Labor Supply, Welfare and Human Capital Effects of a Generous Pension Reform: Evidence from a Natural Experiment in Ukraine

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Abstract

In 2004/05, the Ukrainian government raised the minimum pension level by factor three in response to general discontent which was later exemplified in the Orange Revolution of 2004. This paper uses nationally representative panel and cross sectional data to estimate the impact of this exogenous policy on labor supply of the pension aged using a regression discontinuity difference-in-difference approach exploiting variation across household composition and time. Results suggest that increased pension receipt reduced labor supply of the pension eligible and improved the welfare situation of households with pensioners. There is strong evidence that the increased inflow of monetary resources also helped young Ukrainian females to expand university enrolment.

Keywords: Labor supply, pension reform, regression discontinuity, difference-in-difference, panel

1. Introduction

Ukraine runs a compulsory public pension system which is based on qualification by age. It covers all Ukrainians who have worked for at least 20 years and who have reached pension age. In international comparison, the state pension age is extremely low with women qualifying from age of 55 and men from age of 60. Given this young pension age and a progressively ageing population, the burden of pension payments on the public budget has become substantial in Ukraine.[1] Despite this, the Ukrainian government increased the legal minimum pension levels by factor three in mid 2004 in an attempt to reduce poverty among the elderly. Also, pensioners were recognized as a powerful electorate, which might explain the timing of the sudden pensions increase just months before the general elections scheduled late 2004. In 2005, pension payments accounted for 43 percent of total social transfers or about 15 percent of GDP.

Given such a generous increase in the minimum pension, it is important to understand whether the reform had the desired effects—reducing poverty among pensioners. However, the analysis is complicated by the fact that a substantial number of pensioners have traditionally worked many years over the official state pension age in order to support their previously meagre livelihoods. Beside welfare effects, the reform has changed incentives to stay in the labor force beyond the pension age. This paper will thus also address the question of whether those eligible for an old age pension still kept working for severalyears after this pension reform. Finally, both welfare and labor supply effects might impact on choices made by co-residing household members—and this is the third component of the subsequent analysis. More specifically, I will ask whether the additional funds from the pension increase are channelled into increasing university enrolment among young co-residing women. If elderly women retire sooner with a higher state pension, they bring money into the household which might be used to finance the expansion of university enrolments among young females.

The results show that the pension boost in Ukraine in the mid 2000s, which was meant to reduce poverty among the elderly, improved the welfare situation of those Ukrainian households that have pension aged household members. Also, the pension increase had significant negative labor supply effects on the elderly population, with an average reduction of

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[1] The Ukrainian Prime Minister Yulia Tymoshenko announced on her private homepage in 2007, that no increase in retirement age will be introduced due to the low life expectancy of the Ukrainian population.

income generating work activities of roughly ten percent within the first two years of state pension age. The effect is of similar size for men and women and remains significant after controlling for unobserved heterogeneity. However, the increased inflow of funds not only allowed pensioners to retire earlier, it was also partly channelled into increasing the education of young cohabiting females. University enrolment rates of 18 year old women rose by almost 20 percent in the presence of a female pensioner, pointing to the relaxation of financial constraints in women's access to education. The within household reallocation of funds seems to take place exclusively between pension aged and young women as neither young men benefit, nor male pensioners contribute to the educational expansion.

The remainder of this paper is organized as follows: Section 2 describes main features of the Ukrainian pension reform and gives details on the generous pension increase taking place in 2004. Section 3 lays out the conceptual framework of the evaluation. Section 4 describes the two data sources used for the empirical evaluation of labor supply responses and welfare effects of the pension receipt within the household. Section 5 covers the econometric approach. Section 6 reports the results of the study and presents sensitivity analysis. Section 7 concludes with some implications for public policy.

2. Pension Reform and Pension Increase in Ukraine

In the early 2000s, the Ukrainian pension system suffered from serious fiscal stress and an extremely high level of benefit compression. Pension benefits had been capped at three times the legal minimum wage (plus minor additions) resulting in an almost flat pension rate. Plans for a comprehensive pension reform in Ukraine were agreed upon in the year 2003. The future pension system was designed to rest on three pillars, with the first one resembling a mandatory pay-as-you-go state pension system, the second one being a mandatory individual pension and the third one being private pension insurance. The second pillar was scheduled to start after the year 2007, while the other two pillars were scheduled for 2004 (for details see Handrich and Betliy 2006). Before these policies came into force, however, the Ukrainian government realized the population's growing discontent with Ukrainian politics in 2004. As national elections were scheduled for December 2004, pensioners were discovered as a powerful electorate potential. Pensioners had often been considered the losing generation of the transition process following the break-down of the Soviet Union and considered a highly

poverty-exposed social group. As a consequence, the government started increasing the compulsory age-dependent pay-as-you-go pillar of the pensions system; the legal minimum pension was especially strongly improved in order to fight poverty. The minimum pension rose from below 100 Ukrainian Grivna (UAH) per month in late 2003 to over 280 UAH in late 2004 and even to almost 350 UAH in mid 2005 (Figure 1). After September 2004, the legal minimum pension even exceeded the legal minimum wage substantially. While the reforms were initially designed to give better incentives for high income earners to contribute to the system through removing the top cap on the state pension, the sharp rise in the minimum pension actually introduced a binding pension floor: Average wage earners with full working history (40 years) could now hardly scratch the legal minimum pension, and consequently 88 percent (!) of 13.3 million pensioners in Ukraine received the legal minimum pension in 2004 (World Bank 2005).

