial crises enter as changes to prices of assets, prices of the household's output good, as well as inflation. Equation (13) thus provides the basis for an alternative characterization of household decision-making in the event of a crisis: Different households face different price shocks Φ^i, and this leads to differential responses in household consumption.

IV. Empirical Evidence

Dataset

The data used for this study is drawn from the broader Living Standards Measurement Study (LSMS) household surveys database commissioned by the development economics group of the World Bank. The specific dataset is the Bulgarian Integrated Household Survey for the years 1995 and 1997, and was conducted by Gallup International in Sofia. A fixed number of households were selected in each sample selection, and the data covers all regions and provinces of Bulgaria. The first survey comprises 2,500 households, while the latter survey includes 2,317, with approximately 2,000 of the original households being re-interviewed. The questionnaires include questions on socioeconomic variables, such as the highest level of educational attainment, the type of educational institution attended, employment status, the type of job held, and the health status of an individual in the household; demographic variables such as the number of children in the household and the gender of household members; and production and asset variables such as agricultural and business assets owned, and ownership of household durable assets.[5]

The data were collected between May and July 1995 (for the 1995 survey) and the end of March through August 1997 (for the 1997 survey). Thus, the households were surveyed preceding the 1996/97 financial crisis, as well as in the immediate months of its aftermath. The benchmark results worked with between 1,712 and 2,002 households (for consumption) and 1,230 and 1,274 households (for income). For this reason, therefore, we regard the results on changes in consumption expenditure as superior to those on changes in total income.[6]

Among the constructed variables, the two dependent variables are of particular interest.[7] *Household consumption expenditures* were constructed in three steps. First, expenditures on 13 different categories of food and nonfood consumption goods were collated (these included food items such as cereal, fruits and vegetables, and meat and dairy). Second, these were converted to per capita terms, and then adjusted for seasonality as well as deflated for regional price differences. Third, since monthly inflation was rapidly changing over the time period, we converted the values to real terms using

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[5] A copy of the actual questionnaire used for each survey can be obtained from the World Bank's LSMS website: http://www.worldbank.org/lsms/guide/select.html.

[6] This smaller sample size may well be due to sample selection biases coupled with increased measurement error in household income data.

[7] A more detailed description of both core as well as constructed variables is provided in the data appendix.

monthly CPI data with January 1995 as the base month. *Household total income* is the sum of net agricultural income, wage and self employment income, social benefit income, net remittances, other revenue, and rents from real estate assets.

Estimation Methodology

The primary aim of the empirical explorations is to draw conclusions on the factors influencing the change in consumption behavior of households. Specifically, we seek to estimate equations (9) and (13). Accordingly, we operationalize these theoretical equations into two econometric models given by

$$\begin{aligned} \ln \Delta c_{i,t+1} &\equiv \ln c_{i,t+1} - \ln c_i = \delta_0 + \boldsymbol{\delta}' \mathbf{x}_{it} + \varepsilon_{it}, \\ \ln \Delta c_{i,t+1} &\equiv \ln c_{i,t+1} - \ln c_{it} = \gamma_0 + \boldsymbol{\gamma}' \boldsymbol{\Phi}_{it} + \nu_{it}, \end{aligned} \tag{14}$$

where t and $t + 1$ are the years 1995 and 1997, respectively, δ_0 and γ_0 are intercept terms, $\boldsymbol{\delta} = [\delta_1, \ldots, \delta_j]'$ and $\boldsymbol{\gamma} = [\gamma_1, \ldots, \gamma_j]'$ are vectors of estimated coefficients, $\mathbf{x}_{it}$ is a $(j \times m)$ matrix of household socioeconomic and demographic characteristics measured in 1995, $\boldsymbol{\Phi}_{it}$ is a $(k \times m)$ matrix of household production, asset, and wealth variables, and ε_{it} and ν_{it} are i.i.d., $N \sim \left(0,\ \sigma_\varepsilon^2\right)$ and $N \sim \left(0,\ \sigma_\nu^2\right)$ error terms, respectively. In order to capture the important impact of initial consumption, we include 1995 consumption level as an additional control in the $\mathbf{x}_{1995}$ matrix. Finally, to compare the merits of the two potential theories, we additionally regress

$$\ln \Delta c_{i,t+1} = \rho + \boldsymbol{\lambda}' \mathbf{x}_{it} + \boldsymbol{\mu}' \boldsymbol{\Phi}_{it} + \upsilon_{it}. \tag{15}$$

While we do not have a microfounded model of changes in income, we posit that income changes follow a similar econometric structure to changes in consumption. Thus, we also regress the analogues of (14) and (15), but with changes in income as a dependent variable instead:

$$\begin{aligned} \ln \Delta y_{i,t+1} &\equiv \ln y_{i,t+1} - \ln y_{it} = \delta_0' + \left(\boldsymbol{\delta}'\right)' \mathbf{x}_{it} + \varepsilon_{it}', \\ \ln \Delta y_{i,t+1} &\equiv \ln y_{i,t+1} - \ln y_{it} = \gamma_0' + \left(\boldsymbol{\gamma}'\right)' \boldsymbol{\Phi}_{it} + \nu_{it}', \end{aligned} \tag{16}$$

$$\ln \Delta y_{i,t+1} = \rho' + \left(\boldsymbol{\lambda}'\right)' \mathbf{x}_{it} + \left(\boldsymbol{\mu}'\right)' \boldsymbol{\Phi}_{it} + \upsilon_{it}'. \tag{17}$$

While we report the results for estimates of equations (14) and (16), we regard these as potentially incomplete models of consumption and income behavior in the event of a crisis. Accordingly, we consider equations (15) and (17) as the key benchmark regressions of the study. These were primarily estimated via OLS, with White-robust standard errors.

Descriptive Statistics

Table 1 provides some key summary statistics for the data. Across all 2,002 households that reported consumption expenditures for both 1995 and 1997, the average decline was thirty percent after adjusting for monthly inflation and regional price differences.[8]

(Insert Table 1 here)

When the sample is disaggregated into nine political districts of residence (analogous to U.S. states), it emerges that for 1995, average per capita real consumption expenditures did not vary widely across districts; average consumption in the highest-consumption district was only eighteen percent above that in the lowest-consumption district. However, consumption changes during the crisis varied widely across districts.[9] In order to control for these regional effects, district dummies are included in the multivariate analysis as control variables.

The average decline in consumption also differs across ethnicities.[10] Bulgarian Turks experienced an average decline in consumption of 14 percent, Roma experienced an average decline of 19 percent, while Bulgarians comprise 89 percent of the sample, experienced an average decline of 32 percent (see Table 1). The results for income are quite different, with Roma reporting the largest decline in income. One explanation for the income result is that Roma tended to increase participation in informal economic activities to a greater extent than other ethnic groups (due, perhaps, to labor market discrimination or to cultural factors). An alternative explanation is that Roma tended to be more able to smooth consumption than other ethnic groups. A third, less interesting explanation is that income results are simply driven by measurement error, a problem that may be exacerbated by the small size of the Romany subsample. Whatever the exact source of ethnicity effects, a dummy for

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[8] As the impact of the financial crisis on households differed widely across regions, sectors of employment, and socioeconomic groups, some of the correlations presented in this section are spurious. This is highlighted by the results of the multivariate analysis discussed in the following subsections.

[9] The district with the highest average consumption in 1995 was Bourgas, a coastal district with a major port on the Black Sea. Households in Bourgas had an average decline in consumption of only 3.6 percent (see Table 1), the smallest of any district. Households in Plovdiv, a landlocked district just west of Bourgas, had average consumption only 5 percent below that of Bourgas in 1995, but during the crisis experienced the greatest decline in consumption of any district. The average decline in Plovdiv was 46 percent (see Table 1), and in 1997 Plovdiv's average household consumption was almost 40 percent below that in Bourgas.

[10] Bulgarian Turks, descended from the Ottoman population who ruled Bulgaria from the fourteenth through the nineteenth century, comprise 6.4 percent of the sample. Roma, or gypsies, comprise 3.3 percent of the sample, and Bulgarians, a Slavic ethnicity, comprise 89 percent of the sample.

being Turkish and a dummy for being Romany are included in the multivariate analysis to control for these effects.

