Sustainable and Equitable Pension Reform for Emerging Economies: an Application to Indonesia

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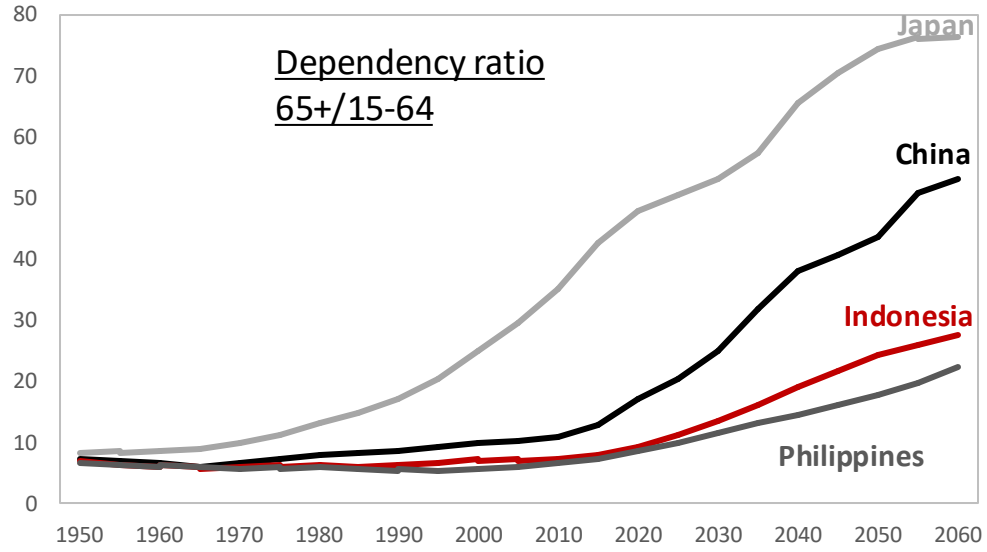
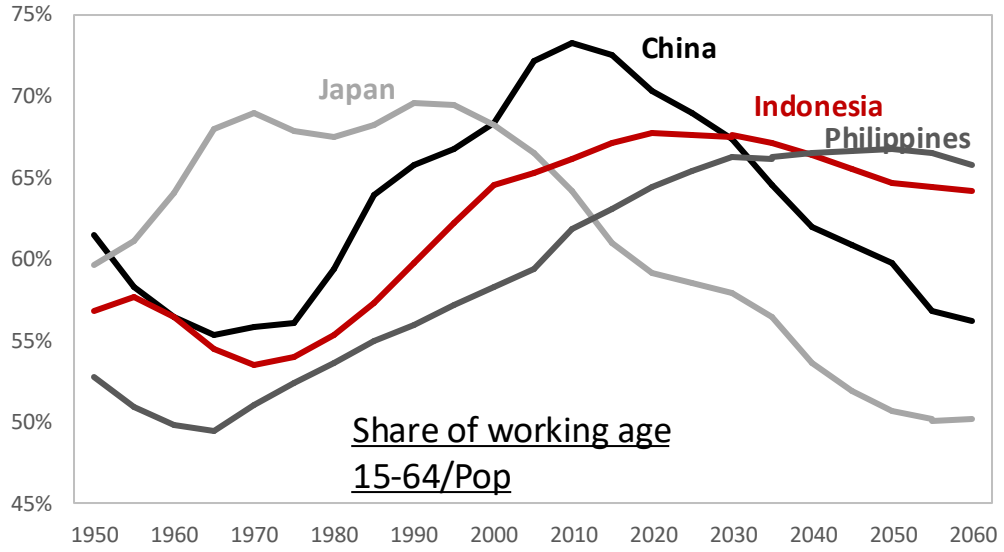
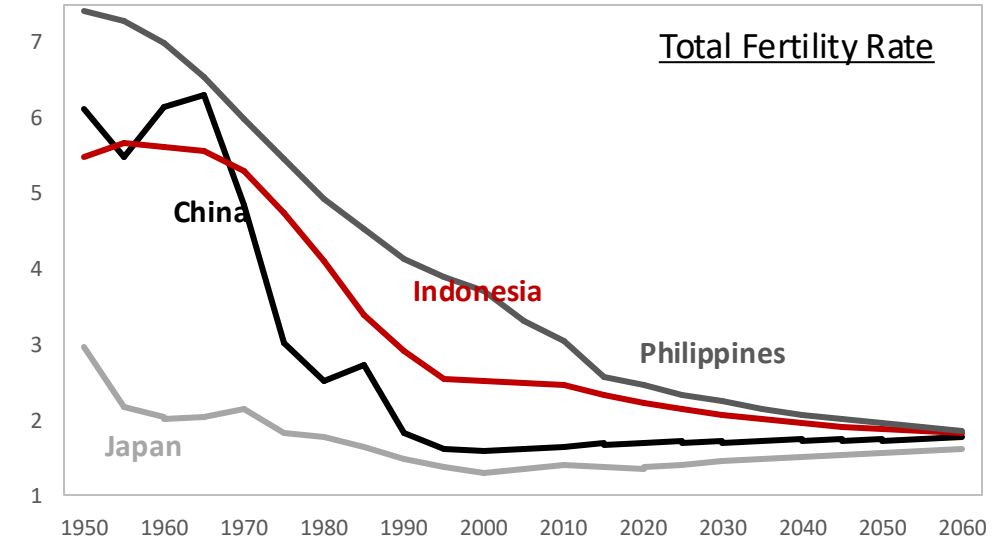
CONTEXT

