Child-Related Transfers, Means Testing, Maternal Labor Supply and Welfare*

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Abstract

This paper revisits the question of whether government transfers should be means-tested or universal, with a focus on child-related transfers. We begin by documenting an M-shaped life-cycle pattern in maternal labor supply in Australia, a country with relatively generous but tightly means-tested child benefits. To assess the implications of these transfers for labor supply and welfare, we develop a dynamic general equilibrium life-cycle model of single and married households that incorporates uninsurable earnings and longevity risks, along with endogenous female labor supply and human capital accumulation. Our results show that replacing the current means-tested system with a universal transfer scheme increases maternal labor supply, aggregate output, and ex-ante welfare, while also securing majority support. However, this shift entails substantial fiscal costs, raising the tax burdens and reducing the net lifetime income and welfare of single mothers, the intended beneficiaries. Moreover, once implemented, a more expansive universal regime receives continued majority backing despite its regressive distributional consequences. We show that either reducing baseline universal benefit generosity or implementing incremental reforms—such as easing the phase-out rates of childcare subsidies—can achieve a more equitable distribution of benefits by containing fiscal costs. The latter, in particular, yields modest yet broadly inclusive gains in welfare for both parents and non-parents. Overall, our findings highlight the complex trade-offs between efficiency and equity in the design of child-related transfer policies.

JEL: E62, H24, H31

Keywords: Child-Related Transfers; Means Testing; Universal Transfers; Female Labor Supply; Welfare; Dynamic General Equilibrium

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1 Introduction

Advanced economies implement child benefit policies to support low-income families with dependent children, namely child-related transfers or child benefits. These transfers—including work conditional or unconditional lump-sum payments, childcare subsidies, and child tax credits—typically fall into two broad categories: *universal programs*, which provide equal support to all families with children regardless of income, and *means-tested* programs, which target assistance to low-income households. Means testing allows governments to direct resources to families most in need, helping achieve redistributive goals at a lower fiscal cost. However, the withdrawal of benefits as income rises creates high effective marginal tax rates, particularly for secondary earners—often married mothers—who may face steep disincentives to work. As a result, while means testing can enhance household welfare and mitigate tax burdens, it may also undermine efficiency by discouraging labor supply.

The optimal design of a child-related transfer system has long been a subject of debates in macroeconomics and public finance, particularly in light of the persistent challenges of balancing efficiency, equity, and fiscal sustainability. In a seminal work, Guner et al. (2020a) examine the effects of child-related transfers on labor supply and welfare in the U.S. context, finding that means testing yields larger welfare gains—or smaller losses—than universal schemes. More recently, Hannusch (2025) extends this literature by analyzing how different child benefit designs shape maternal labor supply across advanced economies, contrasting Denmark's universal approach with the U.S.'s means-tested approach. The study shows that adopting Denmark's universal system could narrow maternal employment gap in the U.S. However, Hannusch (2025) abstracts from assessing welfare implications, leaving open the normative evaluation of alternative policy regimes outside the U.S. setting. Evidence remains limited on whether child-related transfers should be means-tested or universal in countries with substantially different tax and transfer frameworks. This paper aims to fill this gap by providing new insights from Australia's unique policy design, which offers a distinctive counterpoint to both European and U.S. approaches to supporting families with children.

Over the past decade, Australia has allocated approximately 2–2.5% of GDP annually to family transfers—more generous than in the U.S. and comparable to many Northern European countries, including Denmark. However, unlike Denmark and the U.S., Australia delivers generous benefits through tightly targeted and complex means-testing rules.[1] The two main programs—the Family Tax Benefit (FTB), an unconditional lump-sum transfer for eligible families, and the Child Care Subsidy (CCS), which subsidizes formal childcare conditional on the secondary earner's employment—are both strictly means-tested based on joint family income. Together, these programs account for roughly 70% of total family transfers and impose steep work disincentives on married women whose earnings fall within the phase-out ranges.

To motivate our analysis, we begin by documenting two stylized facts using Australian household survey data. First, maternal labor supply exhibits a distinctive M-shaped pattern over the life cycle, with significant reductions in work hours during the child-rearing years. Second, for low-income families, each child-related transfers can account for up to 40% of household income, underscoring their critical role in supporting household welfare. To reconcile these two empirical observations, we develop a simple model illustrating how the interaction between transfer generosity and the stringency of means testing shapes maternal labor market behavior and welfare outcomes.

To quantify these mechanisms, we develop a dynamic general equilibrium life-cycle model of single and married households. The model features endogenous female labor supply and human capital accumulation,

[1] Even though Australia operates an individual-based income tax system, the country has a long history of operating a comprehensive means-tested child benefit system based on family income since the introduction of the New Tax System (Family Assistance) Act in 1999. Both Australia and Denmark provide generous lump-sum child benefits. However, a substantial portion of child-related transfers in Denmark is universal, while Australia applies a detailed set of means-testing rules based on demographic characteristics and joint family income. In contrast, the U.S. does not provide lump-sum child benefits, instead relying on tax-based programs—such as the Child Tax Credit (CTC) and the Earned Income Tax Credit (EITC)—which deliver relatively lower levels of benefits. These are means-tested but often non-refundable, so low-income households with little tax liability may receive limited or no support.

allowing for dynamic feedback from career breaks on mothers' future wages. Households vary exogenously by marital status, number and age of children, and education, and face uninsurable income and longevity risks. Within our framework, the interaction between these risks and childrearing costs generates demand for private insurance (through savings and maternal labor supply) and public insurance (through progressive taxes and transfers). Additionally, to enable incremental reforms to means-testing rules in our policy experiments, we explicitly model the statutory structure of Australia's child-related transfer programs—specifically, the FTB and the CCS.

We discipline the benchmark model using 2012-2018 Australian macroeconomic aggregates and household microdata. Using this benchmark model, we quantify the implications of structural child-related transfer reforms—such as universalization—on maternal labor supply, macroeconomic aggregates, and household welfare, in line with Guner et al. (2020b) and Hannusch (2025). Additionally, we extend our analysis to a broader set of policy counterfactuals, including incremental reforms (e.g., reducing benefit phase-out rates) and abolition of child-related transfers. Each reform is implemented in a budget-neutral fashion, with adjustments to the progressive income tax schedule to maintain fiscal balance. This setup allows us to analyze both the benefit-side and financing-side effects on maternal labor supply and welfare.

Our analysis yields several key findings. First, the baseline universal system significantly boosts maternal labor supply, output, and (ex ante) welfare for newborn households. By eliminating means testing, the reform removes effective marginal tax rate (EMTR) spikes faced by secondary earners—predominantly married women—which unleashes their labor supply and human capital potential. Married households, especially those with low education, are the principal beneficiaries. This mechanism aligns with Hannusch (2025), who documents child-related transfer design shapes maternal labor supply across countries. However, our welfare results contrast with those of Guner et al. (2020b), who—based on the U.S. policy context—find that means testing outperform universality in welfare terms. This divergence highlights that universal systems are not universally welfare-improving. One explanation lies in institutional differences: Australia's child-related transfers are more generous, more complex, and more tightly means-tested based on family income than their U.S. counterparts. As a result, removing these distortions generates larger efficiency gains, which more than offset the fiscal costs associated with universality. Put differently, the welfare impacts of reform might depend critically on the institutional features of the baseline system, including the generosity and targetedness of existing benefits.[2]

Second, while universal child-related transfers deliver aggregate efficiency gains, they generate regressive distributional consequences. Married households benefit, but single mothers suffer welfare losses. Once children age out of eligibility, single mothers—who lack spousal income (family insurance)—must rely solely on their own earnings and savings. Under a universal system, the higher fiscal costs raises the average tax rate by approximately 4 percentage points, which reduces their lifetime disposable income by more than the value of the transfers they receive and causes declines in lifetime consumption and welfare. This illustrates how a universal system—such as the Danish model analyzed in Hannusch (2025)—can improve maternal labor supply and average welfare, but may compromise equity when the adverse effects of tax financing are taken into account.[3]

Third, we identify a more equitable middle-ground universal policy: a scaled-down universal system that halves benefit payment levels. This version generates a tax burden comparable to that of the current means-tested regime, meaning the reform primarily changes the structural design of the system rather than the fiscal size. The removal of means-testing, combined with the reduced tax burden, yields aggregate welfare gains while shielding single mothers from welfare losses. However, the distribution of gains shifts. Childless households and low-education parents—who constitute a majority—experience marginal losses in welfare. In contrast, incremental reforms within the existing means-tested framework, such as reducing the subsidy (CCS)

[2]Disincentives to work embedded in the present Australian tax and transfer system have been highlighted in government policy review papers (e.g., Treasury 2023 and Treasury 2024).

[3]In this study, '*Equity*' refers to the ex-ante distribution of welfare gains and losses across demographic groups (prior to earnings shock realization). A reform is considered equitable (or inclusive) if no group experiences a welfare loss in expectation, after household type is realized.

phase-outs, deliver inclusive welfare improvements. By easing the means test without altering subsidy rates, this design encourages married mothers across education levels to work more. The resulting expansion of the tax base, coupled with the reform's low financing needs, reduces the overall tax burden. Ultimately, it yields positive welfare outcomes for both parents and childless households, although the gains are more modest than those achieved under universal systems.

We next analyze the implications of abolishing the FTB and the CCS, effectively dismantling Australia's core child-related transfer system. This radical reform yields double-digit gains for maternal labor supply and nearly 4% increase in output, the largest macroeconomic improvements among all policies considered. Despite these strong aggregate outcomes, welfare declines by 0.66% for newborn households. Higher output, in this case, does not translate into higher welfare. The loss is concentrated among vulnerable groups, particularly single mothers, who rely on public transfers to smooth consumption during periods of low income and high childcare costs. This result underscores a central trade-off: while abolishing means-tested transfers eliminates behavioral distortions and boosts efficiency, it also removes the insurance and redistributive functions of the system, producing highly uneven distribution of welfare outcomes.

Finally, we evaluate the political feasibility of these reforms by comparing welfare gains and losses across demographic types. Our findings show that universalization and its expansion garner strong majority support from married households, despite its regressive effect on single mothers, the most disadvantaged group. In contrast, easing CCS phase-outs is unanimously preferred over the current system, but are politically dominated by universalization when the two options are presented head-to-head. This reflects a tension between majority rule and inclusive welfare design.

In summary, while our analysis offers a blueprint for efficiency-enhancing and inclusive reform in Australia, its implications extend beyond the national context. For Australia, we show that the current means-tested child-related transfer regime is redistributive but efficiency-limiting. Transitioning to a universal system improves maternal employment and aggregate welfare but undermines fiscal sustainability and equity. Incremental reforms strike a better balance, yet lack majority backing. We also reveal that once universal child benefit regimes are adopted, they can become politically entrenched, locking in inequitable systems even when more balanced alternatives exist. Furthermore, our findings suggest that policy lessons from countries like the U.S. or Denmark may not be readily applicable across institutional contexts. Ultimately, it is not only the design of transfer policies that matters, but also the baseline institutions, as well as the sequencing and framing of reforms, which together shape their feasibility, durability, and long-run welfare of society.

Related literature. This paper contributes to a rich literature at the intersection of public finance, labor economics, and macroeconomic policy, focusing on the design of child-related transfer systems and their implications for maternal labor supply, macroeconomic, and welfare outcomes. By providing evidence from Australia, our analysis offers new insights into the ongoing research and debate over whether child-related transfers should be means-tested or universal.

We build on a large body of macroeconomic research on fiscal policy, female labor supply, and household welfare. A number of studies explore how tax systems influence women's labor force participation and work hours (e.g., Baker et al. 2008, Guner et al. 2012a, Guner et al. 2012b, Bick 2016, and Bick and Fuchs-Schündeln 2018). For example, Guner et al. (2012a,b) model the joint labor supply of married couples in the U.S., highlighting the disincentive effects of joint taxation. Bick and Fuchs-Schündeln (2018) analyze 17 European countries and the U.S., showing that differences in tax policy are a major factor explaining cross-country variation in labor supply of married men and women. More recent developments focus on the design of social insurance and family transfer programs, including social security (e.g., Kaygusuz 2015, Nishiyama 2019, and Borella et al. 2020) and child-related transfers (e.g., Guner et al. 2020a and Hannusch 2025).

Our paper contributes new insights to the latter strand of the literature. Guner et al. (2020a) develop a dynamic general equilibrium life-cycle model to evaluate U.S. child-related transfer policies, finding that targeted (means-tested) transfers can outperform universal programs in terms of welfare. Hannusch (2025) underscores the importance of institutional differences in child benefit policy design in explaining cross-country variation in maternal employment. Using a U.S.-based model, the study simulates the adoption of Denmark's universal child benefit system and finds substantial gains in maternal labor supply. Our study complements Hannusch (2025) by incorporating the financing aspect of reform and assessing welfare outcomes, and extends Guner et al. (2020b) by offering new insights from Australia's policy design. Methodologically, we extend frameworks in both studies by incorporating uninsurable earnings and longevity risks, which elevates the role of private insurance (via savings and labor supply) alongside public insurance (via taxes and transfers) in shaping household welfare. In addition, we model the statutory design of child-related transfers, which allows us to evaluate incremental reforms to means-testing rules.

Our focus on means testing relates our work to the vast literature on means-tested social insurance (e.g., Feldstein 1987, Hubbard et al. 1995, Neumark and Powers 2000, Tran and Woodland 2014, Braun et al. 2017, and Iskhakov and Keane 2021), which highlights the fundamental trade-off between providing insurance and preserving work incentives. These studies generally find that means testing can distort labor supply and savings decisions, but striking a balance between insurance and incentives potentially improves welfare. Drawing on institutional features and household structures in Australia, our paper shows that a well-designed means-tested child-related transfer system can promote both macroeconomic and distributional objectives. While a universal system may enhance overall welfare, it risks entrenching unintended distributional outcomes that undermine original policy objectives.

A longstanding body of empirical research shows that female labor supply is highly responsive to tax and transfer policies. Seminal studies such as Eissa and Liebman (1996) find that expansions of the U.S. Earned Income Tax Credit (EITC) significantly increased labor force participation among single mothers, while Eissa and Hoynes (2004) show that the EITC's joint income phase-out reduces married women's employment. More broadly, empirical studies including Blau and Robins (1988), Averett et al. (1997), Lundberg et al. (1997), Blundell et al. (1998), and Geyer et al. (2015) demonstrate the importance of transfers, wages, and taxation in shaping women's labor supply, human capital accumulation, and household welfare. Australia-specific evidence from Doiron and Kalb (2005), Breunig et al. (2011), Breunig et al. (2012), Gong and Breunig (2017), and Hérault and Kalb (2022) reaches similar conclusions. We contribute to this literature by developing a structural, micro-founded macroeconomic model that replicates these observed behavioral patterns and quantifies the long-run aggregate and distributional impacts of child-related transfers in the Australian context. Our work also adds to the growing literature on the macroeconomic effects of fiscal policy in Australia (e.g., Tran and Woodland (2014), Kudrna et al. (2022), Tran and Zakariyya (2022), and Tin and Tran (2023)), offering new insights by focusing on the design and reform of child benefit programs.

The political economy of redistribution provides further context for our analysis. Meltzer and Richard (1981) present the canonical model in which redistributive policies reflect the preferences of the median voter. Guner et al. (2020a) echo this insight, showing that child-related transfers may be rejected under majority voting if the median voter is a net contributor. Korpi and Palme (1998) argue that targeted programs tend to receive weaker political support than universal ones, particularly in countries with encompassing welfare institutions. Our paper contributes to this literature by quantitatively demonstrating how generous universal schemes can garner majority support even when more equitable and fiscally efficient targeted alternatives exist. We also highlight the risk of political lock-in, whereby popular yet inequitable universal regimes, once adopted, become resistant to reform.

The paper hereinafter proceeds as follows. Section 2 motivates the quantitative analysis by presenting stylized facts and a simple theoretical model. Section 3 provides the full dynamic general equilibrium model. Section 4 describes the internal and external calibration procedures, and reports the benchmark model performance. Section 5 presents main results and discussion. Section 6 concludes. The Appendix provides detailed information on the child-related transfer programs, the model solution algorithm, and supplementary results and statistics.

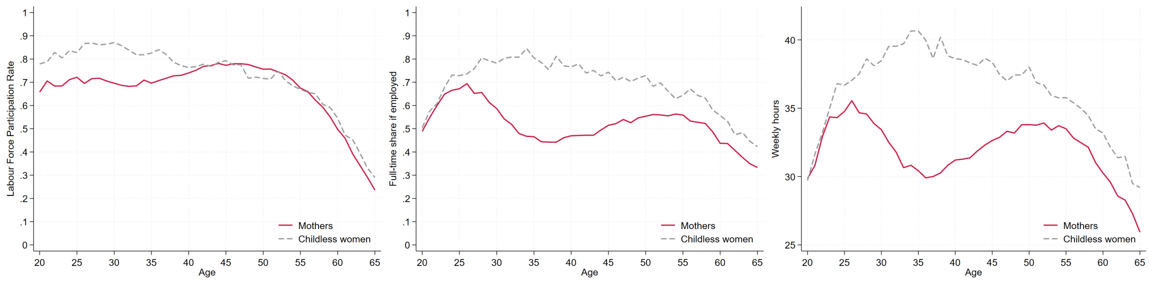
2 Motivation

This section presents key empirical patterns, institutional context, and theoretical insights that motivate our quantitative modeling approach.

2.1 Stylized facts

Drawing on data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey, Restricted Release 20 (2001–2020), we document two central stylized facts: (i) the distinct life-cycle pattern of maternal labor supply in Australia, and (ii) the significant role of means-tested child-related transfers in shaping household income and out-of-pocket childcare costs, particularly among low-income families. Together, these facts underscore the behavioral relevance and distributional stakes of Australia's child-related transfer system.

Maternal labor supply over the life cycle The presence of dependent children is associated with a marked divergence in women's labor supply over the life cycle. Mothers consistently exhibit lower labor force participation and work hours than childless women, with the largest gaps occurring during the prime child-rearing years. As shown in Panel (a) of Figure 1, maternal participation rates lag behind those of childless women by 10 to 15 percentage points (pp) throughout their 20s and 30s. The gap is widest in the early 30s and narrows as women enter their 40s, at which point the profiles begin to converge. In contrast, fathers maintain consistently higher labor force participation rates than non-fathers throughout the life cycle (Appendix Figure B.1).[4]



((a)) Labor force participation ((b)) Full-time rate ((c)) Work hours

Figure 1: **Life-cycle patterns in labour force participation, full-time employment, and hours worked: Mothers vs. Childless women.**

Notes: The age profiles are constructed by stitching together 20-year life-cycle snapshots from selected birth cohorts. The youngest cohort covers ages 20–39 in the data, while the oldest cohort spans ages 75–94.

More striking are the differences in full-time employment and work hours. Panels (b) and (c) of Figure 1 reveal a pronounced M-shaped pattern in both the full-time employment rate and weekly hours worked profiles among mothers. Among employed mothers, the share of full-time workers declines sharply from 70% in their mid-20s to a trough of 45% by mid-30s, before gradually but incompletely recovering in later years. In contrast, nearly 80% of employed childless women work full-time across the life cycle. Since maternal labor force participation remains relatively stable over the same period, this pattern mainly reflects a shift from full-time to part-time work during child-rearing years rather than an exit from the workforce. Indeed, this transition is mirrored in average weekly hours. Mothers work fewer than 35 hours per week for much of their working lives, compared to 35–40 hours for childless women. The gap peaks around age 35, with employed mothers working approximately 10 hours less per week on average. Although these disparities diminish with age, they never fully close, suggesting lasting impacts for human capital accumulation and lifetime earnings.

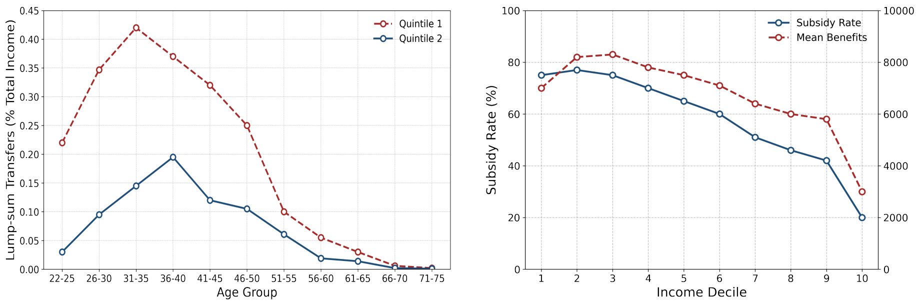
[4]Maternal labor supply in Australia exhibits distinct patterns compared to the United States, Denmark, and many other OECD countries (see Figures 2 and 11 in Hannusch 2025 for comparison).

Child-related transfers Public transfers to families with children have long played a central role in Australia's welfare architecture. Over the past decade, these transfers have accounted for 2–2.5% of GDP annually, a level comparable to that of many European welfare states. Additionally, unlike in the U.S., where child-related support is largely administered through the tax system, Australia delivers these benefits primarily through dedicated social assistance programs.

The two flagship programs are the Family Tax Benefit (FTB)—a lump-sum, unconditional transfer not tied to work participation—and the Child Care Subsidy (CCS)—a conditional subsidy that depends on the work hours of the secondary earner. Both programs are strictly means-tested on joint family income and can be received concurrently. Together, they constitute roughly 70% of total public spending on family transfers (2018-19 budget report) and each covers around one million families, representing over half of all households with children under the age of 16.[5]

Family Tax Benefit (FTB). The FTB consists of two components**.** FTB part A (FTB-A) is paid per child and is the larger component in terms of both payment size and coverage. The benefit phases out in two steps: first at a low income threshold for the maximum payment rate, and again at a higher threshold for the base rate. Payment levels also decline with the age of the child and vary by family characteristics such as number and age of children and marital status. Correspondingly, the income thresholds differ across household types**.** FTB part B (FTB-B) provides additional per-family support, particularly for single parents and single-earner couples. Eligibility depends on the income of the primary earner (extensive margin), while the payment amount is adjusted based on the income of the secondary earner (intensive margin). Similar to the FTB-A, families with younger children receive higher higher transfers.

Panel (a) of Figure 2 illustrates the share of total household income accounted for by FTB over the life cycle for families in the bottom two income quintiles. Among the lowest quintile, FTB payments comprise 25% to 40% of household income during child-rearing years (late 20s to early 40s). Even in the second quintile, the FTB share reaches up to 20%. Thus, these benefits are substantial during key stages of the family life cycle, underscoring their potential impact on both consumption smoothing and labor market incentives.[6]



((a)) Family Tax Benefit ((b)) Child Care Subsidy

Figure 2: **Child-related transfers**

Notes: (*) Panel (a) depicts the age profiles of FTB share of gross household income for the lower two family income quintiles in 2018; (**) Panel (b) uses data from Table 61 in the 2021 report by the AIFS, and shows the effective subsidy rates and mean benefits of the CCS by income decile.

Child Care Subsidy (CCS). The CCS subsidizes the cost of formal childcare for children up to age 13. While it is means-tested on joint family income like the FTB, it also incorporates an activity test, under which the base subsidy rate depends on the secondary earner's work hours. In 2018, households in the lowest income tier could receive a base subsidy rate of up to 85% of childcare costs if the secondary earner worked at least 48

[5]As of June 2018, 1.4 million families received FTB payments, of which 77% received both Parts A and B benefits (AIHW report 2022). In the December quarter of 2018, the CCS covered 974,600 families (Child Care in Australia report 2018). This study excludes the Paid Parental Leave program, which represents a smaller share of family assistance expenditures. Detailed information on all government payments to families in Australia is available from Service Australia. Appendix Section A provides a detailed summary of program rules and eligibility parameters.

[6]We show in Appendix Figure B.4 that for the third quintile households, the FTB share does not exceed 5%.

hours per fortnight. This base rate is scaled down for shorter work hours. In our model, labor supply is used to determine eligibility under the activity test, although the real-world criteria also include non-work activities such as job training and volunteering.

Figure 2(b) shows the distributional incidence of CCS benefits. Households below the median income receive average subsidy rates of 70-75%, equivalent to approximately AUD $8,000$ in annual support. Notably, the bottom decile receives slightly smaller subsidies than adjacent deciles, reflecting the effect of work-hour eligibility requirements. Still, the CCS maintains a progressive structure due to means testing, with subsidy rates declining steadily as household income rises.

In summary, child-related transfers are a major source of income support for low-income families, but their design may create substantial labor supply distortions. In particular, sharp benefit reductions under joint family income means tests impose high effective marginal tax rates on secondary earners—typically married mothers—potentially discouraging additional work effort. Cross-country evidence further highlights that Australia's maternal employment gap is not a universal feature of advanced economies with strong welfare states. For example, Hannusch (2025) documents near parity in labor supply between mothers and non-mothers in Denmark and attributes this convergence to universal child-related policies, which together minimize the implicit tax burden on secondary earners. While Australia's system is comparably generous in fiscal terms, its reliance on joint means testing may amplify distortions to maternal labor supply.

These empirical and institutional contrasts motivate our quantitative analysis. We begin with a simple theoretical model in the subsection below to build intuition. In the sections that follow, we develop a structural model to quantify how Australia's child-related transfer system contributes to observed labor market behavior and influences macroeconomic aggregates and household welfare.

2.2 A simple theoretical model

This section presents a static partial equilibrium model to illustrate how means testing can distort female labor supply decisions and affect household welfare.

We consider a partial equilibrium model with a representative household consisting of married couple with dependent children. The household chooses joint consumption c and the wife's labor supply n^f, taking the husband's labor supply n^m as fixed (inelastic). Labor is awarded at a unit wage rate, and both spouses face a flat income tax rate τ.

The household may be eligible for a means-tested lump-sum transfer, the Family Tax Benefit (FTB). We model the FTB as a means-tested transfer based on joint family income $n^m + n^f$. It provides a maximum payout $\bar{tr}$, subject to a joint-income threshold $\bar{y}$ and a phase-out rate ω. The payment schedule is given by: $FTB(n^f) = \max\left\{\min\left\{\bar{tr} - \omega(n^m + n^f - \bar{y}),\ \bar{tr}\right\},\ 0\right\}$. Childcare costs are incurred only when the wife works and are partially subsidized by the Child Care Subsidy (CCS). For simplicity, we abstract from the CCS means test and assume a linear subsidy on the wife's labor earnings: $CCS(n^f) = sn^f$, where $s \in [0,1]$ is the subsidy rate.

Let $u(c, 1-n^f)$ denote a well-behaved utility function over consumption and female leisure, satisfying standard regularity properties: $u' > 0$, $u'' < 0$, $\lim_{x\to 0} u'(x) = \infty$, $\lim_{x\to\infty} u'(x) = 0$, for $x \in \{c, 1-n^f\}$. The household's problem is: $\max_{c,n^f} u(c, 1-n^f)$ subject to $c = (1-\tau)(n^m + n^f) + CCS(n^f) + FTB(n^f)$.

Means testing introduces piecewise non-linearities in the budget constraint, affecting the marginal incentives to work. Figure 3 illustrates the three key regions:.

(1) Full-Benefit Region. When family income is less than or equal the threshold ($n^m + n^f \leq \bar{y}$), the household receives the full benefit $\left(FTB(n^f) = \bar{tr}\right)$. The effective marginal tax rate on female labor earnings is the tax rate net of the childcare subsidy: $EMTR_1 = \tau - s$.

(2) Phase-Out Region. When family income is greater than the threshold ($n^m + n^f > \bar{y}$) and lies in the phase-out region, they receive a partial benefit $\left(0 < FTB(n^f) < \bar{tr}\right)$. The household loses ω dollars of transfer for every additional dollar earned. This raises the effective marginal tax rate to $EMTR_2 = \tau - s + \omega$.

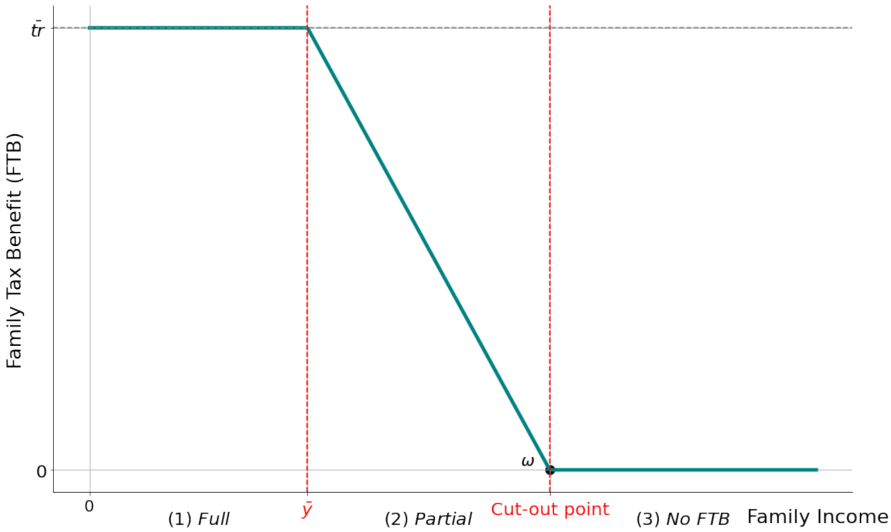


Figure 3: **Example means-tested Family Tax Benefit (FTB) schedule.**
Notes: The slope of the benefit schedule, ω, in the phase-out zone (2), between $\bar{y}$ and the cut-out point, is the taper or phase-out rate.

(3) No-Benefit Region. When family income equals or exceeds the cut-out point $\left(n^m + n^f \geq \frac{\bar{tr}}{\omega} + \bar{y}\right)$, the household becomes ineligible for the transfer $\left(FTB(n^f) = 0\right)$. The effective marginal tax rate reverts to $EMTR_3 = EMTR_1 = \tau - s$.

There are several notable transmission channels. First, the three regions show how means testing leads to high implicit tax rates that vary non-linearly with family income. For women whose combined household income is near the threshold $\bar{y}$, even a marginal increase in labor supply can significantly reduce net transfer receipts, resulting in strong disincentives to work.

Second, the interplay between policies plays an important role in shaping work incentives. In particular, overlapping benefit rules can interact in an unintended way. For instance, outside the FTB phase-out region, the female's EMTR is $\tau - s$, reflecting income tax and the childcare subsidy offset. On the contrary, within the phase-out region, the EMTR rises to $\tau - s + \omega$, highlighting how the withdrawal of transfers can partially or fully counteract the intended work incentives of the childcare subsidy, undermining the central objective of the subsidy program.

Third, a married woman's labor supply is influenced not only by statutory policy parameters ($\bar{tr}$, $\bar{y}$, and ω) but also by her partner's income n^m. As long as the household remains eligible for the FTB benefits, the following condition holds: $\bar{tr} - \omega\left(n^m + n^f - \bar{y}\right) > 0$. This can be re-written as $n^f < \frac{\bar{tr}}{\omega} + \bar{y} - n^m$, which defines the effective eligibility range for the wife's labor income. The term $\frac{\bar{tr}}{\omega} + \bar{y}$ represents the statutory cut-out point, but actual eligibility also hinges on n^m. If n^m is sufficiently high, the household is either pushed into the phase-out region—diminishing the wife's incentive to work—or entirely out of eligibility—rendering the FTB irrelevant to her decision. Conversely, if n^m is sufficiently low or zero—as in the case of single mothers—household income may remain below the threshold $\bar{y}$, regardless of her earnings if $\bar{y}$ is sufficiently large. In this scenario, marginal distortions are absent, though the positive income effect of the transfer may still reduce her labor supply.