Figure 2 shows that the legal minimum pension level was partly binding in 2004. The left superimposed vertical line marks the average monthly legal minimum pension.[2] Given that pension data are reported on a yearly basis, it is impossible to judge whether those pensioners receiving on yearly average less than the average legal minimum pension are victims of pension arrears, of too low monthly pension payments or victims of a too slow revaluation of their pension levels. However, pension arrears were quite rare during the time period under consideration with less than 0.4 percent of pensioners reporting outstanding pension payments. Clearly visible in the Figure is the pension cap (dashed vertical line). In 2005, the pension floor is three times higher and seems to be binding. Overall the distribution of monthly pension receipt has changed from a bimodal to a unimodal, even more compressed, structure.

3. Conceptual framework

The increase in the legal minimum pension in mid 2004 was intended to reduce poverty among the pension aged population. While I will be initially considering the success of the pension increase with respect to household welfare, the main interest of the following analysis touches upon labor supply responses of pension aged adults and the human capital effects for the younger generation.

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[2] As pension receipt is reported on a yearly basis in UHBS, we have to use a legal minimum pension averaged over twelve months.

An investigation of the sudden pension increase in Ukraine should answer the following questions: 1) Did the pension reform improve the welfare of households including pensioners? 2) Have increased pension entitlements reduced the share of working pensioners? 3) Did the pension reform set free side effects for university enrolment of young women?

As can be seen from Figure XX, employment levels for men and women decline around the retirement age, but remain still substantial for several post-retirement years. Two years after reaching the retirement age, 30 percent of women and 20 percent of men are still employed. After five years, 17 percent of women and almost 15 percent of men have regular employment. These high levels of working pensioners are likely to be related to the insufficient pension receipt of many elderly, as evidenced for Russia (Kolev and Pascal 2002). However, given the comparably low pension age, one could imagine that, for instance, 56 year old women or 61 year old men simply voluntarily keep on working. Support of this idea might come from the observation that virtually all working pensioners work full time 40 hours (Figure XX). In reality, working relations are still extremely inflexible in Ukraine and most individuals face the decision to work full time or not to work at all. As a consequence, labor supply responses in Ukraine mainly take place at the extensive margin.

If poverty was at the cause of elderly staying at work, a substantial non-anticipated pension increase like the one projected in 2004 should allow more pension-aged to retire with a decent living standard.[3] As pensioners could not foresee the sudden reform, it should be possible to trace welfare effects as well as labor supply responses directly in the data.

There exists a substantial body of literature pointing to the intra-household allocation of resources from grandmothers to their granddaughters (Duflo 2003). If similarly grandmothers care about the human capital endowment of their female family members, they might be willing to share part of their available resources with them. Unlike in many developing countries, enrolment into basic education is not critical in Ukraine, a country with full enrolment into a well-developed educational system during Soviet times. However, university education is a matter of choice and endowments (of both, ability and money). Grandmothers might help to finance granddaughters' university education. To test this hypothesis, one has to carefully check whether enrolment rates change in an environment where novel university curricula are generally on expansion. As students take up their studies directly after graduation from secondary school around the age of 18 and as lodging is expensive and not freely available in many Ukrainian cities, many students co-reside with their family. I will

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[3] For potential "life-time" labor supply effects on elderly see e.g. Lazear (1985), Bosworth and Burtless (2004).

thus take the natural experiment of the pension increase in order to test whether increased household resources *caused* an increase in university enrolment of young women.

4. Data

To evaluate the impact of the substantial pension increase on the average labor supply of Ukrainian household members, we use five waves (2002-2006) of the national representative Ukrainian Household Budget Survey (UHBS) which interviews 25,000 individuals on an annual basis. Data collection is performed by the State Statistics Committee of Ukraine in December of every year. The data comprise a rich set of individual and household characteristics, information on employment as well as incomes. Unfortunately, the UHBS lacks information on hours worked, but as will be shown later, the low degree of flexibility in the Ukrainian labor market allows individuals only to choose between full-time work and no work in most cases, including those in the pension age. Another drawback of the data set for the current analysis is the way how earnings and pensions are retrieved. Individuals are asked to report net yearly earnings and yearly pension receipts. As a consequence, the effect of a pension increase in mid 2004 will be reflected much weaker in the December 2004 data as compared to December 2005.

To overcome the data limitations of the UHBS and in order to take a closer look at how household members change their working behaviour after the increase in pension receipts for co-residing pensioners, we make use of the panel component of the Ukrainian Longitudinal Monitoring Survey (ULMS). The nationally representative ULMS is collected by the Kiev International Institute of Sociology. All three waves of the panel (for the years 2003, 2004 and 2007) are used for the analysis. As the vast majority of data collection is performed in early summer (May to July), the panel comprises two waves prior to the exogenous pension increase. The data set allows a much more detailed analysis of labor market responses as we can analyse working hours (actual and usual hours) as well as monthly net incomes. Using panel data allows us to control for several unobservable individual characteristics which might impact on labor supply behaviour in a way that is non-traceable when using cross-sectional data.

