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Pensions and Old-age Well-being, 28 November 2025

Wealth Inequality and Welfare States: Pension Systems, the Public-Private Mix, and Augmented Wealth in Old Age

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Background

- Growing literature on wealth inequality & concentration
- Wealth inequality has been rising since the 1980s in most advanced democracies (Piketty & Saez 2014; Saez & Zucman 2016, 2020)
- Affects political inequality & democratic governance (Ansell, 2019); undermines intergenerational mobility (Beckert 2022)
- Wealth distribution is much more unequal than that of income and shows distinct dynamics (Killewald, 2017)
  - Different cross-national patterning, i.e., high wealth inequality in Nordic countries (Skopek et al., 2014; Pfeffer & Waitkus, 2021)

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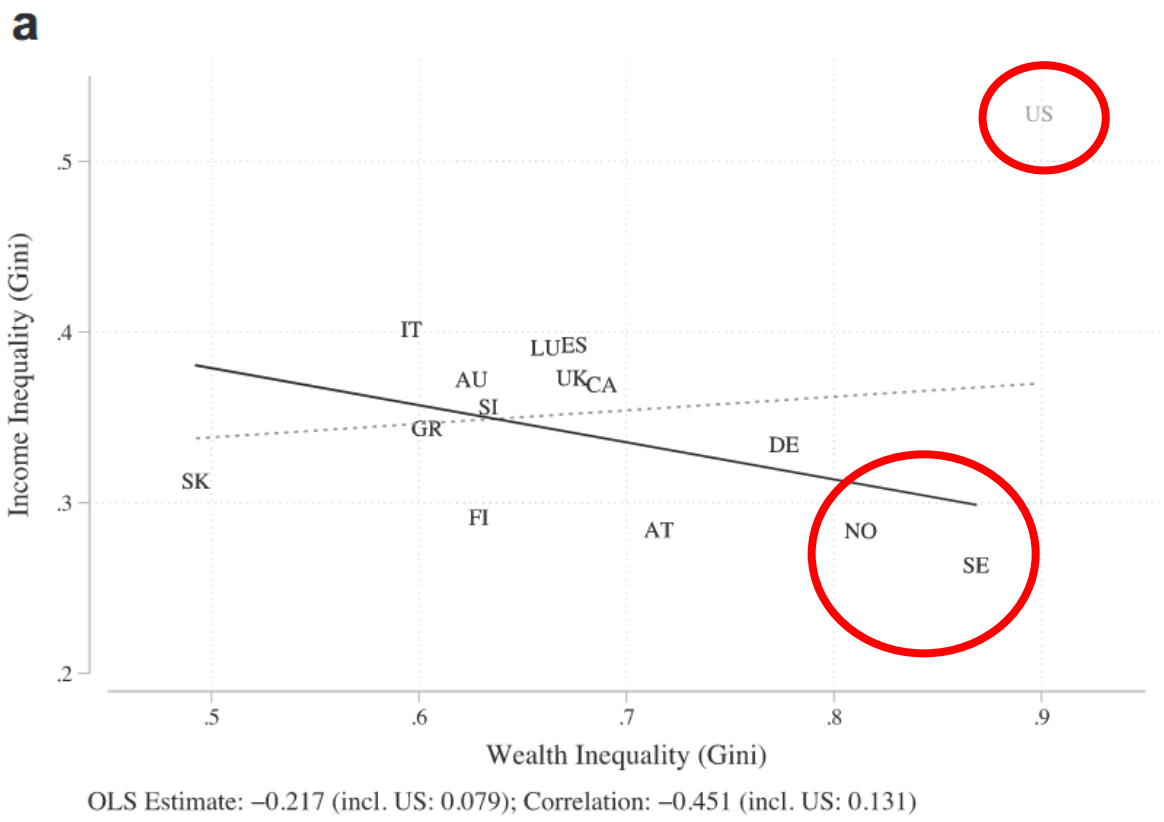
Pfeffer & Waitkus (2021), “The Wealth Inequality of Nations”, *American Sociological Review*, 86(4)



OLS Estimate: –0.217 (incl. US: 0.079); Correlation: –0.451 (incl. US: 0.131)

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Welfare States & Wealth Inequality

- But most studies consider only marketable wealth
  - Social insurance entitlements (esp. pensions) do not count as wealth, despite their explicit function of generating future income

- Socio-political institutions as fundamental causes of inequality and redistribution (Acemoglu & Robinson 2015; Gornick & Smeeding, 2018)

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Welfare States & Wealth Inequality

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- **Varieties of wealth**: private assets have different meanings depending on institutions and political economy (Beckert, 2024)
  - When strong welfare states protect citizens from social risks, marketable wealth may be less relevant for everyday life (Manduca, 2025)
  - Similar levels of wealth inequality in Sweden/Denmark and USA ?

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Why Study Pension Wealth?

- We focus on the role of pension wealth
- Public pensions are the biggest part of the welfare state
  - Pensions crowd out private (marketable) wealth accumulation (Wronski 2023)
- Practical reason = Observability: Almost everyone gets some kind of pensions (conditional on survival)

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Research Questions

Q1) When pension entitlements are translated into wealth values, how much do pensions change the cross-national landscape of wealth inequality?

Q2) What explains the cross-national differences in the role of pension wealth?

- Focus on the institutional structure of pension systems

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Pension systems & Economic Inequality

- Public pensions reduce old-age income inequality and poverty (Been et al. 2017; Etgeton 2018; Bonnet et al. 2022; Lee 2022; Kuitto et al. 2023)
  - The role of private pensions is less clear

- **Augmented wealth**: counting pensions as a wealth component (Bönke et al. 2020; Longmuir 2023; Bartels et al. 2023; Wronski, 2023)
  - Wealth distribution looks much less unequal when pension wealth is taken into account → reduces Gini by 20-40 percent (Frick & Grabka 2013; Wronski 2023; Sierminska & Wronski 2023)

- But public pensions contributes to wealth inequality?
  - High-educated groups live longer, receive more pensions (Oliveira 2019)
  - Lifetime pension inequality greater than pre-retirement earnings inequality (Shi & Kolk 2023)

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The Paradox of Redistribution Revisited

- "A trade-off exists between the degree of low-income targeting and the size of redistributive budgets" (Korpi & Palme 1998)
  - Targeted or basic security systems are by design more redistributive than encompassing social insurance → paradoxically achieves less redistribution
  - The structure of welfare states determines the size of redistribution

- **Old-age Pensions**: "The targeted or basic security countries are likely to have high levels of private insurance because … economically better-off citizens are more likely to acquire private pension insurance"
  - Market-based private pensions are often more unequal than earnings-related social insurance systems

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Varieties of Pension Systems

- **Basic Security** (*Beveridgean*) : tax-financed, flat-rate benefits
  - Focused on poverty alleviation, minimum income protection
  - Oriented towards redistribution by progressive taxation
  - Australia, United Kingdom, Denmark, (Ireland, New Zealand, Netherlands)

- **Comprehensive public** (*Bismarckian*): contributory, earnings-related benefits
  - Consumption smoothing: reproduce pre-retirement earnings inequality
  - Generous income replacement for middle-upper class (with benefit ceiling)
  - Germany, Austria, France, Finland, Italy, Luxembourg, Greece, Slovenia, Slovakia, Spain

- **Hybrid** Insurance**:** Earnings-related benefits but with low ceiling
  - Large private pension funds: Norway, USA, Japan, (Switzerland, Canada)
  - Korea, Estonia: dualized public pensions, immature private pension market

Data & Sample

- Luxembourg Wealth Study Database
- Most recent pre-Covid-19 wave: 2016 to 2019
- 17 OECD countries with varieties of pension systems
- Sample: Households with individuals aged 62 to 84 (top-coded)
  - Remove HHs with non-elderly to minimize measurement error
  - State pension age mostly 65 (62 in SVK, 67 in NOR) but early retirement
  - Sensitivity analysis: lower age bound at 67

- Wittgenstein Centre Human Capital Database (KC et al., 2018)
  - Population size by gender & education levels
  - Projected values based on 2020 census/surveys

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Step 1) Computation of Remaining life expectancy

- Construct gender-education-cohort-specific population sizes at each age from Human Capital Database (1970-2055)
  - Survival rates every 5 years of age for 5 cohorts x 2 gender x 3 education

