

Is There A Relative Price Effect Of Children?*

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Preliminary – Comments Welcome

Abstract: This paper tests for the relative price effect of children using data from the Russian Longitudinal Monitoring Survey (RLMS). The relative price effect is defined as the change in expenditure on a certain consumption item when children arrive, after controlling for changes in household income and other demographic variables. Unlike previous works which either use cross-sectional data with disaggregated consumption items, or panel data with aggregated consumption items, this paper contributes to the literature by finding the effect of new children on expenditure on a variety of disaggregated consumption items for a panel of households.

After controlling for household fixed effects, we do not find evidence on the relative price effect on most consumption items. This finding is due to either 1) the effect is unimportant, or 2) the effect is present, but is weakened by large measurement errors in the consumption and income variables.

Keywords: Household Consumption, Relative Price Effect, Fertility, Russian Longitudinal Monitoring Survey (RLMS)

JEL Classifications: D12, E21, J13

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1. Introduction

This paper uses a panel of Russian households to investigate the effect of children on household consumption pattern and, after controlling for household income and other time-varying demographic variables, finds that the effect is unimportant.

There are three main strands of literature on the effect of children on household consumption. One is to study the impact of children on consumption in the context of the life-cycle hypothesis. In the lifecycle consumption literature, once we control for the change in the number of children over time, we see a less pronounced hump-shape household consumption pattern. (See Browning and Ejrnaes (2002) for reference). When the children are present, the household will incur additional expenses on food, education and other non-durables. The hump-shape consumption is in line with the equalization of expected marginal utility of parents over time. Most of the studies that test life-cycle theory use aggregate nondurable or food consumption of which the children consume a small part. Since most of the household consumption data are cross-sectional, these studies have to rely on the method of synthetic cohorts and have only been concerned with whether the children are present or not. Due to data limitations, they do not analyze the periods right before and after the birth of the child. This paper differs from this literature by focusing on the arrival of new births, but does not deal with the relationship between the effect of children of consumption and the life-cycle consumption pattern.

The second strand of literature concerns with the effect of children on consumption through its effect on women's labor supply. In a recent paper Kalwij (2005) uses a panel of Dutch households and focuses on the period around the new births. He shows that the arrival of children reduces the labor supply of the women, and hence leads

to a drop in household income. The presence of new births seems to reduce the aggregate household consumption, but once income is controlled for, the change in the number of children becomes insignificant in explaining consumption dynamics. This paper differs from this literature by looking at a panel of households from a country that has considerably less generous child care and maternity leave arrangements and, as confirmed later in this paper, the effect of children on consumption through household income is not important in our sample.

This paper looks at a third type of children's effect on consumption. Barten (1967) argues that the relative price effect is another reason why children affect household consumption. The presence of children increases the cost of time required to consume adult goods like traveling, eating out or going to the theater, and as a result the household will consume less of them in that period. In anticipation of this increase in relative prices, the household will substitute consumption over time: the household will increase consumption of these items before the children are born to "take advantage" of the lower relative prices then. For example, couples with children find it more expensive to go to the theater, as they need to spend an extra amount on babysitting. So the relative price of going to the theater becomes higher when the children are present, and the couples may substitute toward activities that become relatively cheaper, such as watching television at home. To give another example, a couple with children will find it more expensive to go to a restaurant, since they have, again, to pay for the babysitting cost, or if they bring the children with them, end up spending more on extra orders. For a couple with new births, the need for child care simply makes all consumption items that are time-consuming and that do not allow secondary child care more expensive, and by the law of demand,

parents consume less of them. This is in line with Becker's (1976) time-allocation model, as now the full price of these items are higher due to the higher cost of time. For the subsample of British households which have children, Browning (1987), focusing on a different question, finds that there is no significant change in the alcohol and tobacco consumptions over the life cycle. His conclusion is that the relative price effect on consumption is not important, and this paper confirms his findings by looking at a wider list of consumption items. To the best of our knowledge there are no studies testing these relative price effect using disaggregated consumption data.

The paper is organized as follows. Section 2 introduces a theoretical model of fertility and consumption decisions, and illustrates how the arrival of children, through relative price and other channels, affects the household consumption patterns. Section 3 describes the data and Section 4 presents empirical tests of the theoretical model. Section 5 concludes. Detailed information about the data and our sample selection procedure is provided in the Appendix.

2. Theoretical Model

This section introduces a model describing a household's fertility and consumption decision, and derives from it the testable implications of interest. Consider a two-period¹, two-good model: in the first period the family decides whether to have a child, and in the second period the child arrives. From now on, "child" is defined as newborn child who is too young to have power in household consumption decision making

¹ The adjective "two-period" is not accurate. Instead we can think of the household solving the same problem in each period, with the decision today affecting the parameter values tomorrow. This possibility is not pursued here. Also this model is not limited to the no-child to one-child transition. The household is facing the same problem when deciding whether to have a second child, though the presence of the first child may affect some of the parameter values in the problem.

and is young enough to require childcare by the parents². The utility function of the family takes the form:

$$U = a \ln(c_1) + (1-a) \ln(c_2) + a \ln(f_1 - \delta I_{(k>0)}) + (1-a) \ln(f_2) + \varepsilon I_{(k>0)}$$