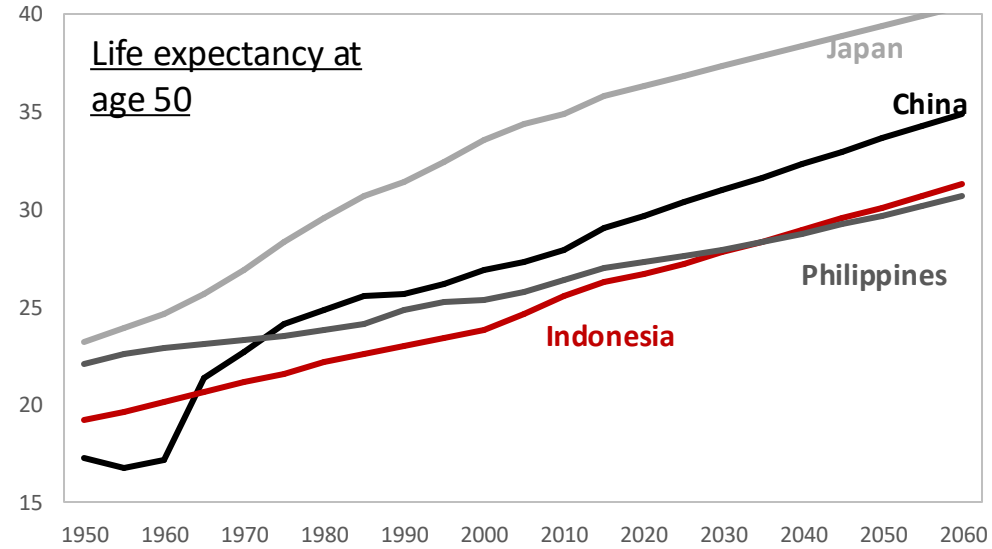
1. Rapid demographic transition
2. Relatively poor. High reliance on labour income and children
3. But migration and cultural change suggest declining family support
4. Declines in employment at older ages + high informal labour force participation, with little formalisation
5. Social protection: low benefits, low coverage
6. But there is a promising policy reform context

