Social Security, Institutional Settings, and Labor Supply[1]

David E. Bloom
David Canning
Günther Fink
Jocelyn E. Finlay

Program on the Global Demography of Aging
Harvard School of Public Health

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Abstract

We analyze cross-country panel data to examine the effect of changes in the social security systems on the labor supply of men over 50 years of age. Our findings indicate that the labor supply of older men rises with the social security eligibility age, increased pension rates for later retirement, and the defined contribution replacement rate. However their participation rate falls with increases in the replacement rates in defined benefit systems and is lower if there is an early retirement option. Overall, our results imply that a switch from a defined benefit system with an early retirement option to a defined contribution system with a high age for pension eligibility (and full reward for delayed retirement) will lead to large and permanent increases in labor force participation rates of males aged 50 and older.

1. Introduction

Longer life spans and aging populations are putting pressure on the retirement systems of many countries. The compression of morbidity observed in recent years produces healthier older people, which in theory allows longer working lives. However, male old-age labor force participation has fallen rapidly over the last decades.

In this paper, we use new data on social security systems from 40 high- and upper-middle-income countries to estimate the degree to which changes in social security systems can explain the declines in male labor force participation. If social security systems were actuarially fair, expected benefits over different retirement periods would perfectly match contributions, and could be undone by private borrowing and saving, and thus should not have any direct influence on labor market decisions Stock and Wise (1990; Cremer, Lozachmeur and Pestieau (2006). However, actuarial fairness is not a feature of most pension systems, and retirement incentives are often quite pronounced and have significant effects on retirement decisions Gruber and Wise (2004). When there is little to no financial incentive to continue working beyond the minimum retirement age, only those with strong preferences for working continue to do so Blondal and Scarpetta (1999).

To better understand the magnitude of the labor force participation effects of social security systems, we separately estimate male labor supply equations for each five-year cohort in a five-year panel. To control for year- and country-specific factors, we allow for both country and time-fixed effects in our specifications. We find that for the 50-54, 55–59 and 60–64 age groups higher wages, proxied by the capital to labor ratio, lead to earlier retirement, indicating that the income effect dominates in the labor leisure trade-off. We do not find any effect of life expectancy on male labor force participation at older ages. We find urbanization is associated with higher participation below age 65 but lower participation above age 65. In our results we find that higher male education levels tend to be associated with lower male participation, which is consistent with the income effect of higher wages dominating the substitution effect, but that higher female education levels appears to increase male participation rates. This may be due to the joint

nature of male and female labor supply decisions, but investigation of that issue requires more detailed microeconomic data.

Social security systems strongly affect old-age labor supply. Our findings indicate that the labor supply of older men rises with the social security eligibility age, increased pension rates for later retirement, and the defined contribution replacement rate. However their participation rate falls with increases in the replacement rates in defined benefit systems and is lower if there is an early retirement option. Male labor force participation strongly responds to the retirement incentives inherent to each country's social security system.

Our results are consistent with a set of recent country studies, many of which are summarized in two recent volumes by Gruber and Wise (1999; (2004). Our results imply that the negative effect of social security systems extends to an even broader set of countries than those focused on in the Gruber and Wise volumes. More importantly, our results imply that old age labor force participation strongly responds to changes in institutional settings within a country over time. While most existing studies analyze labor force behavior of individuals within a given system, our empirical specification controls for country fixed effects and thus explores the variation in systems within each country across time. Our results it imply that male labor force participation at older ages can strongly be affected by changes in social security policy.

Our analysis follows most of the existing literature in assuming social security systems to be exogenous and independent from labor supply trends. As pointed out by Gruber and Wise (1998), this assumption may be problematic if governments use social security schemes to accommodate public demand for social assistance for an aging population struggling in the labor market. However, individual country studies (e.g. Börsch-Supan and Schnabel, 1998) have shown that changes in policy generally precede changes in labor supply. A second concern is that governments may tighten social security legislation in response to increased early retirement and the associated fiscal burden. While there clearly is some evidence of social security reform in this direction, most of it is recent, and should be of limited empirical relevance for the generations

currently retiring. From a theoretical perspective, an endogenous policy response (e.g. increasing retirement ages to counteract increasing early retirement) would imply that we underestimate the true effect of institutional settings, so that our estimates could be interpreted as lower bound of the true effects generated.