The household maximizes the utility function subject to a budget constraint:

$$c_1 + pc_2 + f_1 + (p + I_{(k>0)}\gamma) f_2 = w(1 - \phi I_{(k>0)})$$

Notations

c_i : Period 1 consumption of Good i

f_i : Period 2 consumption of Good i

δ : Subsistence level of Good 1 for children

ε : Unobservable “taste” on children

$I_{(k>0)}$: Indicator function for the presence of children

p : Relative price of Good 2 to Good 1

γ : Relative price effect

w : Family income

ϕ : Proportion of income loss from having children

There is no discounting, and the couple is making decision as a single person (i.e. no intra-household decision making). As is evident from the utility function, Good 1 is a “common good” that both adults and children consume (e.g. good ventilation, fruits and dairy products) and Good 2 is an “adult good” that only adults consume (e.g. going to the restaurant, cigarettes and alcohol). The prices of the two goods are normalized such that the price of Good 1 is one for both periods, and the main focus of our paper, the relative

² In the empirical test of this paper, the child is assumed to have such relative price effect until the age of ten.

price effect, is represented by an increase in the relative price of Good 2 by γ if children are present in the second period. This relative price effect is defined as any observable or unobservable change in the relative price of Good 2 due to the presence of the child. For example, if we define Good 2 as going to the restaurant, then the effect γ includes both the extra cost of feeding the child in the restaurant and, probably, the annoyance caused by the child, or it simply includes the wage of a baby-sitter. The income effect ϕ represents the proportion of income loss due to the presence of the child³, and it differs substantially among households. If the wife is working and the husband is unemployed, then ϕ is close to one, as the wife has to cut down working hours to deliver and take care of the child. This parameter is also affected by the welfare system: a generous package of maternity leave and child care leads to a small ϕ . The benefit of having children comprises both the pure “taste” in having children and the discounted value of investment in children (e.g. care provided by the children in the future). Clearly, we assume that the relative price effect γ , the income loss effect ϕ , the subsistence effect δ and the taste effect ε do not depend on the number of children, but simply the present of any children. This assumption is not far-fetched. The “period” in this model is understood roughly as one year, so the household, instead of deciding the number of children as a continuous variable, is deciding whether to have a child next period or not (multiple-birth is not considered, as it cannot be planned!). The optimization problem is trivial: the family

³ This loss of income only applies for the second period. If we understand the income w as a discounted income stream, the parameter ϕ also represents the discounted income loss due to the wife's permanently leaving the labor market. Also, in the model the income loss proportion ϕ is applied on the total income. In fact, it is usually the wife that suffers from an income loss, but splitting the income into, say, w_H and w_W , and applying ϕ only leads to another standard result: an increase in the husband's wage increases the demand of children, and an increase in the wife's wage decreases it.

simply compares the indirect utilities for the with-children ($k > 0$) and without-children ($k = 0$) cases. Solving for the without-children case:

$$c_1^{k=0} = f_1^{k=0} = \frac{aw}{2}$$

$$c_2^{k=0} = f_2^{k=0} = \frac{(1-a)w}{2p}$$

$$U^{k=0} = 2a \ln\left(\frac{aw}{2}\right) + 2(1-a) \ln\left(\frac{(1-a)w}{2p}\right)$$

Likewise for the with-children case:

$$c_1^{k>0} = \frac{a(w(1-\phi)-\delta)}{2}, \quad f_1^{k>0} = \frac{a(w(1-\phi)-\delta)}{2} + \delta$$

$$c_2^{k>0} = \frac{(1-a)(w(1-\phi)-\delta)}{2p}, \quad f_2^{k>0} = \frac{(1-a)(w(1-\phi)-\delta)}{2(p+\gamma)}$$

$$U^{k>0} = a \ln\left(\frac{a(w(1-\phi)-\delta)}{2}\right) + (1-a) \ln\left(\frac{(1-a)(w(1-\phi)-\delta)}{2p}\right) \\ + a \ln\left(\frac{a(w(1-\phi)-\delta)}{2} + \delta\right) + (1-a) \ln\left(\frac{(1-a)(w(1-\phi)-\delta)}{2(p+\gamma)}\right) + \varepsilon$$

The solution for the with-children case says that the family will consume more Good 1 in the second period (to provide subsistence) and less Good 2 in the second period (due to the relative price effect), while the solution for the without-children case says consumption of both goods are constant across periods.

The family will decide to have children ($k > 0$) if and only if $U^{k>0} > U^{k=0}$. Some intuitions about the model would be helpful. The family weighs the costs of having children (the higher relative price γ in period 2 for Good 2, the income loss ϕ , and the extra amount of Good 1 δ for the children) against the benefits of having children ε .

Comparing two couples that have different observable characteristics (i.e. excluding ε and a), we can arrive at the following implication (the subsistence parameter δ can safely be assumed to be equal among all families): *Comparing two families in cross-section, the couple that suffers less from the relative price effect (γ is smaller), has a lower income loss proportion (ϕ is smaller), or has lower income w , are more likely to have children.*

Let's illustrate this implication with some examples. Considering two couples that like smoking equally; and that one has better ventilation at home. The couple with worse ventilation has to give up smoking or go elsewhere to smoke when the children are present (higher γ) while the couple with better ventilation can keep the habit (lower γ). According to our model the latter couple is more likely to have children. For the income loss effect, the couple with smaller ϕw is more likely to have children. A smaller ϕw can be due to either lower income w or a lower proportion of loss ϕ . A couple with only the wife working (ϕ close to one) is less likely to have children than a couple with only the husband working (ϕ close to zero). Or, when the wife of one household is eligible to more generous maternity leave and child care support (ϕ is lower), the model predicts that it is more likely for that household to have a child.