1. Rapid demographic transition

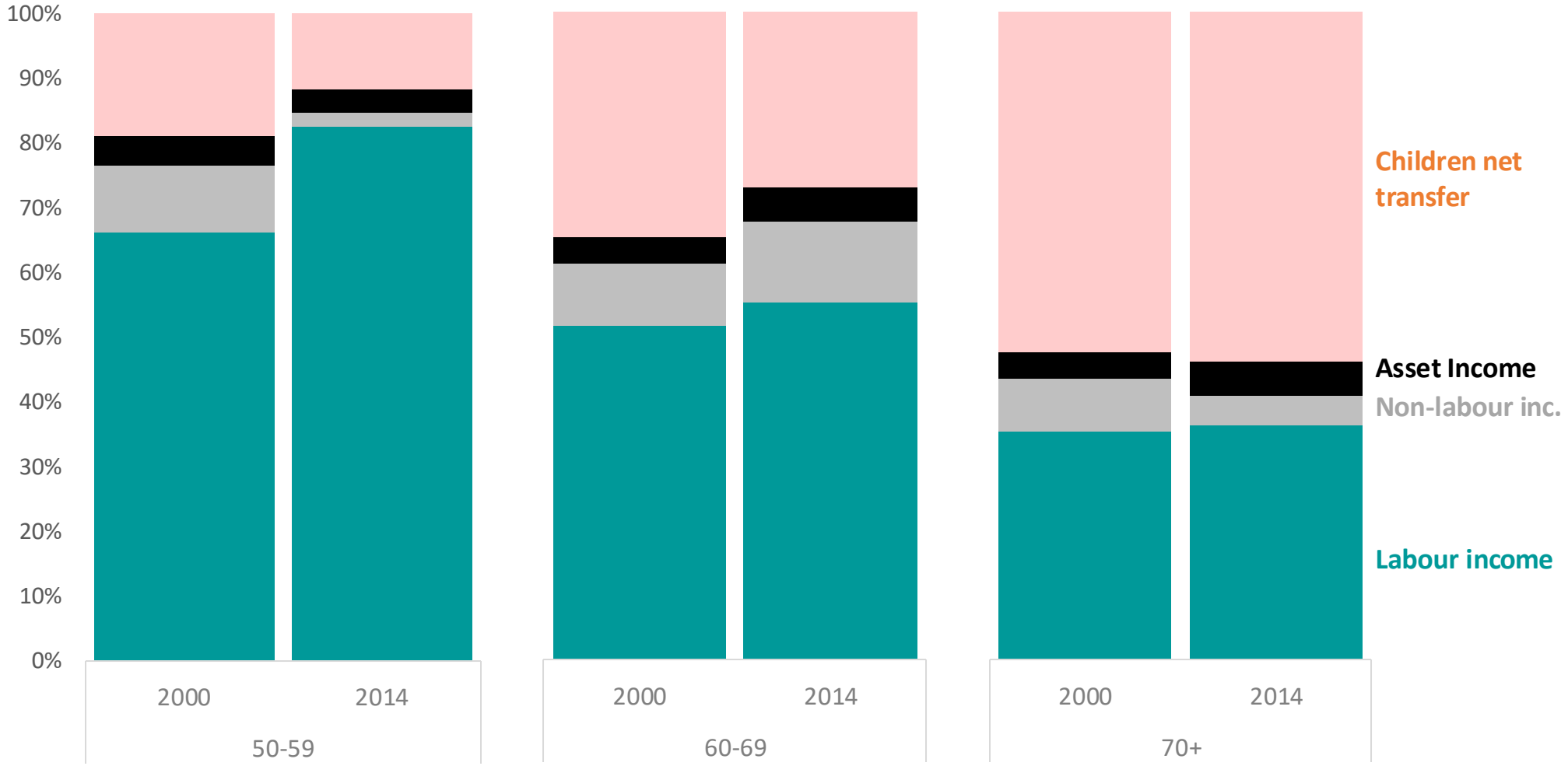






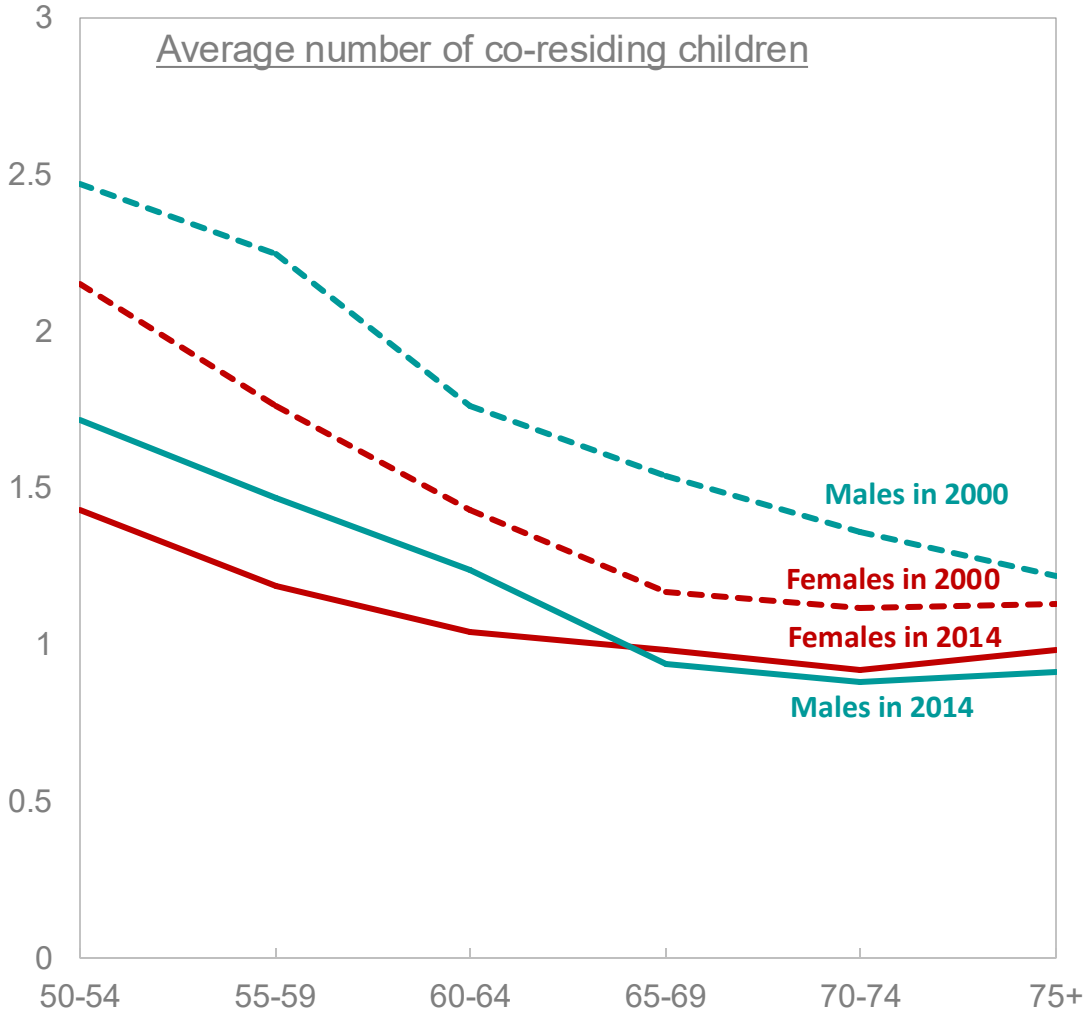


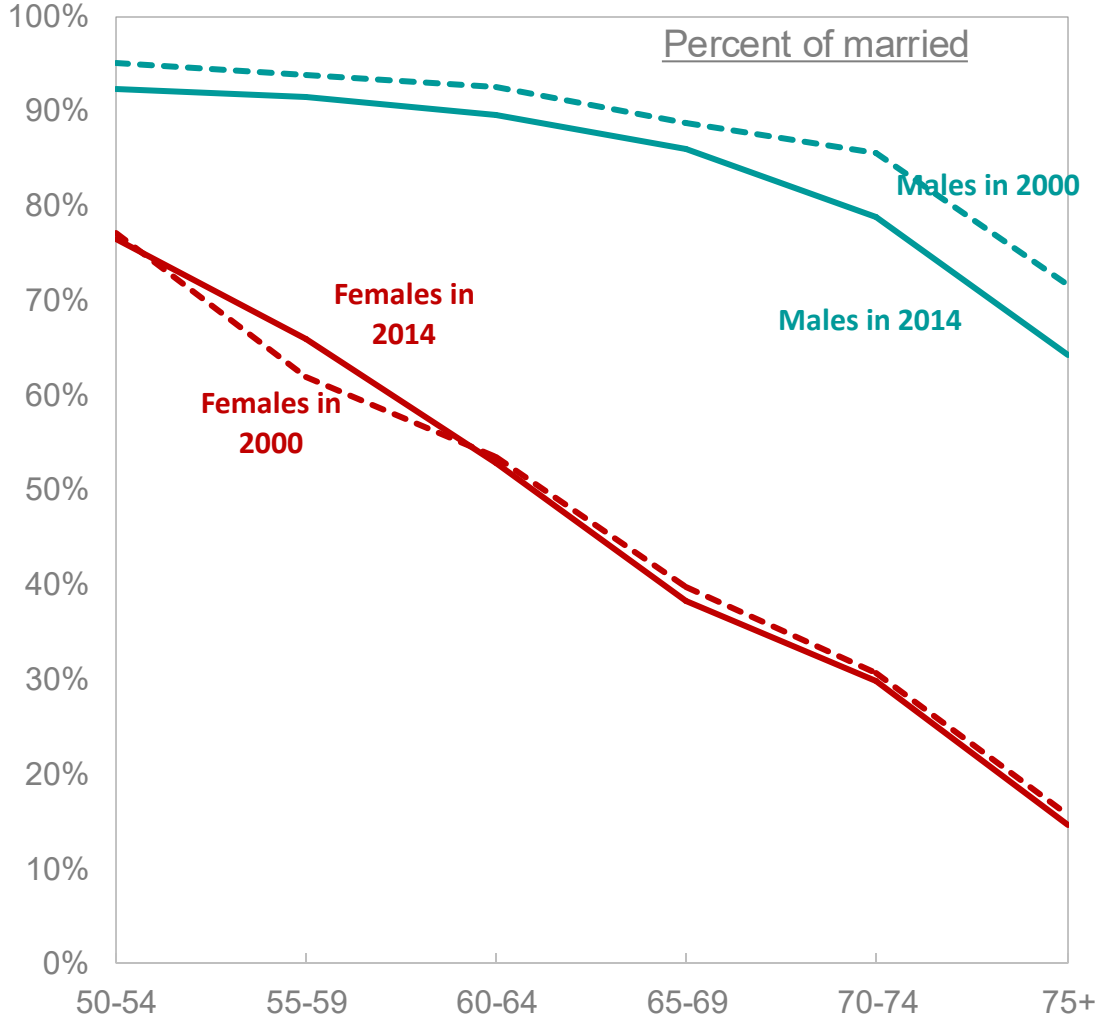
2. High reliance on labour income and children