To understand the labor supply and welfare implications of means-tested transfers, suppose preferences follow a Cobb–Douglas utility function: $u(c, 1 - n^f) = c^\nu (1 - n^f)^{1-\nu}$, where $\nu \in (0, 1)$ denotes the taste for consumption. We derive closed-form solutions for a household in the phase-out region as follows:

$$n^f = \nu - \underbrace{\frac{1-\nu}{1-EMTR}}_{(a)\text{ wage distortion}} \left[\underbrace{(1-\tau)n^m + FTB(0)}_{(b)\text{ direct IE}} \right], \tag{1}$$

$$\begin{aligned} ln(u) &= \nu ln(\nu) + (1-\nu)ln(1-\nu) - \overbrace{(1-\nu)ln(1-EMTR)}^{(c)\text{SE on leisure}} \\ &\quad + ln \left[\underbrace{(1-EMTR)}_{\text{(d) IE via wage}} + \underbrace{(1-\tau)n^m + FTB(0)}_{(e)\text{ direct IE}} \right], \end{aligned} \tag{2}$$

Here, $EMTR = \tau - s + \omega$ captures the effective marginal tax rate faced by the wife, and the term $FTB(0) = \bar{tr} - \omega(n^m - \bar{y})$ denotes the benefit received when the wife does not work.

Equations 1 and 2 reveal how child-related transfers exert opposing forces on female labor supply and household welfare. The direct income effect (IE) associated with $FTB(0)$ reduces labor supply, as seen in term (b), but raises welfare by increasing disposable resources, as shown in term (e).

In contrast, the wage distortion effect is more nuanced. Term (a) shows that a higher tapering of benefits ω increases the EMTR, thereby lowering female labor supply and earnings. However, the effect on welfare is ambiguous. Term (c) reflects a substitution away from work toward leisure as ω increases. For EMTR $\in (0,1)$, a higher EMTR contributes positively to welfare, weighted by the household's preference for leisure $1-\nu$. Term (d) captures the reduction in income, which reduces both consumption and leisure, lowering welfare.

Finally, the financing of transfers through taxation matters. The tax rate τ enters directly into the EMTR and reduces disposable income, potentially offsetting the intended benefits of the transfer. A higher τ also exacerbates distortions and reduces both efficiency and welfare.

Overall, the net welfare effects of means-tested transfers are theoretically indeterminate, warranting quantitative evaluation. The simple static model above provides useful intuition but abstracts from key features necessary for a full assessment of long-run policy impacts. In particular, it omits dynamic incentives, such as the role of female labor supply in human capital accumulation, intertemporal trade-offs through the role of savings and transfers in consumption smoothing and insuring against earnings and longevity risk, and heterogeneity in childcare costs, tax burdens, and child-related policy exposure across household types.

Hence, we develop a dynamic general equilibrium life-cycle model with heterogeneous households that addresses these limitations. This allows us to conduct a comprehensive quantitative assessment of current policies and evaluate the aggregate and distributional consequences of counterfactual reforms. The next section describes the model environment in detail.

3 A dynamic general equilibrium model

Overview. We develop a dynamic general equilibrium (DGE) life-cycle model of a small open economy featuring heterogeneous households, a representative firm with constant-returns-to-scale (CRS) technology, and a government that balances its budget each period through income taxation. Time is discrete, and each model period corresponds to one calendar year.

In the spirit of Guner et al. (2020b), our model incorporates rich household heterogeneity across wealth, education, marital status, age and number of children, child-related costs, and female human capital. Households make joint decisions over consumption, savings, and labor supply. Female labor supply is endogenous along both the participation and discrete hours margins (part-time vs. full-time), and contributes to future earnings through human capital accumulation. Male labor supply is fixed. Households cannot borrow and rely on savings and labor earnings for self-insurance.

Our framework extends Guner et al. (2020b) and Hannusch (2025) in two dimensions. First, it includes uninsurable earnings and longevity risks, capturing the dual insurance roles of private savings and public transfers. Second, it embeds statutory rules for child-related transfers. This enables us to assess both incremental and structural reforms, and their aggregate and distributional implications.

3.1 Demographics

Every period t, a new cohort of households aged $j = 1$ (equivalent to age 21 in real terms) enters the economy. Individuals begin working immediately at $j = 1$ and retire at age $J_R = 45$. The initial total population of households at time $t = 0$ is normalized to one and grows at a constant rate n. The mortality rate is time-invariant and depends on age and gender. An individual of gender $i \in \{m, f\}$ born at time t survives to age $j + 1$ with conditional survival probability $\psi_{j+1,i}$. The maximum attainable age is $J = 80$, after which $\psi_{J+1,i} = 0$.

Family structure. At entry, each household is exogenously assigned one of three family types: married with children ($\lambda = 0$), single childless man ($\lambda = 1$), or single mother ($\lambda = 2$). Married households comprise a husband and wife of identical age j and education θ. The model assumes no endogenous transitions between marital states. That is, households do not make marriage, divorce, or remarriage decision. Instead, transitions across family types are purely mortality-driven. A married household becomes a single household only upon the death of a spouse, and single households remain single until death. The mortality-contingent transition probability between family types ($\pi_{\lambda_{j+1}|\lambda_j}$) is given by:

$\pi_{\lambda_{j+1}\|\lambda_j}$	$\lambda_{j+1} = 0$	$\lambda_{j+1} = 1$	$\lambda_{j+1} = 2$
$\lambda_j = 0$	$\psi_{j+1,m}\psi_{j+1,f}$	$\psi_{j+1,m}(1 - \psi_{j+1,f})$	$(1 - \psi_{j+1,m})\psi_{j+1,f}$
$\lambda_j = 1$	0	$\psi_{j+1,m}$	0
$\lambda_j = 2$	0	0	$\psi_{j+1,f}$

Table 1: **Transition probabilities of family structure**

Children. For parent households ($\lambda = \{0, 2\}$), we abstract from fertility decisions. Instead, all women follow an exogenous fertility schedule. Each household has two children ($\bar{nc} = 2$), with identical spacing between births. However, the timing of childbearing ($b_{k,\theta}$) differs across education types: women with low education (θ_L) have children earlier than those with high education (θ_H). For a mother of education type θ, the k-th child is born at age $j = b_{k,\theta}$, and remains dependent for 18 years until age $j = b_{k,\theta} + 17$. After reaching adulthood, children leave home permanently, ending the parent-child link. The number of children for a household of age j and education θ is therefore deterministic and given by: $nc_{j,\theta} = \sum_{k=1}^{\bar{nc}} \mathbf{I}\{b_{k,\theta} \leq j \leq b_{k,\theta} + 17\}$, where $\mathbf{I}\{x\}$ is an indicator function with a logical argument x.

Child-related costs (pecuniary and non-pecuniary) and childcare quality are exogenous, deterministic, and uniform across households. Informal care options (e.g., grandparenting or neighbor help) are not available.

This setup implies that households know in advance the number and timing of children based on information about their own age j and education level θ. Thus, children are treated purely as anticipated costs. They do not contribute to the household's utility.[7] Instead, their impact is captured through consumption needs and time constraints on parents. Children do not alter the demographic structure, nor do they generate a demographic dividend. That is, they do not grow into workers within the model horizon, and investment in their upbringing does not contribute to future productivity.

3.2 Preferences

Household preferences are represented by a time-separable expected utility function:

$$\sum_{j=1}^{J} \beta^{j-1} \left(\prod_{s=1}^{j-1} \pi_{\lambda_{s+1}|\lambda_s} \right) u(c_j, l_j^m, l_j^f, \theta, \lambda_j) \tag{3}$$

[7] Since fertility is exogenous, including children directly in the utility function is not essential.

where β is the time discount factor, c_j is joint consumption, l_j^m and l_j^f denote leisure time for men and women, respectively. The survival-adjusted continuation probability $\prod_{s=1}^{j-1} \pi_{\lambda_{s+1}|\lambda_s}$ captures both longevity risk and transitions in family type due to mortality.

Suppressing the age subscript j to ease notation, the periodic household utility function for each family type λ can be written as follows:

$$u(c, l^m, l^f, \theta, \lambda) = \begin{cases} \dfrac{\left[\left(\frac{c}{\iota_{0,\theta}}\right)^{\nu} (l^m)^{1-\nu}\right]^{1-\frac{1}{\gamma}} + \left[\left(\frac{c}{\iota_{0,\theta}}\right)^{\nu} (l^f)^{1-\nu}\right]^{1-\frac{1}{\gamma}}}{1-\frac{1}{\gamma}} & \text{if } \lambda = 0 \text{ (married)} \\ \dfrac{\left[(c)^{\nu} (l^m)^{1-\nu}\right]^{1-\frac{1}{\gamma}}}{1-\frac{1}{\gamma}} & \text{if } \lambda = 1 \text{ (single male)} \\ \dfrac{\left[\left(\frac{c}{\iota_{2,\theta}}\right)^{\nu} (l^f)^{1-\nu}\right]^{1-\frac{1}{\gamma}}}{1-\frac{1}{\gamma}} & \text{if } \lambda = 2 \text{ (single female)} \end{cases} \tag{4}$$

Here, $\nu \in (0,1)$ is the taste for consumption relative to leisure, $\gamma > 0$ is the elasticity of intertemporal substitution (EIS), and $\iota_{\lambda,\theta} = \sqrt{\mathbf{1}_{\{\lambda \neq 1\}} + \mathbf{1}_{\{\lambda \neq 2\}} + nc_\theta}$ is a consumption equivalence scale that adjusts for household size and composition. While we abstract from modeling children in household utility, as in quantity–quality fertility frameworks, child welfare is partially captured through the equivalence scale $\iota_{\lambda,\theta}$, which adjusts per capita consumption and reflects parental concern for intra-household resource allocation.[8]

Consumption equivalence scale. Children increase household size, thereby reducing per capita consumption. We capture this effect using a square-root consumption equivalence scale, defined as $\iota_{\lambda,\theta} = \sqrt{\mathbf{I}\{\lambda \neq 1\} + \mathbf{I}\{\lambda \neq 2\} + nc_\theta}$. The inner expression $\mathbf{I}\{\lambda \neq 1\} + \mathbf{I}\{\lambda \neq 2\} + nc_\theta$ calculates the household size, counting two adults for married households and one for singles, plus children. This helps account for household composition and economies of scale: while larger households require more resources, the increase is not linear due to shared consumption (e.g., housing, utilities, durables). For instance, a family of four (two parents and two children) faces greater consumption needs than a childless couple, but not twice as much.[9]

3.3 Endowments

Married and single men. Male labor supply is exogenous and inelastic throughout the working life. All men work full-time until retirement, earning labor income $y_{j,\lambda}^m = w n_{j,\lambda}^m e_{j,\lambda}^m$, where w denotes the market wage and $n_{j,\lambda}^m = 1 - l_{j,\lambda}^m$ is fixed male labor supply (normalized average work hours). $e_{j,\lambda}^m = \overline{e}_j\left(\theta, h_{j,\lambda}^m\right) \cdot \epsilon_j^m$ represents earning ability, which is composed of a deterministic component $\overline{e}_j(.)$ and a stochastic shock ϵ_j^m. The deterministic part is a non-linear function of education θ and male human capital $h_{j,\lambda}^m$, and is specified as $\overline{e}_j(.) = e^{\theta} h_{j,\lambda}^m$. The idiosyncratic shock ϵ_j^m follows a first-order auto-regressive process:

$$\overbrace{\ln\left(\epsilon_j^m\right)}^{=\eta_j^m} = \rho \cdot \overbrace{\ln\left(\epsilon_{j-1}^m\right)}^{=\eta_{j-1}^m} + \upsilon_j^m \tag{5}$$

with persistence parameter $\rho \in (0,1)$ and white-noise disturbance $\upsilon_j^m \sim N\left(0, \sigma_\upsilon^2\right)$.

[8] Early theoretical frameworks by Becker 1960 and Becker and Tomes 1976 introduced the trade-off between child quantity and quality, laying the foundation for subsequent studies such as De La Croix and Doepke 2003, Daruich and Kozlowski 2020, and Zhou 2021. These works show how family transfers can affect fertility, long-term growth, inequality, and intergenerational mobility, highlighting trade-offs between demographic targets, human capital outcomes, and welfare. We adopt a complementary perspective, focusing instead on the economic consequences of family policy for maternal labor supply and welfare outcomes across different household types.

[9] The consumption equivalence scale can be translated into the income adjustment required to equalize per capita consumption between parent and non-parent households. For instance, under the square-root scale $\iota_{\lambda,\theta}$, a dollar to a childless couple is equivalent to x dollars for a couple with nc_θ children if $\dfrac{1}{\sqrt{2}} = \dfrac{x}{\sqrt{2+nc_\theta}}$. Solving this yields $x \approx \$1.2$ for couples with one child and $x \approx \$1.4$ for those with two children. While the square-root scale is adopted here primarily for tractability, these resulting equivalence values align closely with empirical estimates for Australia reported in the Department of Social Services (DSS) report, and with findings for New Zealand by Chatterjee and Michelini (1998).

Married and single mothers. Maternal labor supply is endogenously determined within the household and modeled along discrete margins. At each age j, the household chooses among three maternal employment states: staying at home ($\ell = 0$), working part-time ($\ell = 1$), or working full-time ($\ell = 2$). If a woman participates in the labor force, she commits to an exogenous work hours schedule $n^f_{j,\lambda,\ell}$, which depends on age, family type, and employment type.

She also faces several additional costs. If she works, she (i) *pays formal childcare expenses per child, denoted* κ_j; (ii) *forfeits a portion or all of her means-tested transfers, conditional on family income*; and (iii) *incurs a fixed time cost* χ *that varies by employment type.* Specifically, at age j, her labor choice (ℓ) and family type (λ) affect her available leisure time $l^f_{j,\lambda,\ell}$ in the following manner:

$$l^f_{j,\lambda,\ell} = \begin{cases} 1 & \text{if } \ell = 0 \text{ (not working)} \\ 0 < 1 - n^f_{j,\lambda,1} - \chi_p < 1 & \text{if } \ell = 1 \text{ (working part-time)} \\ 0 < 1 - n^f_{j,\lambda,2} - \chi_f < 1 & \text{if } \ell = 2 \text{ (working full-time)} \end{cases} \tag{6}$$

where χ_p and χ_f are fixed time costs associated with part-time and full-time work, respectively.[10] This fixed cost helps capture any unexplained variation in life-cycle labor supply patterns not accounted for by preferences, child penalties, or other model elements.

A working mother also receives several benefits as she: (i) *earns income* $y^f_{j,\lambda} = wn^f_{j,\lambda,\ell}e^f_{j,\lambda}$; (ii) *accumulates human capital* $h^f_{j+1,\lambda}$; and (iii) *may become eligible for a childcare subsidy of* sr_j, conditional on meeting the CCS eligibility criteria outlined in Subsection 3.5.2. Female earning ability is $e^f_{j,h} = \bar{e}_j\left(\theta, h^f_{j,\lambda,\ell}\right) \times \epsilon^f_j$. The deterministic component $\bar{e}_j\,(.) = e^{\theta} h^f_{j,\lambda,\ell}$ is determined by her education θ and current human capital $h^f_{j,\lambda,\ell}$. The stochastic component ϵ^f_j is governed by the same auto-regressive process as her male counterpart: $\eta^f_j \equiv \ln\left(\epsilon^f_j\right) = \rho \times \ln\left(\epsilon^f_{j-1}\right) + \upsilon^f_j$, with persistence parameter $\rho \in (0,1)$ and white-noise disturbance $\upsilon^f_j \sim N\left(0, \sigma^2_{\upsilon}\right)$.

Female human capital accumulation. Unlike men, however, her human capital evolves endogenously according to the following law of motion:

$$log(h^f_{j,\lambda,\ell}) = log(h^f_{j-1,\lambda,\ell}) + (\xi_{1,\lambda,\ell} - \xi_{2,\lambda,\ell} \cdot (j-1))\, \mathbf{I}\{\ell_{j-1} > 0\} - \delta_l \cdot \mathbf{I}\{\ell_{j-1} = 0\} \tag{7}$$

where the human capital gain from working is determined by the coefficient $\xi_{1,\lambda,\ell} - \xi_{2,\lambda,\ell} \cdot (j-1)$, which declines with age, while δ_ℓ captures the rate of human capital depreciation when not working.[11]

Uninsurable earnings and longevity risks, together with child-related costs, play a central role in shaping women's labor supply and savings decisions—both of which serve as private insurance mechanisms that complement the public safety net. These dynamics vary by marital status.

Single mothers, lacking access to spousal income (family insurance), rely more heavily on work and savings, especially once children age out of transfer eligibility. Their incentives to remain employed are reinforced by the risks of future income shortfalls and human capital depreciation. In contrast, married mothers face weaker work incentives. Spousal income provides family insurance and raises joint income, increasing the likelihood that the household enters the phase-out range of means-tested transfers. This reduces the marginal return to maternal employment by lowering childcare subsidies and accelerating the withdrawal of FTB benefits. We explore these asymmetries in detail in Section 5.

[10]We interpret the fixed time cost as a penalty on the mother's leisure, motivated by evidence that working mothers disproportionately bear childcare responsibilities and domestic chores. See, for instance, the ABS report on barriers and incentives to labor force participation.

[11]We model human capital accumulation as a learning-by-doing process, where continued labor market participation improves future productivity. This differs from on-the-job training models, which require an agent to allocate her work time between production and training. A significant challenge with this setup involves identifying returns to productive time in the data, as these are not directly observable.

3.4 Technology

A representative firm operates with a labor-augmenting production technology A_t, which grows at a constant rate g. Output Y_t is produced using capital K_t and effective labor $A_t L_t$ via a constant-returns-to-scale Cobb-Douglas production function $Y_t = K_t^{\alpha}(A_t L_t)^{1-\alpha}$.

The firm rents capital and hires labor in perfectly competitive factor markets. It takes the wage rate w_t and the capital rental rate $q = r_w + \delta$ as given, where r_w is the constant world interest rate and δ is the depreciation rate of capital. The firm pays a capital income tax τ_t^k and chooses inputs to maximize its after-tax profits. Suppressing time subscripts for simplicity, the firm's problem is:

$$\max_{K,L} \quad (1-\tau^k)(Y - wAL) - qK \tag{8}$$

The first-order conditions for profit maximization imply:

$$r_w = (1-\tau^k)\alpha \frac{Y}{K} - \delta, \tag{9}$$

$$w = (1-\alpha)\frac{Y}{AL} \tag{10}$$

3.5 Fiscal policy

The model features three components of fiscal policy: a progressive income tax schedule, two major means-tested child-related transfer programs (the FTB and the CCS), and a means-tested public pension scheme for retirees (the Age Pension). All other government expenditures not modeled explicitly are captured by exogenous general spending, denoted G_t.

3.5.1 Tax system

The government collects revenue from three main sources: personal income taxes, corporate income taxes, and consumption taxes.

Personal income tax. The government levies taxes on individual labor income via a progressive tax schedule.[12] This allows the model to account for the interplay between income taxation and means-tested transfers. For instance, in lower tax brackets, the marginal disincentive effects of transfer phase-outs (such as those stemming from the FTB) may be relatively mild, while in higher tax brackets, the overlap between transfer withdrawal and rising tax liabilities can amplify work disincentives by increasing effective marginal tax rates (EMTRs).

Let $y^i_{j,\lambda}$ denote the labor income for individual $i \in \{m, f\}$ of family type λ and age j. We adopt a parametric tax function based on Feldstein (1969), Benabou (2000), and Heathcote et al. (2017) to approximate Australia's progressive income tax schedule. Suppressing λ and i superscripts for notational ease, the individual tax payment at age j is given by:

$$tax_j(y_j) = \max\left\{0, y_j - \zeta y_j^{1-\tau}\right\} \tag{11}$$

where ζ is a scaling factor and $\tau \in [0, 1)$ governs the degree of progressivity. When $\tau = 0$, the function becomes $tax_j = (1-\zeta)y_j$, implying a linear tax with constant average and marginal tax rates. As τ increases, the system becomes more progressive, with high-income earners facing disproportionately higher tax rates. In the limit as $\tau \to 1$, the marginal tax rate approaches 100%, and all earnings are taxed away. We impose a non-negative constraint, to rule out all government transfers in the form of negative income taxes.

[12] Australia uses an individual-based tax filing system, treating each person (not the household) as the unit of taxation. The model abstracts from personal capital income taxes and franking credits under Australia's dividend imputation system. We assume that the representative firm pays corporate capital income taxes and distribute fully franked dividends to households, thus exempting them from capital earnings tax. For further details on dividend imputation and franking credits, see the Parliamentary Budget Office (PBO) 2024 report.

Company income and consumption taxes. The government collects revenue from corporate income and consumption taxes. The firm pays a proportional tax on capital income, τ_t^k, based on its rental payments to capital. Households also face a flat consumption tax τ_t^c, applied to their consumption expenditure. Both taxes contribute to general revenue and support the financing of transfers, pensions, and other government spending.

3.5.2 Transfer system

The government operates the following transfer programs: (i) means-tested child-related transfers, and (ii) a means-tested public pension for retirees. The child-related transfers include the Family Tax Benefit (FTB Parts A and B) and the Child Care Subsidy (CCS). While the full statutory rules of these programs are encoded in the model, we present simplified formulations below to illustrate their key mechanisms. Full policy details and parameter values are provided in Appendix Section A.

Family Tax Benefit Part A (FTB-A). The FTB-A provides per-child payments that depend on joint family income, as well as the number and age of dependent children. Benefits are phased out in two stages as income rises: first from the maximum to a base rate, and then from the base rate to zero. Key policy parameters that determine the levels, kinks, and slopes of the FTB-A schedule are: (i) maximum and base payment rates per child, tr_j^{A1} and tr_j^{A2}; (ii) joint income thresholds for maximum and base payments, $\bar{y}^{tr}_{max}$ and $\bar{y}^{tr}_{base}$; and (iii) phase-out rates for the respective thresholds, ω_{A1} and ω_{A2}. The total FTB-A benefit per child for a household aged j is given by:

$$tr_j^A(y_{j,\lambda}) = \begin{cases} tr_j^{\mathrm{A1}} & \text{if } y_{j,\lambda} \leq \bar{y}^{tr}_{max} \\ \max\left\{tr_j^{\mathrm{A2}},\ tr_j^{\mathrm{A1}} - \omega_{A1}\left(y_{j,\lambda} - \bar{y}^{tr}_{max}\right)\right\} & \text{if } \bar{y}^{tr}_{max} < y_{j,\lambda} \leq \bar{y}^{tr}_{base} \\ \max\left\{0,\ tr_j^{\mathrm{A2}} - \omega_{A2}\left(y_{j,\lambda} - \bar{y}^{tr}_{base}\right)\right\} & \text{if } y_{j,\lambda} > \bar{y}^{tr}_{base}, \end{cases} \tag{12}$$

where $y_{j,\lambda} = \mathbf{I}\{\lambda \neq 2\} \cdot y^m_{j,\lambda} + \mathbf{I}\{\lambda \neq 1 \wedge \ell > 0\} \cdot y^f_{j,\lambda} + ra_j$ denotes the combined family income used for means testing.

Family Tax Benefit Part B (FTB-B). The FTB-B provides additional support to single parents and single-earner partnered families with dependent children and limited means. Unlike the FTB-A, the FTB-B is paid per household and is subject to dual income tests, one applied to the primary earner and one to the secondary earner. Key policy parameters that determine the levels, kinks, and slopes of the FTB-B schedule are: (i) maximum benefit levels for households with children below age 5 and between ages 5-18, tr_j^{B1} and tr_j^{B2}, respectively; (ii) joint income thresholds for primary and secondary earners, $\bar{y}^{tr}_{pe}$ and $\bar{y}^{tr}_{se}$; and (iii) a phase-out rate based on the secondary earner's income, ω_B. Let $y_{pe} = \max(y^m_{j,\lambda},\ y^f_{j,\lambda})$ and $y_{se} = \min(y^m_{j,\lambda},\ y^f_{j,\lambda})$ denote the incomes of the primary and secondary earners, respectively. The total FTB-B benefit for a household aged j is:

$$tr_j^B(y^m_{j,\lambda}, y^f_{j,\lambda}) = \begin{cases} \Upsilon_1 \cdot tr_j^{\mathrm{B1}} + \Upsilon_2 \cdot tr_j^{\mathrm{B2}} & \text{if } y_{pe} \leq \bar{y}^{tr}_{pe} \text{and } y_{se} \leq \bar{y}^{tr}_{se} \\ \\ \Upsilon_1 \cdot \max\left\{0,\ tr_j^{\mathrm{B1}} - \omega_B(y_{se} - \bar{y}^{tr}_{se})\right\} & \text{if } y_{pe} \leq \bar{y}^{tr}_{pe} \text{and } y_{se} > \bar{y}^{tr}_{se}, \\ +\Upsilon_2 \cdot \max\left\{0,\ tr_j^{\mathrm{B2}} - \omega_B(y_{se} - \bar{y}^{tr}_{se})\right\} & \end{cases} \tag{13}$$

where $nc_{[a,b],j}$ represents the number of dependent children in age range $[a, b]$ for a household aged j, $\Upsilon_1 = \mathbf{I}\{nc_{[0,4],j} \geq 1\}$ is an indicator for presence of at least one child aged 0-4, and $\Upsilon_2 = \mathbf{I}\{nc_{[0,4],j} = 0 \wedge nc_{[5,18],j} \geq 1\}$ is an indicator for at least one child aged 5-18 and none under 5.

Child care subsidy (CCS). The CCS supports the cost of formal childcare for families with children aged 13 or younger. Like the FTB, the CCS is means-tested based on joint family income and varies by the age and number of children. However, a key difference is that CCS eligibility is also conditional on work activity.[13] Key parameters determining eligibility and per-child subsidy rates include (i) base subsidy rates,

[13] In practice, the Australian CCS defines "recognized activity" more broadly, encompassing paid work (including self-employment), unpaid work in a family business, volunteering, study or training, and job search. We focus on labor supply

$\{sr_1, sr_2, sr_3, sr_4\}$; (ii) joint income thresholds, $\{\bar{y}_1^{sr}, \bar{y}_2^{sr}, \bar{y}_3^{sr}, \bar{y}_4^{sr}, \bar{y}_5^{sr}\}$; (iii) fortnightly work hour thresholds, $\{0, 8, 16, 48\}$; and (iv) phase-out rates, $\{\omega_c^1, \omega_c^3\}$. The effective subsidy rate per child for a household aged j is given by:

$$sr_j(y_{j,\lambda}, n_{j,\lambda}^m, n_{j,\lambda,\ell}^f) = \Psi(.) \times \begin{cases} sr_1 & \text{if } y_{j,\lambda} \leq \bar{y}_1^{sr} \\ \max\left\{sr_2,\ sr_1 - \omega_c^1\right\} & \text{if } \bar{y}_1^{sr} < y_{j,\lambda} < \bar{y}_2^{sr} \\ sr_2 & \text{if } \bar{y}_2^{sr} \leq y_{j,\lambda} < \bar{y}_3^{sr} \\ \max\left\{sr_3,\ sr_2 - \omega_c^3\right\} & \text{if } \bar{y}_3^{sr} \leq y_{j,\lambda} < \bar{y}_4^{sr} \\ sr_3 & \text{if } \bar{y}_4^{sr} \leq y_{j,\lambda} < \bar{y}_5^{sr} \\ sr_4 & \text{if } y_{j,\lambda} \geq \bar{y}_5^{sr}, \end{cases} \tag{14}$$

where the adjustment factor $\Psi(.)$ accounts for the activity test, which scales the base subsidy rate according to the fortnightly hours worked by the parent with the lowest labor supply $n_j^{min} = min\{n_{j,\lambda}^m, n_{j,\lambda,\ell}^f\}$. Formally, $\Psi(.)$ is defined as:

$$\begin{aligned} \Psi(y_{j,\lambda}, n_{j,\lambda}^m, n_{j,\lambda,\ell}^f) \quad &= \quad 0.24 \cdot \mathbf{I}\{y_{j,\lambda} \leq \$70,015 \wedge n_j^{min} \leq 8\} \\ &\quad +0.36 \cdot \mathbf{I}\{8 < n_j^{min} \leq 16\} + 0.72 \cdot \mathbf{I}\{16 < n_j^{min} \leq 48\} + \mathbf{I} \cdot \{n_j^{min} > 48\} \end{aligned}$$

This rule ensures that higher work intensity results in greater subsidy eligibility. Importantly, the joint income test and activity test interact: working longer hours increases the effective subsidy rate via $\Psi(.)$, but also raises income, potentially triggering phase-outs.

Age Pension. Australia's public pension for retirees (the Age Pension) is means-tested and does not depend on an individual's contribution history. Eligibility begins at the retirement age $j = J_R$. Pension benefits are assessed based on both an assets test and an income test, with the final benefit equal to the minimum of the two. Moreover, partnered households receive a full pension, while single households receive two-thirds of the couple amount.

Let $\mathcal{P}^a(a_j)$ be the pension benefit based on the assets test:

$$\mathcal{P}^a\left(a_j\right) = \begin{cases} p^{\max} & \text{if } a_j \leq \bar{a}_1^P \\ \max\left\{0,\ p^{\max} - \omega_a\left(a_j - \bar{a}_1\right)\right\} & \text{if } a_j > \bar{a}_1^P \end{cases} \tag{15}$$

where p^{max} is the maximum pension payment, $\bar{a}_1^P$ is the asset threshold, and ω_a is the corresponding phase-out rate. Similarly, let $\mathcal{P}^y\left(y_{j,\lambda}\right)$ be the benefit according to the income test:

$$\mathcal{P}^y\left(y_{j,\lambda}\right) = \begin{cases} p^{\max} & \text{if } y_{j,\lambda} \leq \bar{y}_1^p \\ \max\left\{0,\ p^{\max} - \omega_y\left(y_{j,\lambda} - \bar{y}_1^p\right)\right\} & \text{if } y_{j,\lambda} > \bar{y}_1^p \end{cases} \tag{16}$$

where $\bar{y}_1^p$ is the income threshold and ω_y is the income-test phase-out rate. The pension benefit received by a household aged j is determined by:

$$pen_j(a_j, y_{j,\lambda}) = \begin{cases} \min\left\{\mathcal{P}^a\left(a_j\right), \mathcal{P}^y\left(y_{j,\lambda}\right)\right\} & \text{if } j \geq J_R \text{ and } \lambda = 0 \\ \dfrac{2}{3}\min\left\{\mathcal{P}^a\left(a_j\right), \mathcal{P}^y\left(y_{j,\lambda}\right)\right\} & \text{if } j \geq J_R \text{ and } \lambda = 1, 2 \\ 0 & \text{otherwise} \end{cases} \tag{17}$$

as a proxy for work requirements.

3.5.3 Government budget.

At each time t, the government's total revenue consists of consumption taxes $\left(T_t^C\right)$, company profit taxes $\left(T_t^K\right)$, and personal income taxes $\left(T_t^I\right)$. To meet its financing needs, the government can also issue new debt, represented by the net change in government bonds $(B_{t+1} - B_t)$. Public expenditures consist of four components: general government purchases (G_t), child-related transfers (Tr_t), the Age Pension $(\mathcal{P}_t)$, and interest payments on outstanding public debt $(r_t B_t)$.