The results presented in this paper complement a more general literature on the effects of social security systems on economic growth. Social security systems distort savings incentives Zhang and Zhang (2004; Bloom, Canning, Mansfield and Moore (2007), fertility decisions Cremer, Gahvari and Pestieau (2006), labor supply Burtless and Moffitt (1985; Krueger and Pischke (1992; Coile and Gruber (2000; Coile and Gruber (2000), and economic growth Zhang and Zhang (2004; Ehrlich and Kim (2005). In this paper we show that the effect of social security arrangements on male labor supply is significant and is therefore an important factor in understanding the long-term relationship between social security and economic development. For the most part, this paper does not address female labor supply, which follows different patterns than male labor supply. As shown in Bloom, Canning, Fink, and Finlay (2007), decreases in fertility rates have led to significant increases in female workforce participation over the last decades.

The rest of the paper is structured as follows: we discuss the data in section two of the paper and present the empirical results in section three. We conclude with a short summary and discussion of our main results.

2. Data

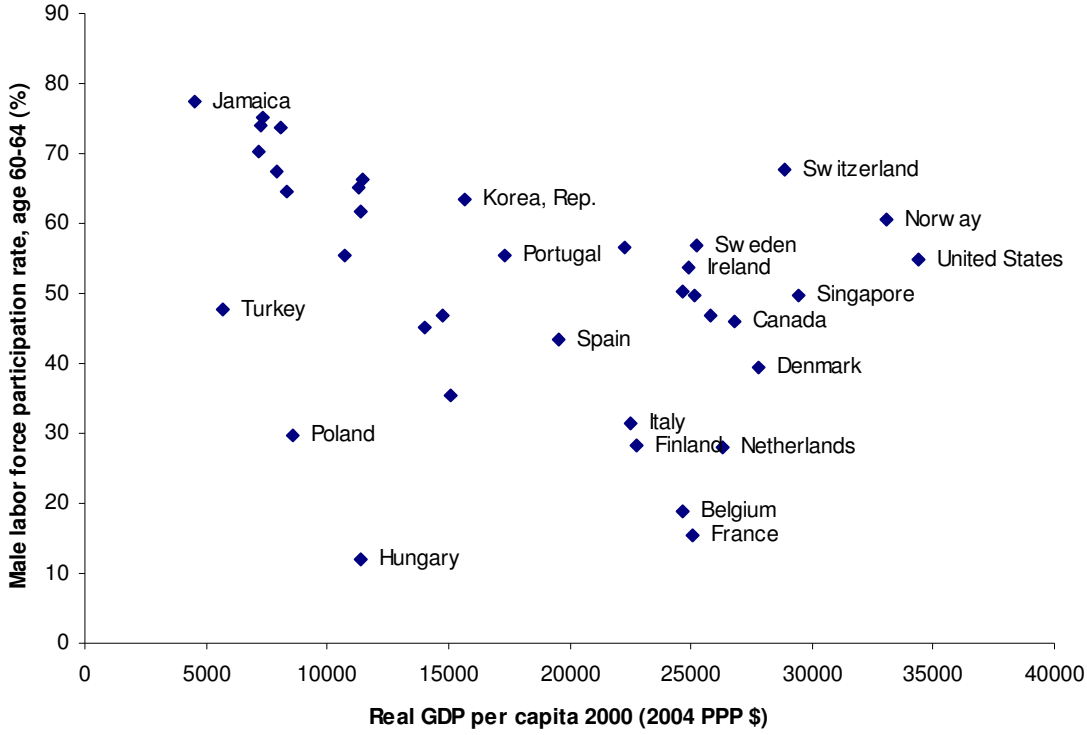
The dataset we use in our empirical work is an unbalanced five-year panel covering the period from 1960 to 2000 for 40 high and middle income countries.[2] The dependent variable in our empirical analysis is the male labor force participation rate. Labor market participation data are from the ILO Bureau of Statistics (2007) and are based on national labor market surveys and censuses. The participation rate is the number of economically active individuals divided by the total population in a given age group.

[2] For a full list of countries, please see the Appendix.

Although definitions vary slightly across countries, those persons classified as "economically active" are either employed or actively looking for work ILO Bureau of Statistics (2007). Participation rates are provided for each five-year age group from age group 14–19 up to age group 60–64, and as an average for the population age 65 and older.