Next we consider looking at one family over time: the family is solving the same optimization problem in each period, with the solution depending on the values of the parameter in that period. Let's say the family is facing a time path of income $\{w_t\}_{t=1,\dots,T}$ and a time path of relative price effect $\{\gamma_t\}_{t=1,\dots,T}$, while all other parameters are assumed to be constant over time. We then have the second implication: *Looking at one family*

over time, the periods in which the family is more likely to have children will be the periods in which the income loss ϕw_t is lower or the relative price effect γ_t is smaller.

This proposition can be illustrated with two examples. A couple, usually the mother (e.g. maternity leave), has to sacrifice market work to take care of the new-born child, and in some cases will never return to the labor market again. The opportunity cost of spending time on child care is determined by the market wage that the parents are earning, and hence couples with their career more developed (higher ϕw_t) are less likely to have children than couples who just start their career (lower ϕw_t). Now consider going to the theater as an example of Good 2. Going to theaters become more expensive with children as the couple has to find someone to take care of the children during their entertainment. That is why a couple with parents (-in-law) living nearby (lower γ_t) is more likely to have children than when their parents (-in-law) are living farther away (higher γ_t), and babysitting is required.

Looking at the solution for the with-children case, we obtain the third testable implication from the model (which is also the focus of this paper): *Controlling for income, the arrival of children increases consumption of Good 1 due to the subsistence effect δ , and reduces the consumption of Good 2 due to the relative price effect γ .* The relative price effect γ may not be observable, but Proposition 3 allows us to test for its presence by looking at the change in the consumption of Good 2 after the arrival of the child. To link the model to our data, the model predicts that for consumption items that requires extra expenditure on the child (e.g. ticket and eating out for hiring a babysitter) the presence of a child reduces expenditures on them. For consumption items that a child needs for subsistence (e.g. meat, diary product or fruit), the presence of a child increases

expenditures on them. On the other hand, the presence of the child reduces expenditures on food items that the child does not consume (tobacco, alcohol or canned food), and the same happens for expenditures that are “public” in nature (repair, energy, service or transportation).

The idea of the relative price effect of children is due to Barten (1964). Barten proposes a household utility function of the form: $u = u(x_1, \dots, x_n)$, with $x_i = q_i / m_i$. The quantity consumed of commodity i q_i is adjusted by a family composition function $m_i = m_i(b_1, \dots, b_f)$, where b_d is the number of household members of type d . A comment by Alan Brown in the discussion section of Barten's (1964) paper provides an intuitive illustration of this formulation: “I was led to Barten's formulation of the utility function by direct observation a few years ago when I realized in a moment of truth that when I was out with my wife and three children and I wanted some lemonade it was in effect costing me four shillings a bottle instead of one shilling a bottle....At the same time I also had the more pleasing feeling that beer was still only costing me 1s. 6d. a pint....So I not only realized that it was rational for me in these circumstances to switch my consumption in favour of beer and away from lemonade but I was stimulated to write down the utility function that Barten has based his work on.” The relative price effect in our model is a simplified version of that of Barten's.

3. Data

This section describes the structure of the dataset, and explains how we select the sample used in the paper. Section 3.1 introduces the RLMS dataset, and Section 3.2 discusses what consumption information can be obtained from the dataset. Section 3.3

points out two measurement problems due to the design of the survey. Section 3.4 describes how the sample used in this paper is selected and why other observations are dropped, and finally Section 3.5 deals with how the household labor supply and income are affected by the arrival of the first child.

3.1 The Russian Longitudinal Monitoring Surveys (RLMS)

RLMS is a series of surveys focusing on the effects of Russian reforms on the health and economic welfare of households and individuals in Russia. Since 1992, detailed information on individuals' health status, household-level expenditures, labor supply and other demographics are collected nationally. The survey is carried out in two phases starting from 1992. Since only data from Phase II of the survey contain the panel component, we only use this phase for our analysis. Phase II has eight rounds (Rounds V through XIII), which covers the years 1994 to 2004, and we use only the last 7 rounds, due to data matching problems in round V. Most of the rounds are compiled every year, except for the two-year gap between rounds VII and VIII (1996 and 1998) and VIII and IX (1998 and 2000).

Unlike a true panel, members of the household are not followed once they have moved away from the dwelling unit, and it creates attrition in the sample that may lead to bias if the departure is correlated with our variables of interest. Since the decision investigated in this paper is of micro-nature, this attrition bias should not be important for our study. Due to this attrition, though we have eight years of surveys, on average each household participates only about 4 years in our sample.

3.2 Consumption Categories

RLMS collects household-level expenditures on a wide range of durable and nondurable goods. It includes expenditures on different types of food, tobacco, alcohol, home improvements, entertainment, clothing and utilities (for summary statistics on the items that we consider in this paper, see Table 1b). Households are asked about expenditures on food in the last seven days and about non-durable expenditures other than food items in the last 30 days, and we translate all expenditures into weekly amounts.