The government's intertemporal budget constraint is thus:

$$T_t^C + T_t^K + T_t^I + (B_{t+1} - B_t) \quad = \quad G_t + Tr_t + \mathcal{P}_t + r_t B_t \tag{18}$$

In every period t, we assume that the government adjusts the income tax schedule to balance its budget. Specifically, we hold the tax progressivity τ constant and use the tax scaling factor ζ as the endogenous policy lever to ensure public budget balance across policy experiments. Changes in ζ affects the overall tax size. For instance, a decrease in ζ raises the overall tax burden by shifting the tax schedule upward and narrowing the zero-tax bracket.

3.6 Market structure

The model is set in a small open economy with incomplete markets. Households cannot insure against idiosyncratic earnings and longevity risks via state-contingent assets. Instead, they can self-insure by saving through a one-period risk-free bond, subject to a no-borrowing constraint. That is, they cannot borrow against future income, and asset holdings must be non-negative at all times.

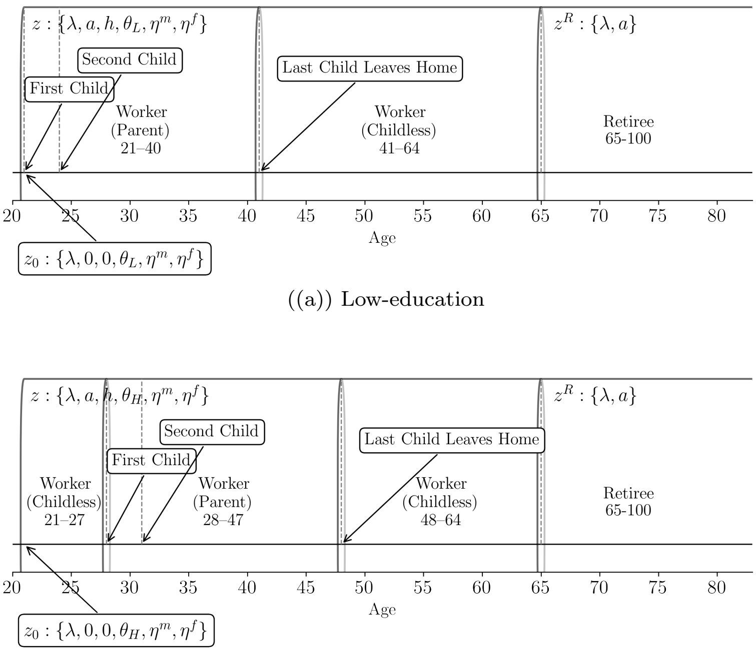
The final good is produced by a representative firm and sold in a perfectly competitive market at a relative price normalized to one. This good serves as the consumption good, the investment good, and the numeraire in the model. Capital is perfectly mobile internationally, so the domestic interest rate is pinned down by the exogenous world interest rate r^w under a no-arbitrage condition. Domestic capital demand is thus perfectly elastic. Because the capital rental rate is fixed, and production uses a Cobb-Douglas technology with constant returns to scale, the real wage is also constant over time. This, in turn, implies a perfectly elastic labor demand curve. The labor market clears in every period, and we abstract from labor market frictions, such as search costs, matching inefficiencies, wage rigidity, or switching costs between part-time and full-time work.

3.7 The household problem

Households are heterogeneous along several dimensions, including: age $j \in \{1, 2, \ldots, J\}$, family type $\lambda \in \Lambda$ where $\Lambda = \{0, 1, 2\}$, permanent education level $\theta \in \Theta$ where $\Theta = \{\theta_L, \theta_H\}$, female human capital $h^f_{j,\lambda,\ell} \in H$ where $H = [h_{min}, h_{max}] \subset \mathcal{R}^+$, asset holdings $a_j \in A$ where $A = [a_{min}, a_{max}] \subset \mathcal{R}^+$, and idiosyncratic productivity shocks to male and female earnings, η^m_j and $\eta^f_j \in S$ where $S \subset \mathcal{R}$. Every household maximizes expected lifetime utility 3 by choosing consumption, savings, and female labor supply, subject to constraints imposed by labor and capital income, child-related costs, taxes, transfers, and borrowing limits. They form rational expectations over future income paths, survival probabilities, productivity shocks, and policy environments.

Working-age married parents ($\lambda = 0$) **and single mothers** ($\lambda = 2$)**.** Define $Z = \Lambda \times A \times H \times \Theta \times S \times S$ as the state space for working-age households ($j < J_R$). Let the individual household state vector at age j be $z_j = \left\{\lambda_j, a_j, h^f_{j,\lambda,\ell}, \theta, \eta^m_j, \eta^f_j\right\} \in Z$. The life-cycle profiles of parent households are summarized in Figure 4.

Given the current state z_j, a working-age parent household chooses a triple (c_j, ℓ_j, a_{j+1}) from the choice set $\mathcal{C} \equiv \{(c_j, \ell_j, a_{j+1}) \in \mathcal{R}^{++} \times \{0, 1, 2\} \times \mathcal{R}^+\}$, where c_j is joint consumption, ℓ_j denotes the female employment status (non-participation, part-time, or full-time), and a_{j+1} is next-period's joint asset holdings. Suppressing the age subscript j to simplify notation, the household's problem can be expressed as the following dynamic programming formulation:



((a)) Low-education

((b)) High-education

Figure 4: **Life cycle of parent households.**

Notes: This figure displays the life cycle of parent households. Panel (a) shows the profile for low-education parents, whereas Panel (b) depicts that for high-education parents. Beyond differences in education, a salient distinction lies in the timing of childbirth, with high-education parents experiencing delayed fertility relative to their low-education counterparts.

$$V(z) = \max_{c,\ell,a_+} \left\{ u(c, l^m, l^f, \theta, \lambda) + \beta \sum_{\Lambda} \int_{S^2} V(z_+)\, d\Pi(\lambda_+, \eta^m_+, \eta^f_+ | \lambda, \eta^m, \eta^f) \right\} \tag{19}$$

s.t.

$$\begin{aligned}
(1+\tau^c)c + (a_+ - a) + \mathbf{I}\{\ell > 0\} \cdot n^f_{\lambda,\ell} \cdot CE_\theta(y_\lambda, n^m_\lambda, n^f_{\lambda,\ell}) &= y_\lambda + FTB_\theta(y^m_\lambda, y^f_\lambda) - T_\lambda(y^m_\lambda, y^f_\lambda) + beq \\
l^f &= 1 - n^f_{\lambda,\ell} - (\mathbf{I}\{\ell = 1\} \cdot \chi_p + \mathbf{I}\{\ell = 2\} \cdot \chi_f) \\
l^m &= 1 - n^m_\lambda \quad \text{if} \quad \lambda = 0 \\
c &> 0 \\
a_+ &\geq 0
\end{aligned}$$

where $y_\lambda = \mathbf{I}\{\lambda \neq 2\} \cdot y^m_\lambda + \mathbf{I}\{\ell > 0\} \cdot y^f_\lambda + ra$ is the total household market income; $n^f_{\lambda,\ell}$ is the female work hours under choice ℓ; $CE_\theta(.) = w\,(1 - sr(.)) \sum_{i=1}^{nc_\theta} \kappa_i$ is the childcare expense per hour worked net of subsidies; $sr(.)$ is the CCS function and κ_i is the hourly childcare cost (as a share of market wages) for the i^{th} child; $FTB_\theta(.) = nc_\theta \cdot tr^A(.) + tr^B(.)$ is the FTB transfer function, comprising $tr^A(.)$ from (12) and $tr^B(.)$ from (13); $T_\lambda(.) = \mathbf{I}\{\lambda \neq 2\} \cdot tax^m(.) + tax^f(.)$ is the total income tax function, with $tax^i(.)$ for $i \in \{m, f\}$ following the progressive tax schedule (11); and τ^c is the consumption tax rate. Households are born with no assets ($a_1 = 0$). Bequest motives are not operative. beq is a uniform lump-sum accidental bequest, redistributed from deceased households in the same period, as described in Section (C.2).

Working-age single childless male households ($\lambda = 1$)**.** Single male households follow an exogenous labor supply path over the life cycle and do not make work decisions. At every age j, they choose a consumption-savings pair (c, a_+) from the choice set $\mathcal{C} \equiv \{(c, a_+) \in \mathcal{R}^{++} \times \mathcal{R}^+\}$ to maximize expected lifetime utility, subject to the budget constraint (21). Formally, a single male household problem reduces to a consumption-savings problem:

$$V(z) = \max_{c,a_+} \left\{ u(c, l^m, \theta) + \beta \sum_{\Lambda} \int_{S^2} V(z_+) \, d\Pi(\lambda_+, \eta_+^m \mid \lambda, \eta^m) \right\} \tag{20}$$

s.t.

$$\begin{aligned} (1+\tau^c)c + (a_+ - a) &= y_\lambda - T_\lambda(y_\lambda^m) + beq \\ l^m &= 1 - n_\lambda^m \\ c &> 0 \\ a_+ &\geq 0 \end{aligned} \tag{21}$$

where $y_\lambda = wn_\lambda^m h_\lambda^m e^{\theta+\epsilon^m} + ra$ is market income, and $T_\lambda(.) = tax^m(.)$ is the progressive tax function defined in Equation (11).

Retirees. Retirement at age J_R is mandatory. Upon retirement, the education level and idiosyncratic earnings shocks become absorbing states. In addition, since retirees no longer have dependent children, they are not eligible for the child-related transfers. Pension payouts are not conditional on earnings history but do depend on family type λ. Eligible single households receive two-thirds of the maximum pension payment that a partnered household would receive. The state vector of a retired household at age $J_R \leq j \leq J$ simplifies to $z^R = \{\lambda, a\} \in \{0, 1, 2\} \times \mathcal{R}^+$, and their choice set becomes $\mathcal{C}^R \equiv \{(c, a_+) \in \mathcal{R}^{++} \times \mathcal{R}^+\}$. Suppressing the age j subscript, the retired household's dynamic programming problem reduces to:

$$V(z^R) = \max_{c,a_+} \left\{ u(c, \lambda) + \beta \sum_{\Lambda} V(z_+^R) \, d\Pi(\lambda_+ | \lambda) \right\} \tag{22}$$

s.t.

$$\begin{aligned} (1+\tau^c)c + (a_+ - a) &= ra + pen(a, y_\lambda) \\ c &> 0 \\ a_+ \geq 0 \quad &\text{and} \quad a_{J+1} = 0 \end{aligned}$$

where $pen(.)$ is the Age Pension function described in Equation (17).

3.8 Equilibrium

The *stationary distribution of households* (C.1.1), *aggregation* (C.1.2), the *definition of competitive equilibrium* (C.1.3), and the *numerical solution algorithm* (C.2) are provided in Appendix Section C.

4 Calibration

We calibrate the benchmark model to a steady-state economy along a balanced growth path, where aggregate variables such as consumption, investment, and capital grow at the constant rate of labor-augmenting technological progress g, while the time endowment is fixed. The model target key features of the Australian economy between 2012 and 2018, a period of relative macroeconomic stability, with steady trends in household consumption and asset accumulation. This window also allows us to incorporate the statutory rules of child-related transfer programs as of 2018, after major changes had been implemented.

Externally calibrated parameters in Table 2 are estimates and statistics drawn from the HILDA survey, the Australian Bureau of Statistics (ABS), the World Bank, and prior Australia-focused studies. The remaining micro and macro parameters are internally calibrated to match key model moments to their empirical counterparts. These are reported in Table 3.

We also evaluate the model fit by comparing its simulated outcomes to a range of non-targeted life-cycle and aggregate moments. Overall, results shown in Table 4 and Figures (7)-(8) demonstrate that the model does reasonably well in replicating salient features of the Australian economy. We discuss the benchmark performance in Subsection 4.6.

Parameter	Value	Target
Demographics		
Maximum lifespan	$J = 80$	Age 21-100
Mandatory retirement age	$J_R = 45$	Age Pension age 65
Population growth rate	$n = 1.6\%$	ABS 2012-2018
Survival probabilities	ψ_m, ψ_f	Australian Life Tables (ABS 2010-2019)
Measure of newborns by λ type	$\{\pi(\lambda_0),\ \pi(\lambda_1),\ \pi(\lambda_2)\} = \{0.70,\ 0.14,\ 0.16\}$	HILDA 2012-2018
Technology		
Labor aug. tech. growth	g =1.3%	Average per work hour growth rate (World Bank 2012-2018)
Output share of capital	$\alpha = 0.4$	Treasury 2019
Real interest rate	$r = 4\%$	World Bank 2012-2019
Households		
Relative risk aversion	$\sigma = 1/\gamma = 3$	Standard values 2.5-3.5
Male and female labor supply	$n_\lambda^m,\ n_\lambda^f$	Age-profiles of average labor hours for employees (HILDA)
Male human capital profile	h_λ^m	Age-profile of wages for men (HILDA)*
Education		
Education level	$\{\theta_L, \theta_H\} = \{0.745, 1.342\}$	College-HS wage ratio of 1.8**
Measure of households by θ	$\{\pi(\theta_L),\ \pi(\theta_H)\} = \{0.7,\ 0.3\}$	College-HS ratio (ABS 2018)
Fiscal policy		
Income tax progressivity	$\tau = 0.2$	Tran and Zakariyya 2021
Consumption tax	$\tau^c = 8\%$	$\tau_c \times \frac{C_0}{Y_0} = 4.5\%$
Company profit tax	$\tau^k = 10.625\%$	$\tau^k \left(\frac{Y - WL}{Y}\right) = 4.5\%$
Government debt to GDP	$\frac{B}{Y} = 20\%$	Average (CEIC 2012-2018)
Government general purchase	$\frac{G}{Y} = 14\%$	Net of FTB, CCS and Age Pension (WDI and AIHW)
FTB, CCS and Pension parameters		HILDA tax-benefit model

Table 2: Externally calibrated parameters

Notes: (*) The age-profiles of median hourly wages for married and single men are obtained by regressing log(wage) on quadratic age terms and four dummies (gender, marital status, employment type, and time). We then normalize all hourly wage estimates by the average hourly wage of male aged 21. (**) Our estimates based on HILDA suggests a wage premium for married men in the range of 1.7-1.8 over the 18 years period 2001-2018.

4.1 Demographics

Households enter the economy at age 21 ($j = 1$) as workers, retire at age 65 ($j = J_R$ =45), and can live up to a maximum age of 100 ($j = J = 80$). Married households consist of spouses who are the same age.

Parameter	Value	Target
Households		
Discount factor	$\beta = 0.99$	Saving ratio 5%-8% (ABS 2013-2018)
Taste for consumption	$\nu = 0.375$	LFP rate 68-72% of working-age mothers (HILDA 2012-2018)
Fixed time cost of work	$\{\chi_f,\, \chi_p\} = \{0.1125, 0.0525\}$	Age profile of full-time employment share for mothers
Female human capital		
Depreciation rate	$\delta_h = 0.074$	Male-female wage gap at age 50*
Accumulation rate for:		
Married mother working full-time	$(\xi_{1,\lambda=0,\ell=1}, \xi_{2,\lambda=0,\ell=1}) = (0.0450, 0.00175)$	Married father's age-profile of full-time wages
Married mother working part-time	$(\xi_{1,\lambda=0,\ell=2}, \xi_{2,\lambda=0,\ell=2}) = (0.0350, 0.00135)$	Married father's age-profile of part-time wages
Single mother working full-time	$(\xi_{1,\lambda=2,\ell=1}, \xi_{2,\lambda=2,\ell=1}) = (0.0206, 0.00088)$	Single father's age-profile of full-time wages
Single mother working part-time	$(\xi_{1,\lambda=2,\ell=2}, \xi_{2,\lambda=2,\ell=2}) = (0.0179, 0.00060)$	Single father's age-profile of part-time wages**
Technology		
Capital depreciation rate	$\delta = 0.07172$	$\frac{K}{Y} = 3.2$ (ABS 2012-2018)
Transitory shocks		
Persistence parameter	$\rho = 0.98$	Literature
Variance of shocks	$\sigma_v^2 = 0.0145$	Gini coefficient of male earnings at age 21, $GINI_{j=1,m} = 0.35$
Fiscal policy		
Maximum pension payment	$pen^{max} = 30\% \times Y$	Pension share of GDP, $\frac{\mathcal{P}_t}{Y_t} = 3.2\%$ (ABS 2012-2018)

Table 3: Internally calibrated parameters

Notes: (*) We chose age 50 to allow sufficient time for δ_h to take effect on female labor supply decisions. (**) We calibrate the female human capital accumulation and depreciation rates for a type $\{\lambda, \ell\}$ woman such that her age-profile of wages matches that of her male counterpart if she chooses to work without time off.

Time-invariant conditional survival probabilities for males and females ($\psi_{j,m}$ and $\psi_{j,f}$) are calculated from the 2001-2019 Australian Life Tables published by the ABS. The growth rate of newborn households is set to $n = 1.6\%$, consistent with the average annual population growth in Australia between 2012 and 2018 (AIHW, 2023).

The distribution of newborn households by family type $\pi(\lambda)$ is estimated using HILDA survey data for working-age adults (ages 21 to 64). Married households comprise 70% of the new entrants ($\pi(\lambda_0) = 0.70$). Of the remaining 30% single households, 53% are female, implying shares of $\pi(\lambda_1) = 0.14$ for single men and $\pi(\lambda_2) = 0.16$ for single mothers.

4.2 Preferences

The subjective discount factor is set to $\beta = 0.99$ so that the model's implied household savings rate falls within the empirically observed range of 5-8%, based on ABS data (2012-2018). The elasticity of intertemporal substitution (EIS), the inverse of the relative risk aversion parameter σ, is calibrated to $\gamma = 1/3$, a value within the standard range commonly used in the literature.[14] The taste for consumption relative to leisure, $\nu = 0.375$, is chosen so that the average female labor force participation in the model falls within the 68-72% range observed in the data. Fixed time costs of work are set to $\chi_f = 0.1125$ for full-time and $\chi_p = 0.0525$ for part-time work. These values allow the model to reproduce the empirical life-cycle profile of full-time maternal employment, as shown in Figure 7.

4.3 Endowments

Labor productivity shock. Every adult household member is subject to idiosyncratic earnings shocks η^i for $i \in \{m, f\}$. These shocks follow an identical AR(1) process with persistence parameter ρ and innovation variance σ_v^2. We set $\rho = 0.98$, within the bound of common values in the literature, and calibrate σ_v to achieve a Gini coefficient of 0.35 for the efficiency wage distribution of 21-year-old men in the model. This configuration yields a Gini coefficient of 0.38 (non-target) for the broader working-age male population.[15]

We discretize the AR(1) shock process using the Rouwenhorst method. This yields 5 shock grid points $\{0.29813,\ 0.54601\,1,\ 1.83146,\ 3.35424\}$, with the following Markov transition matrix:

$$\begin{bmatrix} 0.9606 & 0.0388 & 0.0006 & 0 & 0 \\ 0.0097 & 0.9609 & 0.0291 & 0.0003 & 0 \\ 0.0001 & 0.0194 & 0.9610 & 0.0194 & 0.0001 \\ 0 & 0.0003 & 0.0291 & 0.9609 & 0.0097 \\ 0 & 0 & 0.0006 & 0.0388 & 0.9606 \end{bmatrix}$$

Education. We model two exogenous, permanent education types—low (θ_L) and high (θ_H)—realized at birth. These correspond to individuals with at most a high school diploma and those with a university degree or equivalent, respectively. We set $\theta_L = 0.745$ and $\theta_H = 1.342$ to match a college wage premium of 1.8 in the benchmark economy. Based on ABS (2018) statistics, the shares of low- and high-education households are $\pi(\theta_L) = 0.7$ and $\pi(\theta_H) = 0.3$, respectively. We also assume assortative mating. In addition to spouses being of the same age, they are matched by education. This simplifies calibration and facilitates the identification of human capital parameters, as discussed below.

Labor supply. Men are assumed to work full-time with exogenously given age profiles of labor hours. Women choose from three discrete labor supply options: non-participation ($\ell = 0$), part-time work ($\ell = 1$), or

[14] This implies a growth-adjusted time discount factor $\tilde{\beta} = \beta(1+g)^{\nu\left(1-\frac{1}{\gamma}\right)} = 0.9807$ for the balanced-growth-path steady state economy.

[15] σ_v is calibrated based on the empirical male earnings distribution rather than the wage distribution because our male labor supply profiles are exogenously fixed at average hours. As the model lacks endogenous variation in male work hours, the transitory shock process η^m is used to capture both wage shocks and variation in hours.

full-time work ($\ell = 2$). Once a choice is made, hours worked follow deterministic age profiles by employment status and family type. These gender- and family-type-specific work hour profiles (n^m_λ and $n^f_{\lambda,\ell}$) are estimated from HILDA survey data (2001-2018) and shown in Figure 5. Productivity is set to zero from retirement age ($j \geq J_R$) onward, making retirement mandatory.[16]

Human capital. The exogenous life-cycle profiles of male human capital $\left\{h^m_{j,\lambda}\right\}_{j=1}^{J_R-1}$ are proxied using estimated age profiles of hourly wages for single and married men from the HILDA survey. In contrast, female human capital profile $\left\{h^f_{j,\lambda,\ell}\right\}_{j=1}^{J_R-1}$ evolves endogenously over the life cycle as a function of their labor supply decisions. The female human capital gain parameters $\{\xi_{1,\lambda,\ell}, \xi_{2,\lambda,\ell}\}$ are calibrated by family type (λ) and employment status (ℓ) to ensure that, if a woman works continuously from age 21 to retirement, her human capital trajectory would resemble that of a man with matching marital and labor market characteristics (an implication of the assortative mating assumption). Specifically, we estimate these parameters by applying the law of motion (7), omitting the depreciation term associated with not working, to the male wage growth:

$$log(\hat{w}^m_{j,\lambda,\ell}) - log(\hat{w}^m_{j-1,\lambda,\ell}) = \hat{\xi}_{1,\lambda,\ell} + \hat{\xi}_{2,\lambda,\ell} \cdot (j-1)$$

Here, $\hat{w}^m_{j,\lambda,\ell}$ denotes the estimated average male wage at age j for a given family type and employment status. To improve the robustness of these estimates, especially for demographic groups with sparse observations (e.g., single fathers), we trim extreme values and omit noisy data near retirement age when fitting the wage profiles.[17]

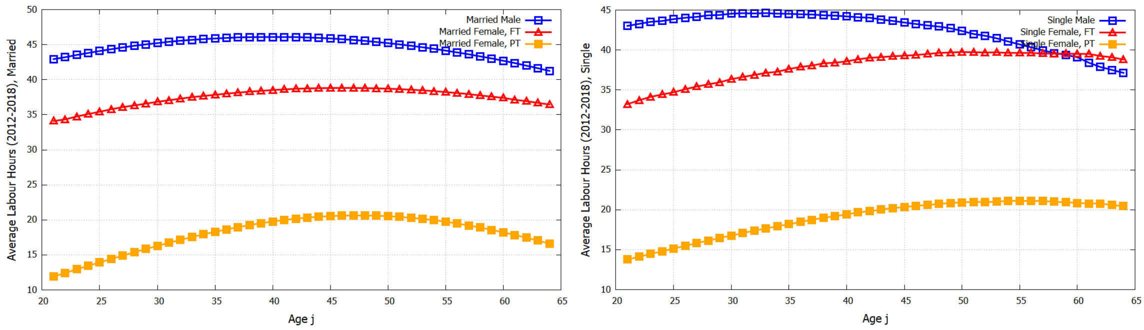


Figure 5: **Exogenous labor supply over the life cycle. Left:** Age profiles of average work hours for married parents if employed. **Right:** Age profiles of average labor hours for single men and single mothers if employed.
Notes: The two y-axes are different. The former ranges from 10 to 50 hours and the latter ranges from 10 to 45 hours.

Children. We assume that all married households and single women have children, while single men are childless. This is empirically justified by the observation that women account for 87% of lone parents in our HILDA sample. To maintain computational feasibility, we further assume that all parents have exactly two children over their lifetime. This is supported by data from households aged 50 and above in the HILDA survey, which reflects completed fertility histories: 12% of parents have one child, 42% have two, 28% have three, and the remainder have four or more. Our assumption reflects the most common family structure and yields an average number of children close to the empirical mean.[18]

Heterogeneity in fertility timing is linked to household education θ. Drawing on statistics from the the 2017 longitudinal study of Australian children (LSAC), we observe that early motherhood is more prevalent among low-education women. Specifically, 67.7% of first-time mothers aged 15-19 have a year 11 or lower education

[16] Empirical evidence suggests that male labor supply is largely inelastic. Doiron and Kalb (2004) find that increases in childcare costs have negligible effects on male labor supply in Australia. Our own estimates using HILDA similarly show little variation in male hours parental or marital status.

[17] Ideally, human capital accumulation parameters would also vary by education, in addition to marital and labor force status. However, this would require additional data moments that are difficult to estimate reliably due to sample size limitations for certain demographics, such as younger married individuals and older single households, in the HILDA survey.

[18] Since married and single female households comprise 86% of the model population, the average number of children per household is $0.86 \times 2 = 1.72$. This aligns closely with Australia's average total fertility rate of approximately 1.8 children per woman during 2012-2018

level, while this proportion drops to just 10% among those aged 25-37. Conversely, nearly half of the first-time mothers in the latter age group hold a bachelor's degree or higher, with the proportion increasing with maternal age. We reflect these patterns in the model by assigning the birth of the first child to low-education (θ_L) households at age 21 (i.e., $j = 1$, the youngest model age) and to high-education (θ_H) households at age 28. In both cases, the second child arrives exactly 3 years later, at age 24 for θ_L and age 31 for θ_H. This spacing aligns with the average child interval observed in in Australia (AIHW 2023).

Childcare costs. We abstract from informal childcare arrangements such as grandparenting or neighbor assistance. Formal childcare services are assumed to be of uniform quality and price across households, abstracting from regional variations and differences in service types. In other words, we assume these services operate in a perfectly competitive market. Using a conservative estimate of \$12.50 per hour, childcare costs amount to 52% of the average hourly wage of a 21-year-old male from HILDA survey. Accordingly, the childcare cost in the model is set as $\kappa = 0.52 \cdot w$.

We assume that childcare costs decline once children reach school age (6 years old). In particular, working mothers pay the full hourly cost of formal care for children aged 0-5 years and one-third of that cost for school-aged children. This reflects the provision of free public schooling and the lower intensity of formal care at older ages. In other words, additional care needs—such as out-of-school hours (OOSH) programs and extracurricular activities—are assumed to be approximately one-third of pre-school childcare expenditure.[19]

4.4 Technology

The capital share in output is set to $\alpha = 0.4$. Given α, along with the company tax rate $\tau^k = 10.625\%$ (see Table 2) and a target capital-to-output ratio of $K/Y = 3.2$ (see Table 4), we use the firm's first-order condition (9) to back out the capital depreciation rate δ. This yields $\delta = 0.07172$ in the initial steady-state equilibrium.

Labor-augmenting technology A is normalized to 1 in the benchmark economy. Based on an average annual growth rate of real GDP per hour worked of 1.3% in Australia, we set the rate of labor-augmenting technological progress to $g = 0.013$.

4.5 Fiscal policy

Taxes. We adopt a progressivity parameter $\tau = 0.2$, in line with Tran and Zakariyya 2021. The scale parameter ζ, which governs the size of the tax schedule for a given τ, is endogenously determined to balance the government budget. The consumption tax rate is set at $\tau^c = 8\%$, which targets a consumption tax-to-GDP ratio $\frac{\tau^c C}{Y} = 4.5\%$, where the consumption share of GDP is $\frac{C}{Y} = 56.3\%$ (ABS 2012-2018). The company income tax rate is calibrated to match a company tax revenue share of GDP $\tau^k \left(\frac{Y - WL}{Y}\right) = 4.25\%$. Provided that the labor income share $\frac{WL}{Y} = 1 - \alpha = 0.6$, this implies a company tax rate of $\tau^k = 10.625\%$.

Family Tax Benefit and Child Care Subsidy. We adopt the 2018 statutory policy settings for the Family Tax Benefit (Parts A and B) and the Child Care Subsidy programs, including base and maximum payment rates, income-test thresholds, and phase-out rates. The detailed rules for benefit calaculation are detailed in Appendix A.

Age Pension. The Age Pension's income and assets test thresholds, along with their respective phase-out rates, are based on 2018 policy parameters. The maximum pension benefit, p^{max}, is internally calibrated to equal 30% of average income. This targets a total Age Pension expenditure of 3.2% of GDP in the benchmark steady state.

[19]OOSH services typically operate before school (6:30am–9am), after school (3pm–6pm), and during school holidays (7am–7pm). The decline in childcare costs for school-aged children also reflects lower average usage: only 40% of children aged 6-8 participate in any form of childcare, and this rate falls to 20% by age 12. We use information on hourly childcare fees from DSS (2005) and assume that the cost ratio between pre-school and school-aged children has remained stable since then. For further details on childcare costs and usage patterns, see the AIFS (2015) and DSS (2005) reports.

General government expenditure and debt. General government expenditure G includes all public spending not explicitly modeled through the two child-related transfer programs (FTB and CCS) or the Age Pension program. In the benchmark, G is set to14% of GDP, derived as the residual from total government spending of 18.5% of GDP after substracting the combined expenditure on FTB, CCS, and the Age Pension (estimated at 4.5% of GDP). Public debt B is set at 20% of GDP, consistent with the the average pre-pandemic debt-to-GDP ratio observed in Australia.

4.6 The benchmark economy

We assess the benchmark model's performance by comparing model-generated moments with their corresponding empirical moments.

4.6.1 Aggregate macro variables

We begin by examining key targeted and non-targeted macroeconomic indicators. Table 4 shows that the benchmark model performs reasonably well in matching aggregate empirical moments observed in the Australian economy. To further assess the model's validity, we next evaluate its ability to reproduce key life-cycle profiles in the following subsection.

Moments	Model	Data	Source
Targeted			
Capital, K/Y	3.2	3-3.3	ABS (2012-2018)
Savings, S/Y	4.7%	5-8%	ABS (2013-2018)
Mothers' labor participation, LFP	72.57%	68-72%	HILDA (2012-2018)*
Consumption tax, T^C/Y	4.23%	4.50%	APH Budget Review
Corporate profit tax, T^K/Y	4.25%	4.25%	APH Budget Review
Age Pension, P/Y	3.65%	3.20%	ABS (2012-2018)
Gini coefficient (male aged 21)	0.35	0.35	HILDA (2012-2018)
Non-targeted			
Consumption, C/Y	52.80%	54-58%	ABS (2012-2018)
Investment, I/Y	32.29%	24-28%	ABS (2013-2018)
Mothers' full-time share	50.32%	50%	HILDA (2012-2018)
Scale parameter, ζ	0.7417	0.7237	Tran and Zakariyya 2021
Income tax, T^I/Y	14.93%	11%	APH Budget Review
Tax revenue to output	28.36%	25%	ABS(2012-2018)
Child-related transfers (FTB + CCS)	1.7%	1.45%	ABS (2012-2018)

Table 4: **Key macroeconomic variables: Model vs. Data moments**

Notes: (*) Multiple sources agree on these ranges of participation rates for mothers. (**) We set 0.35 *as the target for the Gini coefficient of wage distribution at birth* ($j = 1$)*. This results in the Gini coefficient for the male wage distribution over the entire working age of* 0.3766.