Figure 1 shows the labor force participation rate for men aged 60-64 in 2000 by income level. We see very wide variations in participation rates.

Figure 1 Male Labor Force Participation 60-64 in 2000



Our explanatory variables are life expectancy, the percentage of the population living in urban areas, physical capital per working-age person, average years of schooling, and, of most interest for the purposes of this study, five variables describing the institutional settings of domestic social security systems.

Life expectancy and urbanization data are from the World Development Indicators World Bank (2006). The physical capital stock is imputed based on the real capital investment rates from the Penn World Tables 6.2 Heston, Summers and Aten (2006). To avoid potential simultaneity biases in the estimation, we adjust the capital stock by the working-age population rather than the number of workers. Our human capital measures are the average years of schooling in the male and female population aged 25 and older as calculated by Barro and Lee (2000).

Data on social security systems were compiled based on the Social Security Administration's "*Social Security Programs Throughout the World*."[3] The data originated from a survey conducted by the Social Security Administration that summarized the key features of national social security systems. The survey covers more than 150 countries around the world from 1958 to 2007. We restrict our analysis to those high and upper income countries that have a universal system, i.e., a system covering all employees of the country.[4] We generate five variables based on each individual country report.

The first variable is the social security eligibility age. Most social security systems allow retirement if a worker has reached a certain age and/or has achieved a certain number of contributions. In some countries, workers need to achieve both a certain age and a given number of years of contributions; in others, workers can retire if they either reach a certain age (typically 60 or 65) *or* have contributed to the pension system for a given number of years. We define the social security eligibility age as the age at which a worker can retire if he starts contributing to the pension system at age 20 and works continuously, with average earnings, from that point.

The second social security variable we use is an indicator variable which takes on a value of one if workers have an early retirement option, i.e., an option to receive social security benefits before the official eligibility age which qualifies them for the full pension. Note that this will be zero in our definition if early retirement is allowed before

[3] http://www.ssa.gov/policy/docs/progdesc/ssptw/

[4] We exclude countries with very small populations (less than 500,000) since official statistics are often subject to significant fluctuations due to relatively migration flows. Lower income countries some times have universal system in theory but coverage may be limited in practice.

some "normal" retirement age but our eligibility calculation provides an even lower age based on years of work.

Our third variable measures the incentives to postpone retirement. As discussed extensively in Gruber and Wise (1999; (2004), retirement incentives come in many forms that generally translate into very high net effective tax rates on income earned once the worker passes some set retirement age. Many pension systems do not adjust annual or monthly benefits at all if the worker decides to work and contribute beyond the social security eligibility rate, while other pension systems adjust benefits in a partial, or an actuarially fair manner.[5] The "deferred retirement bonus" variable we use in our empirical analysis captures the increase in social security pension, measured in percentage points of earnings, for each additional year of work.

In addition to these three variables we calculate the replacement rate of the system. The replacement rate is given by the size of the annual pension a worker with average income, who works to the social security eligibility age (without taking early retirement) receives upon retirement relative to his pre-retirement income.[6] Distinguishing between the two broad types of pension systems, we calculate separate replacement rates for defined benefit and defined contribution systems. In defined benefit systems, the government fixes the pension level by law; the pension level can be constant or proportional to the worker's income. In defined contribution systems, the government fixes the contributions which then go to an individual capital account. The later pension is then paid from the invested contributions plus accrued interest.

In many cases ─ for example, the United States ─ pension systems are redistributive, so that replacement rates vary considerably across income groups. We normalize our measure to a worker with average income so as to have some comparable measure across countries. We calculate both the effect of any flat rate pension and any

[5] Postponing retirement at age 65 by one year should lead to an increase in the later pensions by about 6-10 percent.

[6] In our calculations we assume that workers enter the labor force at age 20 and that the average earnings correspond to two-thirds of GDP per worker.

earnings related pension. For fully funded systems we assume that the contributions in the fund earn a real rate of return of 3% a year, and are paid out as a constant real annuity rate upon retirement which we assume to be 5.7%.[7]

For countries that introduce new pension systems, older workers are sometimes kept on the older system. We code the system appropriate to the cohort. If the new rules do not apply to workers potentially retiring at a given period (e.g. Bulgaria's reform from 2000 affects only workers born after 1959) we use the old social security laws in our analysis. The coding is particularly difficult for countries (such as Chile) that introduced new pension schemes over time and left the choice between the two systems to workers whose age was below a certain threshold at the time of introduction of the new system. To promote comparability, we assume that all workers who get the choice between an old and a new system eventually fall under the new system, and calculate our measures accordingly.