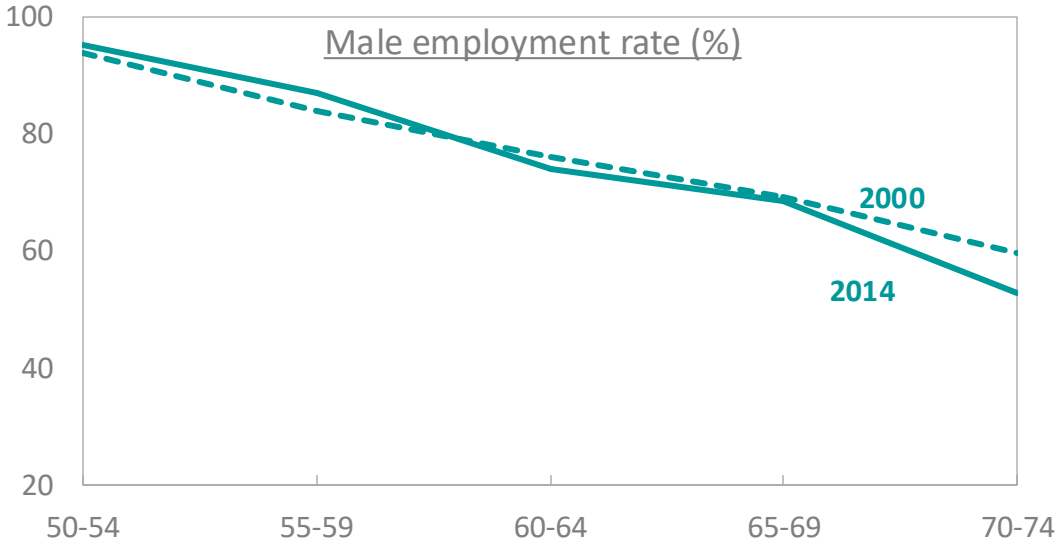
Income sources, Indonesia

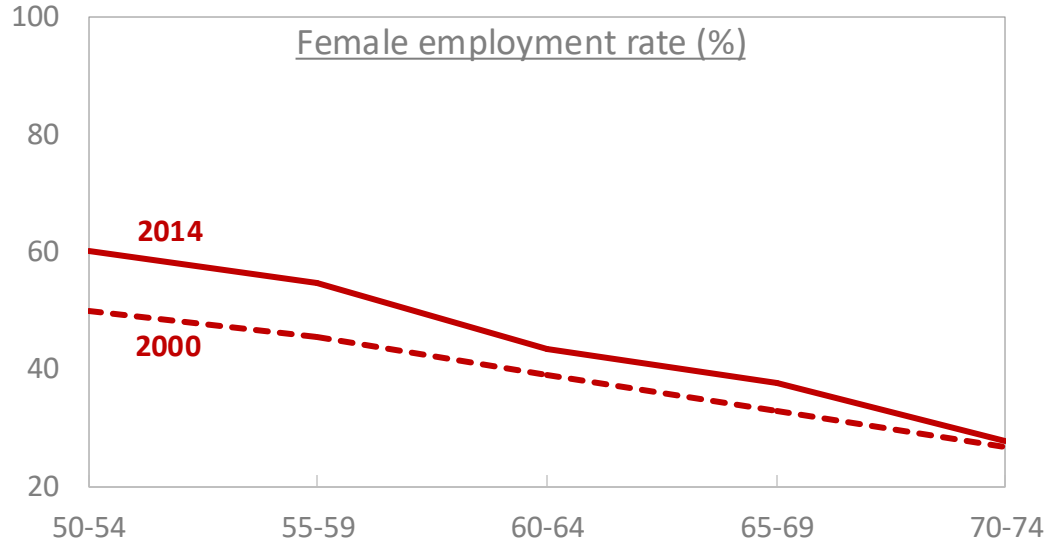
3A. But migration and cultural change implied by living arrangements suggest less family support at older ages