However, the types of consumption items available or their definitions are not consistent among surveys. For our empirical analysis we are only looking at consumption items that are available and having the same definitions for all surveys.

3.3 Data Problems

Two features of the data reduce the accuracy of our estimations. In the Survey, the income information is retrieved by asking the household the following question: “And, concluding this part of our conversation, tell me, please, what was the monetary income of your entire family in the last 30 days? Include here all the money received by all members of the family: wages, pensions, stipends, and any other money received, including hard currency converted into rubles.” Households are providing at best a rough estimate of the income, and the household income variable in our estimations may contain substantial measurement error⁴. This problem biases our coefficient estimates toward zero, and increases the standard errors. We deal with this problem by a two-stage-least-squared procedure, as discussed in Section 3.

⁴ Using the total household income by adding up answers to questions on more detailed income variables (e.g. labor income or non-financial income) gives similar result.

The second data problem comes from the consumption variables. Households are asked on food consumptions in the past seven days, and thirty days for other consumption categories. This brings measurement error to the consumption variables. If the household purchases a certain food item only biweekly, then the household has about 50 percent chance of answering zero consumption for that item, even though the household purchases that item in the other week. Column 4 of Table 2 shows the proportion of zero consumption for each category, and, as expected, consumption items that the households purchase more infrequently (e.g. cars or housings) have a larger proportion of zeros. This measurement error on the left-hand-side does not bias our estimates, but it increases their standard errors and hence makes our estimates less precise (Hausman 2000).

Both features of the data lead to imprecise estimates of the coefficients. In the empirical tests, we only use consumption items that have less than 80 percent of zero expenditure.

3.4 Sample Selection

Our sample is obtained as follows. First, we consider only households that have only one couple (married or cohabiting) present, with the age of the wife below 38. This leaves us with 2,346 households. Then we restrict the households to those that have a transition from no child to one child (new parents), and this leaves us with 193 households (744 observations, with each household presents on average for 3.85 surveys).

The summary statistics for these households are in Table 1a. The average age for the wife is about 26 years old, and for the husband is 29 years old. On average, about 25 percent of female spouses have university education, while for household head this

proportion is only 19 percent. The mean of weekly income is 217.81 rubles (equivalent to roughly 45 USD)⁵. Almost half of the female spouses are not employed in our sample, and this may reflect maternity leaves and exiting the labor market of the couple to take care of the new-born child⁶. The average number of household members is slightly below three, as most of the households we consider have only one couple and the new-born child, and no other members. More detailed explanation of the sample selection is provided in the Appendix.

3.5 Household Income and Labor Supply around the New Birth

A household member is considered as not working if one is on paid leave for taking care for a child under three, or for other reasons; or one is on unpaid leave, and is simply not working. Income is defined as all the money received by all members of the family: wages, pensions, stipends, and any other money received including hard currency converted into rubles. Since the survey was done with two year gaps in 1996 and in 1998, we look at change in income and labor force status around the new birth in terms of one or two surveys right before or right after the birth of the child. Table 4 shows the household income and labor supply of the couple around the new birth. Surprisingly, there is no substantial change in household income for the periods before (pregnancy) and after the first birth. Labor supply of the wife shows a different trend. The proportion of unemployed wives is 73 percent at the period before the new birth, it becomes 46

⁵ We recode observations less than 50 rubles as 50 rubles, and recode observations with more than 700 rubles as 700 rubles. We try simply dropping those observations instead of recoding, and the results are only changed slightly.

⁶ The national female labor force participation rates are much higher. The lower labor force participation in our sample reflects the fact that we observe most of the couples right before the child arrives and at the period child is born.

percent right after the child is born, and it further reduces to 37 percent in the next period. The change in the labor supply of husbands due to the new birth is insignificant and the rates of husbands' labor force participation stay very high over all surveys. The stability of income seems to be contradictory to the large change in the wife's labor supply. To reconcile this finding, it should be pointed out that we are looking at a relatively young sample, and most couples are finishing school or have just finished school. The negative effect of children on income may be canceled by an upward trend in the couple's ability to earn.

Table 5 confirms this explanation. It shows estimates of a simple fixed-effects regression of log household income on a child-present or child-arrival dummy, controlling for age of head, age of spouse and the number of household members except the child. This specification gives a more reasonable result: The presence of a child below ten years old does not have a significant effect on income, while the arrival of the new child reduces household income by 10 percent.

To conclude, new birth only has a temporary effect on household income before and at the time of the new birth, and most wives return to the labor market immediately. Our findings establish the fact that the effect of new birth on consumption, if there is any, does not come indirectly through household income.

The findings in this section are consistent with some “stylized facts” of the Russian labor market. Ample evidence is found on the “inferior” status of Russian women. There is a large gender wage gap in Russia (the women-to-men wage ratio is about 0.7), and it is explained by occupational and industrial employment segregation (Ogloblin (1999)) or differences in hours of work (Glinskaya and Mroz (2000)), but a

large part of the gap is still unexplained. Foley (1997) finds that women experience longer unemployment spells than men. Based on estimations and simulations, Lokshin (1999, 2000) argues that the labor participation of women in Russia is sensitive to changes in hourly wages, and less so to changes in the cost of child cares. Teplova and Woolley (2005) points out that the reluctance of private enterprises to provide child care and maternity leaves contributes to the declining trend of women's employment since the end of the Soviet period.