Age-eligibility of this state pension is crucial for the following analysis, as it allows circumventing potentially endogenous behaviour in drawing pensions. A household can gain

pension eligibility status if at least one member of the household reaches pension age across the years (55 for women and 60 for men) or if a pensioner moves into the household from outside.[4] To the contrary, households can also loose pension eligibility status if a pensioner moves out of the household or dies. To circumvent potential selection bias into actual pension receipt of the elderly, we use age-based pension eligibility as an instrument for it. Another legal requirement for pension eligibility is a minimum of 20 years of work. The UHBS data set contains information on the years worked throughout lifetime which allows us to generate a very strict measure of pension eligibility. Generally speaking, only a minor fraction of those currently pension aged has worked fewer than 20 years as a consequence of the Soviet full-employment policy (1.8 percent). To maintain a purely exogenous pension age indicator, I will demonstrate the results without the minimum-working-years requirement. The purely age-based treatment estimates which I will present later on are thus lower bound estimates of the true effect. Robustness checks excluding those with below 20 years of work experience from the eligibility criterion indeed confirm that the true effect is likely to be economically and statistically bigger.

Table 1 compares households with and without at least one pensioner in both data sets, ULMS and UHBS. At a glance, the two data sets differ to some extent in household characteristics with ULMS comprising somewhat larger households. In both data sets, co-residing households are more prevalent in rural areas. Table 2 shows the share of pension aged individuals in the samples of the ULMS and UHBS. While in UHBS the share of the pension aged is relatively constant around 28 percent, the share increases in ULMS markedly, because this balanced panel "grows" older. Consistently across both data sets and all years, the share of pension aged exceeds the share of those receiving an old age pension by one to two percent. Beside pensions arrears (which were almost negligible during this period of time), the difference mainly stems from pension aged individuals who kept working without drawing the compulsory state pension, which is only based on age.

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[4] Again, the ULMS data set is more detailed as we know exact dates of birth and can thus control for changes in household composition across years.

5. Econometric Approach

To evaluate the effect of the pension rise on household welfare I make use of a simple difference-in-difference estimator (DiD) where the pension increase is interpreted as treatment on those households including at least one pension eligible person. To prevent from endogeneity bias of pension draws, a pensioner is defined as a pension aged person, independent whether the person really received an old age pension. Through the use of a control group (households without any pensioner) we can keep other effects, e.g. a general rising trend in welfare, constant. The estimated regression model is the following

$$y = \beta_0 + \beta_1 P + \beta_2 T + \beta_3 P{*}T + \beta{'}X + u \qquad\qquad (1)$$

with y being the dependent variable (welfare, later university enrolment), P being an indicator for a co-residing pension eligible adult (as compared to the absence of any pensioner N), T being an indicator for the post-treatment period (i.e. the years 2005 and 2006 for UHBS as well as 2007 for ULMS) and $P{*}T$ being an interaction effect of P and T. X is a vector of household controls including household size, the share of females in the household, a dummy for the presence of children up to age seven, average age and education in the household (the latter only for persons older than 19 years), settlement type and region. As such, β_1 captures welfare differences between pension aged and non-pension aged households before the reform. The rationale behind the DiD approach is that while the pension reform "treated" only households which contained at least one pensioner, no change occurred for households without pension aged adults and consequently without a comparable increase in household resources (control group).[5] If the presence of a pensioner is associated with a higher level of welfare, this coefficient should be positive and significantly different from zero. β_2 reflects aggregate changes in welfare that are independent of the scheduled policy and could e.g. comprise a rising trend in wages over time (or in the supply of university facilities for the enrolment example). The coefficient of interest is the difference-in-difference estimator β_3 which reports the average treatment effect on the treated:

$$\beta_3 = (\bar{y}_{P,2} - \bar{y}_{P,1}) - (\bar{y}_{N,2} - \bar{y}_{N,1}) \qquad\qquad (2)$$

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[5] There is no evidence, that the implementation of the pension rise was financed through rising income taxes, which could potentially affect welfare of households containing only working age persons..

The same estimation strategy is used to evaluate the effect of the pension increase on female enrolment rates at university. To reduce confounding factors as much as possible, I make use of the relatively large sample size of the UHBS and focus my analysis only on young persons aged 18 (the year when most students enrol into university courses).

In order to estimate the causal effect of the pension increase on the labor supply choices of pension aged individuals I make use of a Difference-in-Differences estimator exploiting the discontinuity of pension eligibility. As pension ages are rather low in Ukraine, it seems reasonable to compare individuals shortly before and shortly after reaching the pension age threshold without running into the risk of comparing adults of different biological abilities to work. I use a similar estimation strategy as in (1) but compare only individuals two years prior and two years after the official pension age.

It would be desirable to further control for individual unobserved heterogeneity in the labor supply responses of individuals. This can principally be done using the ULMS, however, the smaller sample size requires a broader choice of comparison years (four years). In this case, equation (1) is modified to the following:

$$y_{it} = \beta_0 + \beta_1 P_{it} + \beta_2 T + \beta_3 P_{it}*T + \beta`X_{it} + u_i + e_{it} \qquad (3)$$

A back draw of the ULMS data is the gap in the observation period. The first post-reform observation is in 2007, already two and a half years after the reforms took place. On the one hand this gives us the opportunity to test whether the measured effects have some persistence, on the other hand, it becomes harder to interpret the size of the treatment effects.

As household composition is potentially endogenous (see below; Edmonds et al. 2005) I make use of the panel component of ULMS and restrict the ULMS analysis only on households that have not gained an additional pensioner after the reform year 2004 except for those which contained members who reached the pension age.

