

# Online Appendix to “Dynamic Taxation”\*

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TABLE A-1: AGE-DEPENDENT FEATURES OF THE TAX SYSTEM IN SELECTED COUNTRIES

Life-cycle related					Explicitly age-dependent		
Income	Family	Consumption	Capital	Social security	Pension age	Tax-favored pension plans	Other age-related features
<b>Germany</b>							
Income tax: on annual taxable income, progressive, marginal tax rates from 0% to 45%	Child tax deductions; Child benefit; Joint tax filing for married couples	VAT: Flat tax rate, standard rate 19%, reduced rate 7%	Capital gains tax: (includes interest and dividends) flat tax of 25% on income above threshold; Real estate purchase tax: 3.5 – 6.5% of property value; Property tax: 0.26 – 0.35% on estimated property value	Contributions: employer 20.7%, employee 19.4-20.9%, total 40.1%-41.6%	Statutory age: 65 (increases to 67 until 2031)	Pension contribution tax deduction: 86% of pension contribution up to threshold	Long-term care surcharge: 0.25% of income (above 23 years if taxpayers has no children)
<b>Austria</b>							
Income tax: on annual taxable income, progressive, marginal tax rates from 0% to 55%	Family benefits; Child tax credit	VAT: Flat tax rate, standard rate 20%, medium rate 13%, reduced rate 10%	Capital gains tax: flat tax rate of 25% (on deposits) or 27.5% (other capital incomes); Real estate purchase tax: 0.5-3.5% of property value; Property tax (levied locally on estimated property value)	Contributions: employer 21.38%, employee 18.12%, total 39.50 %	Statutory age: 65 for men, 60 for women (increase for women to 65 until 2033)	Employer pension fund: no income tax on contributions made by employer and tax-favored contributions by employee; Deduction of taxable income: only 25% of pension benefit resulting from higher voluntary insurance are liable to income tax	

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**Switzerland** (*decentralized*)

Income tax: Federal tax, progressive, marginal rates from 0% to 11.5%; Cantonal tax, mostly progressive, marginal rates mostly below 13%; Municipal tax, as a share of cantonal tax, up to 51%	Child allowance; Education allowance; Joint tax filing for married couples	VAT: Flat tax rate, standard rate 7.7%, medium rate 3.7%, reduced rate 2.5%	Capital gains tax: 35% withholding tax on interest and dividend income (sometimes deductible from income tax or refunded); Property rates vary between cantons; property tax on estimated value; Wealth tax (cantonal and local); Imputed rent tax	Contributions: employer 8%; employee 8%; total 16%; Sizeable employer-specific pension schemes and private health insurance	Statutory age: 65 for men, 64 for women	Reduced withholding tax on pensions: 15%
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**Denmark**

State tax: progressive, marginal rate from 12.16 % to 15%; Local tax: rates vary, average rate of 24.9%; Labour market tax: flat at 8%	Child benefit; Joint tax return for married couples	VAT: Flat tax rate, standard rate 25%	Capital gains tax: progressive on shares and dividends, marginal rates of 27%-42%, property gains exempt if principal dwelling; Property tax: on estimated property value, marginal rate of 1%-3%	Contributions: independent of income, per year, employer DKK 2,271.60, employee DKK 1,135.80, total DKK 3,407.40; Voluntary unemployment insurance (tax-deductible contributions); Old-age pension contribution (fixed monthly amount of DKK 284; employer two thirds, employee one third)	Statutory age: 65 (increases to 67 over the next years)	Tax deduction for contributions to private plans; Reduced income tax rates and pension income below threshold tax exempt
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<b>Sweden</b>							
Income tax: on annual taxable income, progressive, marginal tax rates (national and municipal) up to 57%. Municipal tax rates vary	Child benefit	VAT: Flat tax rate, standard rate 25%, medium rate 12%, reduced rate 6%	Capital gains tax: flat rate of 30%; Property tax: on estimated property value (SEK 8.049 or 0.75%, for single family homes)	Contributions: employer 31.42%, 24.26% for pensions, employees 7% (capped and fully refundable), total up to 62.68%	Statutory age: flexible, from 61 (increases to 64 over the next years)		Reduced social security contribution: under 26 years of age (rate of 15.49%) and for employees over 68
<b>France</b>							
Income tax: on annual taxable income, progressive, marginal tax rates from 0% to 45%.	Child benefit; Parental benefits; Family quotient (reduction of tax base depending on the family composition)	VAT: Flat tax rate, standard rate 20%, medium rate 10%, reduced rate 5.5%	Capital gains tax: flat tax rate of 19%, plus 17.2% social contributions; Property tax: rates set by local authorities; Wealth tax: replaced by tax on real estate (since 2018), rates 0.7% - 1.5% above threshold	Contributions: employer 45%, employee around 22% (15% for public, various regimes), total between 60 and 67%, plus special deductions for low-income employees.	Statutory age: 62 (full pension after 43 years of contribution or above 67)	Tax deductions on payments to pension schemes	Minimum income: only over 25 years, unless 2 years of work experience; Tax deductions for dependents if over 60.
<b>Belgium</b>							
Income tax: on annual taxable income after deductions, progressive, marginal tax rates up to 50%	Child benefits; Tax reimbursements for dependent children (conditioned on income, no age limit); Marital quotient (only for single-earner families)	VAT: Flat tax rate, standard rate 21%, medium rate 12%, reduced rate 6%	Capital gains tax: flat rate of 15% (can be declared in income tax); Property tax: on value, regional rate 1.25%-2.5%	Contributions: employer 33-40.73%, employee: 13.07% in private sector and 11.05% in public, total: 44.05%-53.8%	Statutory age: 65 (will increase to 67); Anticipated pension plans and part-time early retirement: at least 55	Tax deduction on payments towards pension schemes: taxed at the moment of withdraw or at 60	