4.6.2 Life-cycle profiles

Age-dependent moments offer a more stringent validation test. Below, we compare model-generated life-cycle profiles to data for female labor force participation, full-time employment, consumption, and wealth (asset holdings). With the exception of full-time employment, these moments are not targeted. Thus, to match these profiles, the average model household must endogenously reproduce observed behaviors across different stages of the life cycle. These comparisons are therefore informative for assessing the model's ability to capture life-cycle dynamics and, by extension, the plausibility of the policy impacts we study.

Female labor force participation and full-time employment share. Figure 7 plots the life-cycle profiles of labor force participation (a non-targeted moment) and full-time employment share (a targeted moment) among women, comparing the model to HILDA data. The model performs reasonably well in matching

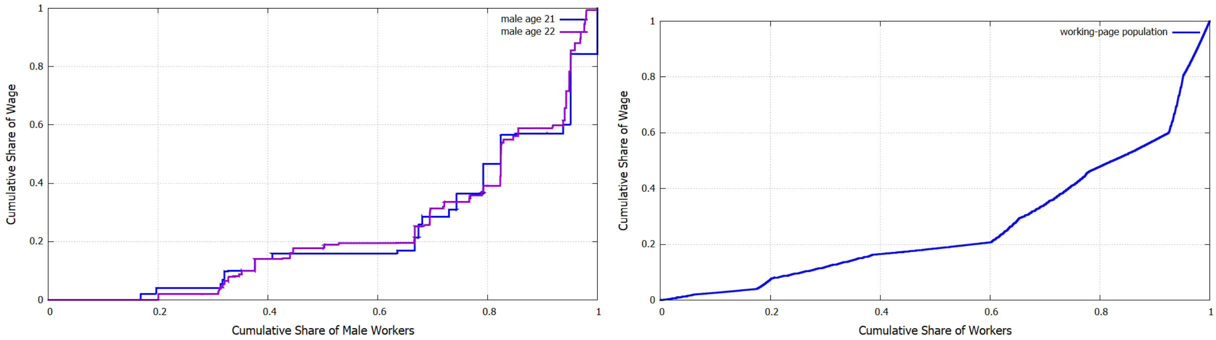


Figure 6: **Lorenz curves of wage distributions. Left:** Lorenz curves of the distributions of married male wages at age 21 and 22 (Gini = 0.35). **Right:** Lorenz curve of the wage distribution of working-age male population (Gini = 0.38).

both profiles up to approximately age 55. Beyond this point, however, the model increasingly overpredicts maternal labor force participation relative to the data, with the gap widening with age. This discrepancy can be attributed to four simplifying assumptions made for tractability: (i) exogenous work hour profiles; (ii) absence of age-related health shocks; (iii) mandatory retirement; and (iv) exogenous fertility.

First, agents in the model cannot adjust work hours and do not experience health deterioration or health-related costs that typically reduce labor supply at older ages. Moreover, with the absence of dependent children and associated policy distortions, older women in the model face few barriers to continued workforce participation. Combined with the mandatory retirement constraint, these assumptions encourage higher labor supply among older women to build sufficient savings and insure against longevity risk post-retirement. Second, the assumption of exogenous children, where all mothers give birth relatively early in adulthood, excludes from the model mothers who have children later in life. In reality, these older mothers may reduce labor supply due to childcare demands or child-related transfer phase-outs. Together, these modeling simplifications lead the model to understate labor market exit among women in the later working years.

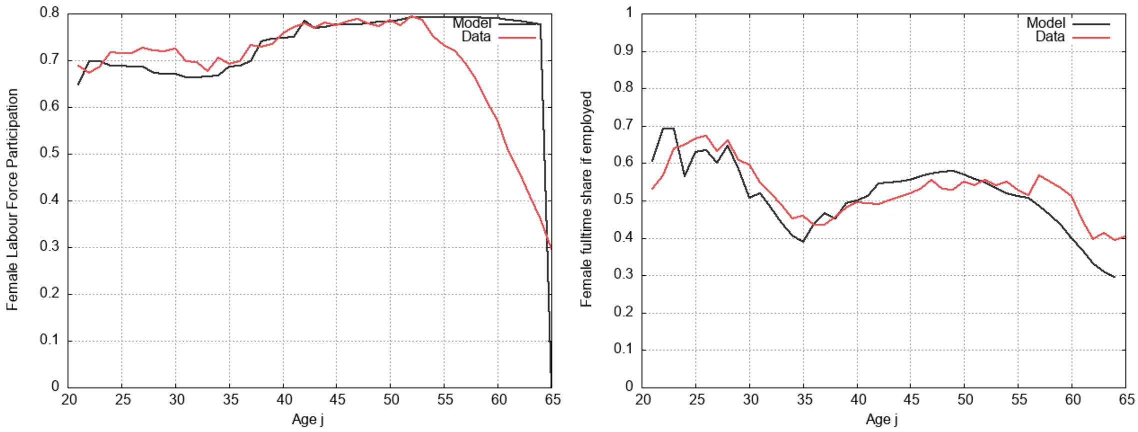


Figure 7: **Model vs Data: Life-cycle profiles of labor supply of mothers. Left:** Labor force participation. **Right:** Full-time share of employment.

To further assess the credibility of the model, we next examine the life-cycle profiles of two key non-targeted moments, wealth and consumption, by comparing model-generated outcomes to estimates from the HILDA survey (Appendix Figure D.2).

Wealth. Figure 8 indicates that the model captures key qualitative features of the empirical wealth dynamics over the life cycle. Both the model and the data exhibit a hump-shaped asset profile. Wealth accumulates throughout the working years, peaks around retirement, and decumulates during the retirement phase. The model is thus capable of accounting for the increasing wealth effect over the working age.[20]

However, some notable deviations remain. First, the model produces a narrower asset profile with a sharper peak compared to the data. This difference partly reflects the assumption that all households enter the economy with zero wealth. In reality, some young households begin with positive wealth (e.g., due to intergenerational transfers) and can adjust their fertility based on economic circumstances. which allows for smoother consumption and less drastic adjustments during periods of income shocks or child-rearing.

Second, the combination of high consumption needs associated with children and strict credit constraints suppresses savings in early adulthood. As a result, model households accumulate wealth more slowly during the child-rearing years, before accelerating their savings around age 40. The acceleration continues into late working life, eventually producing higher wealth levels than observed in the data. This aggressive later-life wealth accumulation is partly driven by the model's mandatory retirement assumption and the lack of post-retirement labor income, which together amplify the need to self-insure against longevity risk. Third, the absence of a bequest motive and the imposition of a zero terminal asset condition lead to faster decumulation of assets after retirement relative to the data. Finally, the interaction between wealth dynamics and labor supply is noteworthy. The pronounced recession in wealth during child-rearing years, followed by rapid recovery, reinforces the persistent female labor force participation observed in the model. That is, it aligns with model mothers' labor supply behavior, who remain in the workforce in later years to rebuild savings depleted during earlier periods of child-rearing.

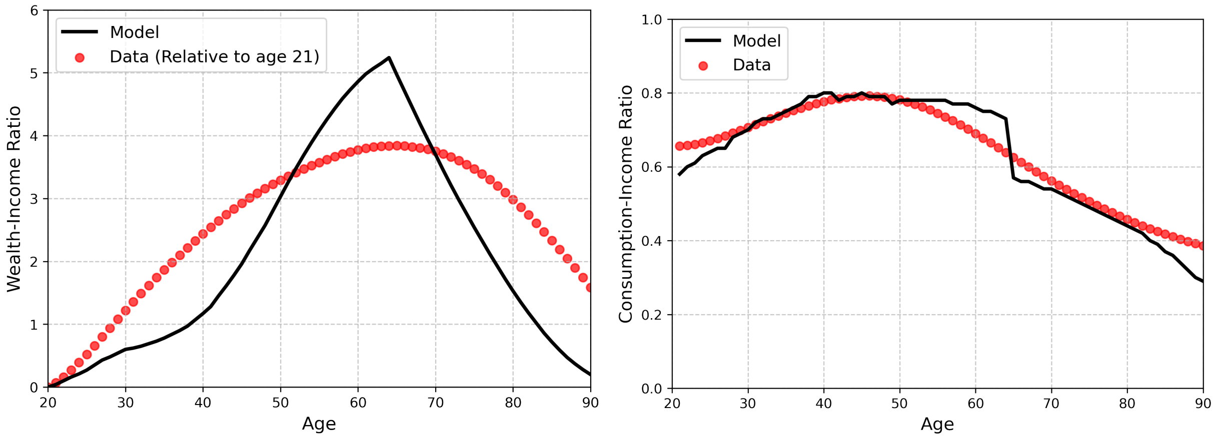


Figure 8: **Model vs Data: Life cycle profiles of wealth and consumption.**

Notes: (*) The estimated wealth profile represents household net worth (assets minus debts) relative to the average annual income of working-age population, based on HILDA household survey data. Scatter points represent net wealth across different years and age groups. Assets include financial assets (bank accounts, superannuation) and non-financial assets (property assets, business assets, collectibles). Debts consist of credit card debt, HECS debt, property debt, other personal debt, and overdue household bills. Further details on asset and debt classifications are available on page 74 of the HILDA User Manual - Release 20. (**) The estimated consumption profile is expressed relative to the average annual income of working-age population, based on HILDA household survey data. Consumption is derived from annualized household expenditures across multiple categories, including food and beverages, transportation, clothing and footwear, communication and utilities, healthcare, leisure and recreation, household expenses (repairs, renovations, furniture, household appliances), and education and technology. Further details on expenditure classifications are available on page 85 of the HILDA User Manual - Release 20.

Consumption. Although not targeted, the model-implied life-cycle profile consumption profile closely tracks the data. It captures the overall consumption trajectory: a gradual rise that plateaus around age 45, followed by a decline in later life. Additionally, for the first 30 years of economic life, model and data differ only slightly.

The most notable divergence occurs around retirement. The mandatory retirement assumption results in

[20] To improve comparability, the empirical asset profile from HILDA is rebased relative to its level at age 21, adjusting for the fact that households in the data do not begin with zero wealth.

higher pre-retirement income and wealth accumulation relative to the data. Upon retirement, the sudden loss of labor income—only partially replaced by capital income and pensions—triggers a negative income effect that leads to a sharp decline in consumption. There are also some discrepancies at very old ages (around 90), likely due to the model's omission of health expenditures and late-life medical shocks.[21] Nonetheless, the observed deviations in pre-retirement labour and savings behavior, driven by structural constraints, help the model households self-insure and maintain a relatively smooth consumption path, with levels that closely match the data.

Summary. Overall, the model captures key empirical patterns in female labor supply, wealth accumulation, and consumption. Still, some discrepancies remain, particularly in late working life, due to simplifying assumptions. While these assumptions aid computational feasibility, they constrain the model's ability to replicate certain behavioral margins. In our case, agents are compelled to save and work more prior to retirement to enable a consumption trajectory consistent with the empirical profile. Relaxing these constraints could improve the model's empirical fit, especially around retirement and in old age.

Further details on calibration—including data estimates for consumption and wealth, as well as the implied gender wage gap—are provided in Appendix Section D.

5 Quantitative analysis

We use the calibrated model to evaluate the impact of Australia's child-related transfer system on maternal labor supply and welfare. The analysis is organized into three groups of counterfactual policy experiments, presented across subsections that follow.

In Subsection 5.1, we examine whether replacing the current means-tested structure with universal child-related transfers—at varying levels of generosity—can improve maternal labor supply and overall welfare. Subsection 5.2 then turns to more modest, incremental adjustments within the existing means-tested system and compare their implications to those of universal reforms. Finally, in Subsection 5.3, we extend the analysis to a more radical scenario, going beyond the design of means testing to consider the broader role of public child support. We ask: Do child-related transfers discourage maternal employment? And if so, is there a case for abolishing these programs altogether? These experiments help illuminate the macroeconomic and distributional implications of child-related transfers, as well as the behavioral responses they induce.

We report welfare outcomes from two complementary perspectives. First, we compute ex-ante welfare, measured as the average expected utility of newborn households behind the veil of ignorance. This represents the viewpoint of a utilitarian social planner. However, aggregate gains under this metric may be driven by concentrated benefits for a minority while obscuring diffused losses across the broader population. As such, they may not reflect the preferences of a democratic society. To address this, we also assess ex-post welfare changes, evaluated after households have realized their permanent demographic types. This provides a distributional lens to examine the heterogeneity of policy impacts and offers insight into the political feasibility of each reform under a simple majority voting rule.

5.1 Universality of child-related transfers, maternal employment, and welfare

This subsection presents two sets of experiments in which we eliminate all means-testing rules, making child-related transfers universally available to all eligible households with children. Demographic and other non-income eligibility criteria—such as conditions related to the number and age of dependent children, as described in Appendix Section A—are retained.

The main distinction across these universal systems lies in the generosity of the transfers. In the first reform, referred to as the *baseline universal child-related transfer system,* we preserve the baseline statutory lump-sum

[21] The kink at retirement also reflects the discontinuous increase in leisure. As leisure jumps to unity, its marginal utility drops abruptly, temporarily disrupting the balance with the marginal utility of consumption. The resulting effect on consumption depends on how this interacts with the negative income shock from retirement.

payment levels for the Family Tax Benefit (FTB) and the subsidy rates for the Child Care Subsidy (CCS). In the second reform, we maintain the universality but vary the payment rates to assess whether greater or lesser generosity improves upon the baseline results.

5.1.1 Baseline universal child-related transfer system

We begin by quantifying the effects on maternal employment and welfare of replacing the current means-tested system with a *baseline universal child-related transfer* scheme, first discussing heterogeneous responses across household types to provide foundation for interpreting the aggregate implications.

	Universalization of child-related transfers		
	[1] 0.5×Baseline	[2] Baseline	[3] 1.5×Baseline
CCS size, %	−15.45	+129.45	+207.27
FTB size, %	+132.56	+281.40	+430.23
Tax scale (λ)	−0.09	−3.90	−4.80
Average tax rate, *pp*	+0.15	+4.20	+6.13
Fe. Lab. For. Part. (LFP), *pp*	+1.06	+2.64	+3.91
Fe. Full time (FT), *pp*	+0.23	+4.39	+6.29
Hour, %	+1.18	+6.67	+9.57
Human cap. (H), %	+0.40	+2.09	+3.09
Savings (S), %	+9.62	+10.84	+16.43
Consumption (C), %	−0.03	+0.04	+0.08
Output (Y), %	+0.16	+0.11	+0.11
Welfare (EV), %	+0.27	+0.85	+1.50

Table 5: **Aggregate efficiency and welfare effects of universal child benefits at different payment rates.**
Notes: Results are reported as percentage changes relative to the levels in the baseline economy. The middle column shows the aggregate changes associated with the baseline universal scheme.

Heterogeneous maternal employment responses. To better understand the drivers of aggregate maternal labor supply impacts, we examine employment responses by family type and education level. Figure 9 illustrates these heterogeneous effects.

Under the universal regime, all mothers are eligible for the maximum lump-sum transfer regardless of family income, and all working mothers qualify for the maximum childcare subsidy. As discussed in Section 2.2, family-income-based means testing leads to benefit clawbacks as secondary earners increase their labor supply, effectively functioning as an implicit tax. In many cases, the resulting loss of transfers can partially or fully offset the financial gains from employment. Thus, by removing these phase-outs, the reform eliminates wage distortions that disproportionately affect secondary earners, especially married women.

Indeed, our quantitative results suggest the reform leads to marked increases in labor supply among married mothers, particularly between ages 20 and 40. This period corresponds to the child-rearing years, during which child-related transfers are active and effective marginal tax rates (EMTRs) are most distortionary under the benchmark regime. Eliminating means testing removes these disincentives, thereby encouraging earlier and stronger labor market engagement. The timing is crucial: it coincides with the phase of life when human capital potential is highest (see Equation 7), resulting in compounding gains in long-run productivity and earnings.

This response is especially pronounced among low-education married mothers. Since this group earns lower wages, they face steeper implicit tax rates under means testing and are more responsive to the removal of such penalties. However, their relatively low productivity and limited taxable earnings under a progressive income tax schedule also mean, despite their stronger labor supply response, they contribute less to aggregate output and fiscal revenue.

In contrast, single mothers exhibit highly inelastic labor supply responses. Their participation changes only marginally, with a small reduction in hours worked (i.e., a shift from full-time to part-time employment). Three key mechanisms help explain this stark difference in responsiveness between single and married mothers.

First, single mothers are already largely insulated from the disincentives of means testing. Lacking a partner, they generally have lower household income than their married counterparts. This implies that most single mothers already qualified for maximum benefits under the benchmark regime. The removal income-based

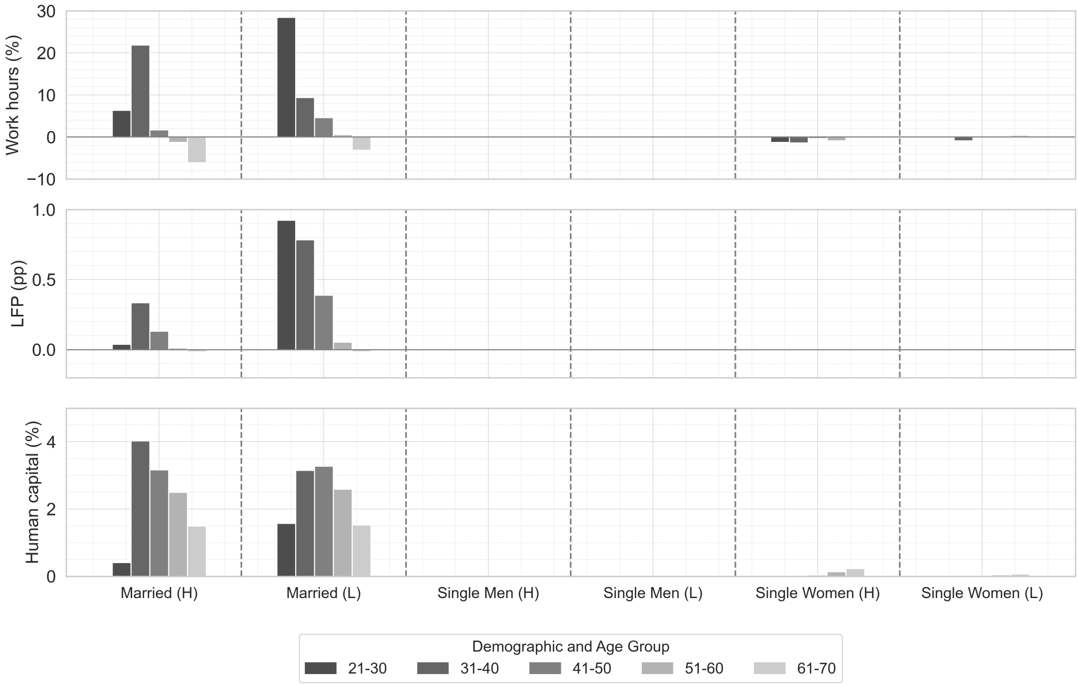


Figure 9: **Changes in female work hours (top), labor force participation (middle), and human capital (bottom) due to universal child benefits.**

Notes: This figure is based on Table E.1 in the Appendix. We report LFP as percentage point (pp) changes, and work hours and human capital as percentage changes (%) relative to their respective values in the benchmark economy.

phase-outs therefore yields limited additional work incentives. Second, without access to spousal income, single mothers rely more heavily on their own labor earnings to smooth consumption and insure against income and longevity risk. Since child-related transfers expire as children age out of eligibility, continued labor market attachment becomes essential for their long-term financial security. Third, their muted response may also reflect the model's limited adjustment margins since labor supply options are restricted to discrete choices. While some single mothers move from full-time to part-time employment, potential adjustments to hours worked within each employment type are not captured. Nonetheless, this limitation is unlikely to overturn the core result, that labor supply responses are stronger among married mothers.

Aggregate maternal employment effects. The heterogeneous responses discussed above culminate in notable gains at the aggregate level. As depicted in Table 5, maternal labor force participation rises by 2.64 pp. In addition, full-time employment share among mothers increases by 4.39 pp, accompanied by a 6.67% improvement in their average work hours. The aggregate improvements, including a 2.1% gain in female human capital and a modest 0.11% rise in total output, observed under the baseline universal transfers are thus primarily driven by behavioral changes among married mothers.

Taken together, these findings support the empirical observations from Section 2, suggesting that the M-shaped pattern of maternal work hours in Australia is, in part, a consequence of family-income-based means testing embedded within the child-related transfer system—particularly through its distortionary effects on married women.

The observed responses reflect the interaction of competing forces: the removal of work disincentives created by benefit phase-outs, the extension of support to previously ineligible high-income families, and the increased tax burden required to finance the reform. On net, the results indicate that the work incentives generated by universality outweigh its income effects and fiscal distortions. In other words, the inefficiencies associated with Australia's tightly targeted system are sufficiently large that universalization—despite requiring higher taxes—can still improve maternal employment and aggregate output.

These same mechanisms may also help explain gender gaps in earnings, particularly those driven by differences in work hours and the cumulative effects of labor market experience on human capital. By contrast, they offer limited explanatory power for the labor supply behavior of single mothers, whose employment patterns remain largely unaffected by the reform.

Heterogeneous welfare outcomes. While the universal reform boosts macroeconomic performance, it produces sharply divergent welfare effects across demographic groups. These distributional patterns reflect the heterogeneous responses in labor supply, consumption, and wealth accumulation, and are most pronounced when comparing married and single households.

Married households emerge as clear winners, experiencing welfare gains of approximately 1.3%, as reported in Table 6. In addition to receiving transfers, increased labor supply during the peak child-rearing years enhances their ability to self-insure, enabling greater savings and facilitating higher and smoother consumption over the life cycle. These dynamics are illustrated in Figure 10.

	Couples (H)	Couples (L)	Single M (H)	Single M (L)	Single W (H)	Single W (L)
Welfare (%)	+1.36	+1.34	−1.47	−1.20	−0.69	−0.51

Table 6: **Welfare changes by demographic due to universal child benefits** (H: High education, L: Low education, M: Men, W: Women).
Notes: Results are reported as percentage changes relative to the levels in the benchmark economy.

Within this group, the largest improvements occur among younger married households, who tend to be more credit-constrained and earn lower incomes due to limited human capital early in life, thereby having larger marginal utilities of consumption compared to older households. Consequently, the transfer-induced increase in consumption during this period translates into relatively large welfare gains. Moreover, with increased financial stability, married women can now afford to reduce labor supply intensity and substitute toward more leisure in later years. These adjustments imply more efficient intertemporal allocations of labor and consumption, and help explain the sizeable welfare improvements observed for this group.

In contrast, single mothers—the primary targets of the transfers—are disadvantaged under the baseline universal system. The key mechanism behind this outcome lies in the financing of universality. Providing all families with baseline-level benefits entails a substantial expansion of public spending. Compared to the benchmark, FTB and CCS expenditures rise by 281.4% and 129.5%, respectively. To maintain fiscal balance, the progressive income tax schedule is uniformly shifted upward by adjusting the scale parameter ζ, resulting in a 4.2 percentage points increase in the average tax rate (Table 5). This broad-based increase in taxation raises tax burdens across the income distribution, including for low-income workers.

Thus, for single mothers whose labor supply remains largely unchanged under the baseline universal system, they bear the full weight of the higher tax burden without commensurate gains in earnings and wealth observed among married households. Furthermore, lacking access to spousal income, credit markets, or alternative insurance mechanisms, these households are less equipped to buffer this tax-induced contraction in disposable income. As depicted in Figure 10, they experience persistent consumption losses throughout the working-age period, which translate into welfare declines by 0.51% for low-education and 0.69% for high-education single mothers.

Single childless men fare even worse. This group receives no transfers under either regime but become liable for the increase in taxes under universality. In net terms, this reform is therefore a redistribution of welfare from single to married households.

Aggregate welfare effects. We now turn to the aggregate welfare implications of universalizing child-related transfers. As reported in Table 5, aggregate welfare—measured as ex-ante lifetime utility—increases by 0.85%.

That such welfare gains emerge despite the fiscal cost of universality suggests that the efficiency costs of Australia's current tightly targeted system are substantial. The long-recognized trade-off between fiscal targeting and work incentives manifests here in quantitatively meaningful terms. By removing benefit phase-outs, the universal reform eliminates the distortions that dampen maternal labor supply and human capital accumulation. The behavioral changes among married mothers generate both efficiency and welfare improvements.

However, this result also reflects how the reform's benefits for married households outweigh the welfare losses experienced by single households. In particular, low-education single mothers—who derive substantial support from the current system—are made worse off by the shift toward broad-based universality. It is thus regressive for the most vulnerable group the original means-tested system was designed to protect.

Majority support. Despite its regressive distributional effects, the reform would likely pass under a simple majority vote. Married households, who benefit substantially from the universal system, constitute 70% of the population. Assuming voters are not inequality-averse, the welfare gains accruing to this majority group would be sufficient to secure political support for the reform.[22]

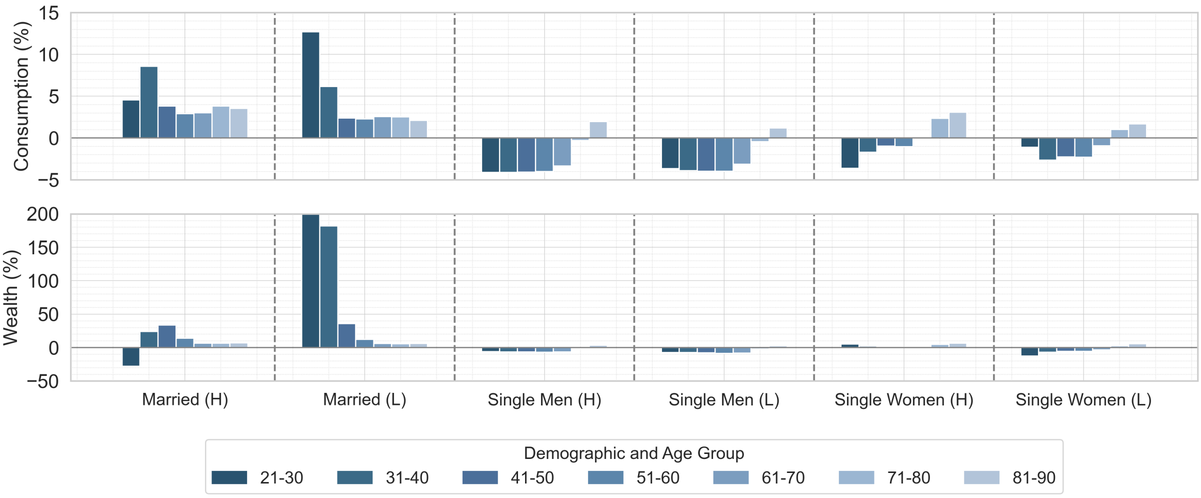


Figure 10: **Changes in consumption (top) and wealth (bottom) due to universal child benefits.**
Notes: This figure is based on Table E.2 in the Appendix. Results are reported as percentage changes relative to the levels in the benchmark economy.

5.1.2 Alternative universal benefit payment levels

The preceding analysis highlights a key limitation of the baseline universal system: while it increases maternal labor supply and aggregate welfare, it disproportionately harms single mothers due to the excessive fiscal expansion. Without means testing, one potential remedy is to control the generosity of transfers to strike a better balance between efficiency and equity.

To evaluate this, we simulate two alternative universal policy scenarios: (i) a reduced universal system, which halves the baseline benefit level; and (ii) an expanded universal system, which increases benefit payments by 50% relative to the baseline. Table 5 summarizes the key aggregate outcomes, while Figures 11, 12, and 13 present the heterogeneous impacts on welfare, labor supply, and consumption across household types.

Expanded universal system: higher aggregate gains, deeper inequity Under the more generous scheme, the average tax rate rises by 6.13 pp, almost 2 points above the baseline universal scenario (Table 5). Despite this heavier fiscal burden, aggregate outcomes continue to improve: maternal labor force participation increases by 3.91 pp, full-time employment by 6.29 pp, and female human capital by 3.09%. These employment gains are driven by the more generous universal childcare subsidies. Aggregate output also goes up slightly by 0.11%, and ex-ante welfare improves by 1.5%, the largest across all policy experiments we consider.

As in the baseline universal regime, married households, particularly those with low education, reap the greatest benefits. Figures 12 and 13 show significant increases in their labor supply early in life, leading to

[22]Since the reform also increases the average (ex-ante) welfare, the majority vote outcome aligns with a utilitarian social planner's choice.

higher consumption over the life cycle and more leisure in later years. Compared to the baseline, welfare gains grow accordingly. High-education couples benefit more (+1.6% vs. +1.4% in the baseline), and welfare gains for low-education couples double (+2.6% vs. +1.3%).

However, the expanded generosity exacerbates the disadvantages faced by single mothers. As in the baseline case, their labor supply remains largely unresponsive to the reform. Although they indeed receive larger transfers, these are outweighed by the substantially higher taxes. With limited access to alternative income sources or insurance mechanisms, the tax burden translates into steeper lifetime consumption losses (Figure 13). As a result, welfare declines further for these households, by 0.9% for low-education single mothers and by 1.3% for those with high education.

In short, more generous universal child-related transfers amplify both the macroeconomic gains and the regressive distributional effects. In the absence of means testing, those most in need of support end up shouldering a disproportionate share of the financing burden relative to their limited earnings capacity.

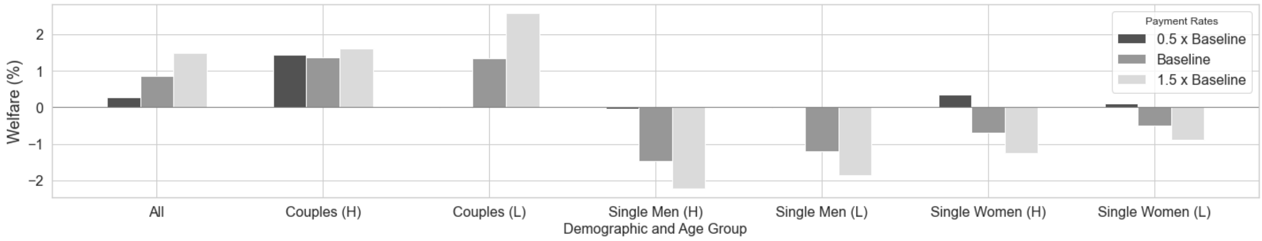


Figure 11: **Changes in welfare by demographic across different universal payment rates.**
Notes: Welfare declines slightly by 0.02% *for low-education couples when the payment rates are* 0.5× *baseline rates. The figure is based on Table E.4 in the Appendix. Results are reported as percentage changes relative to the benchmark economy.*

Reduced universal system: smaller aggregate gains, improved equity

In contrast to the baseline and expanded universal regimes, reducing the generosity of transfers (by halving payments relative to the baseline) delivers smaller macroeconomic and welfare gains but produces a markedly more equitable distribution of outcomes. Crucially, this reform eliminates the distortions associated with means testing without introducing significant new tax distortions that might otherwise erode efficiency gains. That is, the reform alters the policy design while maintaining a roughly constant fiscal cost. As shown in Table 5, the average tax rate increases by only 0.15 pp, marginally above the benchmark level.

This constrained universal scheme yields modest but positive welfare gains for both low-education (+0.1%) and high-education (+0.4%) single mothers. Despite receiving smaller transfers, these households benefit from improved disposable income and higher consumption over the life cycle (Figure 13). In effect, the efficiency gains from a flatter EMTR schedule outweigh the losses from reduced benefit generosity. This avoids the regressive tilt observed under more expansive universal regimes and offers a more balanced policy alternative.