4. Empirical Tests

Section 4.1 describes the generic econometric model and its variants that test for the relative price effect. Estimation results are shown in Table 6-10, and section 4.2 discusses these results in detail.

4.1 Econometric Models

Our model in Section 2 predicts that the arrival of the child reduces the expenditure on consumption items that have a higher relative price with the presence of the child, increases the expenditure on consumption items that the child needs for subsistence and does not affect consumption items that neither have a higher relative price nor provide subsistence. To ensure that we identify only the relative price effect of the child on consumption, we control for changes in demographic variables (age of the couple and family composition) to eliminate the deterministic component of consumption change. Though we find in Section 3.5 that the arrival of the child has an impact on household income only when the child has just arrived, we also control for change in

household income to eliminate the component of consumption change that is due to income change (which might be caused by the arrival of the child). The remaining change in consumption is attributed to the relative price effect of children. More precisely, we are interested in estimating the following fixed-effects model:

$$c_{i,t} = \alpha_i + \beta y_{i,t} + \gamma \mathbf{X}_{i,t} + e_{i,t}$$

Log consumption on some item $c_{i,t}$ by household i at time t is a function of the household fixed effects α_i , log household income $y_{i,t}$ and a vector of demographic variables $\mathbf{X}_{i,t}$. We consider four special cases of the above model. In the first specification, we neglect household income and define $\mathbf{X}_{i,t}$ to be the age, the age of wife, household size excluding the first child and a first child dummy. Due to the restrictions on the sample, we necessarily observe only one transition for each family: from zero to one child. Therefore, the child dummy will capture the effect of the new birth until the age eight on the consumption of the new parent household. In the second specification we include log household income, and use the same set of demographic variables $\mathbf{X}_{i,t}$. In the third specification has the same set of right-hand-side variables, but control for the potential endogeneity in the household income, due either to some macroeconomic shocks that affect both consumption and income, or measurement error in the household income variable itself. In the fourth specification we use the same set of instruments and estimate the model by the generalized method of moments (GMM).

We choose three variables as our instruments: age of the household head interacted with the Volga geographical area dummy (See Table 1 for the proportion of observations living in this area), age of the wife interacted with low-education dummy for

the wife, and the national unemployment rate. Some macroeconomic shocks (e.g. oil prices) affect both income and consumption, and if we assume that the employment or layoff of workers comes with a lag (e.g. due to government or union protection), then the current unemployment rate is correlated with income but not the macroeconomic shock. The geographical dummy captures the fact the unemployment status is more severe in some areas, and (under the assumption that the macroeconomic shocks affect all areas equally) it is correlated with income but not the macroeconomic shocks. The education-age interaction variable again is correlated with income but not the macroeconomic shocks. Similar argument goes through for these three instruments concerning the measurement error in income.

4.2 Results and Discussions

Tables 6 - 10 show the estimation results for each consumption item using all four specifications. In all the first-stage regressions (not reported in this paper), we get an F -statistics of over 10, which suggests that our instruments are reliable (Stock, Wright and Yogo (2000)). Further support of our model comes from the J -statistic of the GMM estimations. The Hansen's (1980) J -statistic, which is the value of the objective function, has a χ^2 distribution with degrees of freedom equals to the number of over-identifying restrictions (which is 2 in our model). A rejection of the null hypothesis suggests either that the instruments are not exogenous, or the instruments are incorrectly excluded from

the model (Baum, Schaffer and Stillman (2003)). Except for energy (p -value = 0.01) and transportation (p -value = 0.12), there is no strong evidence for mis-specification⁷.

Except for a significantly negative effect of children on canned food and a significantly positive effect on bread, all other consumption items show no evidence of a relative price effect of children. For expenditures on eating out, meat, dairy product, potato, energy and repair, there is a weak positive relation with the presence of the new child. And for expenditures on clothing, vegetables and tobacco, there is a weak negative relation. The effects of household income on most consumption items have the correct sign and are significant. Income appears to have no effect on eating out, vegetable, fruits, potato and tobacco, which are consistent with their low income elasticities.

The empirical results suggest that the relative price effect is unimportant (i.e. the size of the parameter γ in the model is negligible). This finding has two implications, not necessarily limited to the Russian households: 1) The consumption profiles for individual consumption items cannot be explained by fertility, and 2) Children do not affect consumption directly, although they may affect consumption indirectly through their impact on household income (which does not happen in our data).

One caveat is in order. As mentioned in Section 3.3, the substantial measurement error in the consumption (though the error in household income is controlled for by our instruments) leads to larger standard errors and hence less precise estimates for our parameters of interest. If the relative price effect is not strong enough, the measurement

⁷ Using a small sample version for calculating the mean square error $\sqrt{RSS/(N-K)}$ instead of the large sample version $\sqrt{RSS/N}$ (where RSS is the residual sum of squares, N is the number of observations, and K is the number of right-hand-side variables) only reduces the significance if household income slightly and does not change the main results.

error may weaken the significance of the relative price effect, and leave only a significant income effect.

5. Conclusion

This paper tests for the presence of the relative price effect of children. The relative price effect of children is motivated by the intuitive observation that once young children are present, some goods become relatively more expensive. For example, for a couple with young children going for a movie requires extra tickets or a babysitter.