6. Results and sensitivity analysis

Table 3 clearly shows that household containing a pensioner received a significant welfare advantage after the implementation of the pension reform. The treatment effect is significant positive for both samples and for both OLS and fixed effects estimation (in ULMS only). The difference in the size of the estimator can be attributed to different measurements of

consumption: ULMS excludes durables while UHBS contains durables consumption. Further the longer observation gap in ULMS might potentially contribute to a slight upward bias in the estimates. Given the setup of the difference-in-differences estimator with a common trend, it is hard to believe that the observed effects might be attributable to overall rising welfare. Also, there is no indication for an expansion of employment participation of working age adults in pensioner households—if any effects are observable the number of working adults is even lower in pension households after the reform as compared to before.

Given these results, the goal of the government to improve welfare levels of pensioners has been realized, although the analysis so far does not allow any welfare distinction between different household members within the household.

Table 4 indicates that pension eligible individuals retired much faster after the reform than before. Within two years after reaching the pension threshold, men and women are working roughly ten percent less.[6] Although this result is robust across both samples, several alternative hypotheses might also partly explain the observed retirement pattern.

As we are comparing persons close to the pension threshold, our estimates will be sensitive to any changes occurring among those below pension age. As Figure 6 shows, those persons directly below the pension age exhibit a much more positive employment trend over the observation period than most of the other age groups. Generally, the Figure indicates that younger individuals had a much more positive general employment trend over time than older individuals. But the spikes below age of 55 for women and below age of 60 for men suggest that individuals might have responded to the pension reform in an unexpected way: In order to be entitled for pension payments, some people might try to enter the labor market shortly below pension age. If this was true, the comparison of 53/54 year old women with 56/57 year old women might be biased. Therefore I also chose an "earlier" comparison group (extending to the previous five years) in order to circumvent this problem and find still highly significant results which are 25 to 50 percent smaller than the initial ones.

The results might also be biased if the pension reform produced other incentives favoring earlier retirement. However, the opposite is true: The Ukrainian pension reform even introduced incentives to work longer (giving bonuses for the time worked beyond the pension

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[6] In a further test whether the pension aged react to the reform I test whether pension withdrawals are affected. Men are significantly more likely to draw their old-age pension in the years following the reform (the effect for women is positive but insignificant), indicating that pension coverage increased in the elderly population through the reform (results not shown).

age). Thus one can state that such a policy might have weakened the work-reducing effect of the pension increase, which however is still significantly negative.

Given the general improvements of the welfare situation of Ukrainian households during the 2000s, one could argue that the results are driven by welfare gains stemming from other household members. However, I control for different types of incomes received by the entire household. I also provide more robustness by looking at households without co-residing working age adults and find qualitatively the same results.

It has been noted in the literature that household formation is potentially endogenous to the receipt of benefits (Edmonds et al. 2005). Household members who would like to reduce their labor supply might decide to co-reside with working aged individuals in order to pool resources. If this was the case, estimates not taking into account the potential self selection might be seriously biased. Although it is impossible to infer any changes in household composition in the UHBS data, the panel component of the ULMS helps to investigate this issue in greater detail. It is not sufficient to simply compare patterns of household composition over time, as some working age adults might just live together with a person who reached pension age between 2004 and 2007. I can use exact birth date information from the household roster to establish whether a pensioner moved into the household between years.[7] Overall, 2.7 percent of working age adults were living in a household to which a pension aged adult had moved between 2004 and 2007. When excluding those rearrangements, I still find the same results so that endogenous household formation can also be ruled out as an explaining factor for the observed patterns of reduced work among the pension aged.

Finally, one could argue that perhaps the health situation of the population is deteriorating over time. Although Ukraine has experienced a severe health crisis, this factor is unlikely to explain the retirement pattern, as the results still hold up after controlling for a wide array of chronic disease.

In a last step I analyze whether the increase pension receipt was used in order to support the young generation in their human capital accumulation. As secondary education is rather the norm in Ukraine, it is interesting to look at higher education, for which some potential students might be financially constrained. Table 5 shows that the presence of a female pensioner after the pension increase has a significantly positive effect on the university enrolment rates of 18 year old women. As the Table reveals, there are no comparable effects

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[7] Also, a working age adult can move into a pensioner's household.

for young men. Also, pension income from male pensioners has no similar enrolment effect on either of the sexes.

To test whether the significant jump in enrolment rates of females can really be attributed to the pension increase I try to "simulate" a treatment between other years throughout my sample. As expected, the effects were zero between all other years thus showing that the responsible treatment took place between 2004 and 2005.

As there was at the same time no policy in place which should selectively support the access of women to higher education, it seems rather unlikely that educational policies should suddenly favor access of women over that of men. This also supports the finding, that the pensions paid to female pensioners were used to support young women.

This result can be further underlined when using real cash pension values as gradual treatment. As becomes evident, more pension income for women improves the likelihood of young women to enroll at university.

7. Conclusions

This paper has shown that the substantial pension increases in Ukraine between 2004 and 2005, which the government preliminary targeted at reducing poverty among pensioners, had significant positive welfare effects on the pensioner population. At the same time, the reform reduced the post-pension age labor supply of both, pension eligible men and women. As second order effect, the reform also has changed the incentives to join the labor market just before reaching the pension age pointing to the development of a sharper retirement threshold in Ukraine. Unlike in Western industrialized countries the relatively static nature of the Ukrainian labor market reduces the opportunities for adjustments of individual labor supply at the intensive margin (due to the absolute predominance of full-time contracts with inflexible hours). The paper also revealed a human capital effect in the younger generation, as pension payments for women contributed to rising tertiary enrolment rates among young females. The results are in line with wider international evidence that women are more likely to pool resources within the household.