Notably, the reduced universal scheme comes close to achieving an inclusive welfare improvement, incurring only minimal equity costs. While single men continue to experience welfare losses, reflecting their role in financing a system from which they receive no direct benefit, these losses are substantially smaller than those in prior scenarios (Figure 11).

Among the intended beneficiaries, low-education married households also incur a slight welfare decline of 0.02. As illustrated in the top panel of Figure 13, their consumption rises by 3–4% throughout much of the life cycle, owing to strong maternal labor supply responses. However, these sustained gains, which even exceed those observed under more generous universal regimes, are insufficient to compensate for their early-life consumption shortfalls. This suggests that the welfare losses are concentrated in the initial stages of life, when marginal utility is highest due to a combination of low joint earnings (reflecting both low education and assortative mating), high dependency ratios from early childbearing, and limited access to credit.

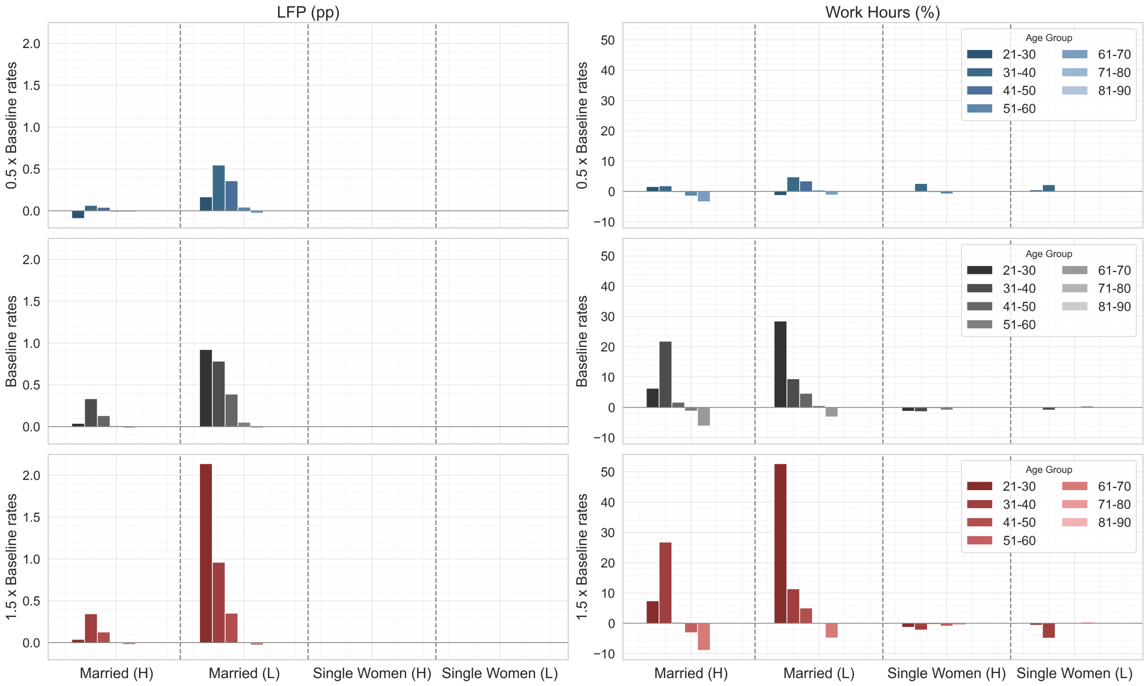


Figure 12: **Changes in female labor force participation (left) and work hours (right) across different universal payment rates: Top**: 0.5×Baseline, **Middle**: Baseline, **Bottom**: 1.5×baseline.
Notes: Figures are based on Table E.3 in the Appendix. LFP and work hours are reported as percentage point (pp) and percentage (%) changes relative to their respective values in the benchmark economy.

This outcome highlights the importance of timing in the design of transfer policies. When benefit reductions coincide with periods of acute needs—such as early parenthood in low-income families—the resulting welfare losses may not be recoverable through future increases in earnings. Supporting consumption during these vulnerable life stages enables more effective consumption smoothing and promotes household welfare.[23]

Majority support. Under a majority voting rule, the political feasibility of universal child-related transfers depends on the generosity of benefits, which shapes their differential welfare impacts across household types. Specifically, we find that married couples favor more generous universal programs, while single households prefer more modest alternatives.

Compared to the baseline universal system, bigger transfers further enlarge welfare gains for married households—up to 2.6% for low-education couples—while deepening losses for single mothers (−1.3%) and single men (−1.9%). Because these benefits are concentrated among demographically dominant groups, the expanded universal regime would still pass a majority vote, despite its more regressive distributional outcomes.

Conversely, scaling down the payment to 50% of the baseline level improves both aggregate welfare (+0.27%) and equity. Single mothers, previously disadvantaged under more generous universal schemes, now register modest welfare gains (0.1% to 0.4%) due to a more favorable trade-off between transfers received and taxes paid. However, despite these improvements in distributional fairness, the reform lacks majority backing. The pivotal voting bloc, married households, continue to prefer the more generous alternatives that offer them higher welfare. As a result, a majority coalition can block the scaled-down proposal.

Taking stock. Our finding contrasts with those of Guner et al. (2020b) in the U.S. context, where means-tested child-related transfers were shown to deliver greater welfare gains than universal alternatives. This divergence reflects underlying institutional differences. Compared to the U.S., Australia's child-related transfers are more generous and its means-testing rules more stringent, pervasive, and based on joint family

[23] Cross-regime comparisons in Figure 13 support this conclusion. Low-education couples exhibit smaller late-life consumption gains under more generous universal systems, due to heavier tax burdens. Yet their welfare gains are larger, indicating that: (i) welfare outcomes are primarily driven by early-life consumption; (ii) marginal utility is highest during the early years due to concave utility; and (iii) early transfer cuts are not fully offset by future earnings.

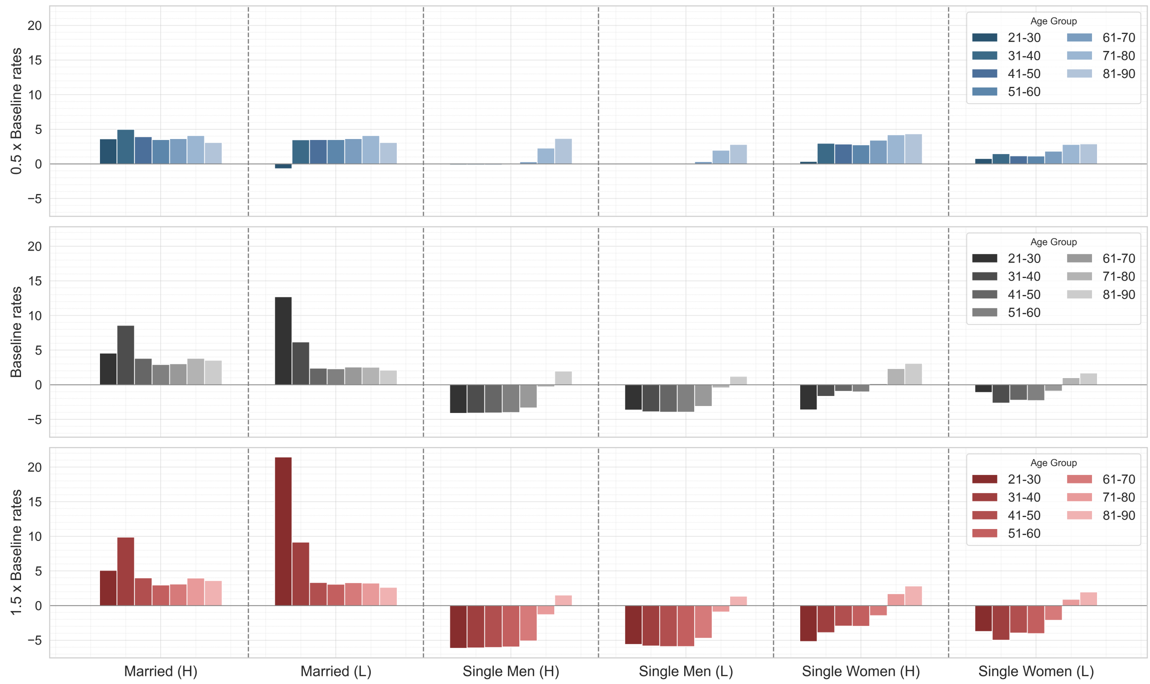


Figure 13: **Changes in consumption across different universal payment rates**. **Top**: 0.5×Baseline, **Middle**: Baseline, **Bottom**: 1.5×baseline.
Notes: The figure is based on Table E.4 in the Appendix. Results are reported as percentage changes relative to the benchmark economy.

income. In such a setting, the labor supply distortions and associated efficiency losses are magnified. This contrast underscores that policy reform outcomes are context-dependent and shaped by a country's existing institutional architecture. Universality is not a universal solution.

Our analysis further shows that the generosity of transfers is critical for shaping both efficiency and inclusion, though not always in ways anticipated in public discourse. A more generous universal scheme delivers larger aggregate gains in labor supply, output, and welfare. However, its unintended distributional consequences undermine the redistributive goals of child-related policies by shifting the fiscal burden onto vulnerable households. In contrast, a scaled-down universal scheme limits tax-induced distortions and achieves more inclusive gains. These results emphasize that without a careful balance between benefit levels and fiscal incidence, even well-intentioned reforms can become regressive.

5.2 Incremental reforms to the means-tested system

The preceding subsection demonstrates that universal child-related transfers can be designed to improve efficiency and ex-ante welfare, while also supporting vulnerable parent groups. However, childless households—particularly single men—continue to experience welfare losses, as they remain net contributors to the system. A key constraint lies in the fiscal burden required to finance a universal system. While Australia's current means-tested approach addresses this by targeting transfers to low-income families, it also introduces sharp work disincentives that ultimately reduces overall efficiency.

Motivated by these trade-offs, we next examine whether incremental adjustments to the existing means-tested policy parameters can improve welfare without incurring the fiscal and distributional costs of universality. In principle, such reforms can succeed if they broaden the tax base (e.g., by increasing labor supply) sufficiently to offset the financing costs of transfers. The complexity of Australia's statutory means-testing rules—encompassing payment levels, income thresholds, taper (phase-out) rates, and work and demographic conditions—create a rich policy space. To keep the analysis tractable while drawing out key insights, we narrow our scope to a selected set of plausible reforms. These include variations to payment levels and phase-out rates for each of the two child-related transfer programs (FTB and CCS). Table 7 summarizes the macroeconomic and aggregate welfare effects across these scenarios.

Among the reforms considered, two stand out for their positive ex-ante welfare effects: increasing FTB payment levels and relaxing the CCS phase-out rates, which yield welfare gains of 0.28% and 0.37%, respectively. However, the macroeconomic outcomes of these policies diverge. While relaxing the CCS taper boosts maternal labor supply and output, expanding FTB payments generates declines on both fronts. Given its superior performance across both efficiency and welfare dimensions, we focus the subsequent analysis on the aggregate and distributional consequences of the CCS phase-out reform.

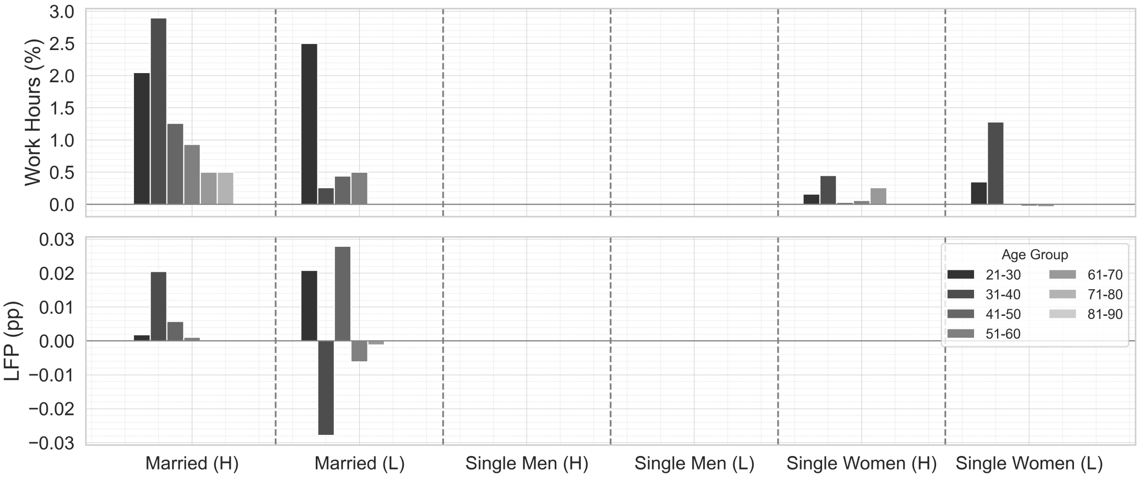


Figure 14: **Changes in work hours (top) and labor force participation (bottom) due to relaxing the CCS phase-out rates.**

Notes: LFP and Work hours are reported as percentage point (pp) and percentage (%) changes relative to their respective values in the benchmark economy.

Heterogeneous maternal employment responses. Labor supply responses vary across family types and education levels. Relaxing the CCS phase-out rate extends childcare subsidy eligibility further up the income distribution. This broader coverage softens the EMTRs faced by secondary earners, which arise from the interaction of means testing and progressive income taxation. As a result, both low- and high-education mothers benefit from this reform.

As illustrated in Figure 14, low-education married mothers respond strongly, especially in their early working years (ages 20–30) when childcare expenses are high and credit constraints most binding. The increase in childcare subsidies during this critical stage encourages them to work more, especially in full-time roles. Later in life, some decline in labor supply is observed, suggesting a reversion to more leisure as financial constraints ease due to earlier savings.

High-education married mothers exhibit even stronger labor supply responses during their prime working years. In the benchmark economy, this group faced steep EMTRs due to their higher productivity and earnings, which placed them in upper tax brackets. By extending subsidy coverage further up the income distribution, the reform alleviates these disincentives, leading to substantial increases in participation and work hours. Importantly, the reform also avoids the crowding-out effects seen under the universal regime. In that setting, older high-education mothers—whose children had aged out of eligibility for child-related transfers—faced sharply increased tax burdens without receiving childcare subsidies. As a result, many exited the workforce despite their high accumulated human capital. In contrast, the more targeted and fiscally restrained design of the CCS taper reform preserves work incentives for this productive group, sustaining their labor market attachment (see Figure 12).

Among single mothers, we observe a shift from part-time to full-time work in early adulthood, reflected in increased work hours. This behavioral change was absent under the baseline and expanded universal reforms, where competing forces—such as high taxes and universally available lump-sum transfers (e.g. FTB)—diluted the work incentives created by childcare subsidies. On the contrary, single mothers exhibit minimal responses in participation, indicating structural constraints beyond subsidy design.

Aggregate implications of incremental child benefit reforms								
	FTB payment rates		CCS subsidy rates		FTB phase-out rates		CCS phase-out rates	
	$0.5 \times tr$	$1.5 \times tr$	$0.5 \times sr$	$1.5 \times sr$	$0.5 \times \omega^F$	$1.5 \times \omega^F$	$0.5 \times \omega^C$	$1.5 \times \omega^C$
Tax rate, *pp*	−0.36	+0.19	−1.37	−0.69	+2.08	+3.34	−0.97	+1.28
Tax scale (λ)	+0.26	−0.94	+1.62	+0.48.	−0.14	−1.54	+0.01	+0.01
Fe. LFP, *pp*	+1.13	−2.87	−5.65	+1.00	+1.69	−2.94	+0.17	−2.66
Fe. Hour, %	+3.28	−5.05	−10.89	+3.67	+1.13	−5.47	+1.00	−5.32
Fe. H. Cap, %	+0.92	−2.22	−4.95	+0.93	+0.76	−2.21	+0.22	−2.49
Savings. (S), %	−0.48	−2.41	−0.32	−1.45	−4.62	−6.93	+1.52	−3.44
Cons. (C), %	−0.17	−1.09	−2.41	+1.03	+1.36	−1.55	+0.46	−2.06
Output (Y), %	+0.88	−1.08	−1.52	+2.20	+0.81	−1.67	**+0.89**	−1.42
Welfare (EV), %	−0.82	+0.28	−0.41	−0.02	−0.44	−1.41	**+0.37**	−0.61

Table 7: **Aggregate effects of incremental reforms to selected means-testing parameters.**
Notes: Results are reported in terms of percentage changes relative to the levels in the benchmark economy. Let tr denote the FTB payment rates, sr denote the CCS subsidy rates, ω^F denote the FTB phase-out rates, and ω^C denote the CCS phase-out rate (a reciprocal of the taper unit which is the amount of income increment by which the subsidy rate falls by 1pp). ϕ_p is a scaling factor for a particular policy parameter. For example, $\phi_p \times tr^{FTB}$ when $\phi_p = 1.5$ means that the FTB payment rates are increased 1.5 times.

Aggregate maternal employment effects. As shown in Table 7, maternal labor force participation increases by 0.17 pp, while work hours rise by 1%. These seemingly modest changes translate into sizeable macroeconomic effects: aggregate consumption rises by 0.46%, and output increases by 0.89%. Notably, these gains exceed those achieved under the universal reform scenarios (see Section 5.1), even though the latter produced larger total increases in labor supply. The key insight here is that who responds matters as much as how much labor supply rises overall.

Crucially, the largest labor supply increases come from high-education married mothers, a demographically smaller but economically significant group due to their high productivity. By strengthening work incentives for this group without imposing offsetting tax burdens that crowd out labor supply during their prime working years, the policy generates efficiency gains that exceed what would be expected from the modest increase in total labor force participation.

Heterogeneous Welfare Outcomes. Welfare gains under the CCS taper reform are modest across demographic groups but notably inclusive in their distribution, as summarized in Table 8. This is a clear contrast with the universal reform scenarios, where some households, including single mothers, bore substantial costs.

This distinction is central. Under universal schemes, aggregate welfare gains were achieved at a high fiscal cost and primarily driven by concentrated improvements among married households, while redistributing resources away from more vulnerable groups. In contrast, the CCS taper reform maintains a low fiscal cost and promotes maternal labor supply across education levels. This broadens the tax base, further mitigating fiscal pressure. Consequently, the additional public spending is more than offset by enhanced revenue flows via income and consumption taxes, as well as a reduced reliance on the FTB.[24] Overall, the reform enables a 0.97 pp reduction in the average tax rate, in stark contrast to the 4.2 point increase required under the baseline universal policy. In this way, the redistributive goal is achieved in a fiscally sustainable manner, spreading modest yet broad-based benefits across the population. These patterns are reflected in the life-cycle profiles of consumption changes in Figure 15.

Married households enjoy the largest welfare improvements, ranging from 0.38% to 0.44%. Their increased labor supply significantly enhances growth in household consumption over the life cycle, particularly among young couples. Single mothers also experience modest welfare gains. While their participation response is limited, they benefit from the expanded subsidy coverage and reduced tax burden, both of which support higher consumption and improve financial resilience.

Perhaps most striking are the welfare outcomes recorded by single childless men. Under universal reforms,

[24] Under this reform, CCS expenditures expand by 11.12%, whereas FTB outlays fall by 2.32%.

this group suffered welfare losses due to increased tax burdens. Here, however, they benefit from improved disposable income and consumption via the general equilibrium effect of reduced average tax rates. Thus, the reform's fiscal sustainability ensures that enhanced support and work incentives for mothers do not necessitate offsetting tax increases elsewhere. Instead, the policy's fiscal surplus allows even childless households to share in the gains.

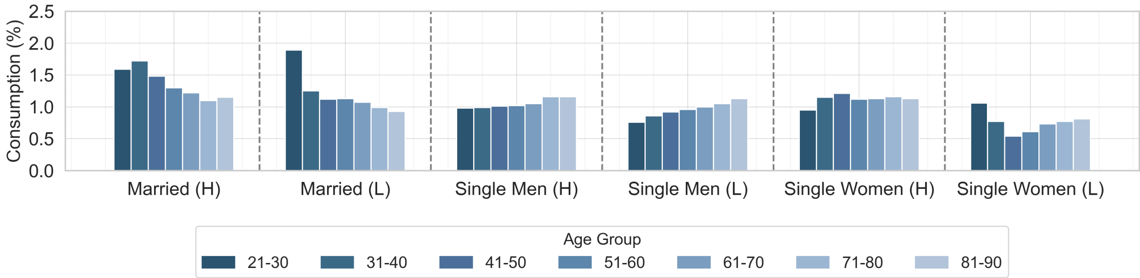


Figure 15: **Changes in consumption in response to the relaxation of CCS taper rates.**
Notes: The figure is based on Table E.5 in the Appendix. Results are reported as percentage changes relative to the benchmark economy.

Aggregate welfare effects. The broad-based welfare increases under this new regime translates into a meaningful aggregate improvement. As reported in Table 7, ex-ante welfare for newborn households rises by 0.37%, driven by the higher disposable earnings and consumption across a wide range of demographic groups. While this aggregate gain is smaller than the 0.85% increase achieved under the baseline universal system, it comes at a markedly lower fiscal cost and without imposing welfare losses on any subgroup.

	Couples (H)	Couples (L)	Single M (H)	Single M (L)	Single W (H)	Single W (L)
Welfare (%)	+0.42	+0.40	+0.34	+0.24	+0.26	+0.18

Table 8: **Welfare changes due to relaxing (halving) the CCS phase-out rates.** (H: High education, L: Low education, M: Men, W: Women).
Notes: Results are reported as percentage changes relative to the levels in the benchmark economy.

Majority support. Despite its favorable welfare and equity profile, the incremental reform may struggle to garner majority support. Married households—the largest voting bloc—derive greater welfare gains from the universal regime, exceeding 1.3% (Figure 11). In contrast, the incremental approach yields smaller gains of around 0.4% for this group. Hence, the incremental reform risks being politically dominated, even if it is superior from an equity-efficiency standpoint.

Taking stock. The CCS taper reform is particularly noteworthy, not for its aggregate gains but for the nature of those gains. Rather than relying on large-scale redistribution, it sustains fiscal discipline by leveraging behavioral responses—especially from high-productivity mothers—to broaden the tax base and raise disposable incomes across the board. This mechanism generates inclusive welfare improvements for both direct beneficiaries and non-beneficiaries, in contrast to universal reforms that require heavy taxation and generate regressivity that undermines its own redistributive aims. In this light, the CCS taper reform demonstrates how carefully targeted, incremental policy adjustments can offer a pragmatic and normatively attractive path forward.

Yet the reform's distributional outcome exposes a deeper political tension. As shown, under a majority voting rule, generous universal regimes, despite being less equitable and more costly, are more appealing to married households, the dominant voting bloc. Without institutional mechanisms to elevate disadvantaged voices or broaden public awareness of the incremental reform's inclusive benefits, such policies risk being politically marginalized. This asymmetry highlights a core challenge in welfare reform: normative desirability does not necessarily align with political viability. Reforms that promote a better balance between efficiency and equity may nonetheless fail to gain traction if they do not align with majority preferences.

Finally, a caveat is warranted. Our experiments are confined to discrete changes in selected policy parameters. A broader and more systematic exploration of the means-testing design space may uncover alternatives that further improve upon this balance.

5.3 Abolishing child-related transfers

Do child-related transfers matter? This section evaluates the social desirability of Australia's existing child-related transfers. Specifically, we examine whether these programs promote efficiency and redistribution, or whether the behavioral distortions they introduce outweigh their benefits. This experiment also serves as a benchmark to assess the net value of the universal and incremental reform packages. To this end, we simulate a policy scenario that abolishes both the FTB and the CCS, effectively dismantling the core pillars of Australia's financial support system for families with children. The analysis is conducted under the same public budget balance constraint as previous reforms.

Aggregate implications of universal FTB and CCS programs			
Average tax rate, *pp*	+0.99	Human cap. (H), %	+8.57
Tax scale (λ)	+0.003	Savings (S), %	+23.45
Fe. Lab. Force Part. (LFP), *pp*	+10.49	Consumption (C), %	+4.27
Fe. Full time (FT), *pp*	+20.38	Output (Y), %	+3.86
Hour, %	+28.67	Welfare (EV), %	−0.66

Table 9: **Aggregate effects of eliminating child-related transfers.**
Notes: Results are reported as changes relative to the levels in the benchmark economy.

Heterogeneous maternal labor supply responses. Abolishing child-related transfers generates varying labor supply responses across demographic groups, with pronounced effects among married mothers. Figure 16 reveals that the largest increases in labor force participation and hours worked comes from low-education married mothers, who were previously subject to steep EMTRs. A significant share of young women in this group enters full-time employment, especially during early adulthood (ages 21–40), a period when labor market engagement is most impactful on human capital accumulation and earnings growth.

In contrast, single mothers exhibit minimal changes in participation rates. Their response occurs primarily along the intensive margin, shifting toward longer work hours to offset the loss of child-related transfers. While these adjustments are non-trivial, they remain modest relative to the stronger extensive and intensive margin responses observed among married mothers. This pattern reflects the fact that single mothers were less exposed to joint-income assessments under the benchmark system, which implies their behavioral adjustment is driven more by income effects than by reductions in effective marginal tax rates.

These patterns, particularly at the intensive margin, are consistent with findings from Hannusch (2025), which highlight the central role of child-related transfers in shaping maternal labor supply. However, with regards to the extensive margin, while abolishing these transfers leads to larger participation gains than the universal and incremental reforms, it still falls short of fully bridging the maternal participation gap shown in Figure 1. Hence, although child-related transfers are an important determinant, this finding suggests that other structural forces beyond the transfers contribute to the persistence of this gap.

Aggregate maternal employment effects. The heterogeneous responses outlined above translate into the strongest macroeconomic performance among all the policy scenarios considered. As reported in Table 9, female labor force participation increases sharply by 10.5 pp, full-time employment rises by 20.4 pp, and average hours worked grow by 28.7%. These changes lead to a substantial 8.6 increase in female human capital and a 3.9% rise in aggregate output.

These outcomes reflect efficiency improvements driven primarily by eliminating the steep EMTRs that arise from the interaction of overlapping means tests and progressive taxation. Without the transfer-induced distortions, work becomes significantly more rewarding, particularly for mothers previously trapped in the benefit phase-out zones.

Heterogeneous welfare outcomes. Table 10 and Figure 16 reveal that the welfare effects of abolishing

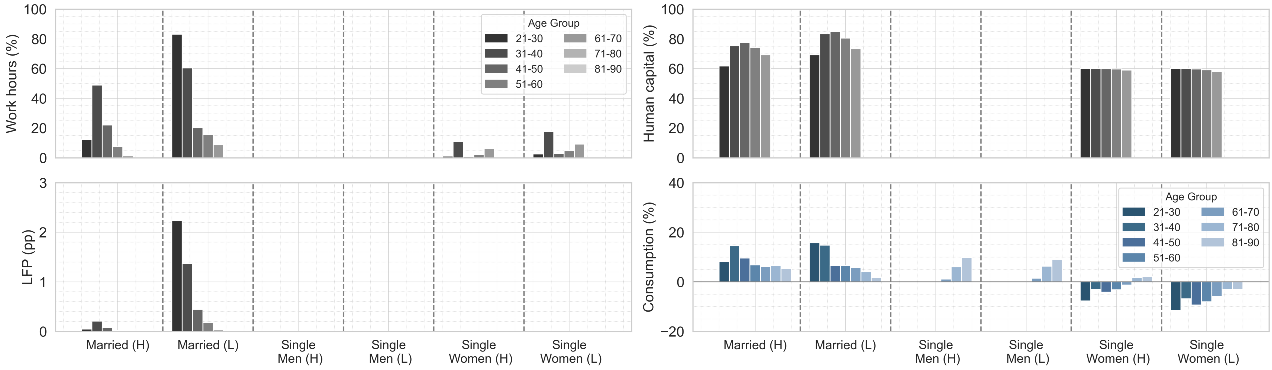


Figure 16: **Labor supply and consumption changes by demographic due to removing all child benefits. Top-left**: Work hours, **Bottom-left**: Labor force participation, **Top-right**: Human capital, **Bottom-right**: Consumption.
Notes: Results for 'Married households' capture the responses by the female spouses. Figures are based on Tables E.6 and E.7 in the Appendix. LFP and Work hours are reported as percentage point (pp) and percentage (%) changes relative to their respective values in the benchmark economy.

child-related transfers are highly uneven. This asymmetry reflects the heterogeneity in labor supply responses and the varying degrees of dependence on the transfer system across demographic groups. For some households, removing transfers lifts disincentives, unlocks latent labor supply, and increases disposable income. For others, particularly those with limited capacity to adjust (e.g., due to time constraints), these transfers serve as a critical form of insurance. In such cases, labor supply changes are relatively weaker, and the resulting income gains are insufficient to offset the welfare losses arising from the absence of public support.

	Couples (H)	Couples (L)	Single M (H)	Single M (L)	Single W (H)	Single W (L)
Welfare (%)	+1.35	−0.22	+0.02	+0.06	−4.03	−6.53

Table 10: **Welfare effects due to the elimination of all child benefits**. (H: High education, L: Low education, M: Men, W: Women).
Notes: Results are reported as percentage changes relative to the levels in the benchmark economy.

Single mothers, who fall into this latter category, are the most adversely affected by the reform. Lacking spousal income and facing greater financial and time constraints, they rely heavily on government transfers to sustain consumption during the early child-rearing years (ages 20–35)—a period marked by low earnings, limited human capital stock, and high household needs. Following the reform, their consumption falls over the life cycle, with drops of up to 10% in early adulthood. As a result, welfare declines sharply: by 4% for high-education single mothers and 6.5% for those with low education. These outcomes underscore the vital insurance role that child-related transfers play in supporting financially vulnerable families.

Among married households, low-education couples also experience modest welfare losses (–0.22%). While they respond to the removal of transfers with significant increases in maternal labor supply and enjoy higher lifetime consumption, these gains are counterbalanced by the disutility from intensified work effort and reduced leisure. The result is a slight net decline in welfare.

In contrast, high-education married households are the primary beneficiaries of the reform. They rely less on transfers and possess greater human capital potential, which enables them to benefit more from the improved work incentives. For this group, stronger early-life labor market engagement yields significant increases in lifetime earnings and consumption, achieved with relatively modest increases in work effort. Ultimately, they experience the largest welfare improvement of 1.35%, comparable to the gains observed under universal reforms.

Finally, single men also see slight welfare gains. As non-beneficiaries of child-related transfers, they are largely unaffected by their removal but benefit indirectly through reduced tax burdens and marginal improvements in disposable income. These gains, though small, are consistent with the broader pattern of redistribution reversal under the reform.

Aggregate welfare effects. Abolishing child-related transfers dismantles critical mechanisms that support low-income families with dependent children. Despite producing the strongest macroeconomic performance of all simulated policy scenarios, overall welfare falls by 0.66 for newborn households (Table 9).

This outcome reflects a fundamental trade-off in welfare reform: although means-tested transfers introduce behavioral distortions that reduce efficiency, their redistributive and insurance functions more than compensate in terms of household welfare.

Removing these programs improves incentives and expands maternal labor supply, but it simultaneously erodes the capacity of low-income families—particularly single mothers—to smooth consumption during periods of low earnings and high childcare costs. Their welfare losses outweigh the gains for high-education married households, even under a utilitarian social welfare criterion. Thus, the efficiency gains from eliminating distortions do not, in themselves, guarantee welfare improvements.

