When to Retire, how is Recessions helping this process and how is the Social Security affected by early retirement

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Abstract

Within the context of slow growth in recent years and fiscal pressures, Kosovo faces the complex dual challenges of high unemployment and weak human development outcomes. Promoting the "jobs agenda" and strengthening human capital rank high among priorities for Kosovo's development. Although the market still may be below what individuals had expected and there may have been some short-term impacts, the market's sharp rise has substantially diminished the importance of this part of the story. The weakness in the labor market, however, continues to be extensive and persistent. On the other hand the economic crisis that began in 2008 had multiple implications for retirement behavior. The stock market crash may have caused some individuals to defer retirement because of losses they experienced in their retirement plans. The purpose of this analysis is to focus on its implications for retirement and retiree well-being in the coming years. High unemployment has the potential to significantly alter the well-being of older workers, both in the present and for

the remainder of their lives. If an older worker loses his or her job, finding a new one may be even more difficult than it is for a younger worker. The older worker's relatively short time horizon in the labor force may reduce their own or a prospective employer's willingness to invest in additional human capital. If specific capital has been lost, the wage a new employer may offer may be considerably below the worker's previous wage, reducing the likelihood of an offer being extended or accepted. For these reasons and others, the future employment prospects of a laid off older worker may be bleak.

In such an environment, Social Security benefits may be a lifeline for these workers. But while taking up benefits when they first become available at age 62 may help a laid off older worker pay the bills, it also means reduced income for the remainder of the worker's life, since monthly benefits are reduced (increased) for early (late) claiming so as to provide roughly the same expected lifetime benefits regardless of the age at which benefits are claimed. The negative impact of early claiming on retiree well-being may be particularly pronounced for low socioeconomic status individuals, who rely heavily on Social Security to make ends meet. The purpose of this paper is to examine the impact of labor market fluctuations on the retirement behavior and Social Security income of older individuals. Specifically, we use 10 years of data from the AFP (Anaketa e fuqise puntore) to measure the impact of a weak labor market on the labor force status and Social Security receipt of individuals between the ages of 55 and 69.

We also use data from the 2001 Census and 2001, 2002, and 2006-2009 Entit të Statistikavës së Kosovës (ESK) to examine whether labor market conditions around the time of retirement affect the subsequent income of retirees in their 70s. We find support for the notion that workers are more likely to leave the labor force, to collect Social Security earlier, and to have lower Social Security retirement income later in life when they face a recession around the time of retirement. The impact of such an event is greatest for the less-educated, who are more susceptible to job loss and rely more heavily on Social Security to support them in retirement.

1 Introduction

Before the 1998 conflict, Kosovo was covered by the Yugoslav pension system. This was a "pay-as-you-go" (PAYG) system in which current workers made contributions to the pension fund, and those contributions were used to pay benefits to current pensioners. Pension levels were determined by a benefit formula based on years of service and salary level. Until 1989, Kosovo had an autonomous pension fund that collected contributions and paid benefits. In 1989, these functions were centralized to Belgrade, and the regional Kosovo fund was disbanded. Many Kosovar workers were excluded from the system as of 1989 when they were removed from formal-sector labor positions. From the beginning of the conflict, Belgrade ceased paying pensions to most past contributors.

After the conflict ended, UNMIK began a social assistance program that included

payments to certain categories of elderly on a needs-tested basis. These payments to elderly did not cover a large share of the older population, mostly did not go to those who made past contributions, and were seen as social assistance rather than pension benefits.

During 2001-2003, a fundamentally new pension system was designed and implemented in Kosovo. The system has three components, or "pillars." Pillar I is comprised of an old-age "basic pension" (paid to all Kosovars, 65 years of age and older) and a disability pension, both of which are funded from general revenues rather than an earmarked wage tax. Pensions are paid through the banking system rather than through the postal service, reducing administrative costs. The disability pension is narrowly focused on total and permanent disability, ensuring that scarce resources are well focused on the truly disabled.

Pillar II of the system is a mandatory, defined-contribution, savings pension program. The program requires all working, habitual residents of Kosovo to contribute 5% of gross salary, matched by a 5% employer contribution. Contributions and records are managed by the Kosovo Pension Savings Trust (KPST), an independent body with strong governance and supervision, established solely for the purpose of administering the savings component of the pension system. The KPST invests participants' assets abroad, through major European asset managers. There are no legal requirements or restrictions on overseas or domestic investment, though high standards are set for the security of instruments. KPST participant assets surpassed Euro 100 million in early 2005 and reached Euro 200 million late in 2006. Collections are centralized to minimize administrative fees.