The impact of the financial crisis also varies widely across sectors of employment. In households with one or more members employed primarily in agriculture, the average change in real per capita consumption expenditures was a 21.5 percent increase. Those in forestry, science, and arts had a smaller increase, on average (see Table 1). In contrast, households with members employed in other sectors faced large declines in consumption, on average (for example, transportation and commercial services). This corresponds to the reasoning that prices of tradable goods, such as food and timber, should increase more rapidly than prices of nontradable goods when the currency is depreciating rapidly; a hypothesis that has also been made in studies of crises in other countries (Frankenberg, Smith & Thomas 2003; Alem & Townsend 2003).

Econometric Estimates

We tested for preference heterogeneity by running regressions that include various demographic and socioeconomic characteristics. In addition, we controlled for regional differences by including dummies for each district. The results using the change in consumption expenditure as a dependent variable are reported in column (C1) of Table 2.

To test the production heterogeneity theory, we would – ideally – use price data. There are two reasons why this is not feasible. First, 1997 market price data for assets bought and sold, by household, was simply not available; moreover, even if they were, the absence of the date in which they were bought and sold makes any such data highly unreliable, given the high levels of inflation in Bulgaria at the time. Second, the use of 1997 data on the value of these goods (the closest data that we have to a market price) could potentially bring in selection problems, since we only have the prices of goods not sold by households during the crisis. Again, to use 1995 data would be highly inaccurate, since good prices changed rapidly between the two years. As a substitute for the prices of assets, we instead generated dummy variables that corresponded to ownership of each asset in each class in 1995 (household durables, agricultural assets, and business assets). In addition, we also include dummies that capture the major sector of employment of the first two members of the household, treating these as proxies for the prices of household output. The results with respect to the change in consumption expenditure are reported in the remaining columns of Table 2. The regressions are as follows: (C2) OLS regression with employment sector and durable asset ownership; (C3) Specification (C2) with business asset ownership; and (C4) Specification (C2) with agricultural asset ownership.

Finally, we also report estimates for the combined regression, which is our preferred specification. These are: (C5) OLS regression with household demographic and socioeconomic characteristics, employment sector, and durable asset ownership; (C6) Specification (C5) with business asset ownership; and (C7) Specification (C5) with agricultural asset ownership.

(Insert Table 2 here)

The analogous results for changes in total income are reported in Table 3.

(Insert Table 3 here)

Discussion of Key Findings

This subsection provides an economic interpretation of the key findings of the benchmark results. It begins with a discussion of the socioeconomic and demographic variables, followed by a discussion of the production and asset variables.

Socioeconomic and Demographic Variables

Across specifications with the household's change in the log of real per capita consumption expenditures on the left hand side, the initial 1995 value has a significant negative coefficient (see Tables 2, 4 and 5). Magnitudes indicate economic significance, as well. That is, households with higher initial log consumption tended to experience substantially greater declines in log consumption, and this qualitative result is independent of the set of control variables. However, this result probably suffers from sample selection bias. The analysis is limited to households that were surveyed in both 1995 and 1997, and households with the highest 1995 consumption were more likely than other households to drop from the sample. If the likelihood that a household moves away during the crisis is related to the impact of the crisis on that household, this biases the coefficient on initial consumption. However, it may be that the initially well-off households who were hardest hit by the crisis were the most likely to move away; if this is the case, the sample selection problem actually biases the coefficient on initial consumption upward, understating the association between high initial consumption and the subsequent decline in consumption during the crisis.

There are a few explanations for the general association between higher initial consumption and greater subsequent decline. One is that initially well-off households may be less likely to produce tradable goods, and thus experience lower than average inflation of their nominal incomes; however, the magnitude and significance of the coefficient is insensitive to the inclusion of sectoral employment variables, which casts doubt on this explanation. It may be that initially well-off households have a greater share of tradable goods in their consumption baskets, so that they

experience higher than average price inflation. This effect would not be fully captured in the analysis because the consumer price index used is not household-specific; good/service-specific inflation data are not available, so basket-specific inflation rates cannot be constructed. However, heterogeneity in households' preferences over goods/services with different inflation rates should correspond to heterogeneity in substitution of leisure for consumption, which could appear to be an association between high initial consumption and a subsequent relative decline. This depends on whether the income or substitution effect dominates, and on whether richer or poorer households prefer goods subject to higher inflation. Another explanation is that if 1995 consumption figures are subject to measurement error, then an erroneously high figure will correspond to a greater subsequent decline and generate a negative coefficient; we are unable to correct for this, since we do not have earlier consumption figures than 1995 to use as independent variables. We are fairly confident that measurement error is not a serious problem, because the World Bank used a great number of very detailed survey questions to construct the consumption data. A final explanation is that initially better-off households held a greater share of their wealth in financial assets, and were thus more vulnerable to the banking crisis and to inflation. The available asset data do not include financial wealth, so this cannot be controlled for; however, this explanation almost certainly has some validity. Frankenberg, Smith & Thomas (2003) argue that this was an important source of differential impact in Indonesia.

In several specifications, household members' average educational attainment is significantly associated with a smaller decline in consumption (see Tables 2 and 4). Without controlling for any other effects, greater educational attainment has a statistically significant association with a greater decline in consumption, but when initial consumption is controlled for, the coefficient switches signs. That is, for households with the same initial consumption, those with more educated members experienced a smaller decline in consumption during the crisis. The result is statistically significant across several sets of controls, but the magnitudes are fairly small. The general result could be due to heterogeneity across households with different educational attainment in preferences, access to new opportunities associated with the crisis, ability to smooth consumption, or employment characteristics not captured by sector dummies and assets.

Ethnicity has statistically and economically significant associations with the decline in consumption. While Romany households were less impacted by the crisis than households of the majority ethnicity on average (see Table 1), this difference is explained by the low initial consumption level of Romany households and not by their ethnicity. Among households with the same initial consumption, Roma experienced a much larger decline in consumption than households of other ethnicities. This might be due to differences in preferences over goods and services due to culture. Alternatively,

consumption preferences may be nonmonotonic in income, which would make the linear econometric specification problematic. If a relatively high food-share of consumption is associated with extreme poverty, the effect of the food-share on an initially low-consumption household's basket-specific inflation rate would not be captured by the coefficient on initial consumption. The food-share effect should not cause a problem directly, since basket-specific inflation rates are not used. If the food-share effect has repercussions in households' consumption-leisure substitution decisions, however, the dummy for being Romany might pick up this effect by acting as an indicator of a high food-share, thus of a labor-supply response that that differs from that of other households. It is unlikely that this is indeed the source of the coefficients on the Romany dummy, judging by the regressions within initial consumption groups. Initial log consumption is associated with a slightly greater subsequent decline in log consumption within the initially worst-off 25 percent of the sample than in initially better-off households (see Table 4). That is, not only do the poorest of the poor experience smaller percent declines in consumption during the crisis, *ceteris paribus*, than households who are poor but less so, but that this effect is slightly stronger among the poorest 25 percent than among the remainder of the sample. Thus, if the negative coefficients on the Romany variable do capture effects of initial poverty, the coefficients are actually offset by these effects and negative effects of being Romany are understated.

One explanation for the coefficients on the Romany dummy, which follows from the model of preference heterogeneity in Section III, is that differences in the preferences factor, x, are related to culture. Another is that differences in the liquidity shock, a, correspond to socioeconomic characteristics stemming from culture which are not captured by sectoral employment and asset variables. A third explanation is that the liquidity shock corresponds to ethnicity because of discrimination in labor markets, or other types of ethnic discrimination which may be exacerbated by financial crises.

Turkish ethnicity does not have significant effects in the total sample, but it does within certain districts. With control variables, being Turkish is significantly associated with a greater consumption decline in the districts Montana and Haskovo (see Table 4). This result is striking, since in the total sample Turkish households experienced an average consumption decline roughly half that experienced by other households when other factors are not controlled for (see Table 1). Household size and dummies for disabilities, children, and for gender and age ranges of the head of household are included in some specifications. They are generally not significant, except that households with a male head between the ages of 35 and 54, or 55 and 99, experience smaller consumption declines(see Table 2). Health problems and the log of household size are not significant in any of the specifications, and nor are dummies for the presence of children in the 0-4 and 5-14 age ranges.