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**Italy**

Income tax: on annual taxable income, progressive, marginal tax rates from 23% to 43%	Child benefits; Parental benefits; Dependent tax deductions; Child tax deductions	VAT: Flat tax rate, standard rate 22%, medium rate 10%, reduced rate 4%	Capital gains tax: 26% (12.50% for government bonds); Wealth tax: 0.76% on real assets abroad, 0.15% on all assets abroad; Property taxes: municipal (0.2%-0.76% of taxable base value); Housing tax: subject to maximum when combined with municipal property taxes	Contributions: employer around 30%, employee around 10%, total around 40% (depends on number of employees of the company and employee's position)	Statutory age: 66 (to be increased), with exceptions (62 for female in private sector, 63 and 6 months for self-employed female and temporary workers); Early pension: 64 years after 20 years of contribution	Tax deductions on payments to pension schemes (up to threshold)	Reduction of tax base for retired (up to threshold)
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**Spain (decentralized)**

Income tax: on annual taxable income, progressive, marginal tax rates from 19% to 43%	Child benefits; Dependent child tax reductions (until 26 years with max. resource condition); Education allowances	VAT: Flat tax rate, standard rate 21%, medium rate 10%, reduced rate 4%	Capital gains tax: part of taxable income; Property tax: based on cadastral value, 0.3- 0.4%; Wealth tax: depends on region, 0.2-3.75% of net assets above the threshold (includes primary residence allowance)	Contributions: employer 29.9%, employee 6.35%, total 36.25%	Statutory age: 65 (to be increased incrementally to 67)	Tax deductions on payments to pension schemes: up to threshold or 30% of income	Unemployment assistance benefits: older than 45 or dependents or at least 6 months of contribution
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**Portugal**