Majority support. Despite producing the strongest gains in labor supply, consumption, and output across all simulated reforms, the elimination of child-related transfers imposes significant welfare losses on vulnerable households, including low-education married couples and single mothers. Together, these groups constitute a majority voting bloc, rendering the reform politically infeasible under a simple majority rule.

Taking stock. The abolition of child-related transfers highlights the power of policy to influence maternal labor supply. By removing high effective marginal tax rates, the reform unlocks previously suppressed labor supply and human capital potential among married mothers, leading to substantial macroeconomic dividends.

However, these aggregate improvements mask deeper institutional and equity challenges. The households most in need of support, particularly single mothers who have limited private resources and tighter time constraints, are also those least able to respond to work incentives. Their welfare declines even as the economy expands. As a result, the reform fails to deliver ex-ante welfare gains and cannot be justified under a utilitarian criterion, even without accounting for social aversion to inequality and impacts on fertility or child development. This affirms the essential role of child-related transfers in providing insurance and redistribution, despite their distortionary effects.

More broadly, the analysis underscores the critical importance of accounting for behavioral heterogeneity in policy design. Family structure and underlying constraints shape both labor responses and welfare impacts. While married mothers are more responsive on the supply side, single mothers are more vulnerable to benefit reductions. These asymmetric effects influence not only aggregate outcomes but also the fairness and feasibility of reform. Ignoring them risks mischaracterizing the true winners and losers, thereby weakening the foundations of sound policy evaluation.

Supports for across reforms

This subsection provides a more comprehensive comparative assessment of the political feasibility of the child-related transfer reforms analyzed in this paper. Specifically, we compare all proposed reforms, providing a structured lens to evaluate which policies are likely to garner support, and which, despite technical merit, may prove politically infeasible.

	Couples (H) 21%	Couples (L) 49%	Single M (H) 4.2%	Single M (L) 9.8%	Single W (H) 4.8%	Single W (L) 11.2%	Newborn (Ex-ante)
Removal	+1.35	-0.22	+0.02	+0.06	-4.03	-6.53	-0.66
Incremental	+0.42	+0.40	+0.34	+0.24	+0.26	+0.18	+0.37
Universal (Base)	+1.36	+1.34	-1.47	-1.20	-0.69	-0.51	+0.85
Universal (0.5)	+1.44	-0.02	-0.04	-0.02	+0.36	+0.10	+0.27
Universal (1.5)	+1.61	+2.59	-2.23	-1.86	-1.26	-0.88	+1.50

Table 11: **Welfare changes by household type**.

Notes: Results are reported as percentage changes relative to the levels in the benchmark economy.

Table 12 presents ordinal rankings of each policy alternative by demographic group. The results reveal a consistent alignment between demographic structure and policy preferences. Single mothers overwhelmingly favor the incremental reform, which preserves much of the existing insurance while introducing modest

	Couples (H) 21%	Couples (L) 49%	Single M (H) 4.2%	Single M (L) 9.8%	Single W (H) 4.8%	Single W (L) 11.2%	Newborn (Ex-ante)
Removal	4	5	2	2	5	5	5
Incremental	5	3	1	1	2	1	3
Universal (Base)	3	2	4	4	3	3	2
Universal (0.5)	2	4	3	3	1	2	4
Universal (1.5)	1	1	5	5	4	4	1

Table 12: **Rankings of Policy Preferences (1 = Most Preferred, 5 = Least).**

efficiency gains. Conversely, married couples—especially those with higher education—consistently prefer universal regimes, especially more generous expansions, due to the concentrated welfare gains they receive.

Similarly, *ex ante* newborn households, who have yet to realize their demographic type, also support generous universal regimes. This reflects strong general preference for broad-based benefit entitlements in the absence of information about one's future type..

These patterns imply that universal reforms enjoy robust political support under majority rule, even without accounting for their simplicity, perceived fairness, and certainty. Furthermore, we show that once implemented, such policies are likely to be expanded and entrenched, even if they undermine the redistributive objectives of the original transfer system.

By contrast, an incremental reform of relaxing the CCS taper rate, which improves labor supply incentives while retaining redistributive intent, offer a more balanced approach. However, they are politically vulnerable: they are favored in head-to-head comparisons against the status quo or abolition proposals, but lose out when universal alternatives that offer larger gains to the electoral majority are included on the ballot.

Take stock. Policymakers must navigate trade-offs between political feasibility, equity, and efficiency. In the Australian context, we show that reforms that prioritize universality enhance efficiency and command majority support, but often come at the expense of vulnerable groups. This regressive tilt may be obscured in short-run measures such as transfer receipts but becomes evident when assessed through the lens of lifetime welfare.

Importantly, the simple majority voting model suggests that political support is shaped not only by the distributional consequences of reform but also by existing institutional context and policy framing. The sequencing of reforms matters in shaping the long-run trajectory of welfare institutions. Given Australia's existing institutional setting, our findings point to a structural political bias toward universality. Once adopted, universal programs generate strong political inertia, making subsequent reversal or redirection toward more targeted alternatives difficult, even when such alternatives are more equitable or efficient.

Thus, designing reforms that are both politically viable and normatively progressive requires anticipating these institutional dynamics. While universal systems may be easier to implement and sustain, carefully designed incremental reforms could offer a more equitable and fiscally sustainable path forward.

6 Conclusion

Australia's child-related transfer system, characterized by generous but tightly means-tested programs based on family income, sits between the universal models common in Europe and the smaller, means-tested systems of the U.S. This institutional middle ground provides a valuable lens through which to examine the design and reform of child-related transfers. Using a rich, life-cycle general equilibrium model, this paper quantifies the aggregate and distributional implications of reforming Australia's Family Tax Benefit (FTB) and Child Care Subsidy (CCS) programs.

Our analysis highlights a fundamental trade-off between efficiency and equity. The current means-tested structure channels support to low-education married couples and single mothers while containing fiscal costs. However, it also imposes steep effective marginal tax rates (EMTRs) that reduce maternal labor supply and output. Universalizing transfers removes these distortions and yields significant gains in maternal employment, output, and ex-ante welfare. Yet, the required tax increases erode disposable income for single mothers, rendering universal policies regressive.

In line with Hannusch (2025), we show that the presence and design of child-related transfers significantly influence maternal employment. However, our conclusions contrast with those of Guner et al. (2020b), whose U.S.-based findings favor means-testing on welfare grounds. This divergence underscores the importance of institutional starting points. Australia's more generous and distortionary baseline makes universality more efficiency-enhancing, but also more redistributively fraught. Incremental reforms, such as easing CCS phase-out rates, strike a better balance, delivering macroeconomic improvements alongside inclusive welfare gains for both recipients and non-recipients.

The political dimension, however, complicates this picture. While the incremental reform receives majority support over the status quo or full abolition, it is dominated by universal alternatives that offer concentrated benefits to the electoral majority of married households. Moreover, once implemented, universal regimes foster political momentum for further expansion. This dynamic risks entrenching fiscally costly and regressive institutions.

Our findings carry three major takeaways. First, well-intentioned policies that overlook fiscal and behavioral constraints can inadvertently harm the very groups they aim to support, but such effects that may only become visible when viewed through a life-cycle lens. Second, equity- and efficiency-enhancing reforms need not be radical. Well-calibrated incremental changes can boost efficiency and deliver inclusive gains. Third, institutional baselines critically shape both welfare outcomes and political feasibility of reforms. Universality is not a universal solution.

Finally, for a more complete assessment of child-related transfer policy, future work could extend the model along several important dimensions. These include incorporating endogenous fertility and marriage decisions, transition dynamics, and the joint design of tax and transfer systems. Modeling social preferences over equity more explicitly—whether through alternative welfare criteria or political economy constraints—would also provide sharper normative guidance from this line of research.

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Technical Appendix for "Aggregate and Distributional Impacts of Child-Related Transfers with Means Testing"

Darapheak Tin and Chung Tran

A The design of Australia's child-related transfer system

The Australian tax and transfer system features progressive income taxes and highly targeted transfers. Key components of the income tax system include a progressive tax schedule, alongside various deductions, concessions, offsets, and surcharges. This progressive schedule applies to individual taxable income, which encompasses both labor and capital earnings. Government welfare transfers are typically subject to complex means-testing rules, including varying benefit levels, multi-tier income and asset test thresholds, phase-out rates, and demographic criteria.

Financial year	Welfare ($b)	Welfare-GDP (%)	Welfare-Revenue (%)
2010-11	140.19	8.43	34.04
2011-12	149.66	8.70	34.20
2012-13	153.24	8.89	33.62
2013-14	155.68	8.88	33.47
2014-15	165.13	9.41	35.15
2015-16	167.68	9.47	34.59
2016-17	165.76	8.95	33.02
2017-18	171.62	8.99	32
2018-19	174.24	8.80	31.18
2019-20	195.71	9.86	36.05

Table A.1: **Welfare expenditure in Australia**.

Notes: $ value is expressed in 2019−20 prices.
Source: Welfare expenditure report by the Australian Institute of Health and Welfare.

Financial year	Families & Children	Old people	Disabled	Unemployed	Others
2009-10	2.51	3.33	1.87	0.48	0.40
2010-11	2.39	3.33	1.94	0.44	0.34
2011-12	2.33	3.43	1.98	0.44	0.52
2012-13	2.31	3.57	2.00	0.49	0.52
2013-14	2.26	3.47	2.02	0.55	0.57
2014-15	2.33	3.79	2.09	0.59	0.61
2015-16	2.32	3.86	2.08	0.60	0.62
2016-17	2.02	3.72	2.01	0.57	0.63
2017-18	1.94	3.67	2.18	0.56	0.65
2018-19	1.81	3.63	2.22	0.49	0.64
2019-20	1.92	3.85	2.53	0.93	0.62

Table A.2: **Welfare expenditure to GDP (%) by target groups**.

Source: Welfare expenditure report by the Australian Institute of Health and Welfare.

		2001-05	2006-10	2011-15	2016-20*	Total
Income support	Pensions	51.74%	51.35%	57.67%	60.80%	55.79%
	Parenting payments	9.52%	6.58%	5.61%	4.63%	6.39%
	Allowances	14.80%	9.94%	10.62%	11.54%	11.59%
	Total	76.06%	67.87%	73.90%	76.98%	73.77%
Non-income support	Family payments	23.09%	24.96%	22.18%	18.02%	21.87%
	Bonus payments	0.00%	5.55%	1.31%	1.38%	2.07%
	Other non-income supports	0.59%	1.40%	2.51%	3.45%	2.10%
	Total	23.68%	31.91%	26.00%	22.85%	26.05%
Other public benefits		0.26%	0.22%	0.10%	0.18%	0.18%

Table A.3: **Components of Australian public transfers over time.**

*Notes: *Welfare transfers account for roughly 30% of government revenue in the 2016-20 period.*

There are two main child-related transfer programs that provide substantial benefits for families with dependent children: Family Tax Benefit (FTB) and Child Care Subsidy (CCS). The FTB and CCS programs are detailed below.

A.1 Family Tax Benefit part A (FTB-A)

The FTB-A program is a non-taxable transfer paid per child and the amount claimable depends on family's circumstances. In short, it is a function of combined household adjusted taxable income, annual private rent, and age and number of dependent children. Important parameters that determine the levels, kinks and slopes of the FTB-A benefit schedule are:

1. Statutory base and maximum payment rates per qualifying dependent child (i.e., FTB child),
2. Income test thresholds for the base and maximum payments,
3. Withdrawal or taper rates for the base and maximum payments, and
4. Supplements such as the Large Family Supplement (LFS), the Newborn Supplement (NBS), the Multiple Birth Allowance (MBA), the Rent Assistance (RA), and the Clean Energy Supplement (CES) that are added to the statutory base and maximum payment rates per child to derive the total base and maximum payments.

These parameters constitute the main structure of the FTB-A program and may vary from year to year. For our purpose, we adopt the 2018 FTB-A parameters in the initial steady state equilibrium of the model economy. All monetary values are expressed in 2018 AUD.

We first calculate the per child total base payment, b_A, and the per child total maximum payment, m_A, of the FTB-A benefit.

$$\begin{aligned} b_{A,j} = LFS_j + NBS_j + MBA_j + CES_{A,base,j} \\ + ndep_{[0,17],j} \times FTBA_{base_1} \\ + ndep_{[18,24],j} \times FTBA_{base_2} \\ + \mathbf{I}\{\text{school=1}\} ndep_{[18,19],j} \times FTBA_{base_3} \\ + \mathbf{I}\{\text{school=0}\} ndep_{[18,21],j} \times FTBA_{base_4} \end{aligned} \tag{A.1}$$

$$\begin{aligned} m_{A,j} = LFS_j + NBS_j + MBA_j + RA_j + CES_{A,max,j} \\ + ndep_{[0,12],j} \times FTBA_{max_1} \\ + ndep_{[13,15],j} \times FTBA_{max_2} \\ + ndep_{[16,17],j} \times FTBA_{max_3} \\ + ndep_{[18,24],j} \times FTBA_{max_4} \\ + \mathbf{I}\{\text{school=1}\} ndep_{[16,19],j} \times FTBA_{max_5} \\ + \mathbf{I}\{\text{school=0}\} ndep_{[16,17],j} \times FTBA_{max_6} \\ + ndep_{[18,21],j} \times FTBA_{max_7} \end{aligned} \tag{A.2}$$

where $\mathbf{I}\{x\}$ is an indicator function with a logical argument x, *school* is a binary variable for school attendance, and $ndep_{[a,b],j}$ denotes the number of children in the age range $[a, b]$ of parents aged j. $FTBA_{base}$ and $FTBA_{max}$ are parameters corresponding to the statutory base and maximum per dependent child payment rates which vary over age of a child. In 2018, $FTBA_{base} = \{\$2,266.65;\ 0;\ \$2,266.65;\ 0\}$ and $FTBA_{max} = \{\$5,504.20;\ \$6,938.65;\ 0;\ 0;\ \$6,938.65;\ 0;\ 0\}$.

The income test thresholds for base and maximum payments, TH_{base} and TH_{max}, are

$$\begin{cases} TH_{max} & = FTBA_{T_1} \\ TH_{base} & = FTBA_{T_2} + (ndep_{[0,24],j} - 1) \times FTBA_{T_2 A} \end{cases} \tag{A.3}$$

The maximum threshold is fixed while the base threshold expands at the rate of $FTBA_{T_2 A}$ for every addition of a dependent child.

In 2018, the starting income test thresholds $FTBA_T = \{\$52,706;\ \$94,316\}$, and the base payment income test threshold adjustment factor per additional qualifying child $FTBA_{T_2A} = 0$.

We can then calculate the FTB-A benefit.

$$FTBA_j^0(y_h) = \begin{cases} m_{A,j} & \text{if } y_h \leq TH_{max} \\ \max\{b_{A,j},\ m_{A,j} - FTBA_{w_1}(y_h - TH_{max})\} & \text{if } TH_{max} < y_h \leq TH_{base} \\ \max\{0,\ b_{A,j} - FTBA_{w_2}(y_h - TH_{base})\} & \text{if } y_h > TH_{base} \end{cases} \tag{A.4}$$

where the total household taxable income $y_h = y_m + y_f + ra$ and $FTBA_w = \{0.20,\ 0.30\}$ is the withdrawal rate.

The statutory rates include extra supplement for low-income households. In our calculation, this supplement is later deducted from the total benefit payment if a household does not meet the supplement's income test cutoff. The income test is conducted separately once the full benefit has been computed

$$FTBA_j(y_h) = \begin{cases} \max\left\{0,\ FTBA_j^0(y_h) - FTBA_{AS} \times cond\right\} & \text{if } y_h > FTBA_{FT1} \\ FTBA_j^0(y_h) & otherwise \end{cases} \tag{A.5}$$

where $cond = ndep_{[0,12],j} + ndep_{[13,15],j} + \mathbf{I}(\text{school}=1) ndep_{[16,19],j})$. In 2018, the annual FTB-A supplement adjustment $FTBA_{AS} = \$737.30$ and the supplement's income test threshold $FTBA_{FT1} = \$80,000$.

Below are the formulae used to calculate the LFS, NBS, MBA, CES (for part A and part B), and RA in the model.

Large Family Supplement (LFS):

$$LFS_j = \min\left\{FTBA_{S_1} \times (ndep_{[0,24],j} - FTBA_{C_1} + 1),\ 0\right\} \tag{A.6}$$

where $ndep_{[a,b],j}$ denotes the number of children in the age range $[a,b]$ of parents aged j, $FTBA_{S_1}$ is the LFS amount per child, and $FTBA_{C_1}$ is the number of dependent children a family must have to be eligible for the LFS for the first child to satisfy the cutoff $FTBA_{C_1}$ and every additional child onward. In 2018, $FTBA_{C_1} = 1$ and $FTBA_{S_1} = 0$.

Newborn Supplement (NBS):

$$NBS_j = \begin{cases} \mathbf{I}\{nb_j \geq 1 \wedge fc_j = 1\} FTBA_{NS_1} \times nb_j + \mathbf{I}\{nb_j \geq 1 \wedge fc_j = 0\} FTBA_{NS_2} \times nb_j & \text{if } ppl = 0 \\ \mathbf{I}\{nb_j \geq 2 \wedge fc_j = 1\} FTBA_{NS_1} \times (nb_j - 1) + \mathbf{I}\{nb_j \geq 2 \wedge fc_j = 0\} FTBA_{NS_2} \times (nb_j - 1) & \text{if } ppl = 1 \end{cases} \tag{A.7}$$

where nb_j denotes the number of newborns to parents aged j, fc_j is a binary variable for first child, ppl is a binary variable for Paid Parental Leave (by default, we set $ppl = 0$), and $FTBA_{NS}$ is the amount of NBS per qualified child. In 2018, $FTBA_{NS} = \{\$2,158.89;\ \$1,080.54\}$.

Multiple Birth Allowance (MBA):

$$MBA_j = \begin{cases} \mathbf{I}\{sa = 3\} FTBA_{MBA_1} + \mathbf{I}\{sa \geq 4\} FTBA_{MBA_2} & \text{if } school = 1 \text{and } j_c \leq FTBA_{MAGES} \\ \mathbf{I}\{sa = 3\} FTBA_{MBA_1} + \mathbf{I}\{sa \geq 4\} FTBA_{MBA_2} & \text{if } school = 0 \text{ and } j_c \leq FTBA_{MAGE} \end{cases} \tag{A.8}$$

where sa is the number of dependent children with the same age, $school$ is a binary variable for school attendance, j_c is the age of children sharing birth date, and $FTBA_{MAGE}$ and $FTBA_{MAGES}$ are a child's age cutoffs to be eligible for the MBA if they attend and do not attend school, respectively. $FTBA_{MBA}$ is the MBA payment. For simplicity, we assume there can only be one instance of multiple births for each household. In 2018, $FTBA_{MAGE} = 16$, $FTBA_{MAGES} = 18$, and $FTBA_{MBA} = \{\$4,044.20;\ \$5,387.40\}$.

Clean Energy Supplement for the FTB part A ($\mathbf{CES_A}$):

The Clean Energy Supplement for the FTB part A (CES_A) is separated into base and maximum payments.

We add the former to the base level and the latter to the maximum level of the FTB-A benefit.

$$\begin{aligned} CES_{A,base,j} &= ndep_{[0,17],j} \times FTBA_{CE_1} + ndep_{[18,19]_{AS},j} \times FTBA_{CE_1} \\ CES_{A,max,j} &= ndep_{[0,12],j} \times FTBA_{CE_2} + ndep_{[13,15],j} \times FTBA_{CE_3} + ndep_{[16,19]_{AS},j} \times FTBA_{CE_3} \end{aligned} \tag{A.9}$$

where $ndep_{[a,b],j}$ denotes the number of children in the age range $[a, b]$ of parents aged j, *school* is a binary variable for school attendance, $ndep_{[a,b]_{AS},j} = \mathbf{I}\{\text{school=1}\} \times ndep_{[a,b],j}$, $FTBA_{CE}$ is the per child amount of the CES_A. In 2018, $FTBA_{CE} = \{\$36.50; \$91.25; \$116.80\}$.

Note that from 2018 onward, only households who had received the CES_A in the previous year were eligible for the supplement. In the baseline model, we assume this is true for all households.

Rent Assistance (RA):

Rent assistance adds to the per child maximum payment of the FTB-A and is available only to FTB-A recipients who rent privately which we assume to hold true for all households in the benchmark model.

$$RA_j(rent) = \begin{cases} \max\{\min\{0.75\,(rent - rent_{min}),\ RA_{max}\},\ 0\} & \text{if } FTBA_1 \geq FTBA_{min} \\ 0 & \text{otherwise} \end{cases} \tag{A.10}$$

where *rent* is the annual rent, $rent_{min}$ is the minimum rent to qualify for the RA, RA_{max} is the cap on the RA benefit, $FTBA_1$ is the FTB-A benefit excluding the RA, $FTBA_{min}$ is the minimum size of the FTB-A for which a household must be qualified to be deemed eligible for the RA. The maximum and minimum rent assistance payment are

$$RA_{max} = \mathbf{I}\{ndep_{[0,24],j} \leq 2\} \times \$4,116.84 + \mathbf{I}\{ndep_{[0,24],j} \geq 3\} \times \$4,648.28$$

$$rent_{min} = \mathbf{I}\{\text{single=1}\} \times \$4,102.28 + \mathbf{I}\{\text{couple=1}\} \times \$6,071.52$$

Before 2013, $FTBA_{min}$ is set to the base FTB-A payment and $FTBA_{min} = 0$ thereafter.

A.2 Family Tax Benefit part B (FTB-B)

The FTB-B program is paid per family. Its objective is to give additional support to single parents and single-earner partnered parents with limited means. Similar to the FTB-A, the FTB-B is a function of age and number of dependent children, but differently, the eligibility and amount claimable are determined by separate tests on the primary and secondary earners' individual taxable income, as well as the marital status of the recipients. Important parameters that determine the levels, kinks and slopes of the FTB-B benefit schedule are: (i) Maximum payment rate; (ii) Separate income test thresholds on primary and secondary earners; and (iii) Withdrawal or taper rates based on secondary earner's taxable income.

Let $y_{pe} = \max(y^m,\ y^f)$ and $y_{se} = \min(y^m,\ y^f)$ denote the primary earner's and secondary earner's taxable income, respectively, and let $m_{B_i,j} = FTBB_{max_i} + CES_{B,j}$ be the maximum payment per family. Note that the structure of the FTB-B changed in 2017. The FTB-B formula prior to 2017 is thus different to that from 2017 onwards.

Before 2017:

$FTBB_j(y^m, y^f) =$

$$\begin{cases} cond_1 \times m_{B_1,j} + cond_2 \times m_{B_2,j} & \text{if } y_{pe} \leq FTBB_{T_1} \text{ and } y_{se} \leq FTBB_{T_2} \\ \\ cond_1 \times \max\{0,\ m_{B_1,j} - FTBB_w(y_{se} - FTBB_{T_2})\} & \text{if } y_{pe} \leq FTBB_{T_1} \text{ and } y_{se} > FTBB_{T_2} \\ +cond_2 \times \max\{0,\ m_{B_2,j} - FTBB_w(y_{se} - FTBB_{T_2})\} & \end{cases} \tag{A.11}$$

From 2017:

$FTBB_j(y^m, y^f) =$

$$\begin{cases} cond_1 \times m_{B_1,j} + cond_3 \times m_{B_2,j} & \text{if } y_{pe} \leq FTBB_{T_1} \text{ and } y_{se} \leq FTBB_{T_2} \\ \\ cond_1 \times \max\{0,\ m_{B_1,j} - FTBB_w(y_{se} - FTBB_{T_2})\} & \text{if } y_{pe} \leq FTBB_{T_1} \text{ and } y_{se} > FTBB_{T_2} \\ +cond_3 \times \max\{0,\ m_{B_2,j} - FTBB_w(y_{se} - FTBB_{T_2})\} & \end{cases} \tag{A.12}$$

where $cond_1 = \mathbf{I}\left\{ndep_{[0,4],j} \geq 1\right\}$, $cond_2 = \mathbf{I}\left\{ndep_{[0,4],j} = 0 \wedge (ndep_{[5,15],j} \geq 1 \vee ndep_{[16,18]_{AS},j} \geq 1)\right\}$ and $cond_3 = \mathbf{I}\left\{ndep_{[0,4],j} = 0 \wedge ndep_{[5,12],j} \geq 1\right\} + \mathbf{I}\left\{ndep_{[0,12],j} = 0 \wedge (ndep_{[13,15],j} \geq 1 \vee ndep_{[16,18]_{AS},j} \geq 1) \wedge \text{single=1}\right\}$

In 2018, the statutory maximum FTB-B payment $FTBB_{max} = \{\$4,412.85;\ \$3,190.10\}$, the income test thresholds $FTBB_T = \{\$100,000;\ \$5,548\}$, and the withdrawal rate $FTBB_w = 0.20$.

Clean Energy Supplement for the FTB part B ($\mathbf{CES_B}$):

The Clean Energy Supplement for FTB part B ($\mathrm{CES_B}$) adds to the statutory per family payment of the FTB-B benefit.

$$CES_{B,j} = \begin{cases} FTBB_{CE_1} & \text{if } ndep_{[0,4],j} \geq 1 \\ FTBB_{CE_2} & \text{if } ndep_{[0,4],j} = 0 \text{ and } (ndep_{[5,15],j} \geq 1 \text{ or } ndep_{[16,18]_{AS},j} \geq 1) \\ 0 & \text{if } ndep_{[0,15],j} = 0 \text{ and } ndep_{[16,18]_{AS},j} = 0) \end{cases} \tag{A.13}$$

where $ndep_{[a,b],j}$ denotes the number of children in the age range $[a, b]$ of parents aged j, *school* is a binary variable for school attendance, $ndep_{[a,b]_{AS},j} = \mathbf{I}(\text{school=1}) \times ndep_{[a,b],j}$, $FTBB_{CE}$ is the per family amount of CES_B. In 2018, $FTBB_{CE} = \{\$73;\ \$51.10\}$.

Note that from 2018 onward, only households who had received the CES_B in the previous year were eligible for the supplement. In the baseline model, we assume this is true for all households.

A.3 Child Care Subsidy (CCS)

The Child Care Subsidy program aims at assisting households with the cost of caring for children aged 13 or younger who are not attending secondary school and is paid directly to approved child care service providers. Eligibility criteria include (i) a test on the combined family income (y_h), (ii) the type of child care service, (iii) age of the dependent child, and (iv) hours of recognized activities (e.g., working, volunteering and job seeking) by parents (n_j^m, n_j^f). The rate of subsidy is also determined by parameters such as income thresholds, work hours, and taper unit (the size of income increment by which the subsidy rate falls by 1 percentage point). Given that the current model is silent on the type of child care and therefore child care fees, we assume the followings:

1. Identical child care service operating within a perfectly competitive framework,
2. No annual cap on hourly fee and on subsidy per child,
3. Households exhaust all the available hours of subsidized care.

The child care subsidy function is

$$CCS(y_h, n_j^m, n_j^f) = \Psi(y_h, n_j^m, n_j^f) \times \begin{cases} CCS_{R_1} & \text{if } y_h \leq TH_1 \\ \max\{CCS_{R_2},\ CCS_{R_1} - \omega_1\} & \text{if } TH_1 < y_h < TH_2 \\ CCS_{R_2} & \text{if } TH_2 \leq y_h < TH_3 \\ \max\{CCS_{R_3},\ CCS_{R_2} - \omega_3\} & \text{if } TH_3 \leq y_h < TH_4 \\ CCS_{R_3} & \text{if } TH_4 \leq y_h < TH_5 \\ CCS_{R_4} & \text{if } y_h \geq TH_5 \end{cases} \tag{A.14}$$

where $y_h = y_m + y_f + ra$ and $\omega_i = \dfrac{y_h - TH_i}{taper\ unit}$.
In 2018,

- Taper unit = \$3,000;
- Statutory (base) subsidy rates, $CCS_R = \{0.85,\ 0.5,\ 0.2,\ 0\}$;
- Income test thresholds, $TH = \{\$70,015;\ \$175,015;\ \$254,305;\ \$344,305;\ \$354,305\}$;
- Let $n_j^{min} = \min\{n_j^m, n_j^f\}$. The adjustment factor is

$$\begin{aligned}\Psi(y_h, n_j^m, n_j^f) \quad = \quad & 0.24\mathbf{I}\left\{y_h \leq \$70,015 \wedge n_j^{min} \leq 8\right\} \\ & +0.36\mathbf{I}\left\{8 < n_j^{min} \leq 16\right\} + 0.72\mathbf{I}\left\{16 < n_j^{min} \leq 48\right\} + \mathbf{I}\left\{n_j^{min} > 48\right\}\end{aligned}$$

Otherwise, $\Psi(.) = 0$.

A.4 Major changes in child-related transfers programs over time

In the past two decades, the Australian government has introduced several policy reforms to enhance the effectiveness of the Family Tax Benefit (FTB) and Child Care Subsidy (CCS) programs. This section provides an overview of the major changes to these policies.

A.4.1 Major changes in Family Tax Benefit Part A (FTB-A)

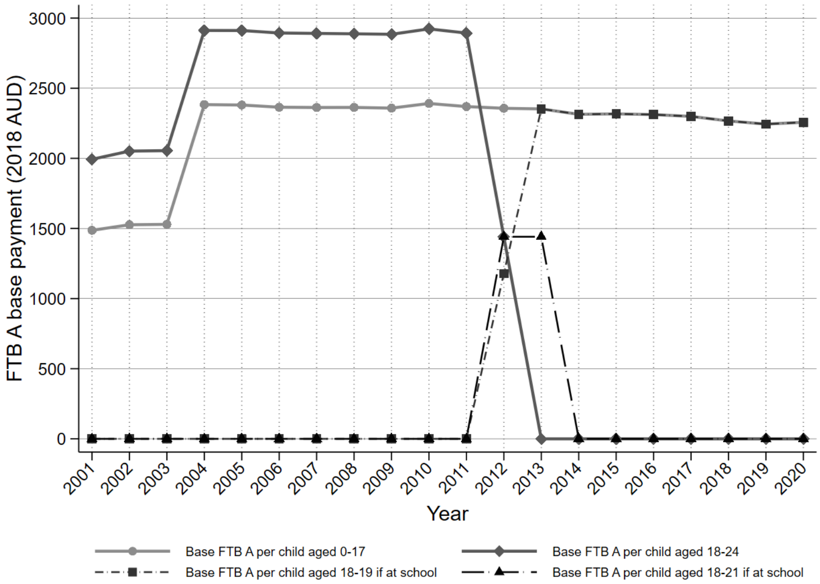


Figure A.1: FTB-A base payment rates per child.

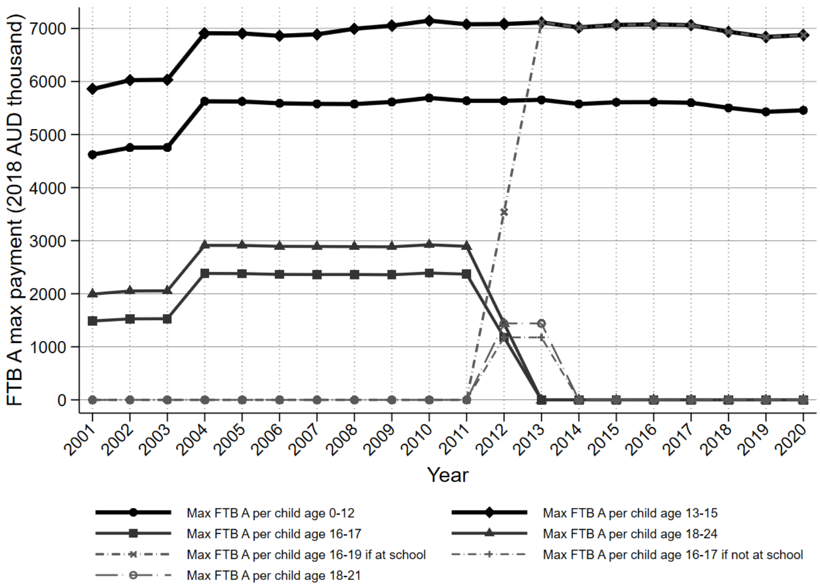


Figure A.2: FTB-A maximum payment rates per child.