- Predict group-specific survival rates at all age from 40, conditional to survival at age 40, fitting survival data to a Gompertz function
  - $s_{age} = exp(-\frac{b}{c} exp(c(age - 40) - 1)))$
  - Follows exponential (log-linear) mortality rate by age

- **Remaining life expectancy** conditional to survival at each *age* (60-100) can be calculated, based on predicted survival probabilities

$$l_a = \frac{\sum_{k=a}^{100} s_k}{s_a}$$

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Step 2) Measuring Household Pension Wealth

- Link gender-education-cohort-specific remaining life expectancy at each age in each country to LWS sample

$$PubW_i = \sum_{i=1}^{k} \sum_{t=1}^{l_i} \frac{PubInc_i}{(1+r)^t} + \sum_{t=1}^{d_h} \frac{Survpen_h}{(1+r)^{l_i - d_h + t}}$$

$$PrivW_h = \sum_{i=1}^{k} \sum_{t=1}^{l_i} \frac{PrivInc_i}{(1+r)^t}$$

- l_i = remaining life expectancy; d_h = intra-couple difference in remaining life expectancy
- Discount rate r=0.02
- Survivor's pension: following country-specific rules
- **DC private pensions** are observed as balance

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Step 3) Estimation of Wealth Inequality & Redistribution

- Use standard **Gini Coefficient** as the measure for inequality

- $Redistribution\ by\ pension\ wealth\ = 100 \times (1 - \frac{G_{augmented.w}}{G_{market.w}})$

→ Percentage decline after adding pension wealth

- $Redistribution\ by\ public\ pension\ wealth = 100 \times (1 - \frac{G_{augmented.w}}{G_{market+priv.pw}})$

→ Percentage decline after adding public pension wealth

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Sensitivity Analysis

1) Age-adjusted Gini: Wealth accumulation is age-dependent

→ age-adjusted Gini = $\sum_{a=62}^{84} p_a G_a$

– p_a=population share of each age group; G_a=age-specific Gini

2) Uniform demographic composition: reweighting sample to resemble USA

$$\psi = \frac{\Pr(C = USA|X)/\Pr(C = USA)}{\Pr(C = c|X)/\Pr(C = c)}$$

3) Uniform life expectancy (USA), keeping country-specific educational gradient

4) Use restricted sample: Households with those aged 67-84

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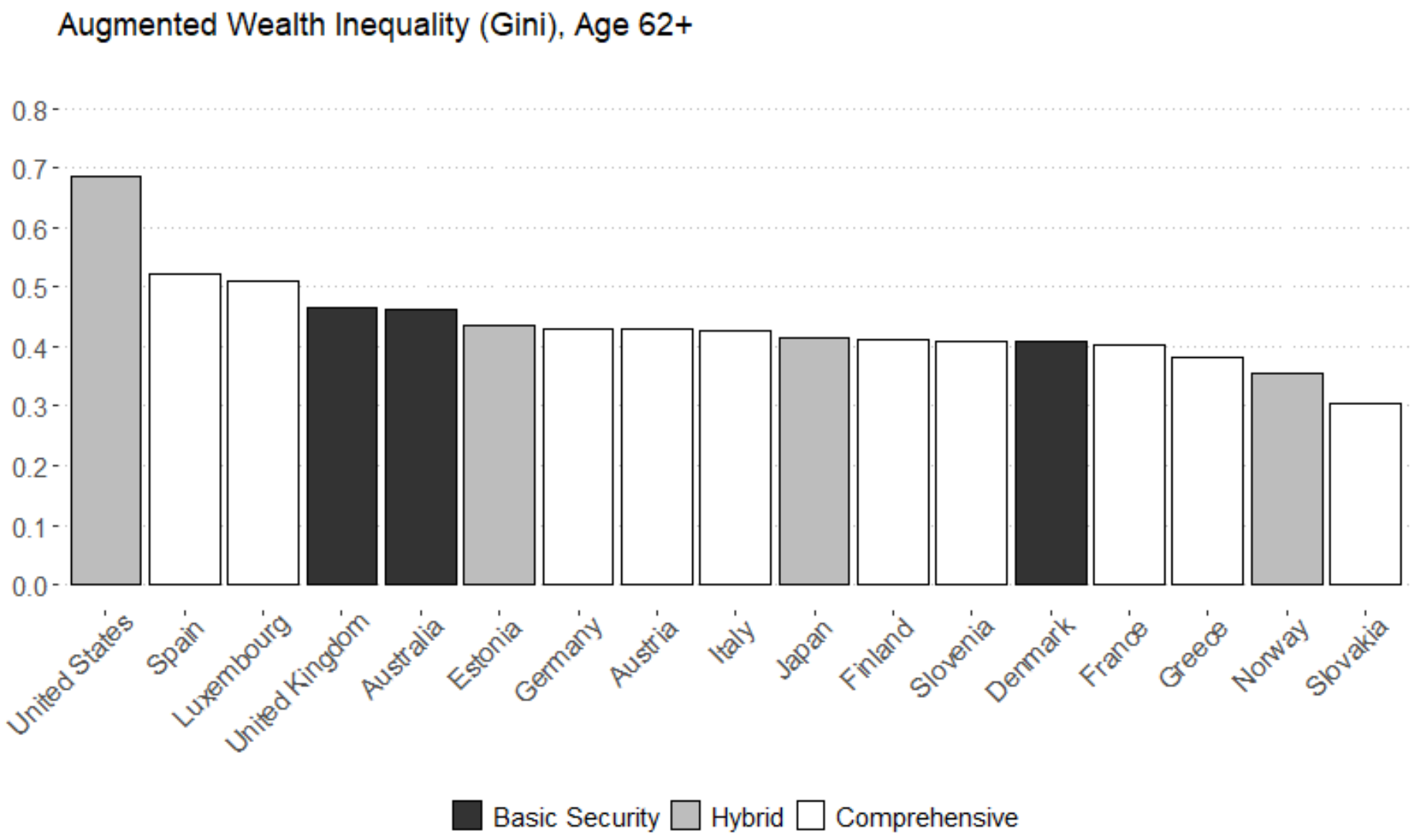
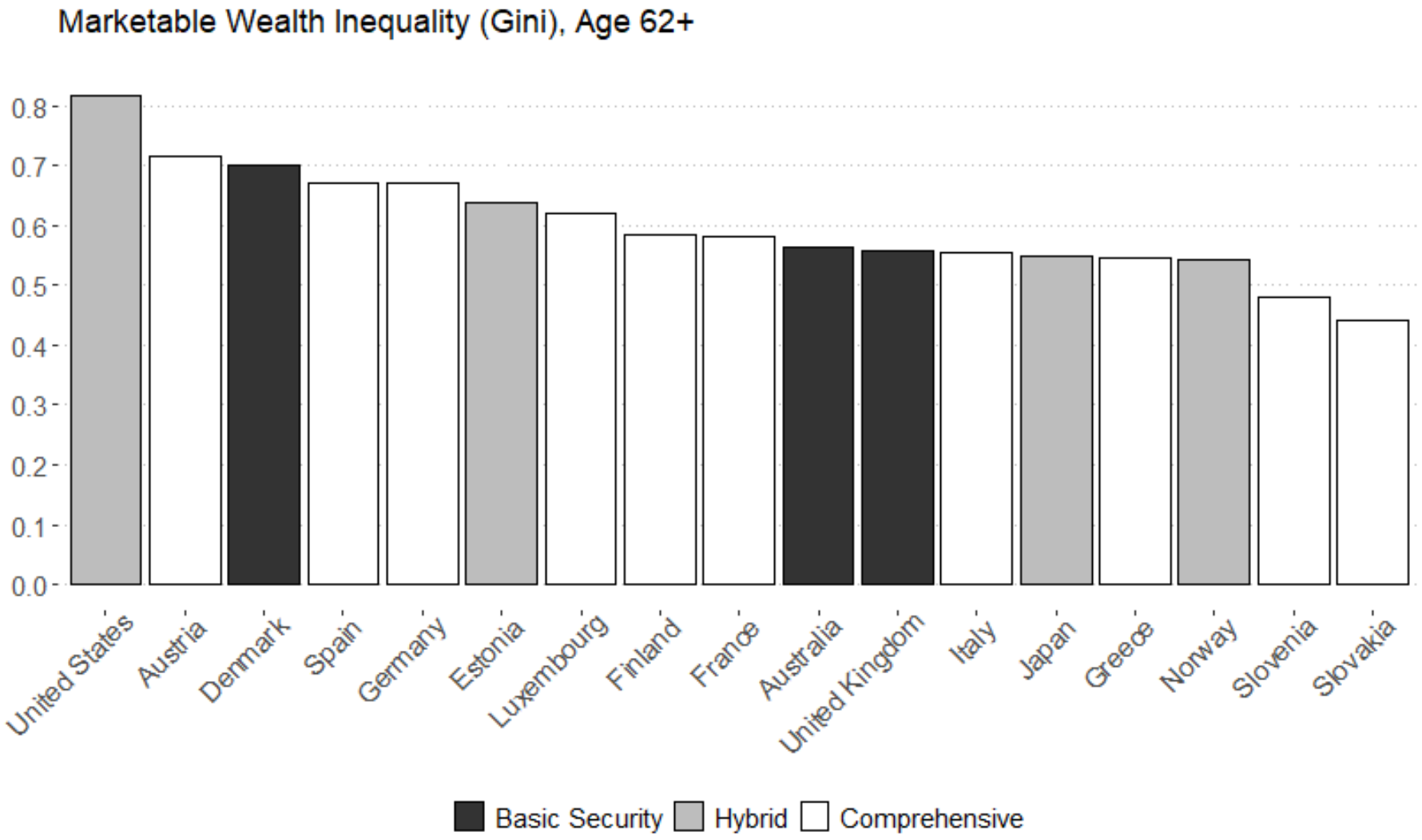
Wealth Inequality with Pensions