The results from the analysis suggest that well-informed public pension policy should take into consideration potential second order effects on individual labor supply (see Fisher and Keuschnigg, forthcoming). The policy goal to combat poverty via pension increases might become ineffective and fiscally extremely costly, when household members withdraw their

manpower from the labor market. As a consequence, overall welfare levels might increase less than in a static framework without labor supply response. At the same time, the untargeted nature of the pension increase has contributed to the human capital enhancement of young women. The state, however, has to consider whether direct financing of educational programs might have reached similar positive effects at lower costs.

Tables and Figures

Figure 1
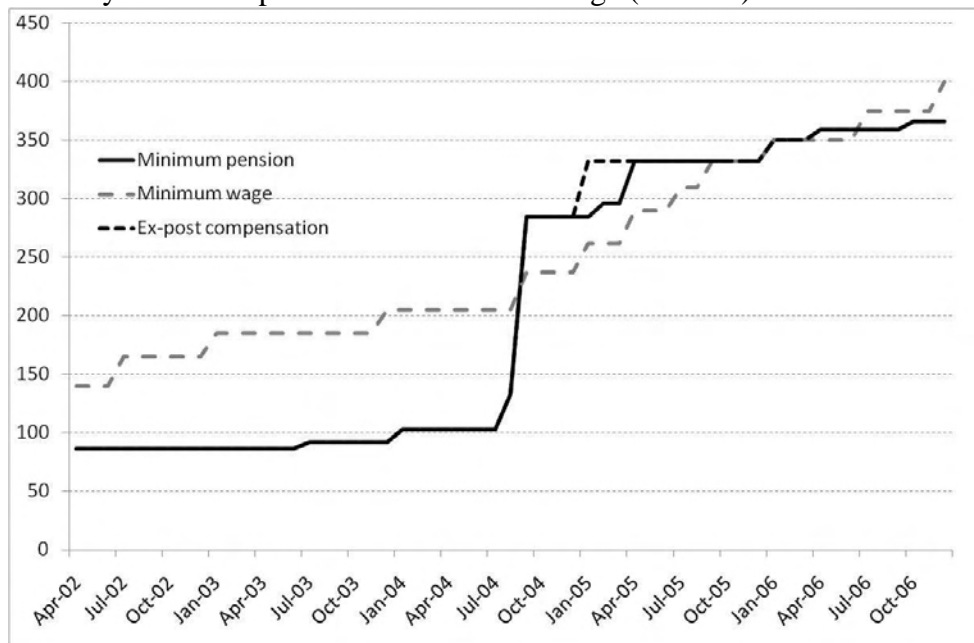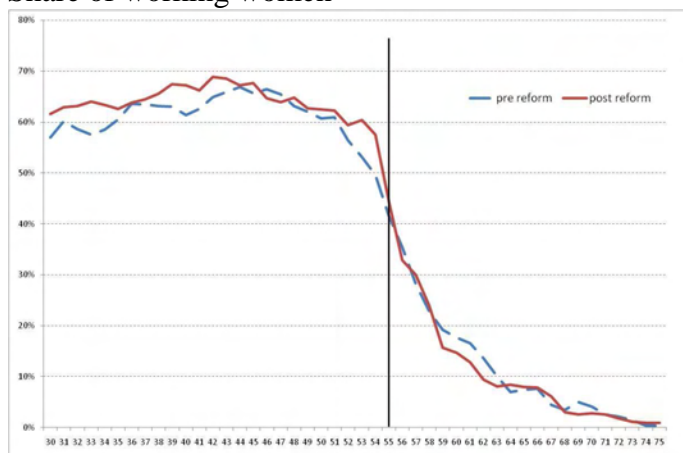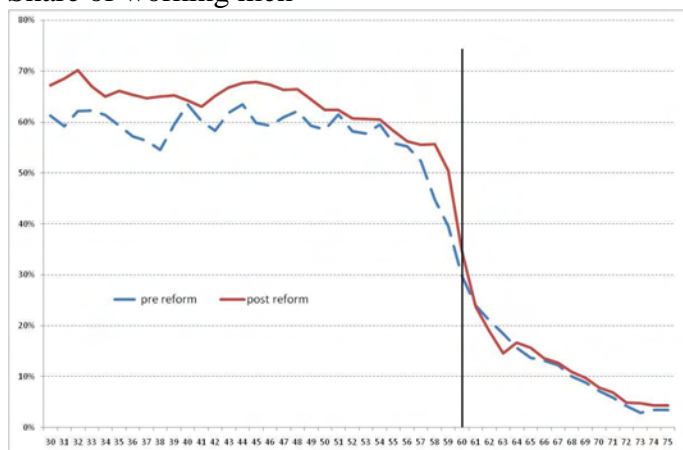Monthly minimum pension and minimum wage (in UAH)