This paper compiles, from the Russian Longitudinal Monitoring Survey (RLMS), a panel of households for which the arrival of a new child is observed. After controlling for household income and other time-varying household characteristics, no evidence is found for the relative price effect of children on a variety of disaggregated consumption items. This finding can be attributed to either that 1) the relative price effect of children is unimportant, or 2) that the large measurement errors in the consumption variables reduce the precision of the estimates.

To the authors' best knowledge, there is no previous study using a panel with disaggregated consumption items to test for the effect of children on consumption. This paper fills this gap by establishing that young children have an insignificant effect on the household consumption pattern.

Data Appendix

To facilitate future research using the RLMS as a panel, this appendix provides detailed descriptions of how the 1995, 1996, 1998, 2000, 2001, 2002, 2003 and 2004 data files from the RLMS are compiled as our final sample.

For each year, we use the *roster file* to identify number of couples in each household, and only keep households that have only one couple. Then we collect the basic demographic information (e.g. age, gender...) of the couple and define the household head as the husband. When the couple is identified, we search through the rest of the household members for their children (biological or adopted) and their age and gender.

The consumption variables are obtained from the *expenditure file*. The respondent is asked whether the household purchased an item for a certain period in the past, and if it did, the respondent is asked for the exact amount spent. We replace observations which answer no for an item with zero, and observations which answer and have no amount reported as missing. All expenditures are transformed into weekly amount.

The *income file* provides us with the total amount the household received from all sources last month, again we divide the amount by 4.3 to obtain the weekly equivalent. The question asked in the questionnaire is “And, concluding this part of our conversation, tell me, please, what was the monetary income of your entire family in the last 30 days? Include here all the money received by all members of the family: wages, pensions, stipends, and any other money received, including hard currency converted into rubles.”

Employment status and education level are available from the *working file* (which is at individual level). When a person is defined as “not working”, the person can be on paid leave, on unpaid leave or unemployed.

After the same set of variables is obtained from each survey, we combine all surveys as a panel. Notice that the household ID only represents a certain location, but not a certain household. If the old household moves away from and a new household moves into the location, the same household ID will stand for two different households over time. We make sure that the same household ID represents the same household in our sample by checking whether the demographic variables of the couple are consistent over time.

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Variable	Mean	Standard Deviation
Age of Head	29.03	5.12
Age of Spouse	25.81	4.05
Head High Education	0.19	0.40
Spouse High Education	0.25	0.43
Head Not Working	0.06	0.24
Spouse Not Working	0.25	0.43
Both Not Working	0.10	0.30
Weekly Household Income	217.87	159.47
Number of Household Members	2.86	0.88
Metropolitan Area	0.05	0.22
Northwest Area	0.12	0.32
Central Area	0.16	0.37
Volga Area	0.23	0.42
North Caucasus Area	0.08	0.28
Ural Area	0.14	0.35
Western Siberian Area	0.09	0.28
Number of Observations	744	
Number of Households	193	

Table 1 - Summary Statistics for the Full Sample: High education is defined as having an undergraduate degree or above. Household income is in 1995 rubles, and it is top-coded at 700 rubles and bottom-coded at 50 rubles (Dropping these outliers gives similar results as top- and bottom-coding). See Section 2.4 for the criteria of selecting this sample.

Consumption Item	Mean	Standard Deviation	Number of Observations	Proportion of Zeros
All Durable	125.37	478.67	511	0.90
Car	18.47	139.70	744	0.97
Housing	40.97	374.13	742	0.85
Adult/Children Clothing	29.38	40.25	703	0.22
Electrical Appliance	4.67	23.21	742	0.93
Furniture	6.24	29.77	744	0.91
Home Appliance	5.05	22.62	743	0.89
Energy	8.59	21.37	726	0.64
Repair	18.80	139.57	737	0.75
Service	2.45	7.72	737	0.69
Ticket	0.60	3.03	665	0.88
Club	2.06	18.48	744	0.96
Hygiene	3.96	5.02	618	0.09
Tour	1.45	34.85	744	0.996
Transportation	6.38	20.21	734	0.33

Table 2 - Summary Statistics for Consumption Items 1: Expenditures are in 1995 rubles. “Car” includes expenditures on automobile, motorcycle and garage. “Housing” includes expenditures on building materials, dacha, house, apartment and land. “Electrical Appliance” includes expenditures on television, tape recorder, video, musical instruments and computer. “Furniture” includes expenditures on furniture and rugs. “Home Appliance” includes expenditures on refrigerator, washing machine, vacuum cleaner, iron and sewing machine. “Energy” includes expenditures on fuel, fire and gas. “Repair” includes expenditures on clothes and shoe repair, repair for recreational items, for furniture and appliances and car repair. “Service” includes expenditures on laundry, dry-cleaning, postal service, long distance calls and ritual services. “Ticket” includes expenditures on theater, circus, movies, concerts and parks. “Club” includes expenditures on adult member attendance of clubs, courses and lessons. “Hygiene” includes expenditures on shampoo, toothpaste, toilet paper and sanitary napkins. “Tour” includes expenditures on sanatorium, vacation homes, children's camps and tourist travel, excluding cost of transportation.