Pillar III of the system provides for supplemental, individual or employer-sponsored pension schemes. The Banking and Payments Authority of Kosovo (the BPK—Kosovo's equivalent of a central bank) licenses and regulates all third-pillar pension schemes. The BPK also regulates the KPST. Demographic data suggested that the number of individuals over 65 was approximately twice the number over 65 and receiving pensions. That is, the coverage rate of the old pension system was quite low, reaching roughly half of the elderly population.

Consideration had to be given to those who were receiving pensions before the conflict and those who had contributed but not yet reached pension age. The main source of data for both of these categories was a set of databases maintained by the people who had led the Kosovo Pension and Invalidity Fund. At the time of the reform, these people worked in the Pension Section of the Kosovo Social Insurance Fund, within the UNMIK Department of Health and Social Welfare. They had data on individuals who were receiving pensions as of December 1998 and on individuals who were still working at that time, and had made contributions to the system. In general, the data available on those who already were receiving pensions was of better quality than the data on those who were still contributing to the system before the conflict.

For each former pensioner, a record existed in a computer database (programmed in Unix on a PC) that included birthdate, address (perhaps not current), and other personal information. Information was also available regarding the pension levels and expenditures for various programs. Much of the information on birthdates had been added by the employees of the central Social Insurance Fund, who contacted regional offices in the initial years after the conflict. This suggested that the quality of the data for former pensioners was relatively high since they seemed able to reconstruct a comprehensive database using existing records.[1]

Furthermore, the Kosovo Social Assistance Program was introduced in 2001 with the goal of supporting the poorest segments[2] of the population by providing cash benefits. Two categories of poor families are currently being supported: (i) those without any member of the family capable of working, and (ii) those with only one member capable of working, but who is registered as unemployed with the PES of the Ministry of Labor & Social Welfare (MLSW) and is actively seeking work, and with at least one child under the age of 5 or an orphan under the age of 15. The level of the benefit depends on the other resources of the family and on the size of the family, ranging from €35 to €75 monthly, with the average being €52. Currently 37,392 families are receiving benefits, which cover a total of 161,863 individuals. The benefit was supposed to have been indexed to inflation but has not been increased since it was initially converted to Euros in 2003. The pension system as it currently stands represents a reasonably optimal mix of providing a minimum subsistence level to all elderly, irrespective of contributor status.[3]

It is important to maintain these features given the high degree of informality in the labor markets and a defined contribution savings-oriented system designed

1 Richard Hitz, Asta Ziniene ,Sergity Biletsy and Tatyana Bogomolova,"the impact of the financial Crisis on the Public Pension System:Stress testing Models of Mandatory Pension System in Middle Income and Development Contries", Social Protection Disscation Paper ,World Bank ,Sep.2009

2 Based on the latest poverty assessment for Kosovo (World Bank, 2007), almost 15 percent of the population is estimated to be extremely poor and unable to meet basic nutritional needs, while 45 percent consume below the poverty line.

3 The pension program in Kosovo provides benefits to all individuals at the age of 65 and above, irrespective of previous contribution history, at the current level of Euro 40 per month. This benefit, which has been fixed since 2005, is provided to 128,000 people. In addition, formal sector workers and their employers aged 55 and younger in 2002 are required to contribute 5 percent of wage each to an individual account with the Kosovo Pension Savings Trust (KPST), an autonomous public entity which manages retirement savings by investing the money with internationally recruited asset managers and provides payments either by lump sum or as periodic withdrawals when they retire or become disabled. Beginning in 2008, the government decided to acknowledge those who had contributed to the former Yugoslavian pension system by providing 75 per month instead of the €40 to those who could prove that they had contributed 15 years or more under the former system. The Government is still accepting applications for this increased pension, but estimates that only 35,000 of the total beneficiaries will qualify on the basis that there were 33,800 old age pensioners in 1998 and that 1,700 applications were still being processed. Until March 2008, 26,767 applications have been received for the increased benefit, with 21,000 of them already certified for payment in April 2008.

to provide additional benefits to current workers when they retire. The poverty assessment completed by the World Bank in 2007 shows that the first component of the pension system has had an important role in reducing both extreme poverty and absolute poverty, even more than the means-tested social assistance program. The second component of the pension system is designed to provide additional future benefits to current workers without imposing further liabilities on the Government and with appropriately low contribution rates, given the high rate of unemployment in the economy.

