Body Weight and Labour Market Outcomes in Post-Soviet Russia

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Introduction

Transition , labor markets and health

- The prevalence of obesity has risen dramatically, not only in high income countries, but in middle and low-income countries.
- Obesity is a major contributor to the global burden of chronic disease and disability, including diabetes, cardiovascular disease, and cancer.
- Obesity is linked to lower wages and employment, induced wage penalties, and job discrimination (Puhl and Brownell 2001, Cawley 2004).
- Given the health effects of obesity, obese individuals are more likely to have work limiting disabilities or to miss work due to illness if they are employed (Cawley et al. 2007).

Goal of the paper

To estimate the impacts of weight, measured by body mass index (BMI), and calculated as weight divided by height in meters squared on employment, wages, and missed work due to illness for Russian adults by gender, in order to better understand the mechanisms through which obesity affects employment, wages and sick-leave days.

Conceptual Issues and Methodology

Following the labor economics literature, in order to determine the effects of obesity on labor force participation (LFP), wage rate (lnw), and the number of sick-leave days (SLD), and to formalize the causal relationships discussed, we develop the following three equation econometric model:

$$LFP^{*}_{it}=\beta_0 + \beta_1 X_{itl} + \beta_2 BMI_{it-1} + \beta_3 BMIsq_{it-1} + \delta_i + \eta_{it} \quad \text{for i=1,…N and t=1,…,T} \qquad (1)$$

where LFP^{*}_{it} is unobservable but if $LFP^{*}_{it} = 1$ *ƒ* $LFP^{*}_{t} > o$ and zero otherwise, and the subscript i is for individual and t for time.

$$lnw_{it} = \alpha_0 + \alpha_1 X_{itw} + \alpha_2 BMI_{it-1} + \alpha_3 BMIsq_{it-1} + \tau_i + \varepsilon_{it} \qquad (2)$$

$$SLD^{*}_{it} = \chi_0 + \chi_1 X_{its} + \chi_2 BMI_{it-1} + \chi_3 BMIsq_{it-1} + \upsilon_i + \mu_{it} \qquad (3)$$

where $SLD_{it} = SLD^{*}_{it}$ if $SLD^{*}_{it} > 0$ and zero otherwise;

X— vector of explanatory variables such as gender, age, education, marital status, etc.

BMI – Body Mass Index

δ_i, τ_i, and υ_i – individual random effects which do not vary with time

η_{it}, ε_{it}, and μ_{it} – zero-expected-mean error terms.

▪ LFP is a binary variable, while SLD and lnw are continuous variables, but SLD is censored.

▪ The probability of being employed (eq.1) and the number of days missing work due to illness (eq. 3) are estimated by the random effects Probit and Tobit models, respectively. The wage equation (eq. 2) is estimated using a random effects Generalized Least Squares estimator, corrected for selection into employment.

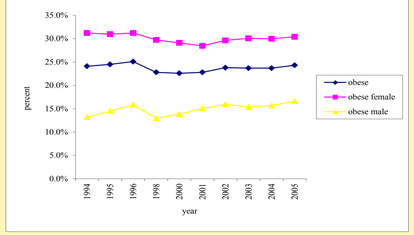
▪ We follow the previous research that uses a lagged BMI variable to deal with bias, due to reverse causality (Averett and Korenman 1996, Berhman and Rosenzweig 2001). In addition to the random effect models with the BMI, we estimate the random effect models using one-period lagged BMI, and instrumented BMI with one-period lagged BMI, and household and individual characteristics as identifying variables.

Data and Sample

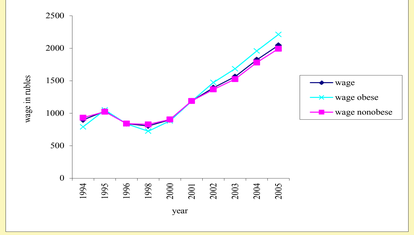
Russian Longitudinal Monitoring Survey (RLMS) for 1994—2004

- The RLMS is a nationally representative household survey that annually (excluding 1997 and 1999) samples the population of dwelling units.
- Sample of 36,917 individuals
- Male—21,236 and female—15,681

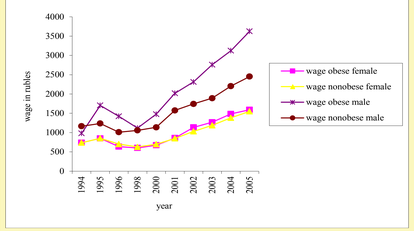
Obesity share by gender in Russia 1994-2005



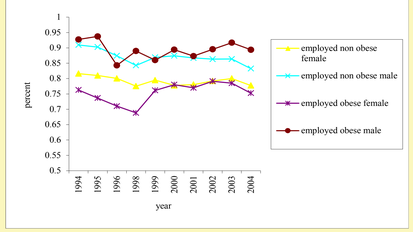
Hourly wage by obesity status in Russia by obesity 1994-2005



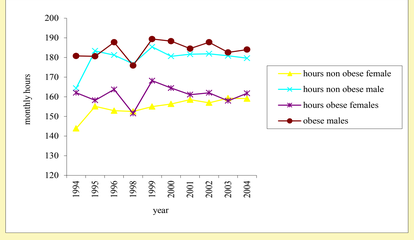
Hourly wages in Russia by gender and obesity 1994-2005



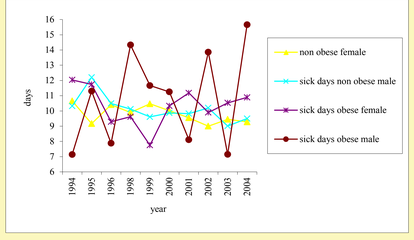
Employment by gender and obesity in Russia 1994-2005



Monthly work hours by gender and obesity in Russia,1994-2005



Number of sick-leave days by gender and obesity in Russia,1994-2005



Results

1. BMI and labor force participation:
- BMI has a nonlinear effect on employment, and the effect is statistically significant for the women sample and for the total, but not for males.
- The probability of women's employment increases with the BMI until the BMI level is about 30 (the obesity category threshold), and after this level, the probability of women's employment continues to decrease with BMI.
- The BMI overall marginal effects are positive but not statistically significant, and the magnitudes are very small.

2. BMI and wages:
- BMI is statistically significant and positively related to wages for the men's samples, but insignificant for the women's sample.
- One unit (or 4%) increase in men's BMI raises their wage by 1.4% at mean BMI. This result is contrary to some studies for developed economies which find wage penalties for obese workers, but consistent with Morris (2007) and Sousa (2005) who find that BMI has a significantly positive effect on men's earnings.

3. BMI and sick-leave days:
- BMI has a non-linear, U-shaped effect on the number of work days missed due to health problems, which is statistically significant only for the total, and for the men's samples.
- The number of work days missed due to illness decreases with BMI for men until their BMI reaches 28.3. After this point, the number of sick-leave days increases with BMI.

Summary and Conclusions

- This paper focuses on the impacts of overweight and obesity on the probability of employment, wages, and the number of sick-leave days by gender in Russia during the transition.
- We employ econometric techniques to control for unobserved heterogeneity and potential biases due to endogeneity in BMI.
- The results show an inverted U-shaped effect of BMI on probability of employment for men and women.
- We did not find evidence of wage penalty for higher BMI. In fact, the wages for overweight males are higher.
- Overall, we find negative effects of obesity on employment only for women, but not on wages.
- The policy implications are gender specific and should help formulate more effective policies for improving the labor market performance through achieving optimal weight of the citizens in Russia.
- The effects of obesity on labor market outcomes should also raise further attention to the growing obesity problem and the associated societal costs.

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