Income tax: on annual taxable income, progressive, marginal tax rates from 14.5% to 48%	Parental allowances; Child Benefits; Education allowances	VAT: Flat tax rate, standard rate 23%, medium rate 13%, reduced rate 6%	Capital gains tax: 16.5%-35%; Property tax: 0.3-0.8%	Contributions: employers 11%, employees 23.75%, total 34.75%	Statutory age: 66 years and 4 months	Tax deductions on payments to pension schemes (up to 20% of earnings, decreases with age)
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<b>United States</b> ( <i>decentralized</i> )							
Federal income tax: on annual taxable income, progressive, marginal rates from 10% to 37%. State income tax, varying rates and degree of progressivity, marginal rates from 0% to 12.3%. Various deductions	Child tax credit; Dependent tax deductions	Sales tax: Levied at the state/local level, sizeable differences between states	Capital gains tax: federal level, short-term gains treated as ordinary income, long-term gains taxed at lower (progressive) rates (0-20%); Property tax: levied at local level, sizeable differences	Contributions: employer 6.2%, plus 1.45% for Medicare, plus 0.6% for unemployment, employee 6.2%, plus 1.45% for Medicare, total 15.9%	Statutory age: 67 (early retirement with lower pension from 62)	Tax deductions on payments to pension schemes: phased out as income increases	Medicare: citizens above 65, covers medical expenditure; Children health insurance program, in low-income, uninsured families below the age of 19; Income tax credit for elderly (up to threshold) under some conditions.
<b>Norway</b>							
Income tax: on annual taxable income, progressive, top marginal tax rate 46% (varies slightly depending on source of income)	Child benefit; Parental benefits; Childcare income tax deduction; Unemployment depending on number of children	VAT: Flat tax rate, standard rate 25%, medium rate 15%;, reduced rate 12%	Capital gains tax: flat rate of 22%; Property tax: on the assessed value of the property (equal to 20-50% of market value), ranges from 0.2 to 0.7% depending on the municipality; Wealth tax: 0.85% on net assets above threshold	Contributions: employer 14.1%, employee 8.2%, total 22.3%	Statutory age: 67 (early retirement from 62, decreases the pension, minimum guaranteed)	Tax deductions on payments to pension schemes; Reduced social security contributions on pensions (5.1% instead of 8.2%)	
<b>Canada</b> ( <i>decentralized</i> )							
Income tax: Federal income tax, on annual taxable income, progressive, marginal rates from 0% to 33%. Provincial income tax, varying rates and degree of progressivity, marginal rates from 4% to 25.75%	Child benefit (phased out with increasing income)	GST and Provincial Sales Tax: Flat tax rate, standard rate 13% (slight variations between provinces)	Capital gains tax: 50% of gains are taxable under income tax; Property tax: varies depending on the region	Pension plan contributions: employer 5.2%, employee 5.2%, total 10.4%; Unemployment insurance contributions: Employer 2.268%, employee 1.62%, total 3.888%.	Statutory age: 65 (Early retirement from 60, with reduction in pension)	Pension plan contribution deducted from gross income	Reduction of taxable base for pensioners over 65 (if low-income)

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**Ireland**

Income tax: on annual taxable income, progressive, standard rate at 20%, higher marginal rate at 40%, various deductions	Child benefit; Parental benefits	VAT: Flat tax rate, standard rate 23%, medium rates 9% and 13.5%, reduced rate 4.8%	Capital gains tax: 33% (flat rate); Dividend withholding tax: 20% (flat rate); Property tax: marginal rate 0.18%-0.25% of market value of the house, local variations	Universal contributions: paid on all income above threshold, progressive rates from 0.5% to 8%. Reduced rates (0.5-2%) for people above 70; Social insurance contributions: standard rates employer 10.95%, employee 4%	Statutory retirement age: 66	Pension plan contributions deductible from taxable gross income	Means-tested non-contributory benefit: lower amount for 18-24. Job seeker's allowance lower for people under 26; Annual exemption limit on income tax for people aged 65 and above (increased for couples); Age tax credit: in addition to personal tax credit (EUR245 if single above 65, EUR490 if married and both over 65)
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**United Kingdom**

Income tax: on annual taxable income, progressive, up to 45% with various deductions.	Child benefit, Child tax credit (part of universal credit)	VAT: Flat tax rate, standard rate 20%, medium rate 5%, reduced rate either 5% or 0%	Capital gains tax: 28% for residential property, 20% for other assets, deductions for low-income households; Dividend tax: flat rate between 7.5% and 38.1% (depending on income); Real estate purchase tax: based on property value, between 0% and 12% (15% for second property)	Contributions: Employers 13.8%, employees 12% (2% for income above GBP 4,167/month), total around 25.8%, exemptions for low-income and over 66	Statutory retirement age: between 65 and 66 (to be increased to 66 until 2020)	Reduction of pension tax base: 25% reduction if pension is taken a lump-sum; Tax deductions on private pension contributions: capped, depends on total income tax	Exemption for social security contributions for employees above retirement age (66); Bereavement payment and allowance: if spouse dies before pension age, tax-free lump-sum GBP2,000, plus allowance of up to GBP350/week for a year
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TABLE A-2: EMPIRICAL LITERATURE ON CAPITAL TAXATION