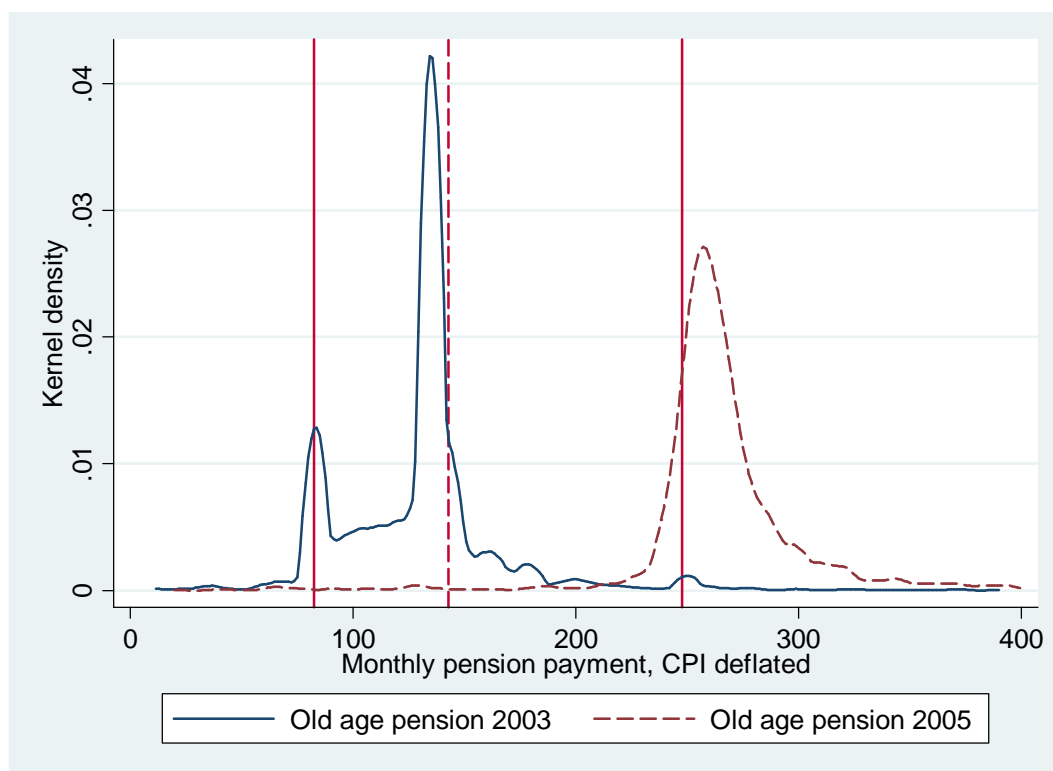### Figure 2
Share of working women

Share of working men

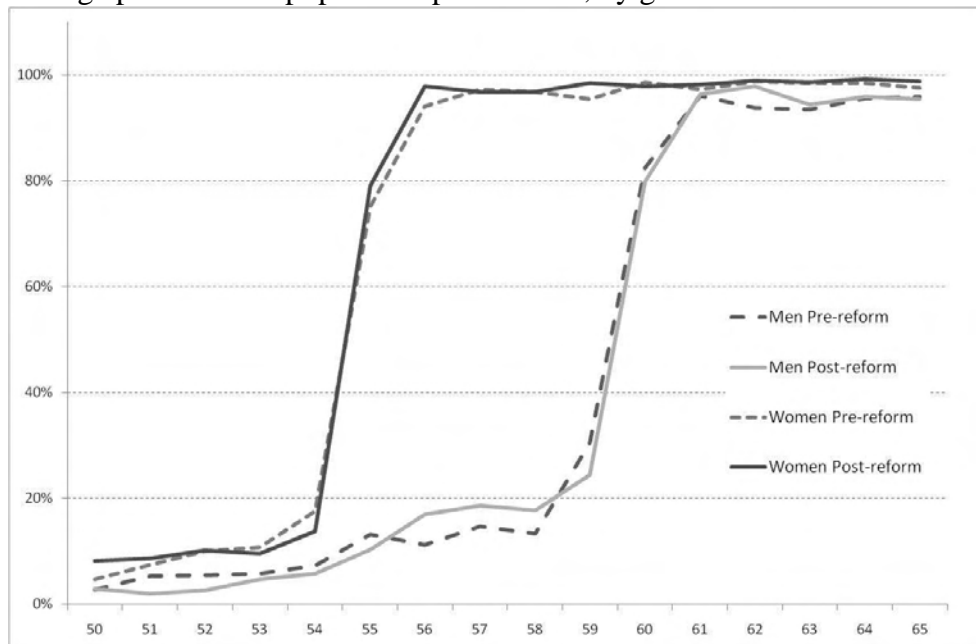
Source: UHBS; author's calculations.