In summary, at the moment reforms were designed, there existed some data on past recipients, and less on past contributors who had not reached pension age, leading some to advocate re-creating the old Yugoslav pension system based on a belief that sufficient information existed to re-establish contribution histories. Instead, a dramatically different approach was followed.

2 Data and methods

We rely on 4 years of data (2003-2006) from the beginning of the year collected by SOK and World Bank Estimates using 2003-2006 LFS data in our analysis of labor market conditions on labor force status and Social Security receipt. The SOK is the leading survey institution of collecting the labor market activity in the Republic of Kosova. The monthly SOK survey asks questions about the respondent's involvement in the labor market around the time of survey and collects demographic data. In March of each year, a supplement is administered that includes questions about income receipt, including from Social Security, in the preceding calendar year. Each March SOK provides sample sizes of 130,000 to 215,000. We focus on those between the ages of 55 and 69. As we describe subsequently, to be consistent with our analysis of the Census/LFS data, we also restrict the sample to men. This leaves us with a final sample size of 292,093 men ages 55 to 69 over the period 2003 through 2009. Our analysis of retirement income for individuals in their 70s relies on data from the 2000 Census and the 2001, 2002, and 2006-2009 Statistics Office of Kosova (SOK).[4]

Kosovo is confronting many complex economic challenges. While estimated GDP growth picked up modestly from 2 percent in 2005 to 4.4 percent in 2007, Kosovo remains the slowest growing economy in Southeast Europe. It is also the poorest economy in the sub-region, with an estimated per capita GDP of only €1,573 in 2007. CPI inflation, which had remained negligible until 2006, has recently accelerated to

4 Recent amendments to the social assistance law have been presented to Parliament, including measures to simplify administration, which could free up some fiscal space and allow the Ministry of Labor and Social Welfare to increase the level of benefits paid. The proposed increase is €5 per month per family so that the available benefits will now range from €40 per month to €80 per month, depending on the number of individuals in the household. For the minimum benefit, this increase represents no more than the cumulative increase in the cost of living since the benefit was first established, but for the larger households, the flat increase of €5 per month does not even cover the cumulative inflation.

over 10 percent, largely fueled by the impact of higher global food and energy prices. With a limited export base, Kosovo relies heavily on donor assistance, spending by foreigners present in Kosovo, and remittances to finance its massive trade deficit. Despite a relatively low overall tax burden and rates of labor taxation, informal employment remains significant. Regarding labor costs, wage and income tax levels are relatively modest, although high relative to labor productivity comparators with neighboring countries. In 2006 the average monthly salary was Euro 236, and income tax on average wage levels was only 5 percent. The pension system consists of a tax-financed basic pension with a requirement that employers and employees each contribute 5 percent of gross wages to a retirement savings account, which results in a relatively low level of labor taxes compared to neighboring countries. Kosovo is not encumbered with excessively burdensome minimum wage laws. Taxes in Kosovo are low compared to neighboring countries. Kosovo has a simple and quick business registration procedure that takes only three days to process. It is vital that Kosovo does not undermine any of these advantages through inappropriate policies. (Ruggles, et al., 2009).

We place three sample restrictions on our data. First, our focus is on retirement income, so we restrict the sample to those individuals who have already left the labor force. This is not a major constraint given the age composition of the sample. More importantly, we restrict our attention to the incomes of men. We do so because women in these birth cohorts are likely to receive Social Security payments based on Law and the right in to the social assistance of 40 Euros per month , either because they do not qualify for retired worker benefits or because their dependent spouse receives working . It will thus be the market conditions present around the time that the husband retired that matter, but for those women who have become widowed, we have no data on the age of the husband. Finally, we focus our attention on those who report some income from Social Security. With over 90 percent of respondents in their 70s in this category, those who report no such income are likely not eligible to receive it, so their income from this source would not be altered by labor market conditions. We are left with a final sample of 22.520 men ages 70 to 79.Our statistical models are identified based on the differing historical experiences of individuals born into different birth cohorts. In essence, we treat labor market conditions around the time of retirement as a draw that is randomly assigned to individuals. In our analysis of labor force status and Social Security receipt using March CPS data, the availability of state-level data on labor market conditions enables us to implement traditional quasi-experimental methods in regression models that include both state and year fixed effects along with age fixed effects to control for differential patterns in outcomes by age. We estimate linear probability models where the outcome variables indicate whether an individual is out of the labor force and whether he is collecting Social Security benefits as a function of the state unemployment rate in the preceding calendar year (to allow for the change in labor force status to have occurred by the survey date), holding constant these fixed effects along with demographic characteristics (race/ethnicity, marital status, educational attainment).