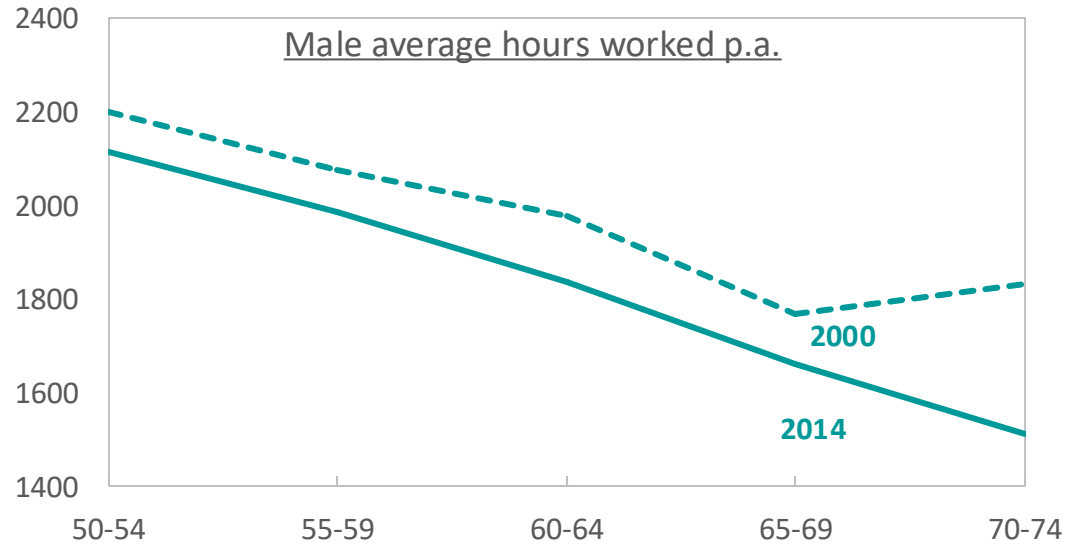


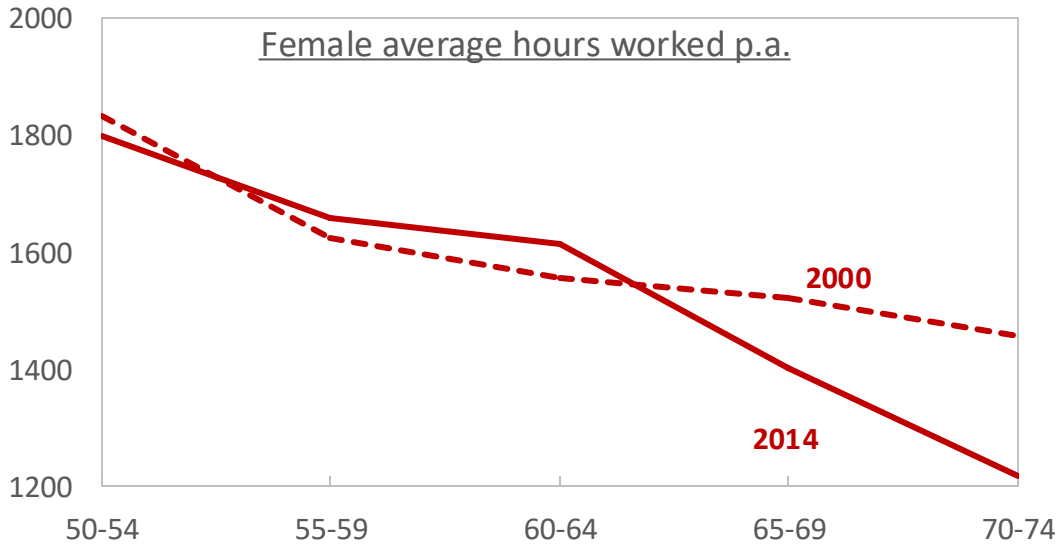


3B. Employment declines at older ages

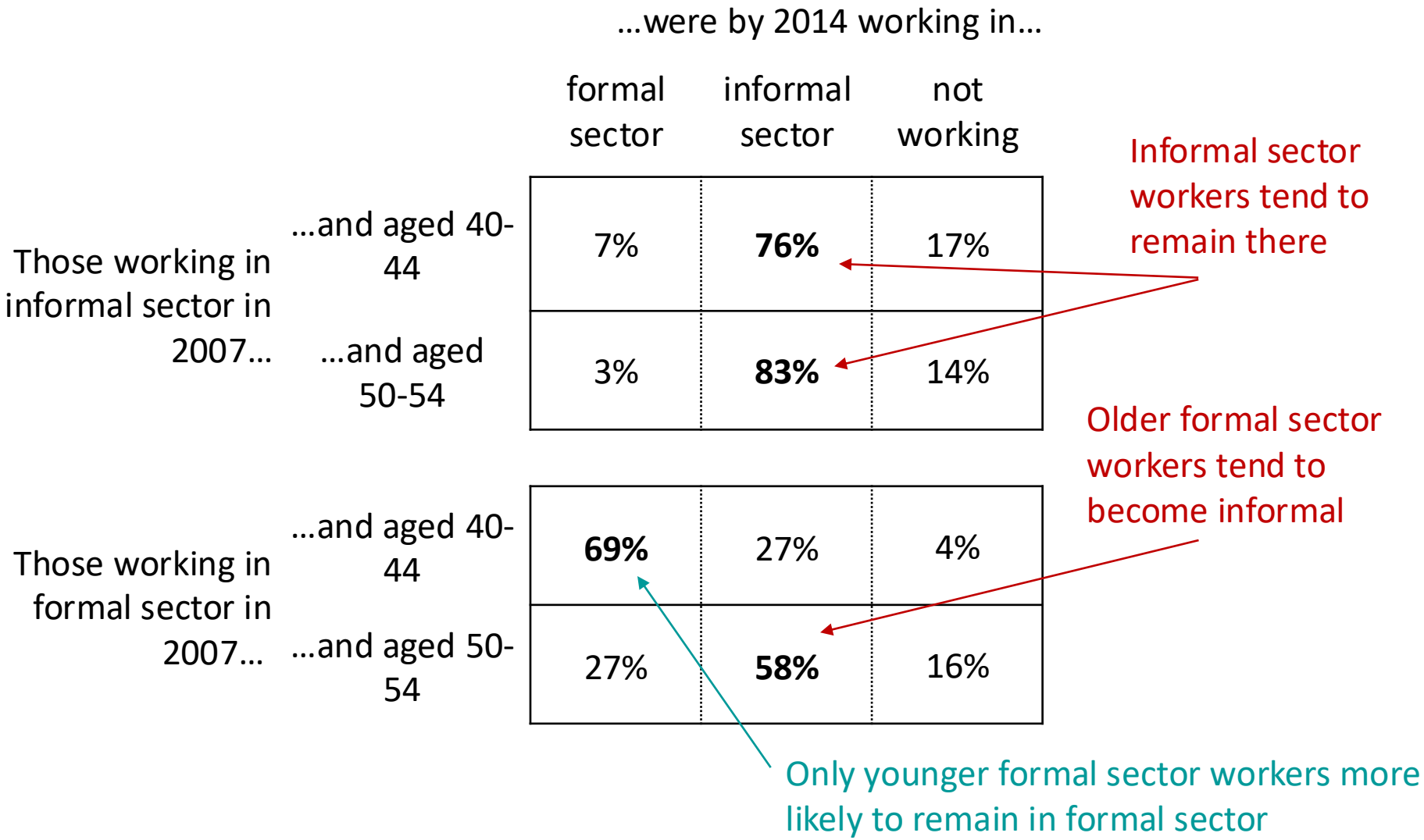




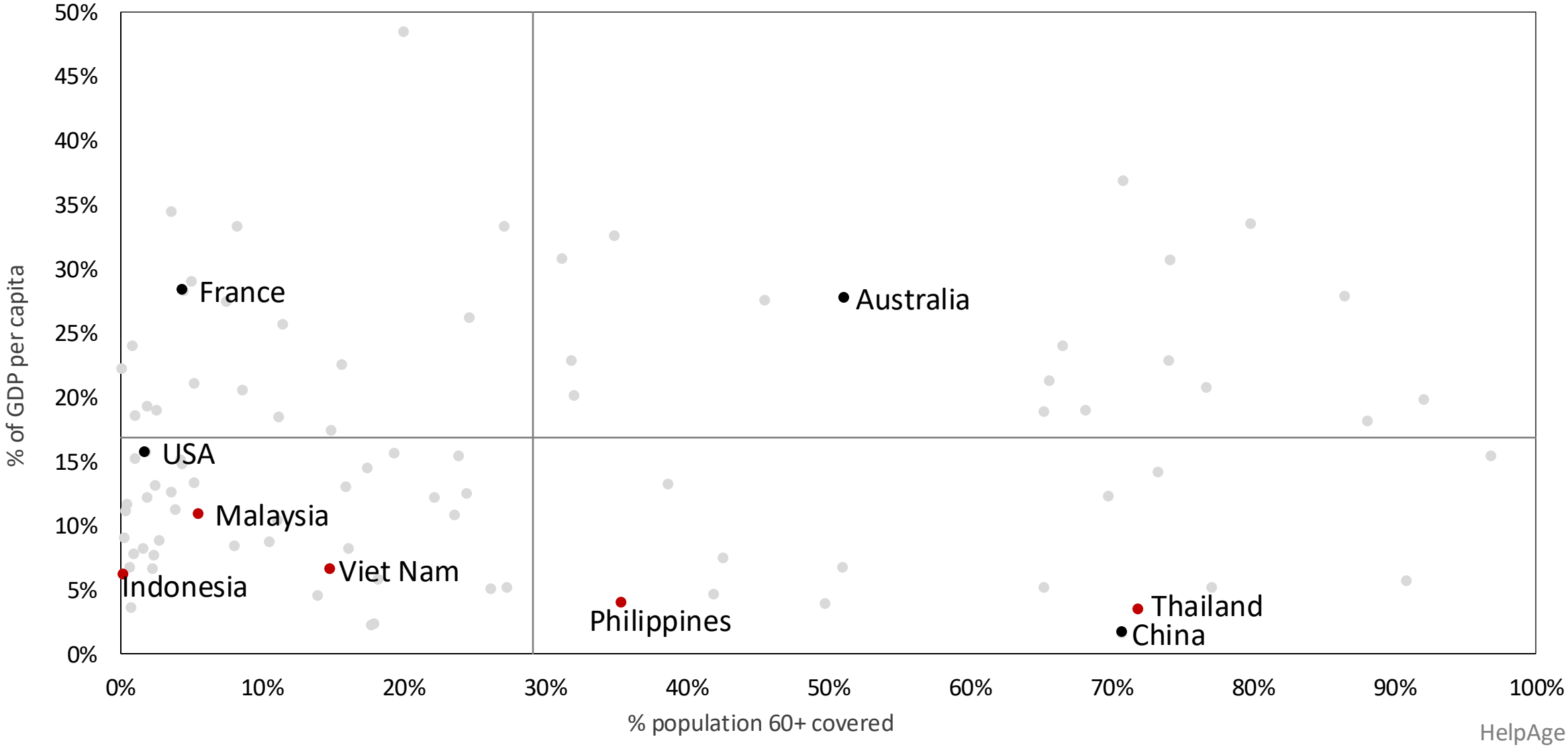




4. High informal labour force participation, with little formalisation



5. Social protection: low benefits, low coverage



HelpAge 2018

But there is a promising policy reform context

- Retirement age increase for PAYG pensions
- Use of digital technology for ID information, easing identification for eligibility
- Establishing an adequate social pension for all non-PAYG pension recipients.

THE MODELLING CHALLENGE

- To determine policy formulation to deliver retirement support in emerging Asia countries that is *adequate*, *equitable* and *sustainable*

- To provide cutting edge economic modelling tool for their analysis

Motivation for the modelling work

- Undeveloped social security (public pensions) for elderly in SEA
  - Low coverage (e.g., $\approx$ no coverage for informal labour), low benefit (see Kudrna, O'Keefe & Piggott 2022)
- High and persistent informality (Indonesian Family Life Survey (IFLS))
  - Around 80% of the workforce informal, with share increasing significantly after retirement age (57 now)
  - Transition from informal to formal labor low ($\approx$ 10%), falling significantly at older age
  - Low income at older age, mainly from working and family transfers (see Kudrna, Le & Piggott 2022)
- Demographic change and population aging (United Nations (UN))
  - Falling number of adult children, impacting transfers to elderly parents
  - Elderly living longer
  - Increasing old-age dependency ratio (e.g., 5-fold increase in Indonesia 2020-2100)