We report descriptive statistics on the dataset we use in Table 1 below. Even though countries in the sample are drawn from the high and upper middle income range, life expectancy and education varies significantly across countries and time. Male life expectancy at birth ranges in 2000 between 41.2 years in Botswana and 77.4 years in Sweden. Average years or schooling range from 2.7 years (Mexico 1970) to over 12 years in the United States in 2000.

Male labor force participation rates up to age 55 are generally around 90%, and fall rapidly for higher ages. In 2000, Belgium had the lowest participation rate in the age group 55-59 (53.8%), followed closely by Italy (53.9%) and Turkey (58.4%). Participation rates are significantly lower in the 60–64 age group, with a sample mean of 66.1%. A number of countries, such as Austria, Belgium, and France, display participation rates below 20% in 2000.

[7] In some cases like Singapore, the government publishes the annual return on the capital accounts each year. In these cases, we use the official return numbers over the worker's lifetime rather than the standardized return of 3%.

The average social social security eligibility age is 61.8 years, with a minimum of 50 and maximum of 70 years of age. 27% of social security systems provide an early retirement option. Similarly, most social security systems provide little incentive to work beyond the official retirement age, with a mean delayed pension reward of only 2.3% per year. Average (conditional) replacement rates in our sample are 85% and 62% for defined contribution and defined benefit systems, respectively.

Table 1: Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
Male labor force participation, age 45-49	94.24	2.79	80.10	98.60
Male labor force participation, age 50-54	90.01	4.62	69.00	97.60
Male labor force participation, age 44-49	80.56	9.09	44.90	96.01
Male labor force participation, age 60-64	61.12	16.96	11.90	92.81
Male labor force participation, age 65+	27.62	17.54	1.90	84.55
Log(capital per working age person)	3.52	0.78	1.10	4.93
Male life expectancy	68.89	5.26	41.20	77.40
Urban population share	67.71	19.01	8.50	100.00
Average years of education, males	7.10	2.15	2.68	12.45
Average years of education, females	6.42	2.30	0.90	12.21
Social security eligibility age	61.86	4.82	50.00	70.00
Replacement rate defined benefit	0.62	0.21	0.03	1.02
Replacement rate defined contributions	0.85	0.27	0.44	1.29
Early retirement option	0.27	0.44	0.00	1.00
Deferred retirement bonus (% increase per year)	2.68	3.19	0.00	12.00

Based on 282 observations in 40 high and upper middle income countries from 1960 to 2000.

Table 2 shows the changes in social security systems over time for the 33 countries that are covered fully by our dataset from 1960 to 2000. Quite remarkably, social security eligibility ages stay constant across the sample period despite the continued increase in life expectancy.[8] Early retirement options became more common, particularly in Europe in the late 1980s and early 1990s. Rewards for dealying retirment

[8] For the countries in our sample, the average increase in life expectancy between 1960 and 2000 was 10.3 years (World Bank, 2007).

increased somewhat over the period. Defined befit pension plans become more generous in the 1960s and 1970s.

Defined contribution (fully funded) systems were rare at the beginning of our sample, and have only recently become more popular. Up to 1980, only Malaysia and Singapore had mandatory defined contribution systems. By 2000, pensions financed through capital accounts were already relevant for workers retiring in Australia, Chile, Kazakhstan and Switzerland. Chile was the first country to introduce mandatory capital accounts in 1981/2, followed by Switzerland (1985) Australia (1992) and Kazakhstan 1998. Recent reforms in many countries such as Argentina, Bulgaria, and Sweden have introduced mandatory capital accounts for all young workers which will become increasingly relevant over the next years and decades. Similarly, many countries have started to increase retirement ages over the last years; while most of these increases were initially targeted at women, male retirement ages have increased over the last five years in countries such as Bulgaria, Italy and Romania.