Consumption Item	Mean	Standard Deviation	Number of Observations	Proportion of Zeros
Nondurable	146.36	196.18	587	0.00
Nondurable Less Food	64.64	181.10	587	0.00
Food (Food 1+ Food 2)	81.25	57.78	744	0.01
Food 1	68.30	51.19	744	0.01
Food 2	12.94	13.61	744	0.11
Eating Out	13.68	25.56	631	0.49
Bread	9.90	10.72	744	0.03
Veggies	2.49	6.36	744	0.62
Fruits	6.16	8.80	744	0.35
Meat	24.02	30.83	744	0.18
Diary	11.85	11.15	744	0.17
Sweet	9.67	12.95	744	0.14
Fish	2.33	4.86	744	0.66
Potatoes	1.88	8.97	744	0.84
Canned Food	2.09	5.55	744	0.68
Butter and Oil	5.48	7.62	744	0.29
Beverages and Juices	5.37	8.07	744	0.33
Alcohol	5.91	11.68	744	0.55
Tobacco	5.36	7.13	744	0.41

Table 3 - Summary Statistics for Consumptions Items 2: Expenditures are in 1995 rubles. “Food 1” includes expenditures on bread, veggies, fruits, meat, diary, sweets, fish and potatoes. “Food 2” includes expenditures on canned food, butter and oil and beverages.

Period	HH Income	Head not Working	Spouse not Working	Both not Working	Number of HH
-2	203.03	0.04	0.34	0.12	50
-1	206.73	0.02	0.73	0.15	188
0	203.11	0.06	0.46	0.12	188
1	216.09	0.10	0.37	0.06	126
2	251.18	0.10	0.19	0.07	81

Table 4 - Summary Statistics for Periods around New Births: Including only observations with non-missing work status.

	Fixed-Effects Estimate of Impact on Household Income
Child below one year old	-0.10 (0.04)
Child below ten years old	0.05 (0.05)

Table 5 - Effect of New Birth on Household Income: The regression also includes ages of the head and spouse and number of household member except the child.

Specification	Child Dummy	Household Income
Clothing		
Without Income	-0.20 (0.17)	-
With Income	-0.17 (0.16)	0.51 (0.12)
With Income 2SLS	-0.09 (0.19)	1.89 (0.55)
With Income GMM	-0.09 (0.17)	1.91 (0.58)
<i>p</i> -value from <i>J</i> -Statistic	0.97	
Total Food		
Without Income	0.00 (0.08)	-
With Income	0.00 (0.08)	0.23 (0.06)
With Income 2SLS	0.02 (0.08)	0.69 (0.23)
With Income GMM	0.02 (0.08)	0.69 (0.27)
<i>p</i> -value from <i>J</i> -Statistic	0.35	
Food 1		
Without Income	0.04 (0.08)	-
With Income	0.05 (0.08)	0.22 (0.06)
With Income 2SLS	0.07 (0.08)	0.76 (0.24)
With Income GMM	0.07 (0.09)	0.75 (0.27)
<i>p</i> -value from <i>J</i> -Statistic	0.35	
Food 2		
Without Income	-0.02 (0.11)	-
With Income	-0.01 (0.11)	0.26 (0.08)
With Income 2SLS	0.00 (0.11)	0.57 (0.32)
With Income GMM	0.01 (0.11)	0.57 (0.33)
<i>p</i> -value from <i>J</i> -Statistic	0.32	
Eating Out		
Without Income	0.08 (0.17)	-
With Income	0.09 (0.17)	0.28 (0.12)
With Income 2SLS	0.08 (0.17)	-0.03 (0.51)
With Income GMM	-0.07 (0.17)	-0.11 (0.48)
<i>p</i> -value from <i>J</i> -Statistic	0.36	

Table 6 – Regression Results 1: Other variables included in the regressions are: age of the head, age of the spouse and number of household members except the child. Instruments include geographical dummy for Volga area interacted with age of head, spouse's high education dummy interacted with her age and national unemployment rate.

Specification	Child Dummy	Household Income
Bread		
Without Income	0.13 (0.08)	-
With Income	0.13 (0.08)	0.03 (0.06)
With Income 2SLS	0.15 (0.08)	0.41 (0.24)
With Income GMM	0.14 (0.08)	0.37 (0.26)
<i>p</i> -value from <i>J</i> -Statistic	0.43	
Vegetable		
Without Income	-0.11 (0.09)	-
With Income	-0.11 (0.09)	-0.00 (0.07)
With Income 2SLS	-0.10 (0.09)	0.14 (0.26)
With Income GMM	-0.10 (0.09)	0.19 (0.24)
<i>p</i> -value from <i>J</i> -Statistic	0.46	
Fruit		
Without Income	0.02 (0.11)	-
With Income	0.03 (0.11)	0.19 (0.08)
With Income 2SLS	0.03 (0.11)	0.19 (0.31)
With Income GMM	0.02 (0.10)	0.10 (0.32)
<i>p</i> -value from <i>J</i> -Statistic	0.17	
Meat		
Without Income	0.06 (0.12)	-
With Income	0.07 (0.12)	0.26 (0.09)
With Income 2SLS	0.10 (0.13)	0.91 (0.37)
With Income GMM	0.09 (0.12)	0.83 (0.40)
<i>p</i> -value from <i>J</i> -Statistic	0.38	
Diary Product		
Without Income	0.07 (0.09)	-
With Income	0.07 (0.09)	0.21 (0.07)
With Income 2SLS	0.08 (0.09)	0.34 (0.26)
With Income GMM	0.09 (0.09)	0.33 (0.29)
<i>p</i> -value from <i>J</i> -Statistic	0.34	

Table 7 – Regression Results 2: Other variables included in the regressions are: age of the head, age of the spouse and number of household members except the child. Instruments include geographical dummy for Volga area interacted with age of head, spouse's high education dummy interacted with her age and national unemployment rate.