Because the availability of Social Security benefits at age 65 suggests that responses to a weak labor market may differ by age, we interact the unemployment rate with a series of categorical age variables. It is our hypothesis that individuals will be more likely to withdraw from the labor force in response to a recession if they are at least 62 years old. Moreover, any impact on Social Security receipt should not begin until that age since retirement benefits are not available before then.[5]

Our models of income for retirees in their 70s similarly rely on the plausibly exogenous variation generated by whether an individual is unlucky enough to approach retirement age during a recession. We estimate regression models where the dependent variable is the natural log of Social Security income and the key explanatory variables are the average historical unemployment rates at earlier ages (55-57, 58-59, 60-61, 62-64, and 65-69). The unemployment rates that an individual experienced can almost be thought of as a historical accident. Along with these unemployment rates, we also control for the contemporaneous unemployment rate and state, age, and survey year fixed effects. The idea is to see if labor market conditions around the time of retirement (and we are agnostic regarding exactly what that age is) affect the income of retirees ten or so years later.

3 Results

Table 1 presents the results of our analysis of March CPS data examining the impact of labor market conditions on labor force status and Social Security receipt. The top panel of the table focuses on the likelihood that men between the ages of 55 and 69 have dropped out of the labor force. We examine this outcome for all men in this age group as well as for sub-samples by level of educational attainment (high school dropouts, high school graduates, and those who have attended any college regardless of whether or not they have graduated). Each model interacts last year's annual average unemployment rate with a set of age categories to assess whether labor market conditions have a differential impact on labor force status at different ages. The base group for this comparison is men aged 55 to 57, so these interactions can be interpreted as the differential impact of unemployment on the specified age group relative to this younger group. Since the younger group is less likely to have retired, it serves as something like a control group that can capture the broader link between aggregate labor market conditions and an individual's labor force status, abstracting from the impact on retirement. The results indicate that a higher unemployment rate leads to a greater probability of withdrawal from the labor force (retirement) as workers age, particularly after age 62 when Social Security benefits are available.

5 The impact may begin somewhat before age 65 because the survey does not distinguish whether Social Security receipt is attributable to retirement or disability. Autor and Duggan (2003) have shown that some older individuals rely on Social Security disability benefits to provide income support when times are tough. The impact may begin somewhat before age 65 because the survey does not distinguish whether Social Security receipt is attributable to retirement or disability. Autor and Duggan (2003) have shown that some older individuals rely on Social Security disability benefits to provide income support when times are tough.

A one percentage point increase in the unemployment rate is estimated to increase the number of 62 to 64 and 65 to 69 year old workers who are out of the labor force by over a full percentage point. The effects are stronger for high school dropouts and high school graduates than for those with at least some college education. The p-value on a test of the equality of coefficients at ages 62-64 across groups is 5.7 percent. We find similar patterns when we focus our attention on the likelihood of Social Security receipt in the lower panel of the table. Again, a higher unemployment rate increases Social Security receipt beginning at age 62 and mainly for workers in the two lower educational attainment groups. Interestingly, the magnitude of the effect at ages 62-64 is larger than it is at ages 65-69 for Social Security receipt, but that is not true for labor force status. A plausible explanation for this is that as workers age into their late 60s, they commence receipt of Social Security benefits regardless of their labor force status, lessening the importance of labor market fluctuations on receipt at those older ages.