Table 2: Social Security Averages Over Time

	1960	**1970**	**1980**	**1990**	**2000**
Social security eligibility age	62.61	62.44	61.75	61.97	62.36
Early retirement option	0.23	0.28	0.28	0.41	0.38
Delay reward	2.27	3.11	2.82	3.68	3.52
Replacement rate defined benefit	0.58	0.61	0.65	0.66	0.65
Replacement rate defined contributions	0.44	0.62	1.22	0.79	0.76
Number of defined contribution systems	2	2	2	3	6

Note: based on 33 countries covered from 1960-2000.

3. Empirical Specification and Results

To analyze the effect of social security on male labor force participation we estimate the parameters of the following reduced-form equation

$$LFP_{ijt} = \beta_{j0} + \beta_{j1} k_{it} + \beta_{j2} Educ_{it} + \beta_{j3} LE_{it} + \beta_{j4} Urban_{it} + \beta_{j5} SocSec + \delta_j + \delta_t + \varepsilon_{ijt}$$

where LFP_{ijt} is the male Labor Force Participation rate in country i of age group j in period t, k is log capital per working age person, and *Educ* is a vector describing the educational attainment. *LE* stands for male life expectancy, *Urban* measures the degree of urbanization, and *SocSec* are the social security variables discussed in the previous section. δ_j and δ_t are country and year dummies, respectively.

We use capital per working age person (k_{it}) and education as our proxies for domestic wage rates or potential earnings. To limit endogeneity concerns we normalize the capital stock to the population of working age rather than the actual number of workers. With income and substitution effects working in opposite directions the priors on the wage proxies are ambiguous. A negative coefficient on the average levels implies that the income effect dominates the substitution effect. A similar, yet slightly more subtle, argument applies to life expectancy. Although lifetime utility maximization generally implies a positive effect of life expectancy on retirement age Bloom, Canning, Mansfield and Moore (2007), this may not necessarily be true if longer life spans are associated with lower degrees of uncertainty regarding the actual length of life Kalemli-Ozcan and Weil (2005). for the 65+ group we include the proportion of this group under age 70 to control for differences between participation rates for those under 70 and those above 70.

Last, we estimate the effect of our five principal retirement variables: the social security eligibility age, the early retirement option indicator, the deferred pension rewards, and the replacement rates in defined contribution and defined benefit systems, respectively.

As shown in our presentation of the results, we have particular interest in the four age groups over 50, i.e., those who are eligible for retirement benefits in at least some countries. In Table 3 we show the results with time dummies only for the 50-54, 55–59,

60–64, and 65+ age groups. In Table 4, we show the results for the same specifications with the inclusion of country fixed effects.

Tables 3 and 4 here

The results for the social security eligibility age are as expected. A higher eligibility age significantly increases male old age labor force participation. According to our fixed effect results (Table 4, column 4) a one year increase in the eligibility age increases male labor supply by 0.86 percentage point in the age group 65+. The presence of an early retirement option reduces participation in all age groups, an effect which is significant for the age groups 60-64, and 65 plus. According to our fixed effect estimates, an early retirement option reduces participation by 4.6 and 3.2 percentage points for the 60-64 and 65 plus age groups respectively (Table 4).

The effects of deferred retirement bonus on old age participation are positive as expected, but appear more significant in the specifications without country fixed effects. Shifting from a system without incentives to continue working past normal retirement age (zero bonus) to a system that is actuarially fair (10% increase per year) increases old age participation between 2.5 (Table 4) and 7 (Table 3) percentage points.

Pronounced differences also emerge between defined benefit and defined contribution systems. While a replacement rate of 100% reduces male labor force participation in the age group 55-64 by about 5-7 percentage points, the participation effects of fully funded systems appear positive. Our point estimates displayed in Table 4 imply that a shift from a defined benefit with 100% replacement rate to an equally generous fully funded system would increase male labor force participation by 11.3 and 14.8 percentage points for age groups 55-59 and 60-64, respectively. To some extent the incentive effects of a defined contribution scheme should be reflected in the retirement bonus. However, defined contribution schemes may encourage working because they may lack the annuitization that is frequently automatic in defined benefit schemes.

Physical capital per working age person has a negative and significant coefficient under the fixed effects specifications for the 50-54, 55–59 and 60–64 year olds as an indication of the dominant income effect in the labor supply decision. Taking the coefficient in column 4 we find that a 100% increase in the capital stock will decrease the extent of male labor force participation by 1.5, 4.9 and 7.4 percentage points, respectively.