Figure 3

Distribution of average monthly pension payments (in UAH), change 2003 to 2005

Note: The superimposed full vertical lines mark the average monthly legal minimum pension for 2003 (left) and 2005 (right). The monthly legal minimum standard is computed as weighted average about the preceding 12 months. In 2005, the legal minimum pension rose slightly between January and April, however, pensioners were ex-post compensated by the government, so that the nominal pension level was 332 for all months in 2005. The dashed vertical line marks the state pension cap which was in place prior to the reform. Pension incomes are deflated by national CPI to December 2002.
Source: UHBS; author's calculations.
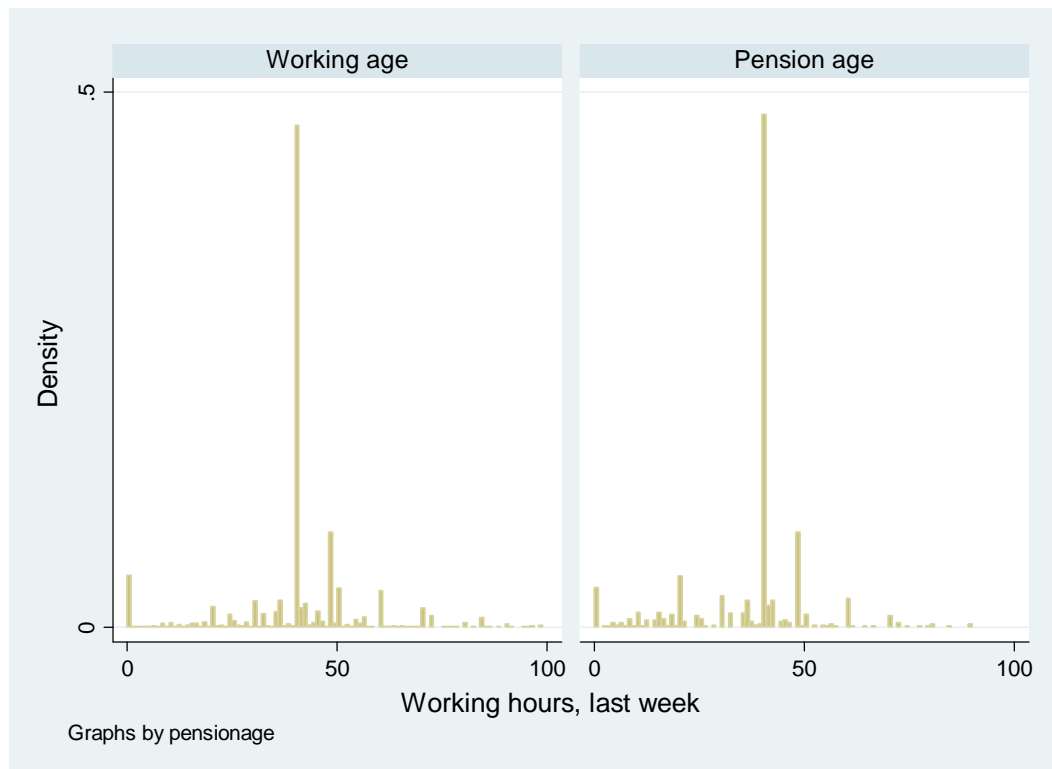
Figure 4
Old age pension receipt pre- and post-reform, by gender

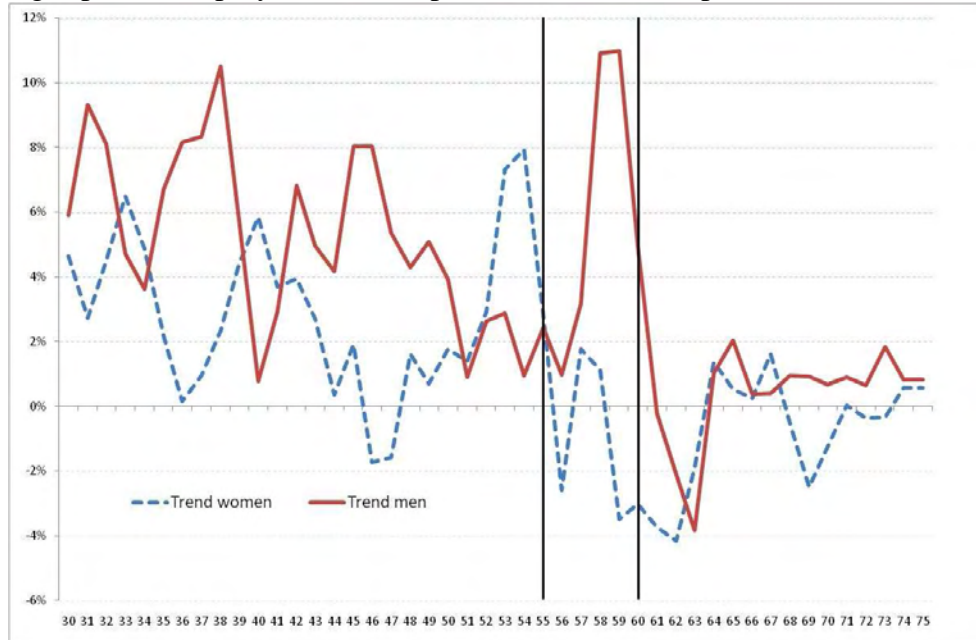Source: UHBS; author's calculations.

Figure 5
Working hours of working age vs. pension age individuals (actual working hours)

Source: ULMS; author's calculations.

Figure 6
Age specific employment trends pre- (2002/2003) vs. post-reform (2004/2005), by gender

Source: UHBS; author's calculations.

Table 1
Comparison of households with pension eligible and without pension eligible persons

	ULMS Non-pension household	ULMS Pension household	ULMS Total	UHBS Non-pension household	UHBS Pension household	UHBS Total
Household size	3.6	4.1	3.7	3.1	3.9	3.3
Rural	34.3%	42.7%	35.6%	31.8%	45.1%	35.0%
Town	26.3%	21.4%	25.5%	29.9%	24.0%	28.5%
Urban	39.4%	35.8%	38.8%	38.3%	31.0%	36.5%

* Note: For ULMS we use imputed years of schooling, while for UHBS we use imputed years of education.
Source: ULMS, UHBS; author's calculations.

Table 2
Share of the pension aged and persons receiving old age pension in total population

Year	ULMS Number of obs.	ULMS Share pension aged	ULMS Share receive pension	UHBS Number of obs.	UHBS Share pension aged	UHBS Share receive pension
2003	5,091	23.6%	22.6%%	23,083	28.7%	27.1%
2004	5,091	26.1%	25.2%	24,079	27.6%	25.8%
2005				24,407	27.4%	25.9%
2006				24,613	27.7%	26.1%
2007	5,091	31.9%	30.3%			

Source: ULMS, UHBS; author's calculations.