Wealth Inequality without Pensions



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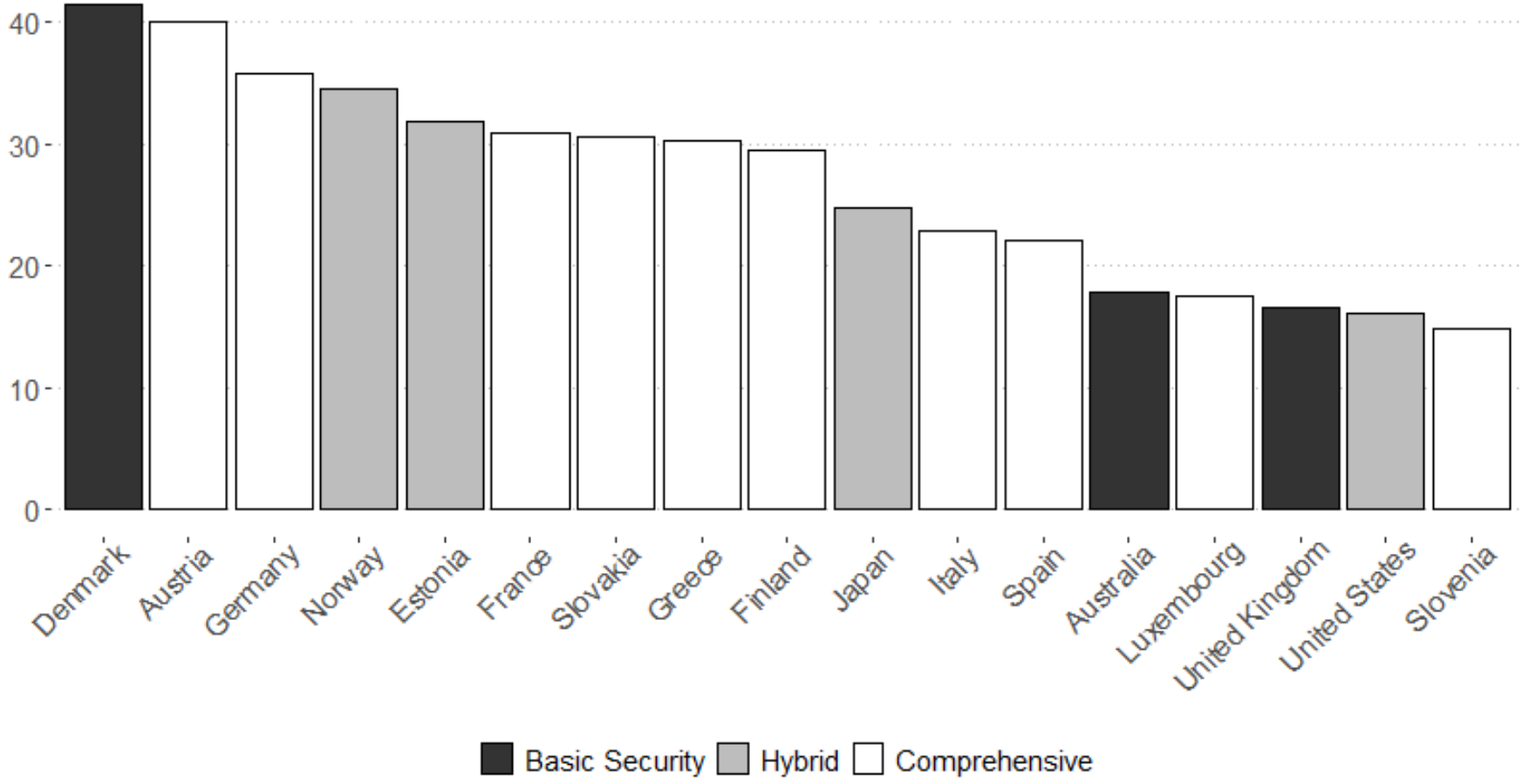
Redistribution by Public & Private Pensions (%)



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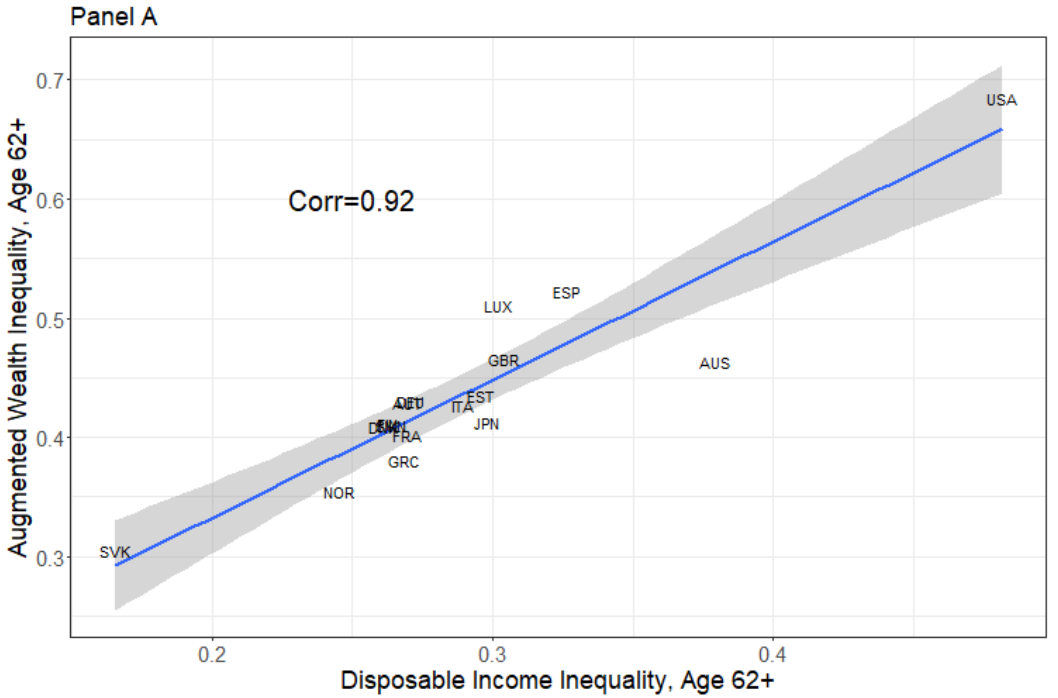
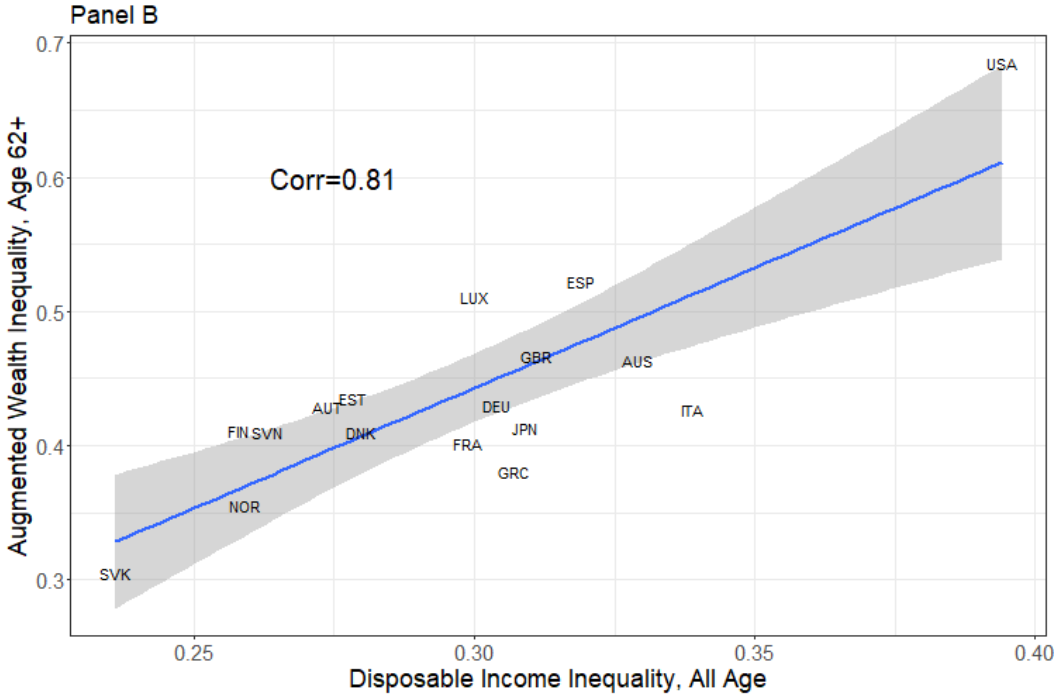
Wealth Inequality vs Income Inequality