The dominant income effect hypothesis is also consistent with our human capital results. With the prior that more education tends to lead to a higher wage, the negative sign on the average male years of schooling indicates that the income effect dominates in the labor supply decision for the 60–64 year olds. On the other hand, female education has a positive effect on male labor force participation. Given the positive correlation between female education and female labor supply, this result may provide evidence of a joint, complementary, household decision about labor force participation.

Life expectancy effects appear to be negative, but are not significant for any age group in the fixed effect specifications. The coefficient on urbanization experiences a reversal of the sign when fixed effects are introduced into the specification. While the effect of urbanization appears negative in the specifications without fixed effects, the fixed specifications displayed in columns 2 and 3 of Table 4 implies that a 10 percentage point increase in the urban population share is associated with a 2.4 percentage point higher male labor force participation in the age group 55-59. The magnitude is even higher for the 60–64 age group, where countries with 10 percentage points higher proportion of urban population have a 4.4 percentage points higher male force participation rate. The positive effects of urban societies on old age labor participation can be interpreted as evidence of higher consumption needs during old age. Urban populations may not be able to rely as much as rural societies on subsistence farming or family income support, and may thus want to retire later than rural populations. Along similar lines, one might argue that modern urban populations have longer life expectancies than their rural counterparts and may thus need to work longer to ascertain a constant life time consumption flow.

4. Summary and Discussion

In this paper, we estimate the effect of the institutional features of national social security systems on male labor force participation. Our empirical results yield two main findings: First, income effects, as measured by physical and human capital endowments, seem to dominate the substitution effect in old age labor force participation decisions─ a finding consistent with the notch-generation study by Krueger and Pischke (1992). On average, labor force participation becomes significantly lower as the physical capital stock increases, a factor that appears to have significantly contributed to the pronounced decline in old age participation in many developed countries over the last decades. Our point estimates imply that the average increase in male education of 3 years as witnessed in developed countries between 1960 and 2000 accounted for a 10 percentage point drop in male labor force participation in the age group 60-64. The effects of the physical capital stock are of similar magnitude. A doubling of the capital stock as observed in most developing countries in the period 1960 to 2000 implies a decline in male labor force participation in the age group 60-64 of about 7 percentage points. Taking together, these income effects account for most of the average decline of 25 percentage points in old age participation observed over the sample period.

Independent of these general trends and income effects, our results highlight the crucial importance of the specific characteristics of social security systems. Old age participation strongly responds to retirement eligibility ages, early and late retirement options as well as the general characteristics of pension systems. Our point estimates imply that shifting from a system with retirement age 60, an early retirement option and no rewards for deferring the pension to a system with retirement age 65, no early retirement option and an actuarially fair pension adjustment or each year of deferring the pension increases labor force supply by about 11.5 percentage points.[9] A complete

[9] The total effect is calculated from the point estimates in column 3 of Table 3: 0.728*5 (retirement age) +4.637 (early retirement) + 0.324*10 = 11.5.

switch from a defined benefit or pay-as-you-go system to a fully funded capital account based system might double this effect. Given the growing relative size of older cohorts generated by declining fertility rates and increased life expectancy this is an important finding: with the right institutional reforms, trends in old age participation are likely to be reversible; accordingly, increased old age participation appears an achievable goal from a policy perspective.

Appendix

Country List

1	Argentina	21	Kuwait
2	Australia	22	Malaysia
3	Austria	23	Mauritius
4	Belgium	24	Mexico
5	Botswana	25	Netherlands
6	Brazil	26	New Zealand
7	Canada	27	Norway
8	Chile	28	Panama
9	Costa Rica	29	Poland
10	Denmark	30	Portugal
11	Finland	31	Singapore
12	France	32	Spain
13	Greece	33	Sweden
14	Hungary	34	Switzerland
15	Ireland	35	Trinidad and Tobago
16	Israel	36	Turkey
17	Italy	37	United Kingdom
18	Jamaica	38	United States
19	Japan	39	Uruguay
20	Korea, Rep.	40	Venezuela, RB