Production and Asset Variables

Without control variables, households with one or both head members employed primarily in the agricultural sector have statistically and economically significantly smaller declines in consumption than other households – indeed, consumption increases thirty-five percent on average among agricultural households(see Table 1). The same is true of the science and education sector, but the magnitude of the increase is not as striking. Employment in forestry is associated with a smaller decline in consumption than experienced by other samples, without controls, a decline of thirteen percent as compared to thirty. In specifications with control variables, households employed in the science and education sector and the sport and tourism sector have significantly smaller consumption declines (see Table 2). The goods and services produced in these sectors may be subject to greater exchange rate pass-through and inflation than others. Agricultural employment is insignificant in the baseline regressions (see Table 2), but is significant within one district and one socioeconomic stratum, as discussed below.

The sectoral employment results are sensitive to restricting the analysis to certain districts (see Table 4). In Russe, agricultural employment is associated with a smaller consumption decline. Forestry is associated with a greater consumption decline in Haskovo and Plovdiv, but with a smaller decline in Russe. Transportation is associated with a greater consumption decline in Sofia City and Montana, but with a smaller decline in Lovech. Army and police employment is associated with a greater consumption decline in Haskovo, but with a smaller decline in Sofia city and Lovech. In some districts, jobs in construction, communications, trade, sport and tourism, and finance and credit are associated with significantly smaller consumption declines. In some districts, jobs in manufacturing and management are associated with significantly larger declines in consumption.

Asset ownership may capture the ability to smooth consumption through the sale of assets in times of crisis. On the other hand, ownership of certain business and agricultural assets may indicate certain economic activities and coefficients on ownership may convey the association of these activities with vulnerability to the crisis. Variables for ownership of household durables are included in the analysis mainly to measure consumption smoothing ability, while variables for business and agricultural assets are included mainly to augment the sectoral employment variables in measuring production activities. Business and agricultural assets may be used to smooth consumption as well, though, which complicates interpretation of the results. A negative coefficient on a business or agricultural asset variable will be interpreted as an indication that a production activity corresponding to that asset is associated with vulnerability to the crisis. Positive coefficients on these variables cannot be interpreted very meaningfully; they may result from ease in using the asset to smooth consumption (for example, a deep market, and a nominal asset value that keeps pace with inflation or

outstrips it), a corresponding production activity associated with insulation from the crisis, use in consumption smoothing that dominates association with a production activity associated with vulnerability to the crisis, or association with insulation from the crisis that dominates illiquidity.

In addition to the dummies that indicate whether the asset was owned by the household in 1995, we also used – as a robustness check – using the value of the asset in 1995 if it was owned. The results for agricultural assets are insensitive to the type of variables used. The results for business assets and durables change slightly in statistical significance but not qualitatively, depending on the type of variables used.

Using dummies for ownership of durables, freezer and dishwasher ownership are associated with smaller declines in consumption (see Table 2). Using values, the same result is found for freezers (see Table 4). These assets might be easily saleable and retain their value in foreign currency, and thus aid in consumption smoothing. Freezers may aid in consumption smoothing even if they are not sold, simply because they are used to store food for long periods. Owning a refrigerator or an electronic sewing machine is associated with a greater consumption decline (using either type of variable). Electronic sewing machines are used as business assets, to some extent. Household-based sewing services are largely nontradeable and probably exhibit relatively little exchange rate pass-through, making home sewers vulnerable to the crisis. We do not have a satisfactory explanation for refrigerator results.

Using dummies for ownership of business assets, trucks and motorcycles are associated with lower consumption declines (see Table 2). The motorcycle result is robust to the use of asset value. These assets should aid in consumption smoothing, but may also be associated with productive activities that provide insulation from crises. The latter explanation may be valid in the case of trucks, since they can be used to sell tradeable goods, the prices of which should outstrip general inflation during a crisis. Cars, when reported as business assets, are associated with greater declines in consumption. Company cars are less likely than company trucks and motorcycles to be used for productive activities, and are probably used by employees mainly for personal transportation. As fuel prices exhibit perfect pass-through and outstrip general inflation, the use of company cars may constitute a liability for a firm. The car result is robust to the use of asset value.

Regardless of the type of asset variables used, ownership of horses or donkeys, plows, and plow trucks are associated with a smaller decline in consumption, and ownership of carts and chemical applicators are associated with a greater decline in consumption (see Table 2). It is likely that horses, donkeys, plows and plow trucks are saleable assets that retain much of their real value in the face of inflation. These are also associated with agricultural production, which should be insulated from

financial crises to some extent. The negative coefficient on cart ownership is a perverse result with no satisfactory explanation, although there is anecdotal evidence that the cart market is extremely shallow– cart owners maintain old carts by repairing them, rather than replacing them when they wear out. Ownership of chemical applicators is associated with a greater decline in consumption. This is probably because chemical pesticide and fertilizer prices have high pass-through, so farmers who rely heavily on these materials experienced increases in production costs during the crisis in excess of the general inflation level.

Regressions by District, Strata, and Asset Values

As a test of the robustness of our results, as well as a means to glean more insights from the data, we considered several additional regressions that considered specific subsamples of the data. These are reported in Table 4, with consumption change as a dependent variable.

(Insert Table 4 here)

Geographic location may have an impact on consumption and income, perhaps due to reasons such as a nonrandom distribution of ethnic groups in different regions, regional variations in climate and industrial structure (which could affect agricultural and wage income), and differing regional tax rates. While the consumption data were deflated for district differences, and the earlier regressions controlled for regions, there is still adequate reason to be interested in regional heterogeneity in its own right. We therefore ran regressions for each region in our sample (specifications (D1) through (D9), for districts 1 through 9). Many results differ by district, but this is not surprising. Sectors probably specialize in different goods and service between districts, due to heterogeneities in access to ports, local demand conditions, local labor market conditions, and similar factors. Coefficients on asset ownership within districts are not very different qualitatively from other specifications, but some significance is lost due to smaller sample sizes.

In order to test for the robustness of the district shocks, we ran the regressions (C1) through (C7) without the district dummies, but with a constructed average shock for each district.[11] Our results are broadly unaffected by this change. Magnitudes of coefficients remain about the same, but standard errors fall and a few more coefficients become significant. In particular, the positive coefficients for female household heads aged 35-54 and aged 55-99 become significant at 10 percent level, and the negative coefficient on one sector – management and administration – becomes significant at the 10 percent level. These results are not reported in tables.

[11] The details of the construction of this variable are provided in the data appendix.

Since inequality and income distribution are perennial areas of interest in developing countries, we separated the data into subsamples that included three broad strata: *Low* (lowest 25th percentile), *high* (highest 25th percentile), and *middle* initial consumption. Figure 1a illustrates the clear relationship between the change in log real per capita expenditure and the initial log expenditure distribution (Figure 1b repeats the exercise with the first percentile dropped). This broad relationship can also be seen in more formal analyses of the data. These are reported as specifications (S1) for *low*, (S2) for *middle*, and (S3) for *high*. In Figure 1, the change in log consumption appears to be approximately linear in initial log consumption, and comparison of (S1), (S2) and (S3) indicate that linearity is robust to the inclusion of control variables. The coefficients on initial consumption in the three regressions are not significantly different from one another at the 5 percent level. Being Romany has a significant negative coefficient within each of the three strata, but the magnitude is the smallest in *Low* and the greatest in *High*; these coefficients differ by a factor of two, but their confidence intervals do overlap. Significance of sectoral employment varies by stratum. Agricultural employment is associated with a smaller consumption decline in *Low* at the 1 percent level, with a large magnitude. The coefficients on agricultural employment are small and insignificant in the other two strata, indicating that only the poor benefited during the crisis from agricultural activities. Employment in the forestry sector is associated with a smaller consumption decline within *Low*, but with a larger consumption decline within *High*. Both of these coefficients are of sizeable magnitude. A similar result is found for employment with the army or police. Employment in the sport and tourism sector is associated with a smaller consumption decline within *High*, but the coefficients in the other two strata are statistically insignificant. Overall, the regressions within strata reveal effects which were not evident in the baseline regressions because these effects differ across segments of the total sample.