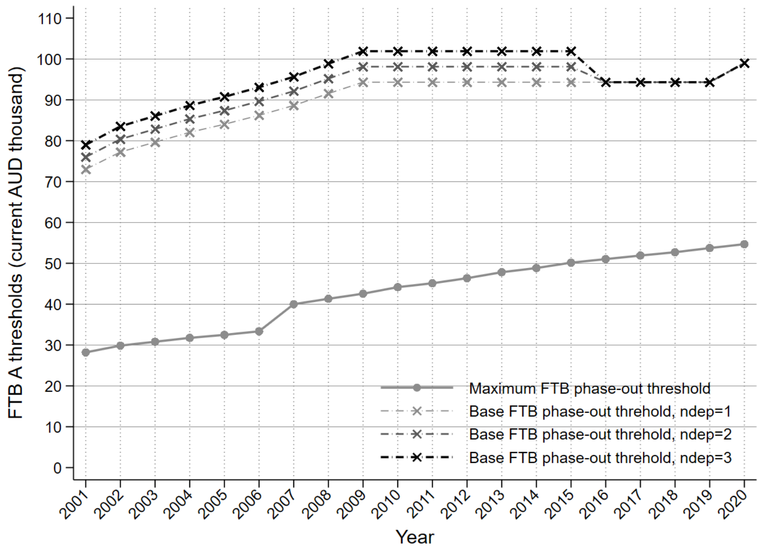


Figure A.3: FTB-A income test thresholds for maximum and base payment rates.

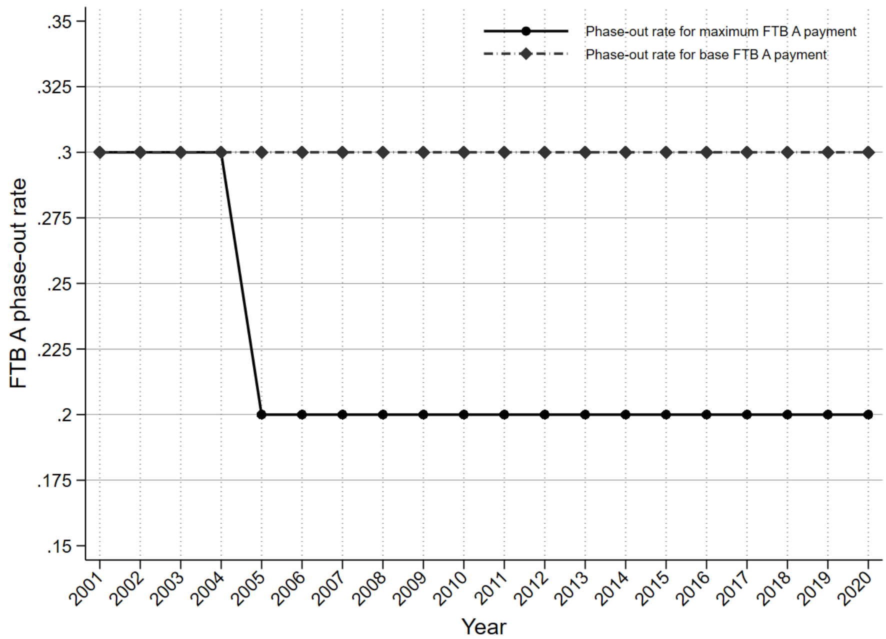


Figure A.4: FTB-A phase-out rates for maximum and base payments.

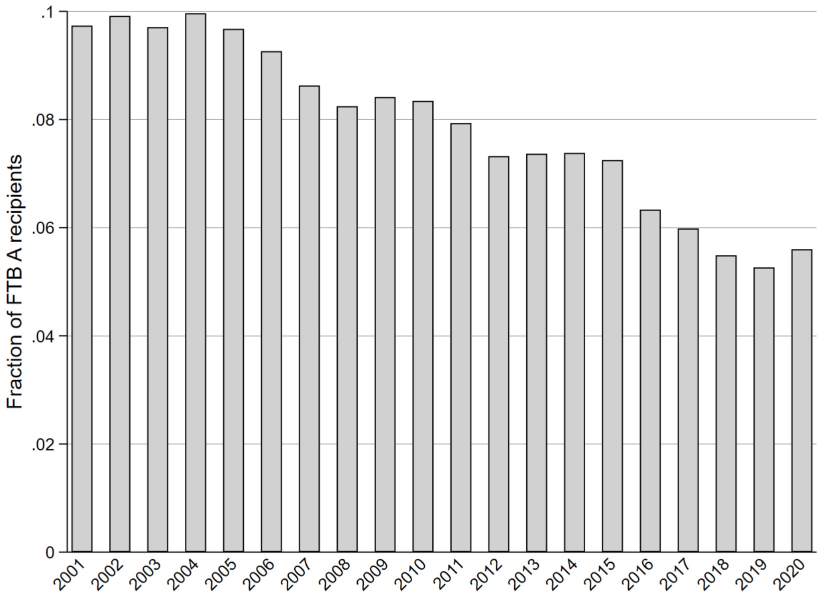


Figure A.5: Proportion of FTB-A recipients over time.

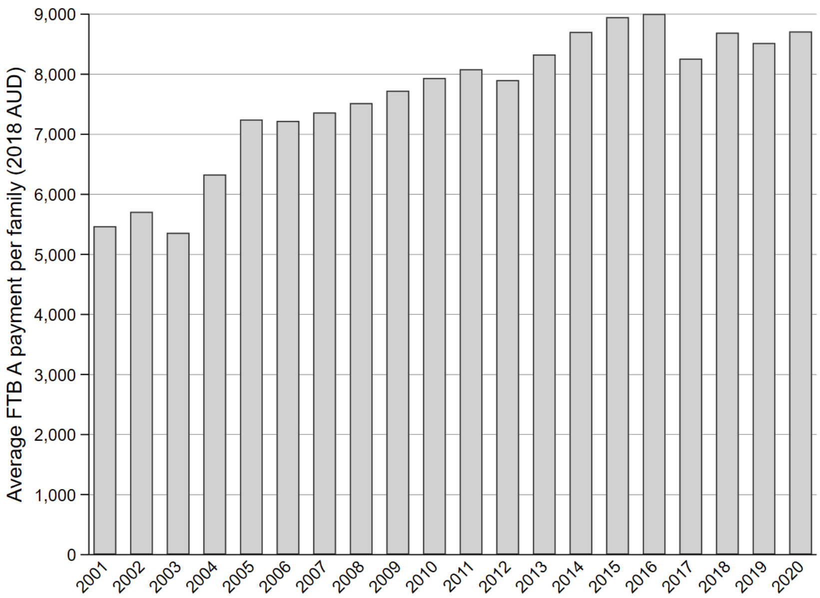


Figure A.6: Average FTB-A payment per family (2018 AUD) over time.

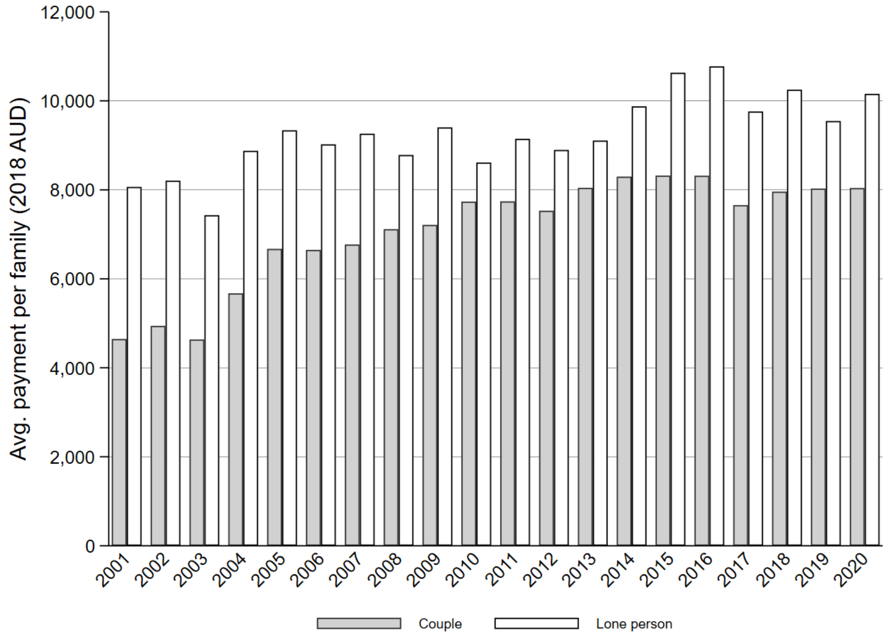


Figure A.7: Average FTB-A payment per family by marital status

The proportion of households receiving the FTB-A (out of all households observed in the survey data) has fallen from 10% in 2001 to slightly over 5% in 2020, (see Figure A.5). This can be attributed, in part, to the falling birth rate and threshold-creep due to inflation. Despite the overall decline, the benefit remains concentrated among low-income families.

At the intensive margin, the FTB-A alone represents a significant sum of inflation-indexed transfers. Figures A.1 and A.2 illustrate that there have been minimal changes to the base and maximum statutory payment rates for children under 18 since 2004. Qualified families with a child aged 13-15 could receive up to $7,000 (2018 AUD). The maximum rate per dependent child aged 12 or younger is slightly lower, but still exceeds $5,500. Given that payments are allocated per child, a two-children family could receive up to $14,000. Moreover, Figure A.6 shows that the benefits delivered to eligible families have been rising. The average FTB-A payout increased from $8,000 to $8,500 (2018 AUD) over the past decade. Moreover, because the scheme predominantly targets single-earner families, especially single parents, single parent households claimed higher benefits on average compared to couple parent households, as seen in Figure A.7.

A.4.2 Major changes in Family Tax Benefit Part B (FTB-B)

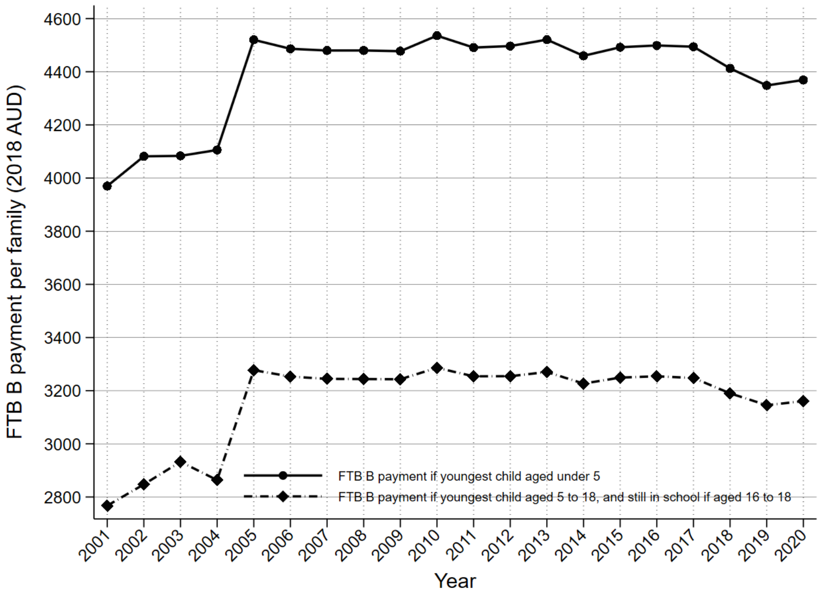


Figure A.8: FTB-B payment rates per family by age of the youngest child.

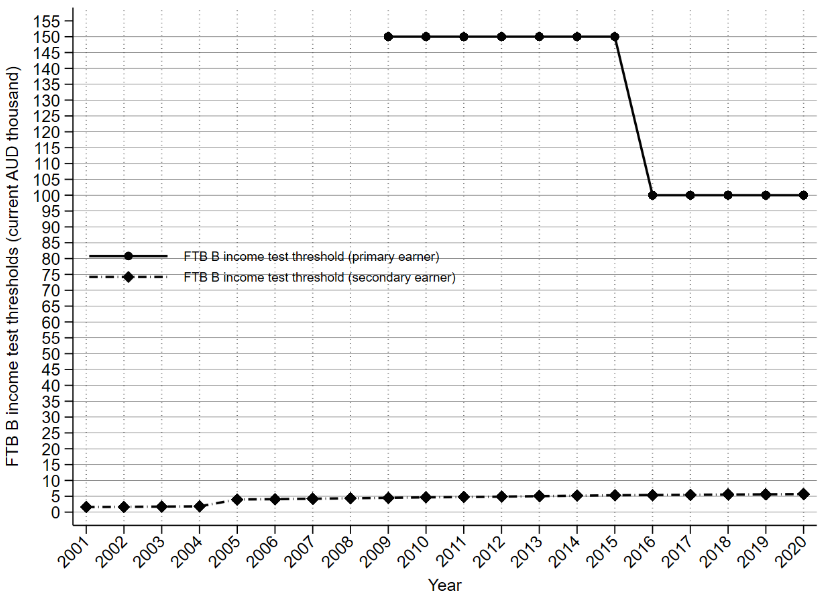


Figure A.9: FTB-B thresholds over time on primary and secondary earners over time.

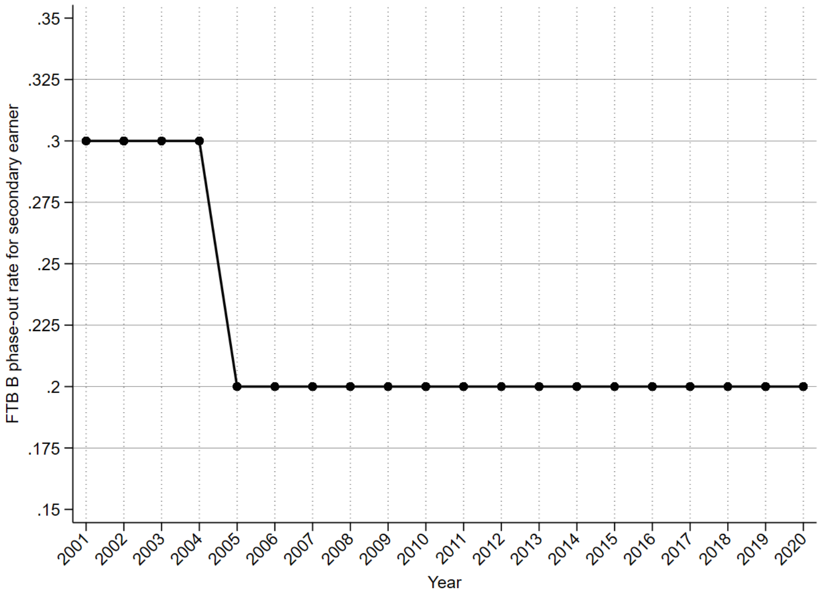


Figure A.10: FTB-B taper rates over time.

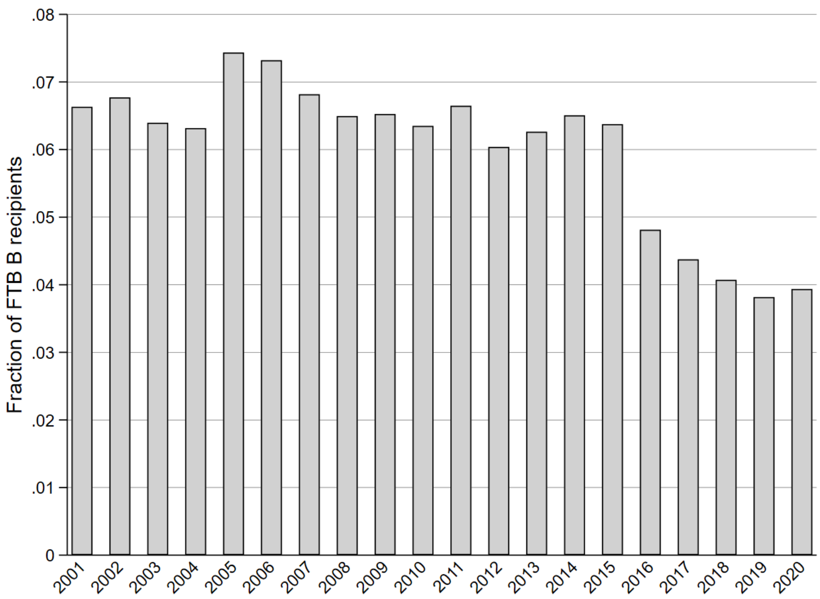


Figure A.11: Proportion of FTB-B recipients over time.

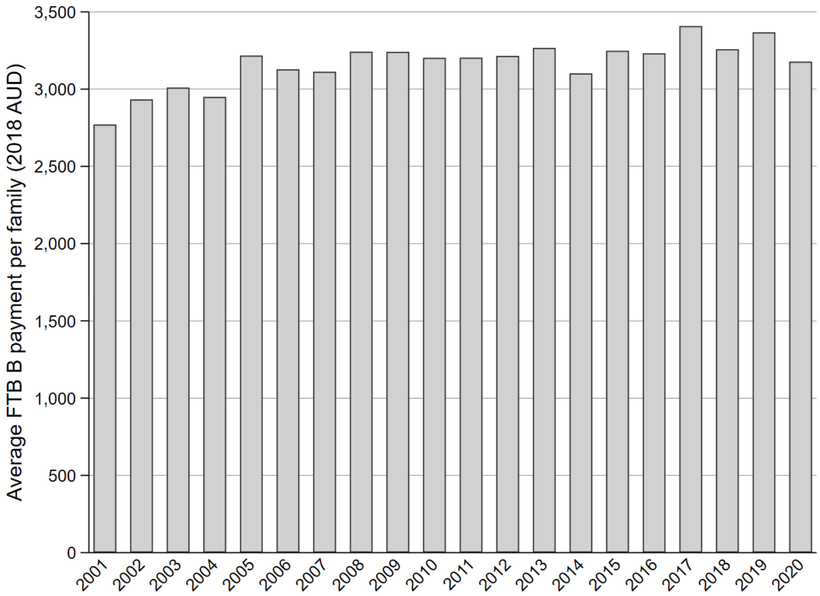


Figure A.12: Average FTB-B payment (2018 AUD) over time.

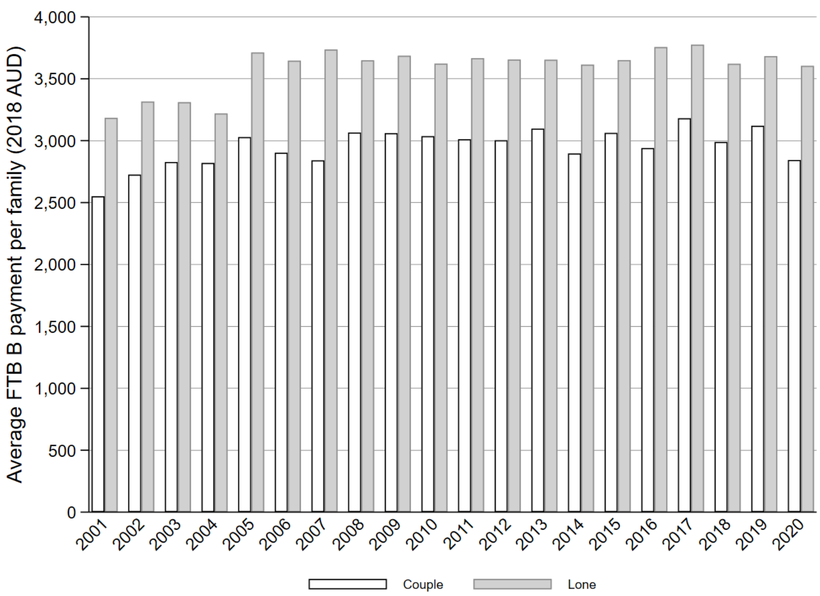
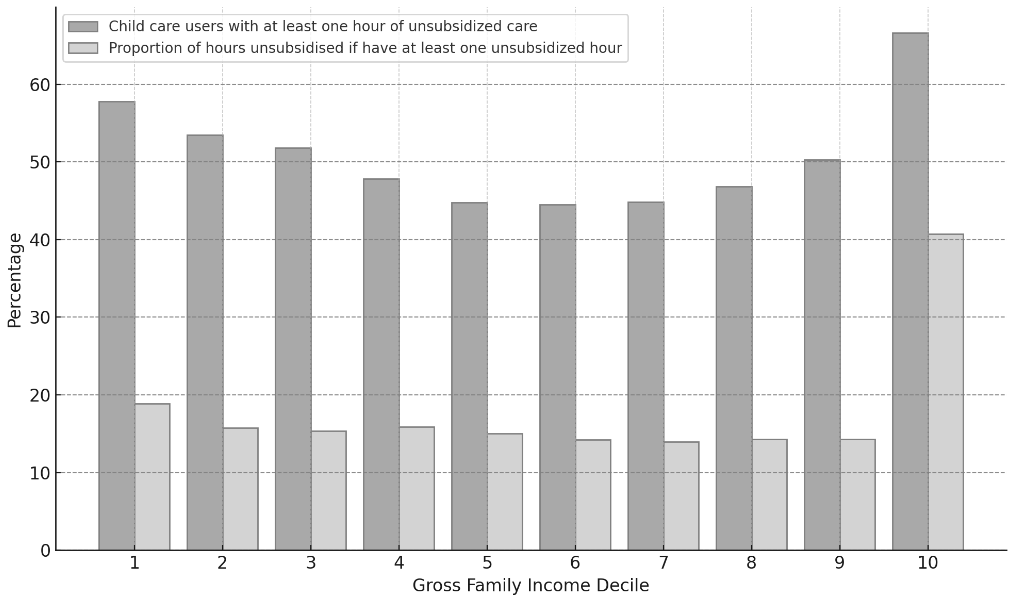


Figure A.13: Average FTB-B payment by marital status.

Because FTB-A recipient status is necessary for a household to access the FTB-B benefits, we can infer from Figures A.5 and A.11 that the majority of FTB-A households also claimed the FTB-B. Although the FTB-A is the larger of the two benefits, the FTB-B offers a non-trivial amount. As shown in Figure A.8, the FTB-B payment remained steady at approximately $\$4,500$ (2018 AUD) for eligible families whose youngest child is under 5 years of age, and $\$3,200$ if their youngest child is between 5 and 18 years old.

At the extensive margins, the proportion of claimants fell over time. Compared to the 2000s and the first half of 2010s, the fraction of married FTB-B households dropped by nearly 50% by 2018 (Figure A.11). This could be partially explained by factors similar to those affecting the FTB-A, such as fertility trends and threshold creep. For the FTB-B in particular, the recent drop in married recipients can also be attributed to the $\$150,000$ (current AUD) income-test threshold for primary earners introduced in 2009, and the subsequent tightening in 2016 as the threshold decreased further to $\$100,000$ (current AUD). These stricter measures, which complemented the existing test on secondary earners, significantly reduced the claimant pool. However, because the primary earner's income test exclusively determines eligibility (controlling the extensive margin), it had no discernible effect on the average benefit rate for recipients. The right panel of Figure A.13 demonstrates that in 2020, eligible single parents could still expect to receive over $\$3,500$ (2018 AUD), while couple parents could expect just under $\$3,000$ — similar to the amount they would receive in 2005.

A.4.3 Major changes in Child Care Subsidy (CCS) over time



over time

Figure A.14: Proportion of hours paid for that are unsubsidized by gross family income decile in 2018-19 financial year.

Notes: This figure uses data from Table 31 in the 2021 Child Care Package Evaluation report by the AIFS. The lowest decile earned at most $\$31,399$. *The top decile earned* $\$240,818$ *or more.*

Figure A.14 illustrates the proportion of unsubsidized child care hours, highlighting the program's expansive coverage. Excluding the top decile, the majority of families received fully subsidized child care. Case in point, between 50-55% of families situated around the median income received full subsidies. The prevalence of families with at least one hour of unsubsidized child care increases among the lower deciles, likely due to the work activity requirement. Yet, approximately 40% of families in the bottom decile still received full subsidies. Additionally, even among families with at least one unsubsidized child care hour, provided that they were not in the top income bracket (with annual earnings above $240,818), the average unsubsidized hours did not exceed 20% of their total child care hours.

B Supplementary figures: Life-cycle profiles

B.1 Labor supply

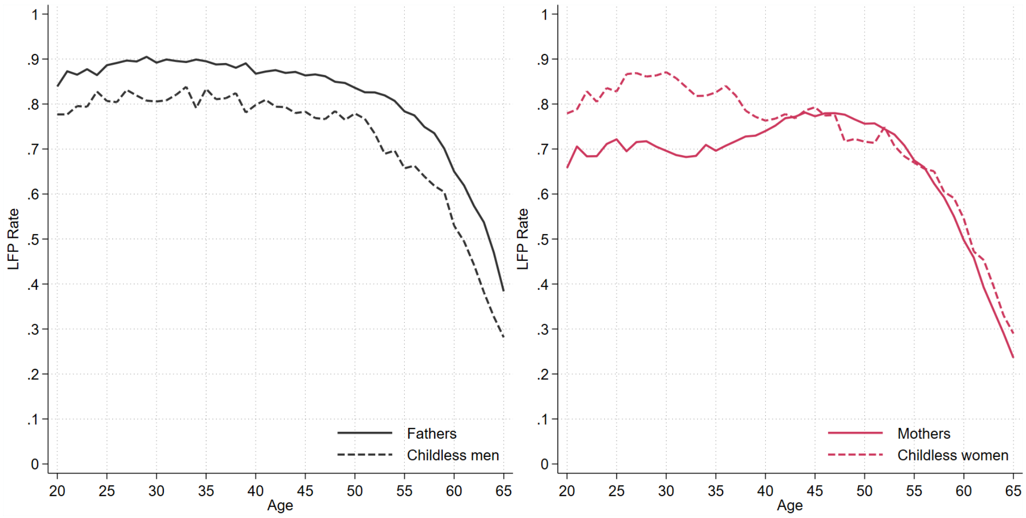


Figure B.1: **Age profiles of labor force participation. Left:** fathers (solid) and childless men (dashed). **Right:** mothers (solid) and childless women (dashed).

Notes: The age profiles stitch together 20-year snapshots of life cycle for selected cohorts. The youngest cohort is cohort 12 aged 20-39 in the data, and the oldest cohort is cohort 12 aged 75-94.

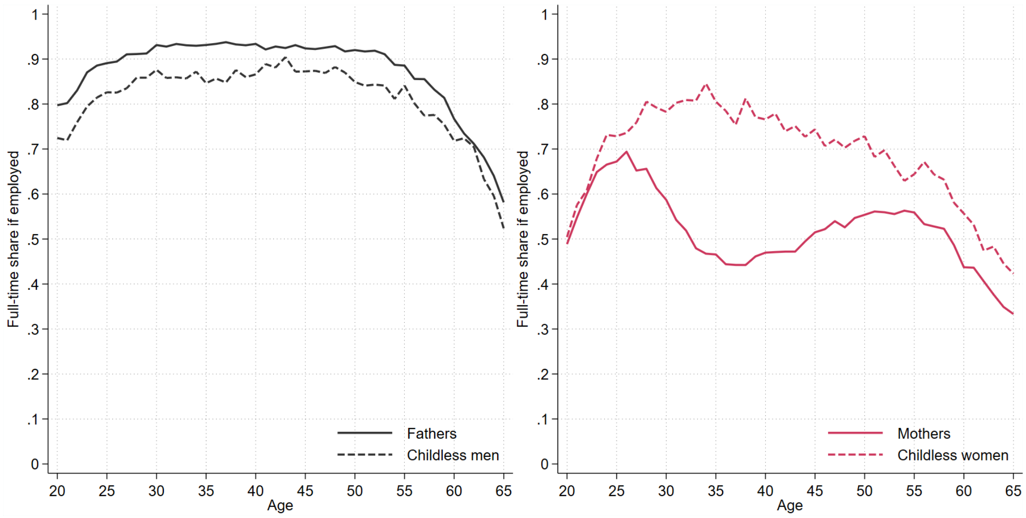


Figure B.2: **Age profiles of full-time share of employment. Left:** fathers (solid) and childless men (dashed). **Right:** mothers (solid) and childless women (dashed).

B.2 Child-related transfers

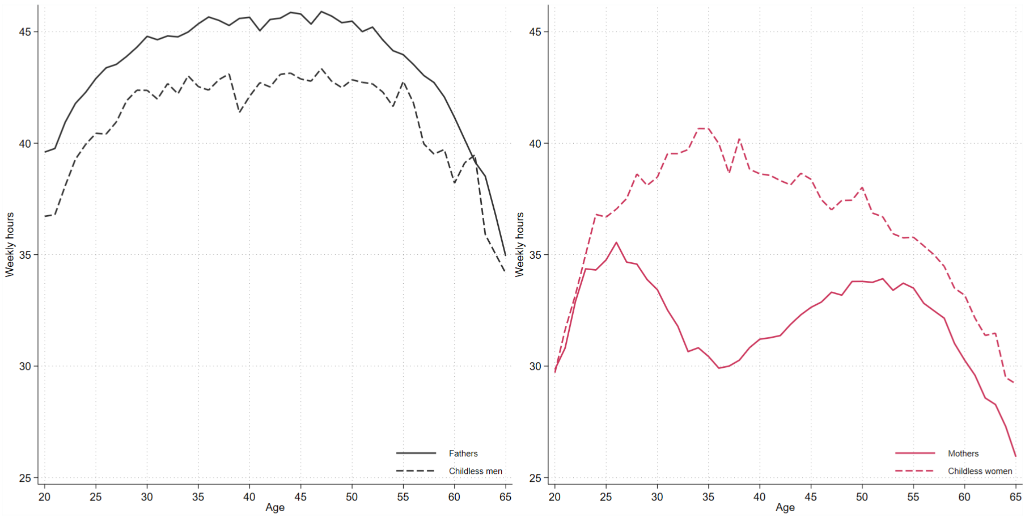


Figure B.3: **Age profiles of work hours (if employed) by key demographics (gender and parenthood). Left:** fathers (solid) and childless men (dashed). **Right:** mothers (solid) and childless women (dashed).

Notes: The age profiles stitch together 20-year snapshots of life-cycle for selected cohorts. The youngest cohort is cohort 12 aged 20-39 in the data. The oldest cohort is cohort 4 (aged 60-79) on the left panel and cohort 5 (aged 55-74) on the right panel. We omit the very old cohorts due to data limitation.