Table 3
Welfare effects of the pension increase, DiD

	(1)	(2)	(3)	(4)
	UHBS		ULMS	
	OLS	OLS	FE	FE
	Number of working persons in HH	Log of pc consumption	Number of working persons in HH	Log of pc consumption
Pension household	-0.527***	0.0237	-0.0368	-0.0612
	(0.0512)	(0.0347)	(0.0642)	(0.0736)
Post-reform	0.0257	0.362***	0.151***	0.326***
	(0.0188)	(0.0139)	(0.0366)	(0.0425)
ATT	-0.00915	0.0331**	-0.146***	0.0929*
	(0.0191)	(0.0151)	(0.0425)	(0.0532)
Constant	-0.388	7.229***	0.599**	5.332***
	(0.475)	(0.235)	(0.283)	(0.333)
Observations	43183	42141	7947	7947
R-squared	0.493	0.525	0.082	0.132

Note: Consumption aggregate in ULMS contains food consumption, goods and services. The UHBS aggregate additionally contains consumption of durables. Regressions control for household size, share of females in household, dummy for presence of children up to age seven, average age in the household, average education among the working age population, settlement type and region. *** $p<0.01$, ** $p<0.05$, * $p<0.1$; Robust standard errors clustered by household size and settlement type in parentheses.

Table 4
Labor supply effect of pension increase on pension eligible individuals

	(1)	(2)	(3)	(4)
	Wald with covariates		Extended pre-pension age group	
	Men	Women	Men	Women
Pension eligible	-.115	-.171***	-.158***	-.147***
	(.0742)	(.0569)	(.0359)	(.0287)
Post reform	.111***	.0774***	.0511***	.0496***
	(.0349)	(.0239)	(.018)	(.0136)
ATT	-.111**	-.0976***	-.0565*	-.0714**
	(.0446)	(.0345)	(.0334)	(.0285)
Constant	.156	-1.19	-.649*	-.328
	(1.3)	(.944)	(.368)	(.249)
Observations	1582	2814	3600	5915
R-squared	0.210	0.192	0.197	0.192

Note: Regressions control for age, marital status, education, health conditions, household size and place of residence; robust standard errors in parentheses; *** $p<0.01$, ** $p<0.05$, * $p<0.1$; Source: UHBS data 2003-2006

Table 5
Effect of pension increase on university enrolment, DiD

	(1) University enrolment of females, aged 18, pension eligibility	(2) University enrolment of males, aged 18, pension eligibility	(3) Later university enrolment of females, aged 18	(4) University enrolment of females, aged 18, money pension
Household with pension eligible women	-.1740***	.0157	-.0777*	-.0010***
	(.037)	(.0334)	(.0368)	(.000242)
ATT	.1850**	-.0331	.1140	.0011***
	(.061)	(.0764)	(.0769)	(.000248)
Post-reform	-.0171	.0305	-.0279	-.0096
	(.0684)	(.0317)	(.0524)	(.0669)
Constant	-2.24***	-2.91***	-2.26***	-2.24***
	(.654)	(.344)	(.662)	(.66)
Observations	929	852	929	929
R-squared	0.281	0.281	0.278	0.278

Note: Dependent variable: Being a university student at age of 18; regressions controlling for marital status, years of schooling, place of settlement, number of working age adults in household, presence of children up to age 5, sum of male incomes; *** $p<0.01$, ** $p<0.05$, * $p<0.1$; Robust clustered standard errors in parentheses (clustered by household size)
Source: UHBS; author's calculations

References

Ardington, C., A. Case and V. Hosegood (2009): Labor supply responses to large social transfers: Longitudinal evidence from South Africa. <u>American Economic Journal: Applied Economics</u> 1(1): 22-48.

Bosworth, B. and G. Burtless (2004). Supply side consequences of social security reform: Impacts on savings and employment. Center for Retirement Research at Boston College, WP 2004-01. Chestnut Hill, MA.

Danzer, A.M. (2008). Labor supply responses of Ukrainian workers in the face of income uncertainty. Paper presented at the EEA conference, Milan.

Duflo, E. (2003). Grandmothers and Granddaughters. Old-Age Pensions and Intrahousehold Allocation in South Africa. <u>World Bank Economic Review</u> 17(1): 1-25.

Edmonds, E. V., K. Mammen and D. L. Miller (2005). Rearranging the Family? Income Support and Elderly Living Arrangements in a Low-Income Country. <u>Journal of Human Resources</u> 40(1): 186-207.

Fisher, W.H. and Ch. Keuschnigg (forthcoming). Pension Reform and Labor Market Incentives. <u>Journal of Population Economics</u>.

Handrich, L. and O. Betliy (2006). The pension system derailed: proposals how to get back on the reform track. Policy Paper V9. Institute for Economic Research and Policy Consulting in Ukraine, Kiev.

Jensen, R.T. (2003). Do private transfers 'displace' the benefits of public transfers? Evidence from South Africa. <u>Journal of Public Economics</u> 88 (2003) 89–112.

Kolev and Pascal (2002). What Keeps Pensioners at Work in Russia: Evidence from Household Panel Data. <u>Economics of Transition</u> 10(1): 29-53.

Lazear, E.P. (1985). Incentive Effects of Pensions. Pension, Labor, and Individual Choice, edited by David A. Wise. Chicago: University of Chicago Press, pp. 253-282.

Moffitt, R. (1992). Incentive Effects of the U.S. Welfare System: A Review, <u>Journal of Economic Literature</u> 30(1): 1-61.

World Bank (2005). Pension Reform in Ukraine. Remedies to Recent Fiscal and Structural Challenges. Mimeo.