Table 20.1 — *Impact of Labor Market Conditions on Older Workers' Labor Force and Social Security Receipt (standard errors in parentheses)*

	All	High School Dropouts	High School Graduates	Attended/ Completed Collage
Outcome : Out of Labor Force				
Unemployment rate age 58-59	0.187	0.114	0.338	-0.22
	-0.118	-0.216	-0.336	0.18
Unemployment rate age 60-61	0.315	0.187	0.541	0.091
	-0.21	-0.21	-0.158	-0.235
Unemployment rate age 62-64	1.231	1.213	1.323	0.274
	-0.173	-0.326	-0.197	-0.329
Unemployment rate age 65-69	1.356	1.213	1.875	0.324
	-0.137	-0.312	-0.193	-0.353
Outcome : social security receipt				
Unemployment rate age 58-59	0.161	0.159	-0.127	-0.119
	-0.152	-0.197	-0.121	-0.124
Unemployment rate age 60-61	0.192	0.457	-0.142	0.172
	-0.163	-0.269	-0.162	-0.175
Unemployment rate age 62-64	0.962	1.064	0.937	0.065
	-0.193	0.286	-0.297	-0.204
Unemployment rate age 65-69	0.321	1.032	0.419	-0.718
	-0.137	-0.241	-0.199	-0.296
#obs.				

Notes: All estimates come from linear probability models that also include the current and lagged annual unemployment rate without age interactions, race/ethnicity, marital status, and exact age, state of residence, and year fixed effects. Reported coefficients are multiplied by 100. Standard errors are clustered at the state level.

Table 20.2 reports the results of our analysis of the effect of labor market conditions around the time of retirement on the income of retired men ages 70 to 79. We focus on income received from Social Security in the top panel and on total personal income in the bottom panel. In both cases, we report coefficients on the historical unemployment rates that these individuals experienced in their late 50s through their 60s, using the average rate at specified ages. Models are estimated for all men and for sub-samples by level of educational attainment.

The results suggest that experiencing a recession in the years leading up to retirement lowers subsequent retirement income. This finding is particularly evident for Social Security income, for less educated workers, and for labor market events that take place at or after age 62. Overall, experiencing a one percentage point increase in the unemployment rate at ages 62-64 reduces income from Social Security by 0.209 percent. We interpret this magnitude subsequently. As anticipated, the effect of unemployment at ages 62-64 on retiree income falls as education rises, although imprecision prevents us from rejecting the null hypothesis that the coefficients are equal. One puzzling finding in this table is that higher unemployment at ages 65-69 is associated with significantly *higher* Social Security benefits for retired men in their 70s.

Although we have no specific explanation for this finding, we are at least somewhat comforted by the fact that the coefficient for high school dropouts is small and statistically insignificant.

When we focus on total income, we find that the only significant effect of historical unemployment on subsequent retiree income is the effect of unemployment at ages 60 to 61 for high school dropouts. That coefficient has a p-value of .085. The equivalent coefficient for age 62-64 unemployment is of a comparable magnitude, but it is not quite significant at even the 10 percent level. Overall, the findings from Table 2 provide some support for our hypotheses, but they are not as strong as they could be.

A final way to interpret these findings is by assessing whether the magnitude of the coefficients is reasonable. To address this, we can combine results from the bottom panel of Table 1 regarding Social Security receipt around retirement age and the top panel of Table 2 regarding Social Security income for workers in retirement. Consider, for instance, the impact of a one percentage point increase in the unemployment rate at ages 62-64 for high school dropouts. The results in Table 20.1 suggest that they would be 1.064 percentage points more likely to receive Social Security at that age.

The results in Table 20.2 suggest that subsequent Social Security income in retirement is estimated to fall by 0.065 percentage points. If that one point increase in unemployment led 1.064 percent more workers to collect Social Security at ages 62-64 and that change led to a 0.065 percent reduction in aggregate receipt of Social Security income, then this suggests that the average worker who began Social Security receipt as a result of the increase in unemployment experienced a 25 percent reduction *(0.274/1.064 = 0.257)* in Social Security benefits. A similar analysis for high school graduates indicates that the average incremental Social Security recipient would face a 53 percent benefit reduction. To put these estimates in perspective, for individuals in these birth cohorts, claiming benefits at 62 rather than 65 would be associated with a 20 percent reduction in their Social Security benefit.[6]

On that basis, our estimates are rather high. However, we have estimated 95 percent confidence intervals for both estimates using the delta method and both include this 20 percent figure.