In the benchmark regression subsection, we noted that data limitations as well as econometric issues made it impossible to utilize the actual price data that was inherent in our theory for production heterogeneity. We disaggregate assets owned in 1995, in order to capture heterogeneity in subsequent asset price changes across households to the extent that the heterogeneity is due to the types of assets initially owned. A dummy for a household's ownership of each type of asset was then applied. Here we consider an alternative specification, where we use the 1995 values of each asset owned instead, in order to measure the quantity of each type of asset held in 1995 (we set this value to zero if it was not owned). We do this for just household durables (our preferred specification), as well as for two estimations that include, alternately, business and agricultural assets. These are reported as specifications (V1)-(V3). As has been discussed in detail in the previous section, the results are generally robust to the alternative data, with some minor differences.

The contention that initial real per capita consumption expenditures may be endogenous to changes in consumption expenditures should not be taken lightly. Although the crisis was largely unanticipated, some households may have anticipated future income changes independent of the crisis, and adjusted 1995 consumption accordingly. A more serious problem might be correlation of measurement errors on the left and right hand sides of the regression. In order to account for these econometric issues, we instrumented real per capita expenditure with real per capita income, and vice versa. The correlation of the two variables was 0.177, and this was significant up to 1 percent level. We ran two instrumental variable regressions: For the benchmark specifications (C5) and (Y5). These are reported in Table 5, as specifications (I1) and (I2), respectively. Overall, the results remain fairly robust; although some explanatory variables – notably average household education and the Romany dummy – are rendered insignificant. This could be due to the relatively poor quality of the instruments (while statistically significant, the correlation of the two variables is relatively low); nonetheless, controlling for endogeneity via instrumental variables does not dilute the primary findings of the paper.

V. Conclusion

This paper has sought to provide a microeconomic picture of a financial crisis and its impact on consumer behavior, drawing on the case of Bulgaria. The main findings echo that of earlier literature: Financial crises exert differential impacts on different groups in society. In particular, for Bulgaria, our empirical results imply that ethnicity, educational level, and employment sector are the most important determinants of consumption and income change in a crisis, with a lesser influence from particular assets.

To distinguish between the potential causes of this differential response, we have sought to frame the debate in terms of two alternative theoretical explanations for these differences – one based on preference heterogeneity, and the other based on differences in household production technology. The data suggest that both of these theories are plausible explanations for the differential impact of the idiosyncratic shock on consumption, since ethnicity and education potentially capture responses in terms of preferences, while employment sectors and ownership of certain assets potentially capture responses in terms of production.

There are several shortcomings of the paper; these naturally suggest avenues for future research. First, because the study uses data at the household level, we have imposed a household-production structure on the theoretical underpinnings of the analysis. While this may be appropriate in the context of a middle-income economy, it will be interesting, if data are available, to seek similar trends from micro-level firm data. Second, the data that we employ span only two years, 1995 and 1997.

The World Bank has recently released a new LSMS dataset for Bulgarian household for 2001. The primary disadvantage of that dataset (and the reason why we have not utilized it in this study) is that the 2,500 households interviewed in 2001 do not overlap with the earlier two surveys, and hence we have longitudinal, as opposed to panel, data.[12] Despite this shortcoming, it is possible to make broader generalizations of the impact of the crisis on income distribution and poverty issues, which do not require a balanced panel. Finally, a longer-term goal of this project is to extend the methodology of the present study to a larger selection of countries. This, again, will be dictated by data limitations, but given the scope and scale of the World Bank's LSMS project – as well as the increased availability of household survey data in general – together with the frequency of financial crises in emerging markets, we are confident that this extension will be both feasible and fruitful.

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Data Appendix

This appendix describes, separately, several key core and constructed variables used in the study.

Core Variables

The indicator variables for *durable asset ownership* comprise 19 different household durable goods that constitute household assets, which can potentially be bought or sold in order to smooth consumption (as well as income). These include, among other things, a gas stove (*DA1*), a refrigerator (*DA3*), a manual washing machine (*DA6*), and a color television (*DA11*). Likewise, the dummies for *business asset ownership* and *agricultural asset ownership* comprise, respectively, 18 and 14 different business and agricultural assets owned by a particular household. Examples of these in each category include a tractor (*AA1*), a plow (*AA3*), and a cart (*AA13*), and office equipment (*BA3*), fax machines (*BA7*), and tools (*BA16*). The various codes are summarized in the table below.

Durable assets	**Business assets**	**Agricultural assets**
1 Gas stove	1 Building	1 Tractor
2 Electric stove	2 Machinery	2 Trailer
3 Refrigerator	3 Office equipment	3 Plows
4 Freezer	4 Furniture	4 Pick-up
5 Automatic washing machine	5 Computer	5 Hay truck
6 Manual washing machine	6 Copy machine	6 Combine
7 Dryer	7 Fax machine	7 Plow truck
8 Dishwasher	8 Medical	8 Chemical applicator
9 Sewing machine	9 Other capital equipment	9 Seeder
10 Electronic sewing machine	10 Cars	10 Threshing
11 Color TV	11 Trucks	11 Bale press
12 VCR	12 Buses	12 Horse/donkey
13 Parabolic antenna	13 Motorcycles	13 Cart
14 Stereo	14 Motorboats	14 Other
15 Radio	15 Boats	
16 Personal computer	16 Tools	
17 Car	17 Storage	
18 Motorcycle	18 Other	
19 Other		

The indicator variables for *household composition* involve dummies for whether the head of household was: A male (female) up to age 34; a male (female) up aged between 35 and 54, and a male (female)

between the ages of 55 and 99. In addition, dummies included whether there were children in the household under 4 years of age; and children between the ages of 5 and 14.

The *health* dummy took on a value of unity if there was any chronic disease in the household in the past 12 months, and null otherwise. *Population group* comprised two dummies, one for Bulgars and another for Gypsies. The *geographical district* control added dummies to each of the following regions: Sofia City (*DIST1*), Bourgas (*DIST2*), Varna (*DIST3*), Lovech (*DIST4*), Montana (*DIST5*), Plovdiv (*DIST6*), Russe (*DIST7*), Sofia Region (*DIST8*), and Haskovo (*DIST9*). Finally, *household size* is a discrete measure of the number of resident household members.

Constructed Variables

The *average years of household education* was constructed by, first, dropping individuals that were still schooling at the time of the survey, as well as children under schooling age, and averaging these years over these remaining household members. The *district average shock* was calculated as the mean change in log real per capita consumption expenditures in the district in which the household lives.

Employment sector was constructed as an indicator variable that took on a value of unity if one of the first two household members (usually the father and/or mother) worked in a particular sector of the economy in 1995, and null otherwise. These sectors were: Manufacturing (*ES1*); construction (*ES2*); agriculture (*ES3*); forestry (*ES4*); transportation (*ES5*); communications (*ES6*); trade (*ES7*); commercial services (*ES8*); other production (*ES9*); science and education (*ES10*); arts and culture (*ES11*); healthcare (*ES12*); sport and tourism (*ES13*); finance and credit (*ES14*); management and administration (*ES15*); army and police (*ES16*); and other non material activities (*ES17*).

Household consumption expenditures were constructed in three steps. First, expenditures on 13 different categories of food and nonfood consumption goods were collated (these included food items such as cereal, fruits and vegetables, and meat and dairy). Second, these were converted to per capita terms, and then adjusted for seasonality as well as deflated for regional price differences. Third, since monthly inflation was rapidly changing over the time period, we converted the values to real terms using monthly CPI data with January 1995 as the base month.

Household total income the sum of net agricultural income, wage and self employment income, social benefit income (this includes income from sources such as child allowance and unemployment insurance), net remittances, other revenue (such as returns from financial assets, lottery earnings, and debts), and rents from real estate assets.