Literature

- Population ageing and pension policy in Emerging Asia
  - Song et al. (2015), Curtis et al. (2015) both applied to China (no employment type heterogeneity)
  - Our contribution to model formal and informal labor and uncertain income, evaluating proposed social pensions targeted to informal labor
- Pension policy and informality in Emerging Latin America
  - Jung and Tran (2012) applied to Brazil (long run analysis of extending social security to informal labor)
  - Albagli et al. (2020) and McKiernan (2021), applied to pension reforms in Chile
  - Sectoral choice in above models – But note: Drivers of informality different in Latin American countries (Levy 2008) vs. emerging Asia (Rothenberg et al 2016)
- Our contribution: Pension policy development and modeling in emerging Asia (different policy for formal vs. informal labor)

What we do and how

- Objective: Examine pension policies, aiming to increase pension coverage and adequacy, and welfare:
  - Increasing retirement age and contributory (PAYG) pension coverage for **formal labor**
  - Extending pension coverage to **informal labor** via non-contributory (modest) social pensions
  - Examine economy-wide (lifecycle, macro, welfare) effects of these policies under demographic transition
- Approach: Develop a stochastic, general equilibrium, overlapping generations model with formal and informal labor, featuring:
  - Household lifecycle, with multiple generations of different employment/skill workers facing stochastic labor productivity
  - Optimization problem with consumption, labor supply, retirement and savings decisions, and bequest motive
  - Detailed micro calibration (of household behavior) to IFLS data