Table 3: Male Labor Force Participation - Time Fixed Effects

Dependent variable	**Male labor force participation**				
Age group	*50-54*	*55-59*	*60-64*	*65+*	*50+*
	(1)	(2)	(3)	(4)	(5)
Log(capital stock per working age)	0.0328	-3.326***	-7.770***	-8.455***	-5.103***
	(0.32)	(1.00)	(1.77)	(1.37)	(1.02)
Life expectancy (males)	0.214***	0.226*	-0.167	-0.726***	-0.0787
	(0.056)	(0.13)	(0.21)	(0.21)	(0.14)
Urban population share	-0.0254***	-0.0749**	-0.104*	-0.142***	-0.0909***
	(0.0081)	(0.031)	(0.056)	(0.050)	(0.034)
Male years of education	-0.556**	-1.483**	-2.829**	-1.974*	-1.752**
	(0.24)	(0.64)	(1.17)	(1.11)	(0.73)
Female years of education	0.260	1.887***	3.016***	0.928	1.674**
	(0.22)	(0.63)	(1.09)	(1.02)	(0.70)
Social security eligibility age	0.0457	0.233**	0.687***	0.702***	0.452***
	(0.034)	(0.12)	(0.19)	(0.18)	(0.12)
Early retirement option	-0.265	-1.183	-3.327*	-2.770*	-2.283*
	(0.31)	(1.16)	(1.93)	(1.59)	(1.17)
Deferred retirement bonus	-0.0160	0.406**	1.072***	1.077***	0.712***
	(0.049)	(0.17)	(0.33)	(0.26)	(0.19)
Replacement rate fully funded	1.558*	-6.844***	0.138	3.967	-1.095
	(0.88)	(2.38)	(4.14)	(4.27)	(2.49)
Replacement rate defined benefit	-1.815***	-5.282***	0.974	1.837	-1.311
	(0.68)	(1.90)	(3.72)	(3.50)	(2.14)
Share (ages 65-69/population 65+)				54.45**	24.64
				(23.4)	(15.6)
Year fixed effects	YES	YES	YES	YES	YES
Country fixed effects	NO	NO	NO	NO	NO
R-squared	0.35	0.39	0.43	0.62	0.51

Notes:
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
All regressions are based on 282 observations in 40 countries over the period 1960-2000.

Table 4: Male Labor Force Participation - Time and Country Fixed Effects

Dependent variable	**Male labor force participation**				
Age group	*50-54*	*55-59*	*60-64*	*65+*	*50+*
	(1)	(2)	(3)	(4)	(5)
Log(capital stock per working age)	-1.517**	-4.947***	-7.362***	0.750	-3.250***
	(0.67)	(1.10)	(1.40)	(1.84)	(1.01)
Life expectancy (males)	-0.181	-0.402	-0.219	-0.235	-0.259
	(0.17)	(0.25)	(0.23)	(0.31)	(0.20)
Urban population share	0.0157	0.210**	0.441***	-0.209*	0.118
	(0.062)	(0.094)	(0.11)	(0.13)	(0.079)
Male years of education	-1.283**	-1.050	-3.060***	-1.951	-1.788**
	(0.61)	(0.94)	(1.14)	(1.22)	(0.86)
Female years of education	1.970***	2.290***	3.777***	1.481	2.358***
	(0.56)	(0.80)	(1.05)	(1.29)	(0.79)
Social security eligibility age	0.203***	0.470***	0.728***	0.855***	0.555***
	(0.068)	(0.10)	(0.18)	(0.30)	(0.12)
Early retirement option	-0.878	-1.206	-4.637***	-3.212**	-2.446***
	(0.56)	(1.01)	(1.01)	(1.29)	(0.75)
Deferred retirement bonus	0.0106	0.361**	0.324	0.332	0.255*
	(0.066)	(0.16)	(0.25)	(0.22)	(0.13)
Replacement rate fully funded	6.626***	6.029*	7.597**	5.203	6.395***
	(1.99)	(3.12)	(2.94)	(3.75)	(2.26)
Replacement rate defined benefit	-2.549	-5.320*	-7.246**	-4.974	-5.038**
	(1.85)	(2.78)	(3.09)	(3.98)	(2.21)
Share (ages 65-69/population 65+)				37.88**	4.848
				(15.1)	(9.96)
Year fixed effects	YES	YES	YES	YES	YES
Country fixed effects	YES	YES	YES	YES	YES
R-squared	0.83	0.89	0.94	0.94	0.94

Notes:
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
All regressions are based on 282 observations in 40 countries over the period 1960-2000.

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