Figures and Tables

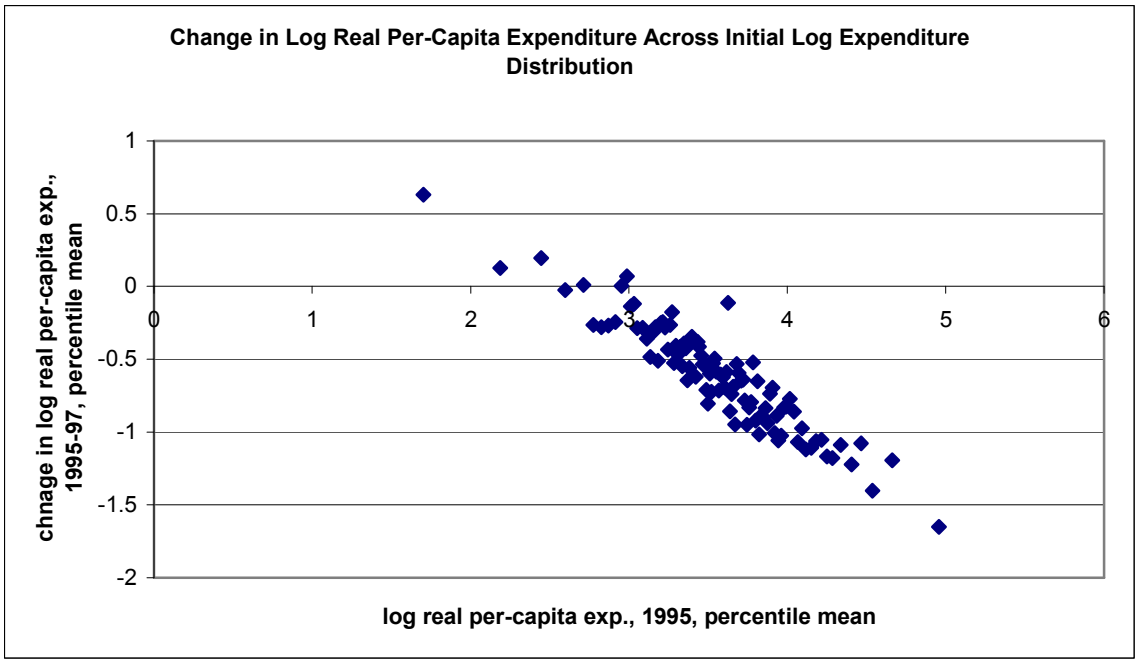

Figure 1a. Change in Log Real Per Capita Expenditure across Initial Log Expenditure Distribution

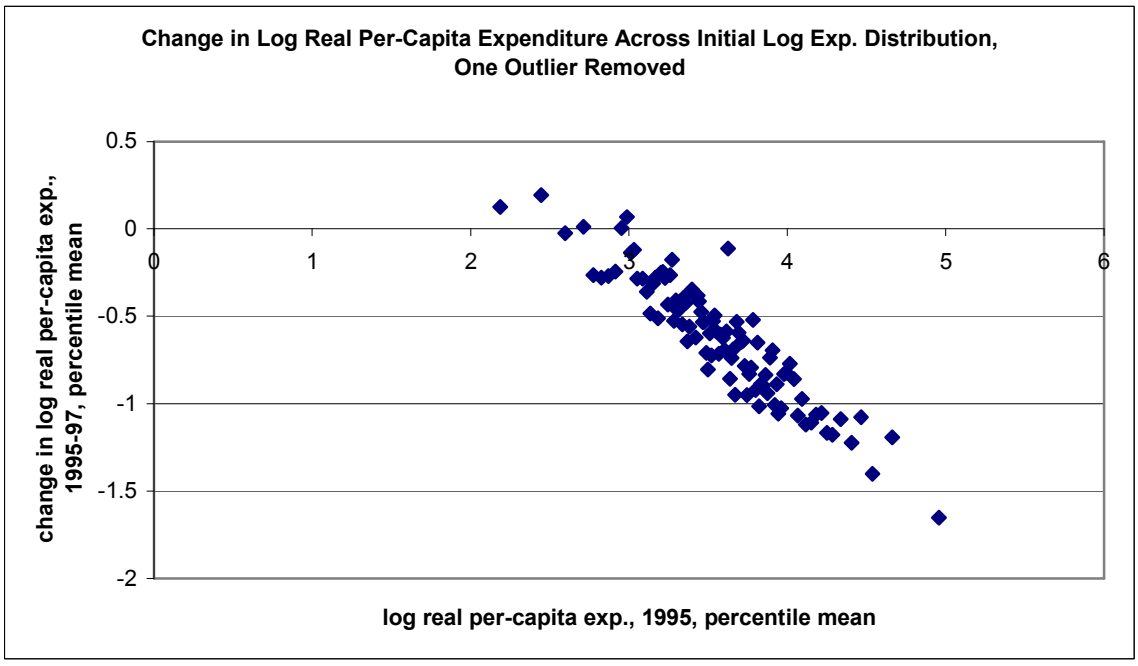

Figure 1b. Change in Log Real Per Capita Expenditure across Initial Log Expenditure Distribution, One Outlier Removed

Table 1. Summary statistics

	Mean relative Δ consumption expenditure	*Mean relative Δ total income*
Full sample	-0.304 (1.097)	-0.747 (4.774)
District		
Sofia City (*DIST1*)	-0.413 (0.032)	-0.036 (0.719)
Bourgas (*DIST2*)	-0.036 (0.124)	-0.717 (0.256)
Varna (*DIST3*)	-0.248 (0.041)	-0.743 (0.075)
Lovech (*DIST4*)	-0.186 (0.059)	-0.789 (0.055)
Montana (*DIST5*)	-0.275 (0.030)	-0.879 (0.071)
Plovdiv (*DIST6*)	-0.462 (0.022)	-0.700 (0.146)
Russe (*DIST7*)	-0.349 (0.037)	-1.234 (0.573)
Sofia Region (*DIST8*)	-0.320 (0.150)	-0.792 (0.731)
Haskovo (*DIST9*)	-0.389 (0.020)	-0.757 (0.139)
Employment sector		
Agriculture (*ES3*)	0.350 (0.525)	-0.813 (0.040)
Forestry (*ES4*)	-0.131 (0.253)	-0.497 (0.327)
Transportation (*ES5*)	-0.272 (0.068)	-0.965 (0.137)
Commercial services (*ES8*)	-0.391 (0.049)	-0.957 (0.129)
Science and education (*ES10*)	0.075 (0.400)	-0.813 (0.059)
Arts and culture (*ES11*)	0.076 (0.269)	-0.977 (0.056)
Population group		
Bulgarian	-0.321 (0.026)	-0.767 (0.138)
Turkish	-0.142 (0.109)	-0.343 (0.195)
Romany	-0.191 (0.089)	-0.830 (0.130)

Notes: Mean values are reported with standard errors in parentheses.

Table 2. Benchmark regressions for change in consumption expenditure

	(C1)	*(C2)*	*(C3)*	*(C4)*	*(C5)*	*(C6)*	*(C7)*
Initial consumption	-0.754 (0.028)***	-0.671 (0.028)***	-0.672 (0.028)***	-0.671 (0.028)***	-0.757 (0.029)***	-0.757 (0.029)***	-0.758 (0.029)***
Average years education	0.119 (0.038)***				0.121 (0.038)***	0.120 (0.037)***	0.115 (0.038)***
Household size	-0.041 (0.034)				-0.023 (0.037)	-0.023 (0.037)	-0.028 (0.037)
Health	0.001 (0.003)				0.001 (0.004)	0.001 (0.004)	0.002 (0.003)
Population group							
Turkish	-0.053 (0.056)				-0.037 (0.057)	-0.038 (0.058)	-0.031 (0.057)
Romany	-0.416 (0.102)***				-0.405 (0.103)***	-0.398 (0.105)***	-0.434 (0.104)***
Household composition							
Head, male under 35	0.197 (0.153)				0.200 (0.153)	0.211 (0.154)	0.223 (0.152)
Head, female under 35	0.195 (0.216)				0.193 (0.214)	0.195 (0.215)	0.200 (0.214)
Head, male 35-54	0.262 (0.145)*				0.267 (0.144)*	0.277 (0.145)*	0.281 (0.143)**
Head, female 35-54	0.223 (0. 155)				0.218 (0.154)	0.223 (0.155)	0.239 (0.153)
Head, male 55-99	0.269 (0.145)				0.270 (0.144)*	0.273 (0.145)*	0.290 (0.144)*
Head, female 55-99	0.209 (0.147)				0.211 (0.148)	0.215 (0.148)	0.234 (0.147)
Child between 0-4	0.061 (0.044)				0.052 (0.044)	0.060 (0.045)	0.059 (0.045)
Child between 5-14	0.011 (0.026)				-0.001 (0.023)	-0.002 (0.023)	-0.002 (0.023)
Employment sector							
Science/Education (*ES10*)		0.143 (0.073)**	0.138 (0.074)*	0.147 (0.066)**	0.146 (0.078)*	0.137 (0.079)*	0.154 (0.071)**
Sport/ Tourism (*ES13*)		0.241 (0.109)**	0.236 (0.109)**	0.258 (0.105)***	0.236 (0.113)**	0.230 (0.113)**	0.255 (0.109)**
Durable asset ownership							
Refrigerator (*DA3*)		-0.044 (0.046)	-0.042 (0.046)	-0.039 (0.047)	-0.088 (0.053)*	-0.088 (0.053)*	-0.087 (0.054)
Freezer (*DA4*)		0.066 (0.042)	0.072 (0.042)*	0.055 (0.043)	0.056 (0.042)	0.058 (0.042)	0.052 (0.042)