Sensitivity Checks: Correlations with Augmented Wealth Inequality

	Baseline	Age-adj.	US Demo	US RLE	Age 67+
Marketable Wealth Inequality	0.74	0.73	0.78	0.73	0.72
Redistribution by Pensions	-0.53	-0.59	-0.40	-0.55	-0.60
Income Inequality, Old Age	0.92	0.93	0.92	0.93	0.87
Income Inequality, All Ages	0.81	0.82	0.77	0.82	0.79

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4) Decomposition Analysis

- Wealth components: Real wealth, financial wealth, private pension wealth, public pension wealth
- Gini factor decomposition (Lerman & Yitzhaki 1985)

$$G = \sum_{k=1}^{4} S_k G_k R_k$$

  - S_k= share of wealth component k in aggregate wealth
  - G_k = Gini of wealth component k
  - R_k = equivalent to Pearson's rank correlation between component k and aggregate wealth distribution
- $S_k G_k R_k$ = Contribution of each wealth component k to total inequality
- $Progressivity_k = 1 - \frac{G_k R_k}{G_{aw}}$ = normalized Kakwani (1977) index

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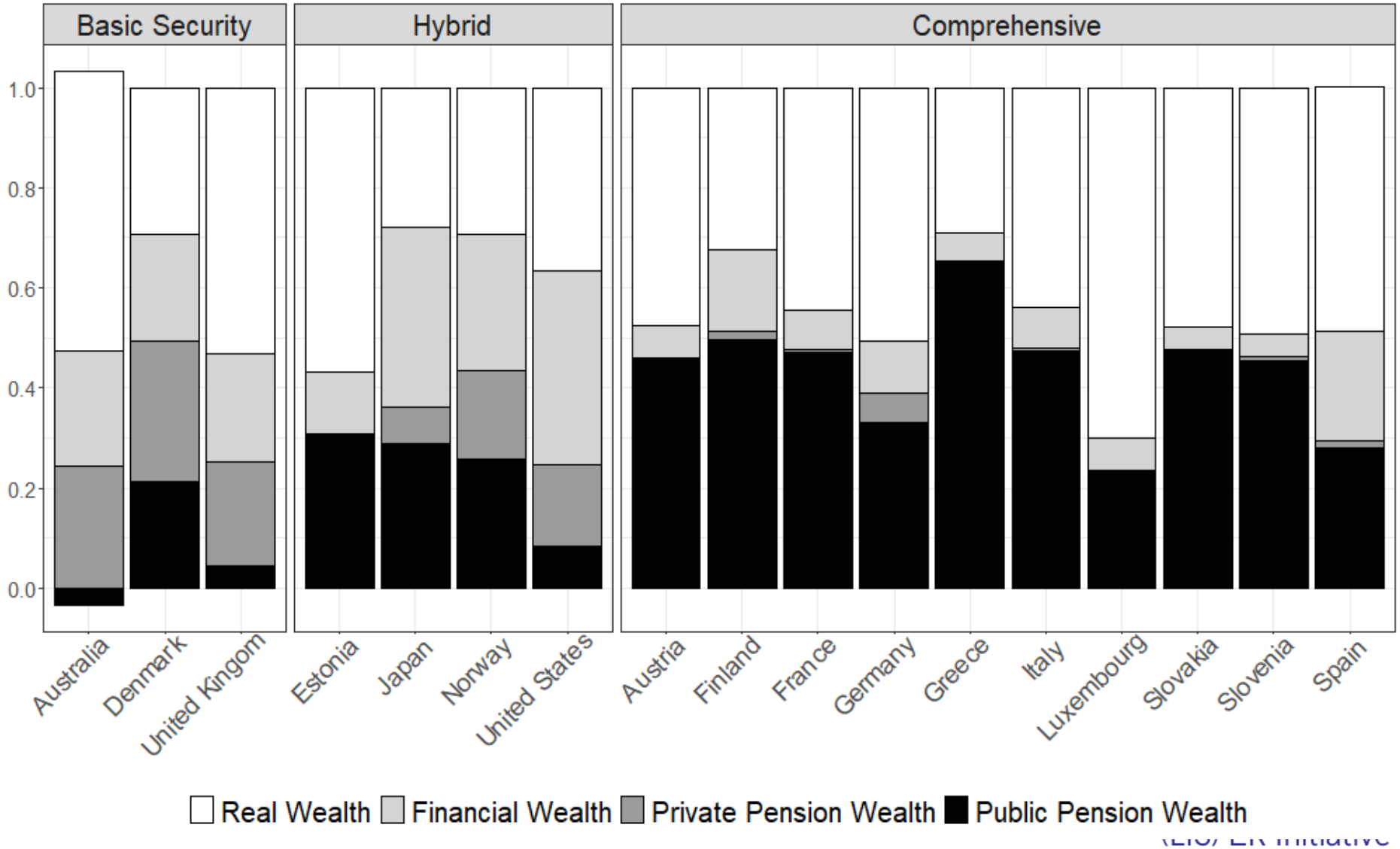
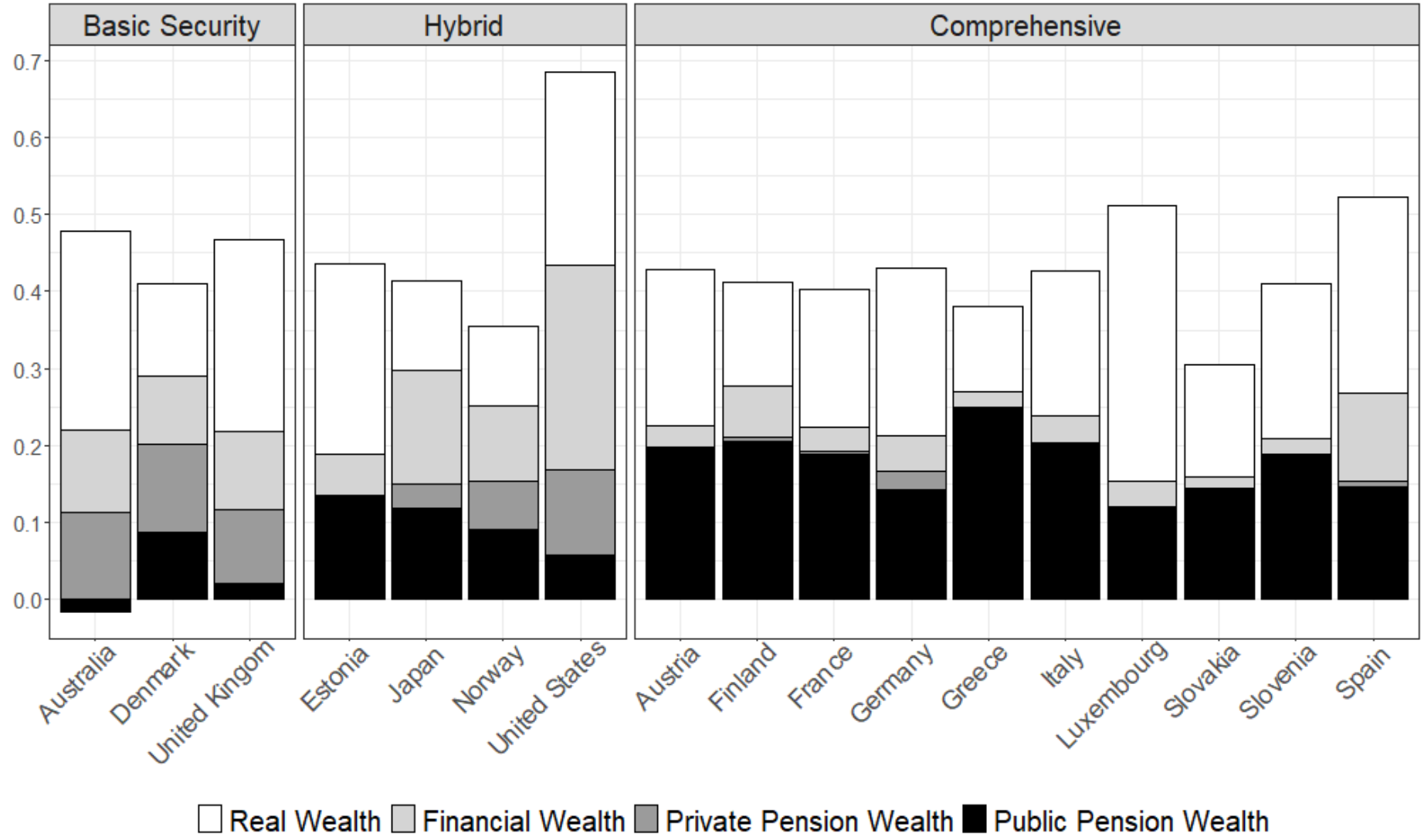
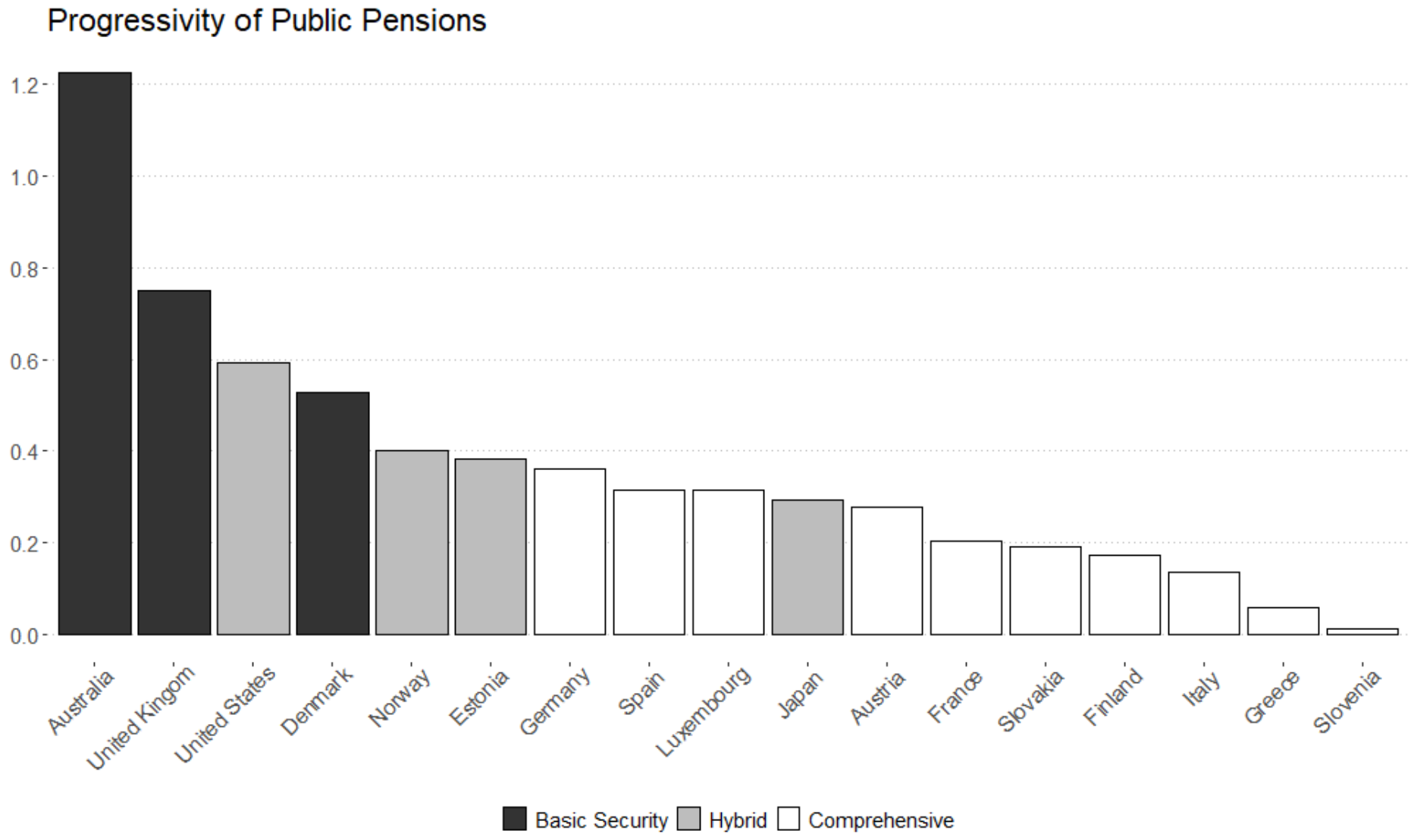
Decomposition by Wealth Source (Relative)



Decomposition by Wealth Source (Absolute)