TABLE 20.2 — *Long-Term Impact of Labor Market Conditions on the Amount of Social Security Received by Retirees (standard errors in parentheses)*

	All	**High School Dropouts**	**High School Graduates**	**Attended/ Completed Collage**
Outcome : Out of Labor Force				
Unemployment rate age 58-59	0.187	0.114	0.338	-0.22
	-0.118	-0.216	-0.336	0.18
Unemployment rate age 60-61	0.315	0.187	0.541	0.091
	-0.21	-0.21	-0.158	-0.235
Unemployment rate age 62-64	1.231	1.213	1.323	0.274
	-0.173	-0.326	-0.197	-0.329
Unemployment rate age 65-69	1.356	1.213	1.875	0.324
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Unemployment rate age 65-69	0.321	1.032	0.419	-0.718
	-0.137	-0.241	-0.199	-0.296
#obs.				

Notes: Estimates come from linear regressions where the dependent variable is the natural log of Social Security benefits received. Other control variables include the contemporaneous annual unemployment rate, race/ethnicity, marital status, and age, state of residence, and year fixed effects. Reported coefficients are multiplied by 100. Standard errors are clustered by state.

4 Conclusions

High unemployment has attracted much attention, but there has been less consideration of how older workers have fared. In past recessions unemployment has remained relatively low for older workers, whose seniority often protected them during

6 These rules have since changed.

rounds of layoffs. However, age might not protect older workers as well as it once did, because workplaces are now less regularized and labor unions are less powerful. Also with the political situation and market collapse, which wiped out millions of dollars of retirement savings, appears to have raised fears about the affordability of retirement and discouraged many older workers from leaving the workforce. Older unemployed workers were more likely than their younger counterparts to be out of work for many months. This analysis began by hypothesizing that the current high rate of unemployment in the Republic of Kosova will lead some older individuals to withdraw from the labor force early (particularly after age 62), to claim Social Security benefits early, and to subsequently receive lower retirement income (as a result of earlier claiming of Social Security benefits). Our analysis of historical data provides evidence not supporting much of this conjecture. We find that individuals ages 62 and older are more likely not to withdraw from the labor force when the unemployment rate is high and are also more likely to be receiving Social Security benefits. These effects are strongest for less educated workers. Our analysis of retiree income is less persuasive, but still offers evidence that is suggestive in its support of our hypotheses.

Taken as a whole, we believe that these findings highlight the importance of focusing on the well-being of older workers who have lost their jobs in the present recession and may suffer lower income for many years as a result. On the other hand while marginal changes may be required to the current pension policy in Republic of Kosovo, the Kosovo authorities are advised not to make large changes to the current system. Indexing pensions to accommodate price increases since 2005 and the recent rise in food prices is clearly beneficial. But the structure of the current pension system is sound. For the future, the pension system provides both poverty relief for the elderly and a mechanism to provide a minimal level of replacement income without creating unsustainable fiscal liabilities for the Government. The current pensioners and soon to be pensioners are indeed receiving less than they had expected, but any attempt to provide better benefits for those with verifiable work histories will create more inequity for those with unverifiable work histories and will prevent the development of a sustainable pension system for current and future workers.

5 References

Alexander, J. Trent, Michael Davern, and Betsey Stevenson (2010). “Inaccurate Age and Sex Data in the Census PUMS files: Evidence and Implications.” NBER working paper 15703.

Autor, David H. and Mark G. Duggan (2003). “The Rise in the Disability Rolls and the Decline in Unemployment.” Quarterly Journal of Economics, 118(1): 157-205.

Coile, Courtney C. and Phillip B. Levine (2010). Reconsidering Retirement: How Losses and Layoffs affect Older Workers. Washington, DC: Brookings Institution Press.

Coile, Courtney C. and Phillip B. Levine (2009). "The Market Crash and Mass Layoffs: How the Current Economic Crisis May Affect Retirement." National Bureau of Economic Research, Working Paper 15395.

Coile, Courtney C. and Phillip B. Levine (2007). "Labor Market Shocks and Retirement: Do Government Programs Matter?" Journal of Public Economics. 91(10): 1902-1919.

Steven Ruggles, Matthew Sobek, Trent Alexander, Catherine A. Fitch, Ronald Goeken, Patricia Kelly Hall, Miriam King, and Chad Ronnander (2009). Integrated Public Use Microdata Series: Version 4.0 [Machine-readable database]. Minneapolis, MN: Minnesota Population Center [producer and distributor].

Richard Hitz, Asta Ziniene, Sergity Biletsy and Tatyana Bogomolova,"the impact of the financial Crisis on the Public Pension System:Stress testing Models of Mandatory Pension System in Middle Income and Development Contries", Social Protection Disscation Paper, World Bank, Sep.2009.