Dishwasher (*DA8*)		0.307 (0.183)*	0.092 (0.042)**	0.309 (0.184)*	0.135 (0.160)	0.013 (0.071)	0.130 (0.163)
Electronic sewing machine (*DA10*)		-0.069 (0.041)*	-0.071 (0.041)*	-0.066 (0.041)	-0.058 (0.042)	-0.061 (0.042)	-0.057 (0.042)
Business asset ownership							
Cars (*BA10*)			-0.280 (0.111)***			-0.275 (0.118)**	
Trucks (*BA11*)			0.190 (0.187)			0.321 (0.176)*	
Motorcycles (*BA13*)			0.754 (0.106)***			0.736 (0.102)***	
Agricultural asset ownership							
Plows (*AA3*)				0.426 (0.199)**			0.432 (0.223)**
Plow truck (*AA7*)				0.375 (0.150)***			0.381 (0.160)**
Chemical applicator (*AA8*)				-0.175 (0.089)**			-0.207 (0.094)**
Horse/donkey (*AA12*)				0.196 (0.098)**			0.252 (0.103)***
Cart (*AA13*)				-0.239 (0.103)**			-0.282 (0.109)***
R^2 (adjusted)	0.362	0.342	0.349	0.353	0.376	0.384	0.390
Observations	1709	2002	2002	2002	1709	1709	1709

Notes: A constant term and district dummies were included in the regressions, but are not reported. Standard errors are in parentheses. * indicates significance at 10 percent level, ** indicates significance at 5 percent level, and *** indicates significance at 1 percent level. To economize on space, employment sector and asset ownership variables are reported only for those with statistically significant coefficients in at least one specification, although the regressions were run with all sectors and assets.

Table 3. Benchmark regressions for change in total income

	(Y1)	*(Y2)*	*(Y3)*	*(Y4)*	*(Y5)*	*(Y6)*	*(Y7)*
Initial income	-0.548 (0.138)***	-0.496 (0.052)***	-0.499 (0.052)***	-0.496 (0.052)***	-0.552 (0.065)***	-0.552 (0.066)***	-0.547 (0.066)***
Average years education	0.182 (0.114)				0.205 (0.113)*	0.203 (0.114)*	0.219 (0.113)*
Household size	-0.029 (0.148)				-0.070 (0.158)	-0.070 (0.160)	-0.040 (0.159)
Health	0.003 (0.011)				0.003 (0.012)	0.004 (0.018)	0.001 (0.012)
Population group							
Turkish	0.548 (0.163)				0.515 (0.165)***	0.493 (0.166)***	0.517 (0.166)***
Romany	-0.177 (0.298)				-0.146 (0.305)	-0.143 (0.311)	-0.137 (0.311)
Household composition							
Head, male under 35	0.338 (0.401)				0.216 (0.348)	0.210 (0.349)	-0.020 (0.334)
Head, female under 35	1.524 (0.493)***				1.604 (0.550)***	1.573 (0.544)***	1.397 (0.536)***
Head, male 35-54	0.123 (0.366)				-0.107 (0.307)	-0.076 (0.304)	-0.325 (0.286)
Head, female 35-54	0.672 (0.402)*				0.461 (0.341)	0.470 (0.340)	0.260 (0.324)
Head, male 55-99	0.273 (0.363)				0.218 (0.300)	0.227 (0.299)	0.024 (0.275)
Head, female 55-99	0.071 (0.384)				-0.014 (0.327)	-0.015 (0.327)	-0.210 (0.303)
Child between 0-4	0.060 (0.122)				0.092 (0.132)	0.098 (0.134)	0.077 (0.133)
Child between 5-14	-0.053 (0.090)				-0.072 (0.090)	-0.069 (0.091)	-0.062 (0.090)
Employment sector							
Manufacturing (*ES1*)		0.241 (0.123)**	0.246 (0.124)**	0.267 (0.120)**	0.332 (0.137)**	0.330 (0.139)**	0.359 (0.133)***
Communications (*ES6*)		0.535 (0.303)*	0.508 (0.302)**	0.551 (0.300)*	0.667 (0.319)**	0.633 (0.317)**	0.684 (0.316)**
Trade (*ES7*)		-0.513 (0.237)**	-0.551 (0.241)**	-0.517 (0.239)**	-0.389 (0.243)	-0.434 (0.249)*	-0.394 (0.248)
Other production (*ES9*)		0.332 (0.219)	0.337 (0.210)	0.321 (0.212)*	0.410 (0.221)*	-0.408 (0.216)**	0.397 (0.220)*
Science/ education (*ES10*)		0.446 (0.192)**	0.439 (0.193)**	0.409 (0.193)**	0.603 (0.199)***	0.588 (0.201)***	0.570 (0.200)***

Sport/ tourism (*ES13*)		1.325 (0.558)**	1.412 (0.547)***	1.281 (0.565)**	1.424 (0.544)***	1.498 (0.533)***	1.368 (0.549)***
Management (*ES15*)		1.102 (0.524)**	1.100 (0.516)**	1.042 (0.526)**	1.068 (0.463)**	1.061 (0.459)**	1.015 (0.459)**
Army/ police (*ES16*)		0.340 (0.184)*	0.068 (0.250)	0.221 (0.208)	0.213 (0.259)	0.201 (0.263)	0.353 (0.216)*
Durable asset ownership							
Gas stove (*DA1*)		-0.448 (0.160)***	-0.473 (0.163)***	-0.461 (0.160)***	-0.437 (0.164)***	-0.467 (0.169)***	-0.448 (0.165)***
Dryer (*DA7*)		-1.483 (0.775)*	-1.361 (0.746) *	-1.491 (0.774)**	-1.593 (0.649)***	-1.474 (0.632)**	-1.605 (0.645)***
El. Sewing Mach. (*DA10*)		0.261 (0.148)*	0.268 (0.149)*	0.260 (0.148)*	0.289 (0.151)*	0.286 (0.152)*	0.290 (0.151)*
Business asset ownership							
Machinery (*BA2*)			0.836 (0.501)*			0.941 (0.574)*	
Copy machine (*BA6*)			-3.030 (1.194)***			-2.658 (1.244)**	
Fax machine (*BA7*)			2.876 (1.003)***			2.658 (1.071)***	
Other capital equipment (*BA9*)			0.769 (0.474)			1.040 (0.592)*	
Trucks (*BA11*)			-1.201 (0.461)***			-1.145 (0.608)*	
Motorcycles (*BA13*)			0.415 (0.226)*			0.286 (0.238)	
Tools (*BA16*)			-1.173 (0.479)**			-1.109 (0.474)**	
Agricultural asset ownership							
Pick-up (*AA4*)				-1.029 (0.403)***			-1.121 (0.491)**
Seeder (*AA9*)				-4.539 (0.519)***			-4.677 (0.539)***
Horse/donkey (*AA12*)				-0.751 (0.330)**			-0.711 (0.347)**
Cart (*AA13*)				0.653 (0.339)**			0.553 (0.358)
R^2 (adjusted)	0.117	0.137	0.147	0.148	0.156	0.164	0.167
Observations	1222	1269	1269	1269	1222	1222	1222

Notes: A constant term and district dummies were included in the regressions, but are not reported. Standard errors are in parentheses. * indicates significance at 10 percent level, ** indicates significance at 5 percent level, and *** indicates significance at 1 percent level. To economize on space, employment sector and asset ownership variables are reported only for those with statistically significant coefficients in at least one specification, although the regressions were run with all sectors and assets.