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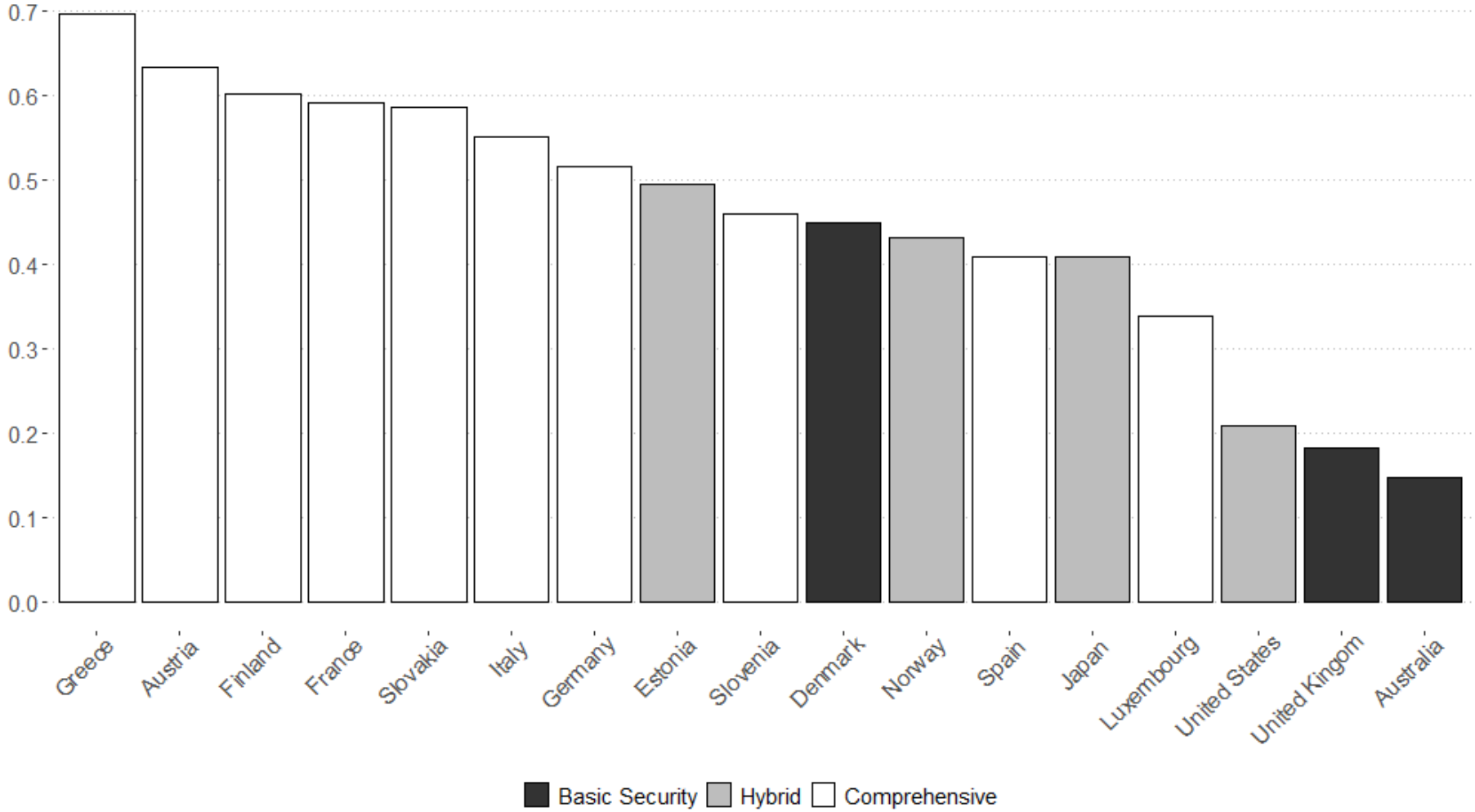
Share of Public Pensions in Augmented Wealth



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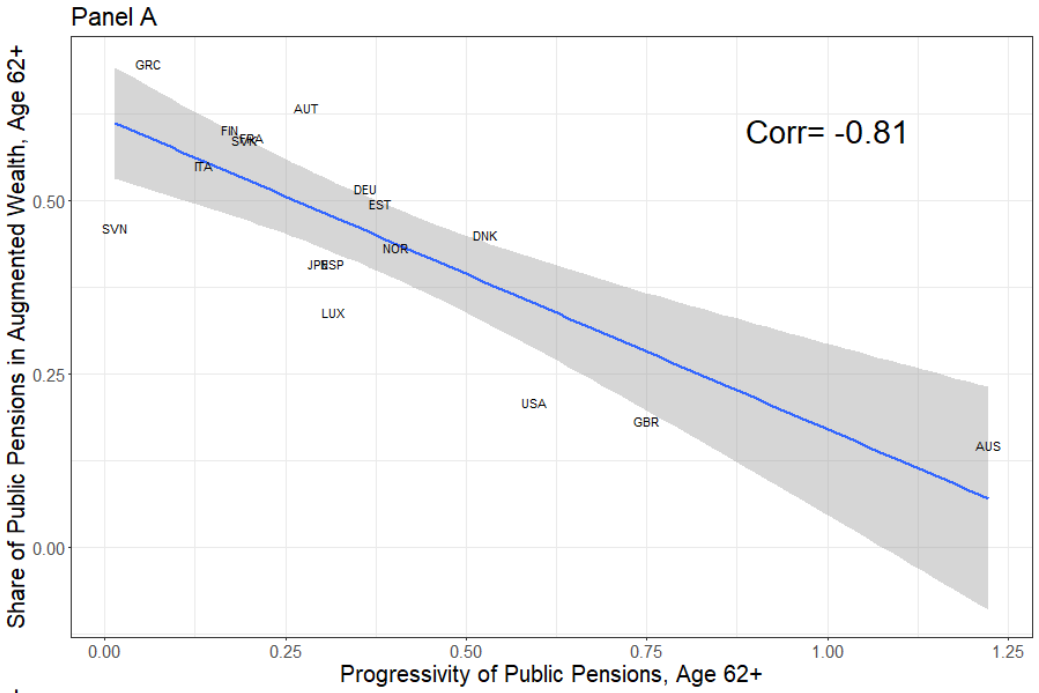
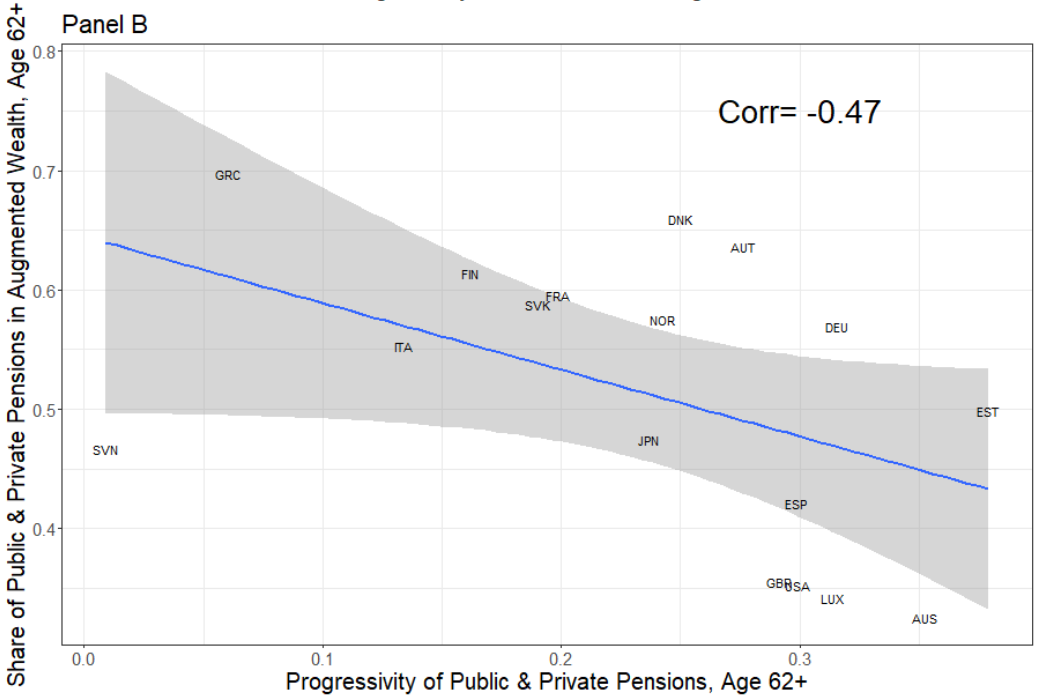
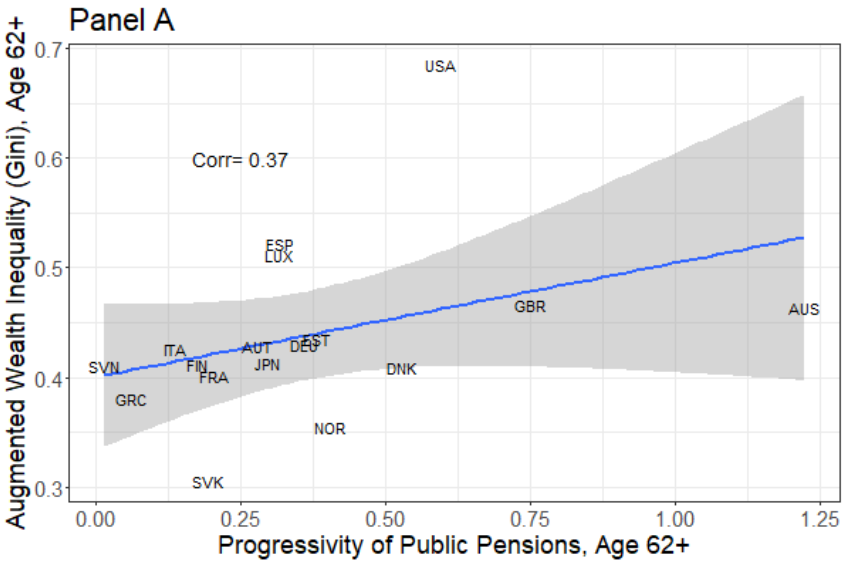
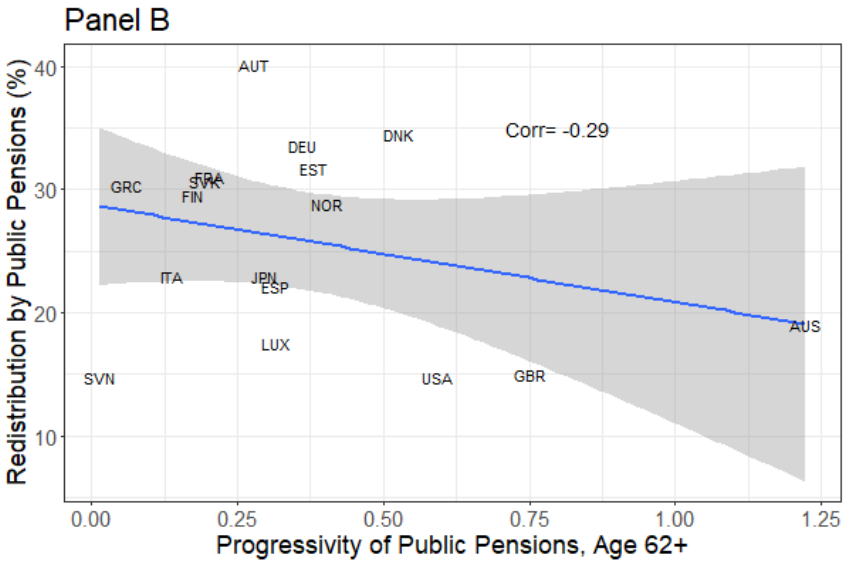
Progressivity vs Share of Pension Wealth