Specification	Child Dummy	Household Income
Sweet		
Without Income	-0.04 (0.11)	-
With Income	-0.03 (0.11)	0.26 (0.09)
With Income 2SLS	-0.01 (0.12)	0.76 (0.34)
With Income GMM	-0.01 (0.37)	0.80 (0.37)
<i>p</i> -value from <i>J</i> -Statistic	0.52	
Fish		
Without Income	0.01 (0.09)	-
With Income	0.01 (0.09)	0.12 (0.07)
With Income 2SLS	0.01 (0.09)	0.07 (0.27)
With Income GMM	0.01 (0.09)	0.06 (0.25)
<i>p</i> -value from <i>J</i> -Statistic	0.86	
Potato		
Without Income	0.11 (0.07)	-
With Income	0.11 (0.07)	-0.09 (0.06)
With Income 2SLS	0.11 (0.08)	-0.17 (0.22)
With Income GMM	0.12 (0.08)	-0.13 (0.19)
<i>p</i> -value from <i>J</i> -Statistic	0.25	
Canned Food		
Without Income	-0.23 (0.08)	-
With Income	-0.23 (0.08)	0.07 (0.06)
With Income 2SLS	-0.21 (0.09)	0.63 (0.26)
With Income GMM	-0.21 (0.09)	0.62 (0.27)
<i>p</i> -value from <i>J</i> -Statistic	0.94	
Butter and Oil		
Without Income	0.10 (0.10)	-
With Income	0.11 (0.10)	0.32 (0.08)
With Income 2SLS	0.12 (0.11)	0.54 (0.30)
With Income GMM	0.13 (0.10)	0.56 (0.33)
<i>p</i> -value from <i>J</i> -Statistic	0.30	

Table 8 – Regression Results 3: Other variables included in the regressions are: age of the head, age of the spouse and number of household members except the child. Instruments include geographical dummy for Volga area interacted with age of head, spouse's high education dummy interacted with her age and national unemployment rate.

Specification	Child Dummy	Household Income
Drink		
Without Income	0.06 (0.11)	-
With Income	0.07 (0.11)	0.15 (0.08)
With Income 2SLS	0.07 (0.11)	0.06 (0.30)
With Income GMM	0.05 (0.10)	0.06 (0.32)
<i>p</i> -value from <i>J</i> -Statistic	0.51	
Alcohol		
Without Income	-0.02 (0.12)	-
With Income	-0.00 (0.12)	0.38 (0.09)
With Income 2SLS	0.01 (0.12)	0.65 (0.35)
With Income GMM	0.01 (0.12)	0.61 (0.34)
<i>p</i> -value from <i>J</i> -Statistic	0.76	
Tobacco		
Without Income	-0.07 (0.09)	-
With Income	-0.06 (0.09)	0.05 (0.07)
With Income 2SLS	-0.05 (0.09)	0.42 (0.27)
With Income GMM	-0.05 (0.09)	0.39 (0.27)
<i>p</i> -value from <i>J</i> -Statistic	0.39	
Energy		
Without Income	0.14 (0.12)	-
With Income	0.15 (0.12)	0.25 (0.09)
With Income 2SLS	0.15 (0.12)	0.22 (0.34)
With Income GMM	0.13 (0.12)	0.25 (0.32)
<i>p</i> -value from <i>J</i> -Statistic	0.01	
Repair		
Without Income	0.18 (0.15)	-
With Income	0.19 (0.15)	0.27 (0.11)
With Income 2SLS	0.22 (0.15)	0.95 (0.44)
With Income GMM	0.20 (0.14)	0.95 (0.42)
<i>p</i> -value from <i>J</i> -Statistic	0.76	

Table 9 – Regression Results 4: Other variables included in the regressions are: age of the head, age of the spouse and number of household members except the child. Instruments include geographical dummy for Volga area interacted with age of head, spouse's high education dummy interacted with her age and national unemployment rate.

Specification	Child Dummy	Household Income
Service		
Without Income	-0.02 (0.09)	-
With Income	-0.00 (0.09)	0.14 (0.07)
With Income 2SLS	0.05 (0.12)	0.47 (0.25)
With Income GMM	-0.00 (0.02)	0.42 (0.23)
<i>p</i> -value from <i>J</i> -Statistic	0.58	
Transportation		
Without Income	0.11 (0.11)	-
With Income	0.11 (0.11)	-0.07 (0.08)
With Income 2SLS	0.15 (0.12)	0.77 (0.36)
With Income GMM	-0.10 (0.05)	0.67 (0.37)
<i>p</i> -value from <i>J</i> -Statistic	0.76	

Table 10 – Regression Results 5: Other variables included in the regressions are: age of the head, age of the spouse and number of household members except the child. Instruments include geographical dummy for Volga area interacted with age of head, spouse's high education dummy interacted with her age and national unemployment rate.