Table 4. Regressions for change in consumption expenditure by district, strata, and asset values

	District									*Strata*			*Asset prices*		
	(D1)	(D2)	(D3)	(D4)	(D5)	(D6)	(D7)	(D8)	(D9)	(S1)	(S2)	(S3)	(V1)	(V2)	(V3)
Initial consumption	-0.605	-1.027	-0.718	-0.651	-0.909	-0.812	-0.961	-0.679	-0.570	-0.789	-0.764	-0.698	-0.762	-0.764	-0.762
	(0.113)***	(0.113)***	(0.079)***	(0.073)***	(0.099)***	(0.075)***	(0.091)***	(0.104)***	(0.078)***	(0.131)***	(0.099)***	(0.091)***	(0.029)***	(0.029)***	(0.029)***
Average years education	0.325	0.001	0.169	0.071	0.162	-0.016	0.100	0.185	0.060	0.091	0.167	0.031	0.123	0.124	0.120
	(0.163)**	(0.099)	(0.098)*	(0.107)**	(0.081)**	(0.084)	(0.099)	(0.105)*	(0.084)	(0.079)	(0.052)***	(0.060)	(0.038)***	(0.038)***	(0.038)***
Population group															
Turkish	0.315	-0.316	-0.109	0.481	-0.361	-0.163	0.058	-1.021	-0.111	-0.110	-0.060	0.101	-0.039	-0.039	-0.027
	(0.326)	(0.414)	(0.121)	(0.249)*	(0.121)***	(0.130)	(0.132)	(0.203)***	(0.085)	(0.115)	(0.063)	(0.150)	(0.057)	(0.058)	(0.058)
Romany	0.302	-1.178	-0.115	0.231	0.097	-1.209	-0.388	-0.271	-0.165	-0.321	-0.548	-0.702	-0.405	-0.412	-0.439
	(0.268)	(0.257)***	(0.257)	(0.346)	(0.203)	(0.295)***	(0.455)	(0.196)	(0.276)	(0.144)**	(0.185)***	(0.416)*	(0.103)***	(0.104)***	(0.105)***
Employment sector															
Manufacturing (*ES1*)	-0.236	-0.130	-0.013	0.001	0.123	0.169	0.158	-0.418	-0.068	-0.009	-0.053	0.033	-0.017	-0.025	-0.021
	(0.254)	(0.148)	(0.114)	(0.120)	(0.133)	(0.104)	(0.123)	(0.166)***	(0.085)	(0.084)	(0.061)	(0.075)	(0.039)	(0.040)	(0.040)
Construction (*ES2*)	0.091	0.088	0.074	-0.038	0.419	0.030	-0.211	0.055	0.034	-0.044	0.047	0.014	0.030	0.026	0.031
	(0.209)	(0.180)	(0.159)	(0.181)	(0.181)**	(0.117)	(0.219)	(0.186)	(0.153)	(0.121)	(0.097)	(0.104)	(0.058)	(0.059)	(0.058)
Agriculture (*ES3*)	-0.210	0.105	-0.157	0.228	-	-0.141	0.266	0.005	-0.118	0.519	-0.013	-0.054	0.080	0.068	0.056
	(0.214)	(0.167)	(0.187)	(0.344)		(0.147)	(0.156)*	(0.412)	(0.227)	(0.182)***	(0.161)	(0.106)	(0.097)	(0.098)	(0.080)
Forestry (*ES4*)	-	0.261	0.227	0.505	-	-0.693	1.175	-	-0.706	0.482	0.210	-0.412	0.049	0.042	0.118
		(0.510)	(0.358)	(0.321)		(0.191)***	(0.203)***		(0.216)***	(0.143)***	(0.269)	(0.232)*	(0.170)	(0.170)	(0.182)
Transportation (*ES5*)	-0.705	0.456	0.011	0.252	-0.701	0.075	0.115	-0.189	-0.064	0.149	-0.200	-0.103	-0.073	-0.078	-0.066
	(0.369)*	(0.438)	(0.164)	(0.142)*	(0.175)***	(0.047)	(0.254)	(0.128)	(0.121)	(0.160)	(0.076)***	(0.083)	(0.070)	(0.070)	(0.071)
Communications (*ES6*)	-	-0.271	0.574	0.403	0.831	-0.174	-0.056	-0.157	-0.065	0.119	-0.065	0.026	0.136	0.138	0.144
		(0.590)	(0.238)**	(0.196)**	(0.180)***	(0.141)	(0.388)	(0.749)	(0.173)	(0.166)	(0.382)	(0.226)	(0.140)	(0.141)	(0.142)
Trade (*ES7*)	0.246	-0.344	-0.016	0.046	0.009	0.051	0.356	0.115	-0.094	-0.252	0.081	-0.019	-0.004	-0.004	0.014
	(0.174)	(0.225)	(0.241)	(0.160)	(0.104)	(0.245)	(0.184)*	(0.219)	(0.122)	(0.118)**	(0.070)	(0.097)	(0.050)	(0.050)	(0.051)
Other production (*ES9*)	-0.067	-0.033	0.030	0.100	-0.182	-0.098	-0.024	0.049	-0.079	-0.033	-0.190	0.011	-0.073	-0.073	-0.060
	(0.252)	(0.321)	(0.183)	(0.240)	(0.196)	(0.140)	(0.192)	(0.198)	(0.129)	(0.127)	(0.087)**	(0.141)	(0.066)	(0.066)	(0.065)
Science/education(*ES10*)	0.435	0.203	-0.145	-0.060	0.184	-0.130	0.448	1.263	-0.019	0.036	0.275	-0.072	0.148	0.142	0.154
	(0.166)***	(0.268)	(0.231)	(0.207)	(0.246)	(0.180)	(0.193)**	(0.939)	(0.114)	(0.137)	(0.129)**	(0.102)	(0.079)*	(0.081)*	(0.070)**
Arts/ culture (*ES11*)	-0.391	0.117	0.316	0.436	-	0.378	0.026	-	-0.471	0.033	0.104	0.137	0.057	0.054	0.064
	(0.319)	(0.209)	(0.339)	(0.426)		(0.172)**	(0.185)		(0.143)***	(0.195)	(0.157)	(0.275)	(0.103)	(0.106)	(0.104)