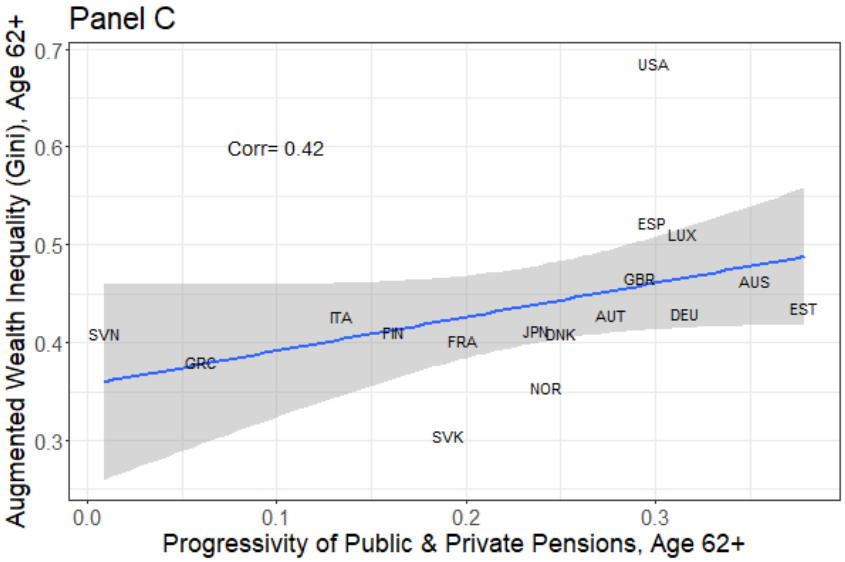


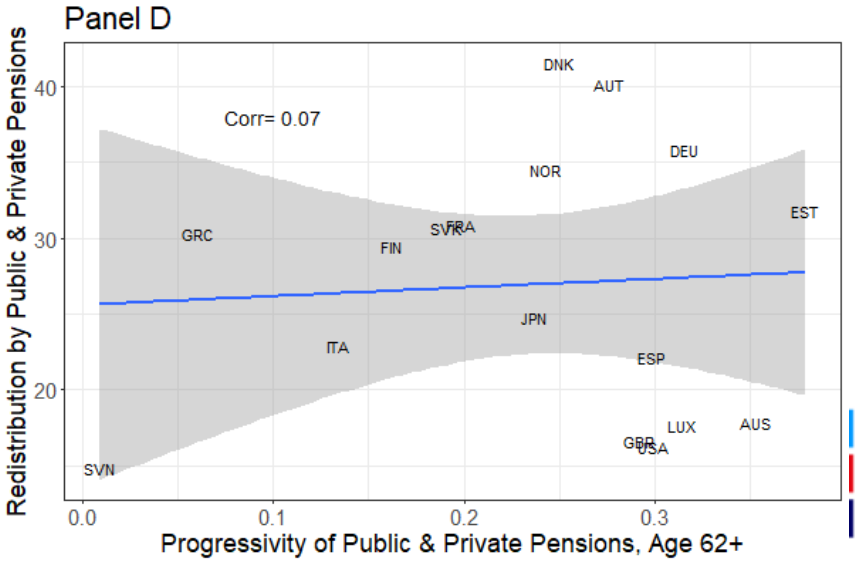


Role of system progressivity
Paradox of Redistribution?