OLG structure

- IFLS data, match labor supply, earnings and assets
- Formal labor pays income, payroll and consumption taxes, subject to formal retirement age and PAYG pension
- Informal labor (self-emp + workers with no health ins.) pays no taxes (limited c-taxes); they face no retirement age and receives no pensions

Households

- Populated by overlapping generations (16 cohorts aged 20-24,.. 95-99) of 4 household types (estimated from IFLS 2000-14)[6]
  - Formal labor, low skill type
  - Formal labor, high skill type
  - Informal labor, low skill type
  - Informal labor, high skill type
- Households face stochastic labor productivities (by household type), with only formal-high skill labor subject to income tax and (PAYG) pension policy (retirement age at 55)
- Households decide on consumption-saving and leisure-labor over lifecycle, by solving their utility maximization problem[7] ▸ household problem

IFLS: definition of informal labor

- Based on definition by ILO (2018) $=$ employees not subject to national labor legislation, income taxation, social protection or entitlement to certain employment benefits $+$ others with non-fixed premises and size of ≤ 5 employees
- Our definition: all self-employed $+$ employees with no health insurance and/or any other medical expenditure from employers (in IFLS – an ongoing longitudinal survey in Indonesia, representative of $\approx 83\%$ of Indonesian population)
- Our focus on IFLS waves in 2000, 2007, 2014

Firms, government and markets clearing

- Production sector – demands capital and effective labor inputs from both formal and informal labor to produce aggregate output[8]
- Government – runs fiscal and PAYG pension budgets, balanced by consumption and payroll taxes [Note: Progressive taxation of income and consumption[9], with PAYG pensions to formal high-skill labor]
- Market clearing – labour, capital and goods markets all clear

Calibration of the benchmark model

- The benchmark economy assumed to be in a stationary steady state equilibrium, calibrated to Indonesia (2000-2019)
- We target micro data (from IFLS 2000-2014, provided above), macro-level and fiscal policy data prior to COVID-19
- Stationary demographic structure fitted to UN (2019) demographic data – with inputs for population growth rate and survival rates
    - Note: Demographic transition simulations adopt time-variant demographic inputs derived from UN medium fertility variant projection
- Tax and pension policy differentiated by household employment type (formal vs. informal) (even for consumption taxes)

Pension Reform – Our Approach

- Scenario 1) Baseline aging: use UN medium (fertility) population projections for Indonesia, with survival probabilities for 2020-2100 and pop growth (of newborn cohort), closely matching UN dependency ratio for 2020-2100.

- Scenario 2) Increasing formal retirement age from 55 to 65 (over the first 25 years of transition) – directly impacting only formal high [Note: under this (in Indonesia already legislated) change, their productivity increases for ages 55-64 in the long run but they pay payroll tax for 10 more years and receive pensions from 65]

- Scenario 3) Scenario 2 plus introducing social pension (in 2020-25) with value of 6.5% of per capita GDP – this flat rate is paid everyone at age 65 and over, except for high-skill formal group that gets PAYG pension. [Note: this social pension is non-contributory with the expenditure part of government fiscal budget]

- Under each scenario above, there are two public budget constraints – Government fiscal budget and PAYG pension constraints balanced by consumption tax rate and payroll tax rate, respectively.

Macro & fiscal effects in long run

Selected macroeconomic and fiscal effects in long run*

Variable	Benchmark	Scenario 1[i] (aging only)	Scenario 2[ii] (+ reform 1)	Scenario 3[iii] (+ reform 2)
Effective labour	100.00	83.71	87.68	85.79
Wage rate	100.00	118.83	117.18	115.15
Output (GDP)	100.00	99.43	102.77	98.80
Private consumption	100.00	109.34	114.69	112.01
Capital stock	100.00	131.66	133.16	124.38
Interest rate p.a. (%)	5.93	3.88	4.03	4.23
PAYG pension cost[a]	1.00	3.06	2.72	2.66
Social pension cost[a]	0.00	0.00	0.00	1.80
PAYG contribution rate (%)[b]	5.46	19.44	13.68	13.69
Consumption tax rate (%)[c]	9.49	11.04	9.60	12.93

Notes: *Indexed to benchmark equilibrium (= 100), if not stated otherwise; [i]Aging equilibrium with changes in payroll tax and consumption tax balancing govt budgets; [ii]As in Scenario 1 but also with increased retirement age for formal high skill; [iii]As in Scenario 2 but also including new social pensions - flat benefit at 6.5% of benchmark GDP to all those 65+ not receiving formal pension; [a]% of benchmark GDP; [b]Adjusted to balance PAYG pension budget; [c]Adjusted to balance government budget.