Citation	Countries	Time period	Tax variation	Main result	Size
<b>Capital gains tax</b>					
Feldstein et al. (1980)	USA	1973	Variation across individuals	Reduction in capital gains realization	-3.8
Minarik (1981)	USA	1973	Variation across individuals	Reduction in capital gains realization	-0.4
Auten and Clotfelter (1982)	USA	1967-1973	Variation across/within individuals over time. 1969 reform	Reduction in long-run capital gains realization	Transitory: -1.1 Permanent : -0.4
Lindsey (1987)	USA	1965-1982	Variation across individuals and over time.	Increase in tax decreases the fraction of realized capital gains reported in tax returns	Transitory: -2.1 Permanent: -1.4
Poterba (1987)	USA	1965-1982	Variation over time. Multiple reforms	Increase in tax decreases the fraction of realized capital gains reported in tax returns	-1
Auerbach and Poterba (1988)	USA	1954-1986	Variation across time	Non-significant decrease in capital gains realization	0
Auten et al. (1989)	USA	1979-1983	Variation across/within individuals. 1981 reform	Reduction in capital gains realization	Transitory: -3 Permanent: -1.6
Slemrod and Shobe (1990)	USA	1979-1984	Variation across/within individuals. 1981 reform	Non-robust reduction in capital gains realization	0
Gillingham and Greenlees (1992)	USA	1954-1989	Variation over time. Multiple reforms	Non-significant but large reduction in capital gains realization	0
Burman and Randolph (1994)	USA	1980-1983	Variations across/within individuals. 1981 reform	Transitory shock in tax rate decreases capital gains realization, permanent shock effect not significant	Transitory: -6.4 Permanent: 0



Auerbach and Siegel (2000)	USA	1986-1993	Variations across/within individuals. Multiple tax reforms	Reduction in capital gains realization	Transitory: -4.4 Permanent: -1.7
Dowd et al. (2015)	USA	1999-2008	Variation across/within individuals. 2001 and 2003 reforms	Reduction in capital gains realization	Transitory: -1.2 Permanent: -0.8

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<b>Dividend tax</b>						
Chetty and Saez (2005)	USA	1980-2004	Variation across firms over time. 2003 reform	Tax cut increases dividend payments		Short-run: -0.5
<b>Wealth tax</b>						
Brühlhart et al. (2016)	Switzerland	2001-2012	Variation across/within individuals and across cantons over time	Increase in wealth tax decreases reported wealth		Net-of-tax: 1.2
Seim (2017)	Sweden	2000-2006	Variation across/within individuals and bunching at the zero-tax threshold	Increase in wealth tax has a negative impact on reported taxable net wealth		Net-of-tax: 0.1 to 0.3
Jakobsen et al. (2020)	Denmark	1980-1996	Variation across/within individuals, at exemption threshold, and over time. 1989 reform	Decrease in wealth tax leads to increase in wealth accumulation, effect increases with time		Long-run net-of-tax Moderately wealthy: 0.5 Very wealthy: 2
<b>Capital income tax</b>						
Pirttilä and Selin (2011)	Finland	1992-1995	Variation across/within individuals over time. Dual tax reform of 1993	Decrease in tax on capital income leads to income shifting for self-employed		Net-of-tax All: 0 Self-employed: 0.5 to 59
Kleven and Schultz (2014)	Denmark	1980-2005	Variation across/within individuals over time. 1980s tax reforms	Capital income elasticities 2-3 times larger in absolute value than labor income ones		Net-of-tax: 0.1 to 0.3
<b>Estate and inheritance taxes</b>						
Slemrod and Kopczuk (2000)	USA	1916-1996	Age variation across individuals over time. Multiple reforms	Negative impact of taxes on reported estate value		Net-of-tax: 0.2
Holtz-Eakin and Marples (2001)	USA	1992	Variation across individuals and states	Negative impact of taxes on reported estate value		Net-of-tax: 0.1
Kopczuk and Slemrod (2003)	USA	1916-1984	Variation across individuals and states over time. Multiple tax reforms	Increase in potential savings leads to later time of death. Possibly due to reporting timing.		Death elasticity: 0.6

Bakija and Slemrod (2004)	USA	1965-1998	Variation across individuals and states over time	Increase in estate and inheritance taxes leads to decrease in number of estate tax returns	Returns elasticity: -0.1
Joulfaian (2005)	USA	1989	Variation across individuals and states	Increase in relative gift price with respect to estate leads to decrease in gifts.	Gift elasticity: -2.3 to -2.9
Joulfaian (2006)	USA	1951-2001	Variation across states over time	Increase in estate tax leads to decrease in taxable estate.	Net-of-tax: 0.1

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