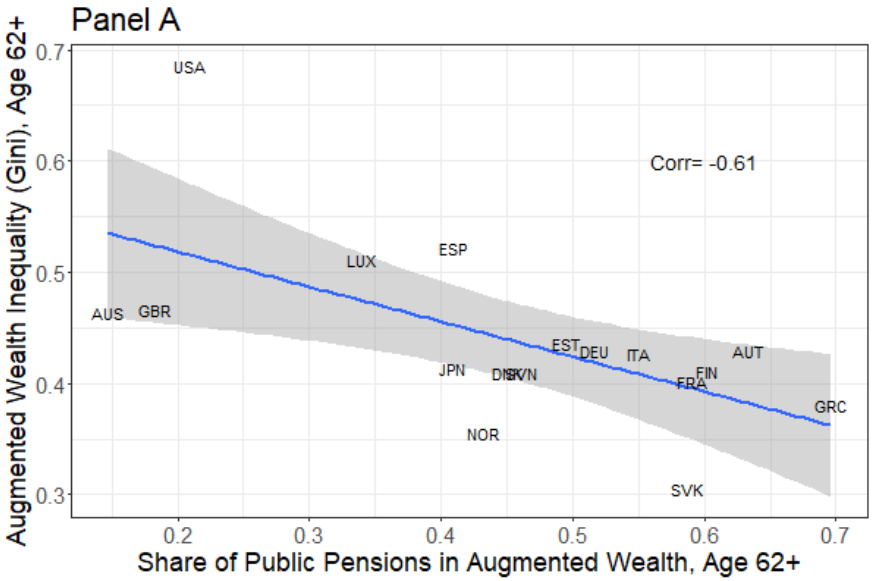


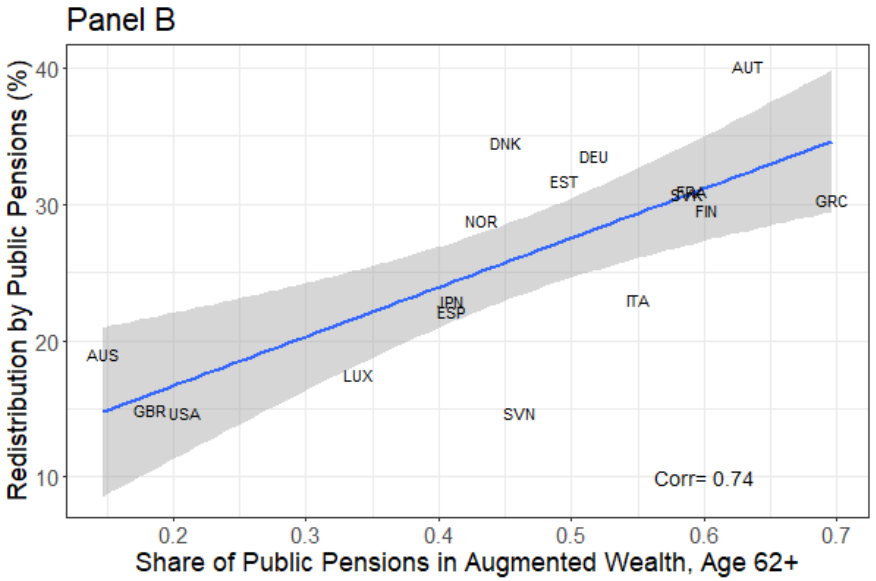


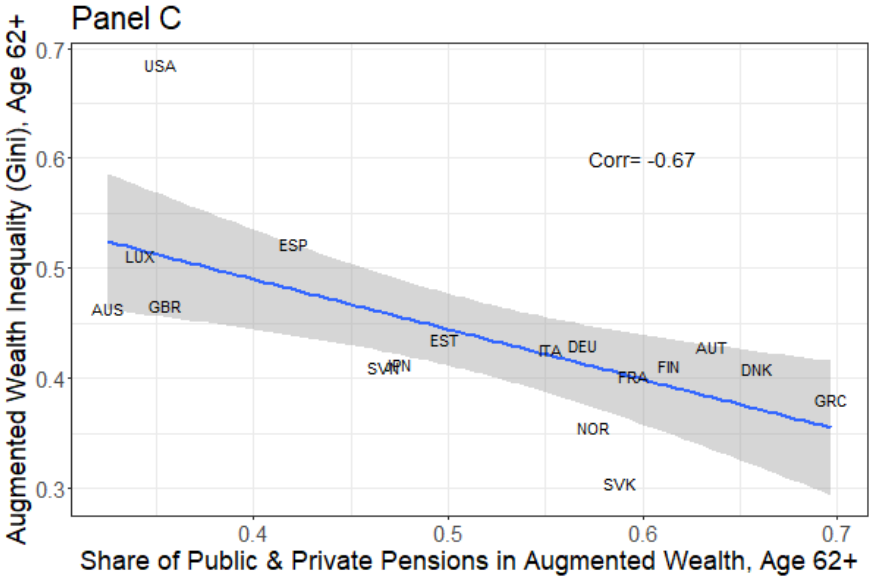


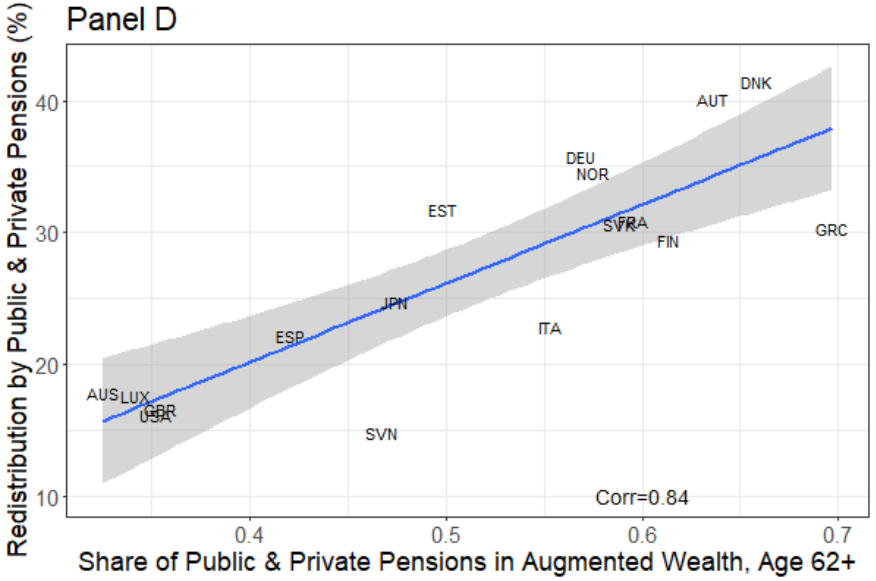


It is the share (size) of pension wealth that matters









Regression: Progressivity sign flipped!

Table 4. Regression results, inequality and redistribution on pension institutions

	Public Pensions		Public + Private Pensions	
	Inequality	Redistribution	Inequality	Redistribution
(Intercept)	0.691 ***	-15.426 *	0.621 ***	-21.401 ***
	(0.112)	(5.928)	(0.106)	(2.948)
Progressivity	-0.106	24.103 ***	0.117	43.597 ***
	(0.098)	(5.154)	(0.181)	(5.033)
Pension Share	-0.470 *	71.477 ***	-0.409 *	72.054 ***
	(0.176)	(9.324)	(0.152)	(4.220)
Adj. R-squared	0.345	0.799	0.383	0.948
N	17	17	17	17

Note: $^{+}p < 0.1$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$; In parentheses are standard errors.

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Key Findings

- Augmented wealth inequality: higher than income inequality, much lower than marketable wealth inequality

- When pensions are taken into account, cross-national patterning of wealth inequality resembles that of income inequality
  - Significance of welfare state institutions in wealth inequality

- In **comprehensive insurance** countries, public pension wealth contributes to inequality greatly, but the distribution of pension wealth is *less progressive* compared to **basic security** countries

- It is not the *progressivity* per se, but the *share* of pension wealth that strongly predicts wealth inequality & redistribution

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Implications (1)

- Paradox of Redistribution: does 'comprehensive but less redistributive' social insurance eventually achieve greater equality & redistribution?
  - Only partly true, mainly through the *size* of pension assets
  - Denmark/Norway: public pensions are relatively progressive and achieves greater redistribution (jointly with private pensions)

- The story is not that "public pensions crowd out private pensions" (Korpi & Palme 1998)
  - It is the **mix of public & private pensions** that matters more

- Greater contributions (share) of *public & private* pension wealth to inequality may crowd out the influence of (more unequal) marketable wealth
  - Beckert (2024) & Manduca (2025): wealth may be not as important for low- & middle-income households in generous welfare states

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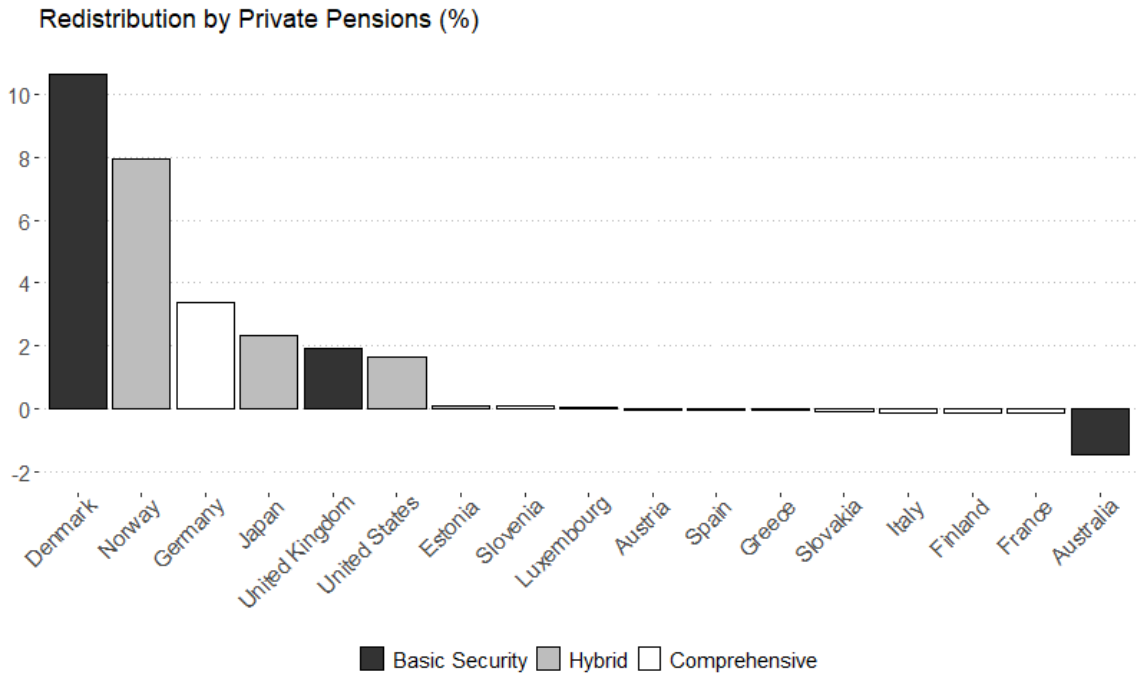
Implications (2)

Private pensions are also part of the welfare state



- The nature of public-private pension mix varies substantially across countries, depending on regulation/management of occupational pension plans
  - Mandatory (France, Norway), quasi-mandatory (Netherlands, Denmark), auto-enrolment (UK), individualized (USA)
  - Also influenced by collective bargaining institutions (Denmark, Norway, Netherlands

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