Welfare effects in long run

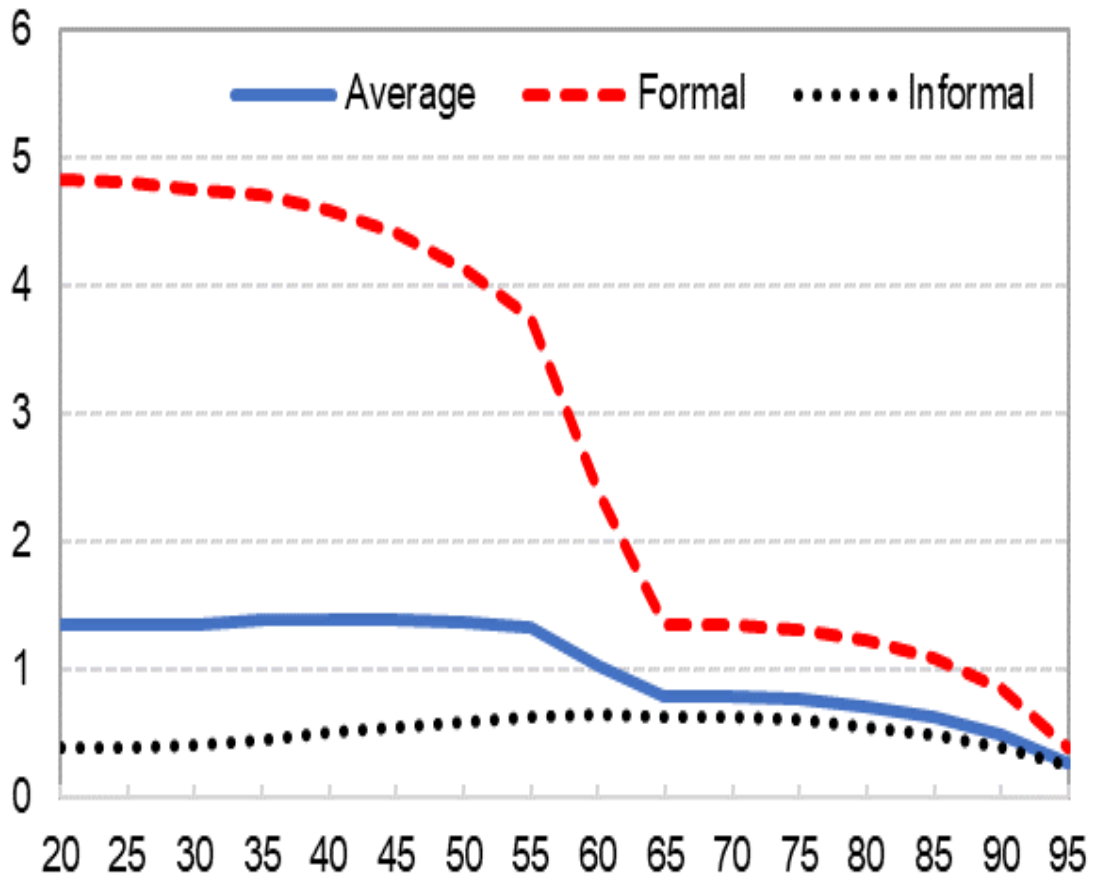
Welfare effects in long run*

Variable	Scenario 2[i] (+ reform 1)	Scenario 3[ii] (+ reform 2)
New born		
- Average	1.35	1.60
- Formal	4.82	4.16
- Informal	0.39	0.90
At age 65		
- Average	0.80	4.48
- Formal	1.35	1.60
- Informal	0.64	5.33

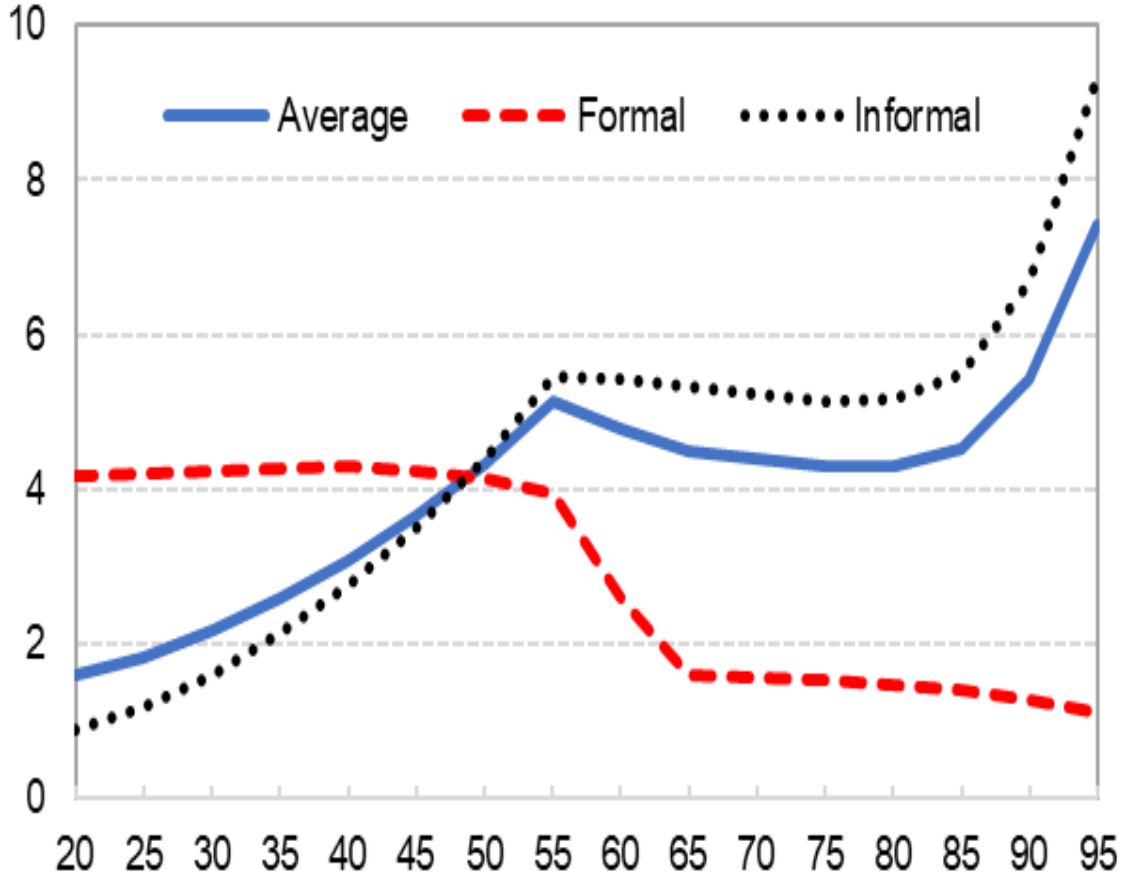
Notes: * % change in utility levels relative to Scenario 1 (aging only); [i]Increased retirement age for formal high skill under aging; [ii]As in Scenario 2 but also including new social pensions - flat benefit at 6.5% of benchmark GDP to all those 65+ not receiving formal pension.

Welfare effects in long run

Scenario 2



Scenario 3



CONCLUSIONS

Conclusions

- Using a stochastic OLG model calibrated to Indonesia (IFLS data) with large informal labor, we examine pension policies targeted at
  - Formal labor – increasing coverage and retirement age (that are being implemented gradually in Indonesia)
  - Informal labor – introduction of social pensions (non-contributory, modest, public benefits for informal elderly)
- **Simulation findings** support overall reform with these targeted policies (and means testing of social pensions mitigates increasing fiscal cost due to ageing)
- **Future work**:
  1) Occupational (sectoral) choice built into OLG model with self-employed, subject to labor market frictions to match employment transitions derived from IFLS
  2) Endogenous intergenerational links (Abbott et al 2019) built into OLG model with fertility choice, adapted to emerging economy with high & persistent informality

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