Sport/ tourism (*ES13*)	1.006 (0.394)***	0.142 (0.423)	0.443 (0.451)	-0.198 (0.173)	-	1.369 (0.274)***	1.222 (0.361)***	-0.461 (0.296)	-	-0.082 (0.148)	0.236 (0.173)	0.491 (0.137)***	0.247 (0.113)**	0.249 (0.112)**	0.245 (0.112)**
Finance (*ES14*)	0.483 (0.211)**	-0.251 (0.377)	0.294 (0.225)	-0.216 (0.204)	-	-0.145 (0.194)	0.488 (0.189)***	-0.460 (0.386)	0.218 (0.116)*	1.158 (0.242)***	0.053 (0.113)	0.082 (0.104)	0.141 (0.098)	0.151 (0.100)	0.139 (0.098)
Management (*ES15*)	0.379 (0.397)	-0.678 (0.289)**	0.003 (0.232)	-0.257 (0.423)	-	-	-0.061 (0.307)	-0.174 (0.373)	-	-0.457 (0.275)*	-0.177 (0.211)	-	-0.283 (0.180)	-0.286 (0.167)*	-0.297 (0.194)
Army/ police (*ES16*)	0.310 (0.178)*	-0.215 (0.254)	-0.140 (0.258)	0.455 (0.167)***	0.140 (0.408)	-0.310 (0.215)	-0.042 (0.193)	0.083 (0.416)	-0.246 (0.123)**	0.265 (0.151)*	-0.085 (0.105)	-0.200 (0.109)*	-0.054 (0.065)	0.062 (0.065)	-0.059 (0.066)
Durable asset ownership															
Gas stove (*DA1*)	0.265 (0.201)	0.315 (0.141)**	-0.148 (0.113)	-0.004 (0.190)	0.036 (0.125)	-0.002 (0.121)	0.045 (0.121)	-0.067 (0.217)	-0.197 (0.108)*	-0.063 (0.102)	-0.006 (0.064)	-0.025 (0.093)	-0.001 (0.005)	-0.002 (0.005)	-0.001 (0.005)
Electric stove (*DA2*)	-0.083 (0.181)	-0.234 (0.154)	0.144 (0.131)	0.083 (0.121)	0.105 (0.135)	-0.184 (0.092)**	0.031 (0.171)	-0.286 (0.339)	-0.010 (0.135)	0.058 (0.101)	-0.105 (0.063)*	0.017 (0.075)	-0.002 (0.005)	-0.002 (0.005)	-0.001 (0.005)
Refrigerator (*DA3*)	0.158 (0.206)	0.169 (0.213)	-0.435 (0.145)***	-0.105 (0.134)	-0.211 (0.120)*	-0.071 (0.129)	0.101 (0.265)	0.068 (0.204)	-0.207 (0.175)	-0.019 (0.108)	-0.051 (0.078)	-0.124 (0.090)	-0.003 (0.005)	-0.004 (0.005)	-0.004 (0.005)
Freezer (*DA4*)	0.018 (0.209)	-0.063 (0.154)	0.041 (0.163)	0.174 (0.147)	0.574 (0.158)***	0.148 (0.084)*	0.090 (0.136)	0.076 (0.193)	-0.042 (0.095)	0.003 (0.096)	0.061 (0.061)	0.126 (0.075)*	0.009 (0.004)**	0.009 (0.004)**	0.009 (0.004)**
Automatic washing machine (*DA5*)	-0.149 (0.149)	0.105 (0.192)	0.194 (0.109)*	-0.075 (0.131)	-0.281 (0.137)**	-0.200 (0.078)***	-0.229 (0.114)**	-0.038 (0.138)	0.190 (0.102)*	-0.067 (0.084)	-0.036 (0.055)	0.103 (0.073)	-0.003 (0.004)	-0.002 (0.004)	-0.003 (0.004)
Manual washing machine (*DA6*)	-0.276 (0.127)**	-0.168 (0.164)	0.037 (0.101)	0.003 (0.086)	-0.054 (0.110)	0.020 (0.066)	-0.225 (0.118)*	0.014 (0.114)	0.000 (0.083)	-0.145 (0.073)**	0.017 (0.041)	-0.026 (0.060)	-0.004 (0.004)	-0.003 (0.004)	-0.004 (0.004)
Dryer (*DA7*)	0.531 (0.329)	-0.013 (0.263)	0.261 (0.236)	-	-	-0.985 (0.575)*	-	-	0.118 (0.345)	-0.254 (0.261)	0.007 (0.244)	-1.692 (0.136)***	-0.044 (0.025)*	-0.042 (0.022)*	-0.044 (0.025)*
Sewing machine (*DA9*)	0.156 (0.121)	-0.044 (0.117)	0.060 (0.095)	-0.081 (0.082)	-0.067 (0.112)	0.111 (0.062)*	0.039 (0.107)	-0.013 (0.098)	0.057 (0.080)	0.070 (0.066)	-0.048 (0.043)	-0.018 (0.054)	0.001 (0.004)	0.002 (0.004)	0.000 (0.004)
Electronic sewing machine (*DA10*)	0.017 (0.160)	-0.221 (0.141)	0.018 (0.124)	0.093 (0.228)	-0.276 (0.157)*	0.117 (0.108)	-0.124 (0.122)	-0.670 (0.240)***	-0.037 (0.090)	0.087 (0.093)	-0.034 (0.058)	-0.140 (0.081)*	-0.003 (0.004)	-0.003 (0.005)	-0.002 (0.005)
VCR (*DA12*)	-0.152 (0.155)	-0.116 (0.134)	0.230 (0.095)**	0.166 (0.112)	-0.165 (0.144)	-0.069 (0.094)	-0.207 (0.100)**	0.237 (0.140)*	-0.135 (0.072)*	0.020 (0.075)	-0.009 (0.057)	-0.062 (0.072)	-0.002 (0.004)	-0.002 (0.004)	-0.002 (0.004)
Parabolic antenna (*DA13*)	0.436 (0.434)	-0.416 (0.284)	0.238 (0.287)	-0.349 (0.258)	-0.577 (0.426)	0.532 (0.110)***	0.103 (0.147)	-0.229 (0.725)	0.193 (0.223)	-0.011 (0.176)	0.018 (0.115)	-0.030 (0.095)	0.003 (0.009)	0.003 (0.009)	0.003 (0.009)
Personal computer (*DA16*)	-0.262 (0.481)	0.266 (0.191)	-0.232 (0.190)	0.006 (0.531)	-0.598 (0.318)*	0.553 (0.235)**	0.186 (0.174)	0.215 (0.254)	-0.181 (0.210)	-0.411 (0.357)	0.115 (0.161)	0.116 (0.166)	0.007 (0.010)	0.006 (0.010)	0.007 (0.010)

Business asset ownership															
Office equipment (*BA3*)														-0.063 (0.024)***	
Copy machine (*BA6*)														0.051 (0.031)*	
Cars (*BA10*)														-0.019 (0.009)**	
Motorcycles (*BA13*)														0.079 (0.010)***	
Agricultural asset ownership															
Plows (*AA3*)															0.065 (0.038)*
Plow truck (*AA7*)															0.049 (0.023)**
Chemical applicator (*AA8*)															-0.031 (0.012)***
Horse/donkey (*AA12*)															0.025 (0.010)**
Cart (*AA13*)															-0.029 (0.012)**
R^2 (adjusted)	0.524	0.575	0.533	0.442	0.557	0.588	0.553	0.393	0.443	0.296	0.192	0.318	0.376	0.381	0.390
Observations	170	175	186	232	152	236	154	202	202	428	858	423	1709	1709	1709

Notes: To economize on space, only selected variables are reported, although the regressions were run with all the controls as highlighted in the text, as well as a constant term. Standard errors are in parentheses. * indicates significance at 10 percent level, ** indicates significance at 5 percent level, and *** indicates significance at 1 percent level. – indicates that the variable was dropped, due to insufficient observations or degrees of freedom.

Table 5. Instrumental variable regressions for change in consumption expenditure and income

	(I1)	*(I2)*
Initial consumption/income	-0.505 (0.191)***	0.433 (0.384)
Average years education	0.055 (0.061)	-0.322 (0.243)
Household size	-0.016 (0.039)	0.928 (0.446)**
Health	0.002 (0.004)	-0.077 (0.012)**
Population group		
Turkish	0.012 (0.066)	0.223 (0.233)
Romany	-0.239 (0.173)	0.054 (0.364)
Household composition		
Head, male under 35	0.247 (0.175)	0.797 (0.552)
Head, female under 35	0.236 (0.233)	2.151 (0.719)***
Head, male 35-54	0.275 (0.166)*	0.444 (0.496)
Head, female 35-54	0.246 (0.175)	0.893 (0.492)*
Head, male 55-99	0.307 (0.168)*	0.728 (0.481)
Head, female 55-99	0.252 (0.171)	0.557 (0.521)
Child between 0-4	0.033 (0.048)	-0.043 (0.175)
Child between 5-14	-0.010 (0.024)	-0.148 (0.110)
Employment sector		
Manufacturing (*ES1*)	-0.008 (0.041)	0.347 (0.163)**
Forestry (*ES4*)	0.015 (0.195)	0.876 (0.463)*
Science and education (*ES10*)	0.150 (0.078)**	0.622 (0.216)***
Sport and tourism (*ES13*)	0.273 (0.115)**	1.113 (0.550)**

Durable asset ownership		
Gas stove (*DA1*)	-0.078 (0.046)	-0.502 (0.184)***
Refrigerator (*DA3*)	-0.108 (0.057)*	0.111 (0.219)
Dryer (*DA7*)	-0.252 (0.260)	-1.946 (0.880)**
Electronic sewing machine (*D10*)	-0.055 (0.044)	0.300 (0.169)*
R^2 (adjusted)	0.338	-
Observations	1669	1217

Notes: A constant term was included in the regressions, but not reported. Standard errors are in parentheses. * indicates significance at 10 percent level, ** indicates significance at 5 percent level, and *** indicates significance at 1 percent level. Only selected employment sectors and asset ownership variables are reported, although all variables were included.