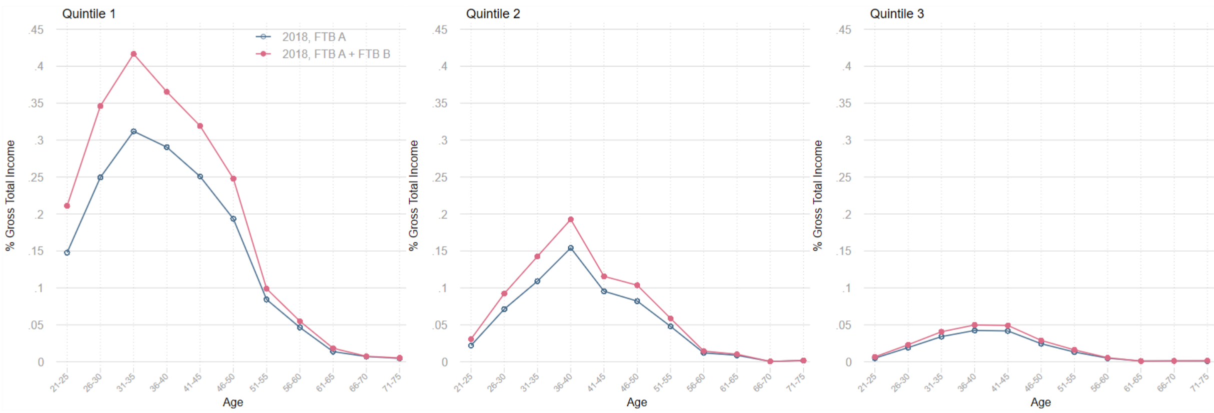


Figure B.4: **Age profiles of FTB share of gross household income for the first three quintiles by family market income in 2018.**

C Equilibrium and numerical solution

C.1 Competitive equilibrium

C.1.1 The distribution of households

Let $\phi_t(z_j)$ and $\Phi_t(z_j)$ denote the stationary density and cumulative distribution of households aged j at time t unadjusted for population growth, respectively.[25] Given that households enter the economy with identical female human capital level, set at unity ($h^f_{j=1,\lambda,\ell} = 1$), and no assets ($a_{j=1} = 0$), the initial distribution of newborns ($j = 1$) in every period t is determined by:

$$\begin{aligned} \sum_{\Lambda\times\Theta}\int_{A\times H\times S^2} d\Phi_t(\lambda, a, h, \theta, \eta^m, \eta^f) &= \sum_{\Lambda\times\Theta}\int_{S^2} d\Phi_t(\lambda, 0, 1, \theta, \eta^m, \eta^f) = 1, \quad \text{and} \\ \phi_t(\lambda, 0, 1, \theta, \eta^m, \eta^f) &= \prod_{x\in\{\lambda,\theta,\eta^m,\eta^f\}} \pi(x) \end{aligned}$$

We suppress subscripts and superscripts of the state variables wherever appropriate for brevity. Here, $\pi(x)$ is the unconditional probability density of state $x \in \{\lambda, \theta, \eta^m, \eta^f\}$ for $\lambda \in \Lambda,\ \theta \in \Theta,$ and $\eta^m, \eta^f \in S$.

From age $j = 2$ onward, the population density $\phi_t(z)$ evolves according to the following law of motion

$$\phi_+(z_+) = \sum_{\Lambda\times\Theta}\int_{A\times H\times S^2} \mathbf{I}\{a_+ = a_+(z, \Omega),\ h_+ = h_+(z, \Omega)\} \times \pi(\lambda_+|\lambda) \times \pi(\eta^m_+|\eta^m) \times \pi(\eta^f_+|\eta^f)\, d\Phi(z) \tag{C.1}$$

The time subscript is omitted for brevity. Ω is a vector of behavioral, technology, and policy parameters at time t; $\pi(\eta^i_+|\eta^i)$ is the probability of η^i_+ conditional on η^i for $i \in \{m, f\}$; and $\pi(\lambda_+|\lambda)$ is the probability of λ_+ given λ from the transition probabilities in Table 1. Assets and human capital are continuous states that evolve endogenously. The share of households on each (a^+, h^+) pair is obtained through linear interpolations of a_+ and $\log(h_+)$ on the discretized domains of assets (A) and human capital (H), respectively.

C.1.2 Aggregate variables

There are J number of generations living in every period t. Let the share of each living cohort j at time t be denoted by $\mu_{j,t}$ such that $\sum_{j=1}^J \mu_{j,t} = 1$. Taking into account the optimal decisions $\{c(z_j, \Omega_t),\ \ell(z_j, \Omega_t),\ a(z_j, \Omega_t)\}_{j=1}^J$ and the unit mass of households, aggregate variables for the model economy are equivalent to per household variables. For an economy governed by a vector of parameters Ω_t in time t, the aggregate consumption C_t, wealth A_t, female labor force participation rate LFP_t, and labor supply in efficiency units for male LM_t and female LF_t are expressed as

$$\begin{aligned} C_t &= \sum_{j=1}^{J}\sum_{\Lambda\times\Theta}\int_{A\times H\times S^2} c(z_j, \Omega_t)\mu_{j,t}\, d\Phi_t(z_j) \\ A_t &= \sum_{j=1}^{J}\sum_{\Lambda\times\Theta}\int_{A\times H\times S^2} a(z_j, \Omega_t)\mu_{j,t}\, d\Phi_t(z_j) \\ LM_t &= \sum_{j=1}^{JR-1}\sum_{\Lambda\times\Theta}\int_{A\times H\times S^2} h^m_{j,\lambda} e^{\theta+\eta^m_j} n^m_{j,\lambda}\mu_{j,t}\, d\Phi_t(z_j) \\ LF_t &= \sum_{j=1}^{JR-1}\sum_{\Lambda\times\Theta}\int_{A\times H\times S^2} \mathbf{I}\{\ell(z_j, \Omega_t) > 0\}\, h^f_{j,\lambda,\ell} e^{\theta+\eta^f_j} n^f_{j,\lambda,\ell}\mu_{j,t}\, d\Phi_t(z_j) \\ LFP_t &= \sum_{j=1}^{JR-1}\sum_{\Lambda\times\Theta}\int_{A\times H\times S^2} \mathbf{I}\{\ell(z_j, \Omega_t) > 0\}\, \mu_{j,t}\, d\Phi_t(z_j) \end{aligned}$$

[25] Because population growth rate is constant, adjustment for population growth is done when aggregating over cohorts. Mortality is age-dependent and is accounted for by the transition probabilities of family type λ as described in Table 1.

The aggregate government variables are

$$
\begin{aligned}
T_t^C &= \tau_t^c C_t, \\
T_t^K &= \tau_t^k (Y_t - w_t A_t L_t) \\
T_t^I &= \sum_{j=1}^{JR-1} \sum_{\Lambda\times\Theta} \int_{A\times H\times S^2} T_\lambda\left(y_\lambda^m(z_j,\Omega_t), y_\lambda^f(z_j,\Omega_t)\right) \mu_{j,t}\, d\Phi_t(z_j) \\
Tr_t &= \sum_{j=1}^{JR-1} \sum_{\Lambda\times\Theta} \int_{A\times H\times S^2} \left[FTB_\theta\left(y_\lambda^m(z_j,\Omega_t), y_\lambda^f(z_j,\Omega_t)\right)\right] \\
&\qquad\qquad + CCS\left(y_{j,\lambda}(z_j,\Omega_t),\, n_{j,\lambda}^m,\, \mathbf{I}\{\ell(z_j,\Omega_t)>0\}\, n_{j,\lambda,\ell}^f\right) \mu_{j,t}\, d\Phi_t(z_j) \\
\mathcal{P}_t &= \sum_{j=JR}^{J} \sum_{\Lambda} \int_A pen\left(a_j(z_j^R,\Omega_t), y_{j,\lambda}(z_j^R,\Omega_t)\right) \mu_{j,t}\, d\Phi_t(z_j^R)
\end{aligned}
$$

where $T_\lambda(.)$ is the household income tax function calculated using Equation (11); $FTB(.) = tr^A(.) \times nc_{j,\theta} + tr^B(.)$ is the sum of FTB-A of Equation (12) and FTB-B of Equation (13); $CCS(.)$ is the CCS function with subsidy rate $sr_j(.)$ from Equation (14); $pen(.)$ is the Age Pension from Equation (17); and L_t in the company tax (T^K) equation is the total labor supply in efficiency units, an aggregator of LM_t and LF_t.

C.1.3 Definition of competitive equilibrium

Given the household, firm and government policy parameters, the demographic structure, and the world interest rate, a steady state equilibrium is such that

(a) The collection of individual household decisions $\{c_j, \ell_j, a_{j+1}\}_{j=1}^J$ solves the household problem (19) and (22);

(b) The firm chooses labor and capital inputs to solve its profit maximization problem (8);

(c) The government periodic budget constraint (18) is satisfied;

(d) The factor markets clear, $K_t^s = K_t^d = K_t$ and $L_t^s = L_t^d = L_t$, where

$$L_t^s = LM_t + LF_t;$$

(e) The goods market clears:

$$
\begin{aligned}
Y_t &= C_t + I_t + G_t + NX_t \\
NX_t &= (1+n)(1+g)B_{F,t+1} - (1+r)B_{F,t} \\
B_{F,t} &= A_t - K_t - B_t
\end{aligned}
$$

where $I_t = (1+n)(1+g)K_{t+1} - (1-\delta)K_t$ is investment; $B_{F,t}$ is the required foreign capital to clear the domestic capital market; NX_t is the trade account and $NX_t > 0$ denotes a trade account surplus.[26]

(f) The lump-sum bequest is the total untapped end-of-period private wealth left by deceased agents in time t. Given the known survival probabilities, the total amount of bequest available at any time t is $BQ_t = \sum_{j=1}^J \sum_{\Lambda\times\Theta} \int_{A\times H\times S^2} (1-\psi_{j,\lambda})(1+r_t)a(z_j,\Omega_t)\, d\Phi_t(z_j)$, where $\psi_{j,\lambda}$ is the conditional survival probability for each household type λ at age j. Let $m_{j,t}$ represent the mass of households. We assume bequest is uniformly distributed to each living working-age household. The amount of bequest to a

[26] See Appendix Subsection C.2 for detailed explanation on $B_{F,t}$ and NX_t.

household aged j at time t is[27]

$$beq_{j,t} = \frac{BQ_t}{\sum_{j=1}^{JR-1} m_{j,t}} \tag{C.2}$$

C.2 Numerical solution

The quantitative model is solved numerically in FORTRAN. We first solve the model for household optimal allocations, their distributions, and aggregate variables along the initial balanced-growth path steady state equilibrium. The model economy is calibrated to the Australian economy's key micro and macro economic moments during 2012-2018 (a relatively stable period for these moment values). With the benchmark economy in place, we then conduct policy experiments by solving for counterfactual allocations, distributions, and aggregates in the final steady state equilibria of our alternative policy regimes. The algorithm is as follows:

1. Parameterize the model and discretize the asset space $a \in [a_{min}, a_{max}]$. The choice of grid points is such that
   - Number of grid points, $N_A = 70$;
   - $a_{min} = 0$ (No-borrowing constraint);
   - The grid nodes on $[a_{min}, a_{max}]$ are fairly dense on the left tail so households are not restricted by an all-or-nothing decision (i.e., unable to save early in the life cycle due to the lack of choices on the grid nodes for small asset levels);
   - a_{max} is sufficiently large so that: (i) household wealth accumulation is not artificially bound by a_{max}, and (ii) there is enough margin for upward adjustments induced by new policy regimes;
2. In a similar manner, discretize the human capital space $h^f_{\lambda,\ell} \in [h^f_{min,\lambda,\ell}, h^f_{max,\lambda,\ell}]$ for each λ and ℓ types such that
   - Number of grid nodes, $N_H = 25$;
   - $h^f_{min,\lambda,\ell} = 1$ for all λ and ℓ;
   - $h^f_{max,\lambda=0,\ell} = h^m_{max,\lambda=0,\ell}$ and $h^f_{max,\lambda=2,\ell} = h^m_{max,\lambda=1,\ell}$ for every ℓ;
3. Guess the initial steady state values of the endogenous aggregate macro variables (K_0 and L_0) and government policy variable (ζ_0), taking $r = r^w$ where r^w is a given world interest rate;
4. Solve the representative firm problem's first-order conditions for market clearing wages w;
5. Given the vector of the benchmark economy's macro and micro parameters (Ω_0)—such as the parameters governing the conditional survival probabilities (ψ) and income (η_m, η_f), factor prices (w, r), and the government policy structure—solve the household problems for optimal decision rules on future asset holdings (a^+), joint consumption (c), female labor supply (ℓ) and the value function of households by backward induction (from $j = J$ to $j = 1$) using *value function iteration method*. The numerical optimization and root finding algorithms are from a toolbox constructed by Hans Fehr and Fabian Kindermann;
6. Starting from a known distribution of newborns ($j = 1$), and given household optimal allocations, compute the measure of households across states z_j and over the life cycle by forward induction, using

[27] For married households ($\lambda = 0$), $\psi_{j,0} = 1 - (1 - \psi^m_j)(1 - \psi^f_j)$ is the probability that both spouses survive and the household maintains its status quo marital status. Bequest to each surviving household aged j at time t is determined by a general formula

$$beq_{j,t} = \left[\frac{b_{j,t}}{\sum_{j=1}^{J} b_{j,t}\, m_{j,t}}\right] BQ_t$$

where $b_{j,t}$ is the share of bequest for each surviving household aged j at time t. Since we assume uniformly distributed bequest, $b_{j,t} = \frac{1}{JR-1}$ if $j < JR$ and $b_{j,t} = 0$ otherwise.

- the computed decision rules $\left\{a_j^+(z_j, \Omega_t), c_j(z_j, \Omega_t), \ell_j(z_j, \Omega_t)\right\}_{j=1}^J$;
- the time-invariant survival probabilities $\{\psi_{j,m}, \psi_{j,f}\}_{j=1}^J$;
- the Markov transition probabilities of the transitory earnings shocks η^m and η^f;
- the law of motion of female human capital from Equation (7);

For determining the next period measure of households on the asset (a) and female human capital (h) grids, we employ a linear interpolation method;

7. Accounting for the measure of living households, sum across all state elements to get the aggregate levels of assets (A), consumption (C), female labor force participation (LFP), labor supply (L), output (Y), tax revenue, transfers, and other relevant variables. Aggregate variables necessary for the market clearing conditions (L, K, I, C and Y) are updated via a convex updating process to ensure a stable convergence;

8. Solve for the government policy variable ζ (overall tax size) using the public budget balance equation 18;

9. The goods market convergence criterion for a small open economy at time t is

$$\left|\frac{Y - (C + I + G + NX)}{Y}\right| \quad < \quad \varepsilon$$

where

- the trade balance NX is the difference between current and future government foreign debts. That is, $NX_t = (1+n)(1+g)B_{F,t+1} - (1+r)B_{F,t}$ and $B_{F,t} = A_t - K_t - B_t$ is the required foreign capital to clear the domestic capital market;
- $NX < 0$ implies a capital account surplus or current account deficit (net inflow of foreign capital and thus an increase in the foreign indebtedness);
- $\varepsilon = 0.001$;

10. Return to step 3 until the goods market convergence criterion is satisfied.

Our steady-state analysis is capable of capturing the ex-ante welfare effect of a regime shift (i.e., effect on the newborn households). However, grasping the full impact of a policy change requires that one also investigates the welfare effect on the current generations (non-newborns) living in the reform period. This requires that we consider the dynamics of the problem in-between steady states by solving for the transition path of the economy. Due to computational costs resulting from the high dimensionality of our model, we leave these to future endeavor. For this study, only the steady-state results are presented.

D Calibration: Supplementary results

D.1 Life cycle profiles of assets and consumption

Figure D.1 presents the estimated cross-sectional age profiles of wealth (left panel) and consumption (right panel) in 2018 AUD. For the real-world counterpart of assets (or wealth) in the model, we use average household net worth (financial + non-financial), defined as total assets net of total debts. For consumption, we estimate the household expenditure profile by age.

Both consumption and asset profiles exhibit a hump-shaped pattern. Household assets gradually accumulate, peaking at approximately 550,000 AUD around age 65—coinciding with the model's mandatory retirement age—before declining. Notably, consumption peaks earlier, around age 45, at approximately 45,000 AUD. The decline in consumption after age 45 aligns with the "empty nest" phase, a period when children leave home, leading to significant changes in household dynamics and consumption patterns.

Two key observations in Figure D.1 highlight divergences between the model assumptions and the data. First, household assets (or net worth) at age 21—the economic birth of households in the model—are not zero in the data, unlike the model's assumption. This discrepancy arises because in reality: (i) some individuals begin working before age 21, and (ii) inter vivos transfers, such as parental gifts, are non-negligible.[28] Second, the observed asset profile evolves gradually, with no indication that assets fall to zero in later life. In contrast, the model imposes a zero-asset terminal condition, meaning all households fully deplete their wealth if they survive to the maximum age 100. This assumption is necessary for computational feasibility, as it enables the household problem to be solved via backward induction using value function iteration.

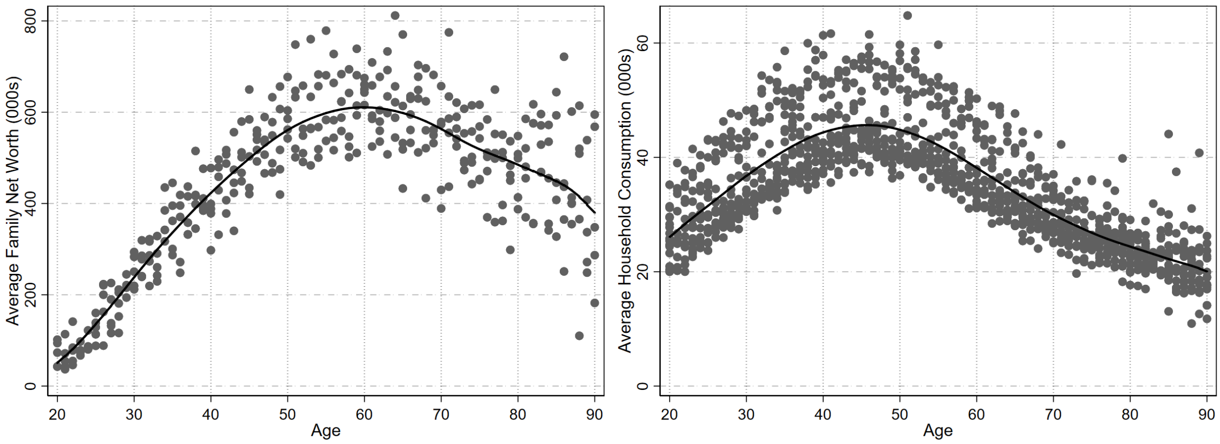


Figure D.1: **Life cycle profiles of wealth and consumption in 2018 AUD.**

Notes: (*) The estimated wealth profile represents household net worth (assets minus debts) based on HILDA household survey data. Scatter points represent net wealth across different years and age groups. Assets include financial assets (bank accounts, superannuation) and non-financial assets (property assets, business assets, collectibles). Debts consist of credit card debt, HECS debt, property debt, other personal debt, and overdue household bills. Further details on asset and debt classifications are available on page 74 of the HILDA User Manual - Release 20. (**) The estimated consumption profile is derived from annualized household expenditures across multiple categories, including food and beverages, transportation, clothing and footwear, communication and utilities, healthcare, leisure and recreation, household expenses (repairs, renovations, furniture, household appliances), and education and technology. Further details on expenditure classifications are available on page 85 of the HILDA User Manual - Release 20.

Relative measures of wealth and consumption to average annual income (of the working-age population) are used to compare model-generated values with the data, as presented in Figure D.2. These cross-sectional profiles indicate that consumption peaks at approximately 80% of average income before declining to around 40% by age 90. Wealth reaches a peak of approximately 5.5 times average annual income. This estimate is conservative, as net worth values below 1.5 times the lower quartile or above the upper quartile are treated as outliers and removed. This filtering helps exclude the super-rich, whose wealth accumulation mechanisms (e.g., inheritance, entrepreneurship) are not explicitly modeled in this study.

D.2 Human capital profile and the gender wage gap

Effective wages are determined by the product of market wages, education, and human capital. The endogenous component of wages is human capital follows a learning-by-doing process and is distinct from the education level obtained before workforce entry. Moreover, since market wages, education, and shocks are exogenous, the driver of the evolution of the gender wage gap over the life cycle is female human capital.[29]

Figure D.3 highlights two key observations. First, model-generated human capital trajectories for women are consistently lower than those for men across all ages. Second, high-education (high-skilled) women exhibit higher human capital levels than their low-education counterparts throughout the life cycle, with steeper

[28] For example, net worth includes bank accounts and vehicles, which are often gifted to young adults at the start of college.
[29] Recall that male human capital is exogenous.

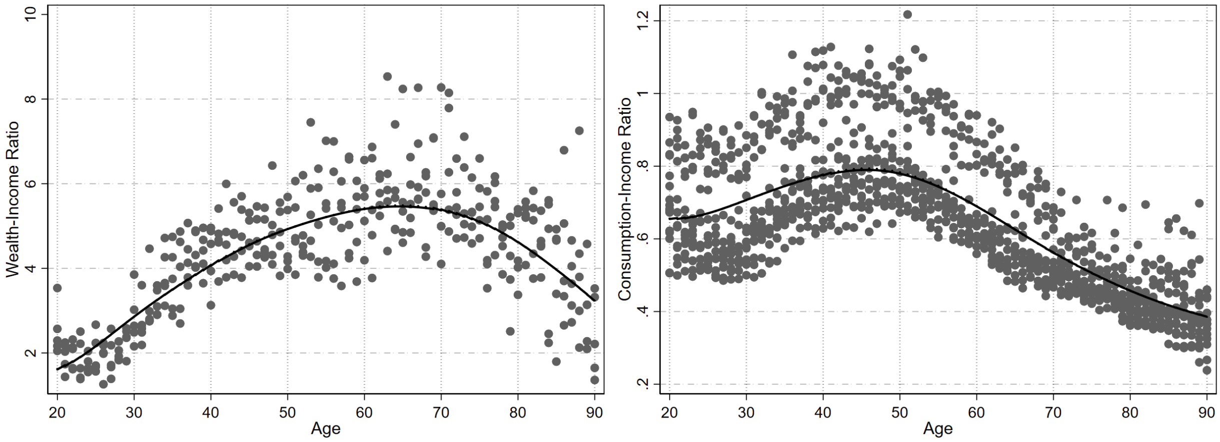


Figure D.2: **Life cycle profiles of wealth and consumption relative to average income.**
Notes: (*) The estimated wealth profile represents household net worth (assets minus debts) relative to the average annual income of working-age population, based on HILDA household survey data. Scatter points represent net wealth across different years and age groups. Assets include financial assets (bank accounts, superannuation) and non-financial assets (property assets, business assets, collectibles). Debts consist of credit card debt, HECS debt, property debt, other personal debt, and overdue household bills. Further details on asset and debt classifications are available on page 74 of the HILDA User Manual - Release 20. (**) The estimated consumption profile is expressed relative to the average annual income of working-age population, based on HILDA household survey data. Consumption is derived from annualized household expenditures across multiple categories, including food and beverages, transportation, clothing and footwear, communication and utilities, healthcare, leisure and recreation, household expenses (repairs, renovations, furniture, household appliances), and education and technology. Further details on expenditure classifications are available on page 85 of the HILDA User Manual - Release 20.

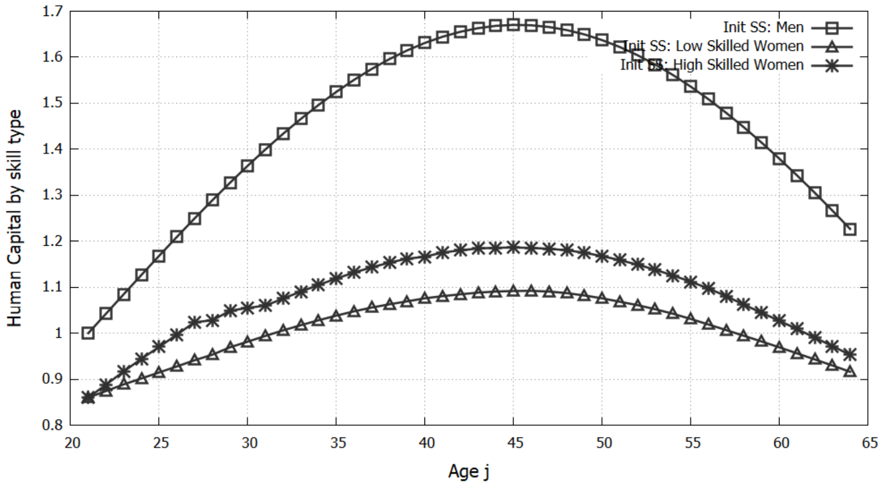


Figure D.3: **Life cycle profiles of human capital by gender and female education level.**
Notes: The male profile represents full-time married fathers and is exogenously determined. Female profiles are endogenously generated by the model, reflecting the interaction between women's labor supply decisions at each age (governed by the calibrated human capital gain and loss rates).

trajectories during the first 10 years of their careers before the arrival of their first child (at age 28). Childbirth leads some high-education women to reduce their labour supply, thereby lowering their subsequent human capital accumulation.

While the gender wage gap is not the primary focus of this study, this section provides a brief discussion of the model's implied gender wage gap (driven by endogenous human capital accumulation) to further assess its ability to match non-targeted moments. As shown in Figure D.4, the model overestimates the gender wage gap, particularly during prime working years. Specifically, it predicts an average gender wage gap of approximately 30% for the 35–44 and 45–54 age groups, whereas the ABS data reported in the AGEC report (2020) indicates pay gaps of 17.3% and 15.6% for full-time earnings in the same age groups. However, the model aligns more closely with observed gaps for younger and older workers, predicting 23% for the 21–34 age group (compared to 14.2% in the data) and 19.7% for the 55+ age group (compared to 17.7%). These results suggest that labor force participation decisions and human capital accumulation alone generate substantial wage gaps, indicating the need for additional mechanisms to fully explain the observed gender wage gap.

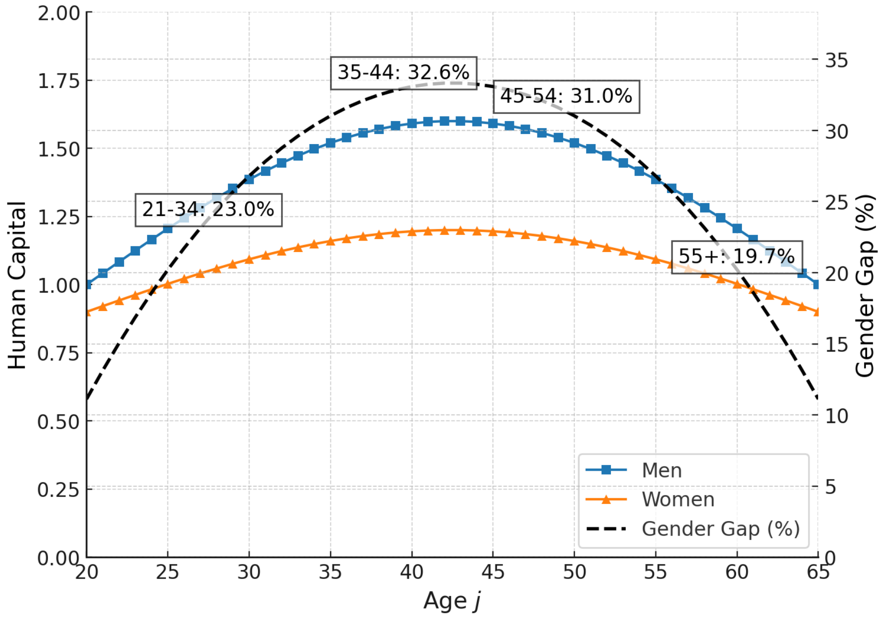


Figure D.4: **Gender wage gaps across the life cycle.**

Several factors contribute to the model's overestimation of the gender wage gap. First, for tractability, the calibration assumes assortative matching, ensuring that female wage profiles mirror those of their male counterparts if they work continuously over the life cycle. For instance, married women are assumed to have the same human capital growth potential (governed by the human capital gain parameters $\xi_{1,\lambda,\ell}$ and $\xi_{2,\lambda,\ell}$) as their male spouses, and similarly for single men and women. Second, the human capital accumulation process follows a second-degree polynomial function to minimize the number of parameters required. Since it is governed by only two gain parameters, this structure lacks the flexibility needed to capture the smaller observed gender gap during prime working years.

E Policy reforms: Supplementary results

E.1 Baseline universal child-related transfers (with current payment rates)

Labor supply responses by mothers to universalized child-related transfers											
LFP (*pp*)	21-30	31-40	41-50	51-60	61-70	**FT** (*pp*)	21-30	31-40	41-50	51-60	61-70
M (H)	+0.0390	+0.3347	+0.1323	+0.0126	-0.0161	M (H)	+0.4783	+1.0791	-0.0287	-0.0879	-0.0814
M (L)	+0.9228	+0.7844	+0.3895	+0.0542	-0.0153	M (L)	+2.3560	+0.4973	+0.3216	+0.0178	-0.0855
S (H)	0	0	0	-0.0003	-0.0004	S (H)	-0.0305	-0.0192	-0.0036	-0.0088	0
S (L)	0	0	-0.0001	-0.0005	+0.0009	S (L)	+0.0131	-0.0276	-0.0015	-0.0042	+0.0032
			Hour (%)	21-30	31-40	41-50	51-60	61-70			
			M (H)	+6.33	+21.87	+1.69	-1.25	-6.12			
			M (L)	+28.49	+9.42	+4.64	+0.60	-3.11			
			S (H)	-1.26	-1.40	-0.32	-0.89	-0.12			
			S (L)	+0.24	-0.88	-0.06	-0.20	+0.48			

Table E.1: **Labor supply responses by married (M) and single (S) female households to universal child-related transfers** (H: high education, and L: low education)**.**
Notes: Results are reported in terms of percentage changes relative to the levels in the benchmark economy.

C (%)	M (H)	M (L)	SM (H)	SM (L)	SW (H)	SW (L)
Age 21-30	+4.56	+12.70	-4.12	-3.65	-3.64	-1.12
Age 31-40	+8.59	+6.18	-4.11	-3.90	-1.69	-2.65
Age 41-50	+3.82	+2.40	-4.08	-3.97	-0.96	-2.25
Age 51-60	+2.92	+2.30	-4.03	-3.97	-1.05	-2.30
Age 61-70	+3.02	+2.56	-3.35	-3.13	+0.15	-0.93
Age 71-80	+3.81	+2.54	-0.31	-0.44	+2.34	+1.03
Age 81-90	+3.53	+2.12	+1.96	+1.21	+3.08	+1.70
Welfare (%)	+1.36	+1.34	-1.47	-1.20	-0.69	-0.51

Table E.2: **Consumption and welfare responses to universal child-related transfers** (M: Married, SM: Single men, SW: Single women (Single mothers); H: High education and L: Low education)**.**
Notes: Results are reported in terms of percentage changes relative to the levels in the benchmark economy.

E.2 Universal child benefits with different payment rates

Labor supply responses by mothers												
	0.5×Baseline rates				Baseline rates				1.5×Baseline rates			
LFP (*pp*)	21-30	31-40	41-50	51-60	21-30	31-40	41-50	51-60	21-30	31-40	41-50	51-60
M (H)	−0.0935	+0.0634	+0.0397	−0.0149	+0.0390	+0.3347	+0.1323	+0.0126	+0.0379	+0.3452	+0.1266	+0.0019
M (L)	+0.1662	+0.5453	+0.3592	+0.0440	+0.9228	+0.7844	+0.3895	+0.0542	+2.1401	+0.9600	+0.3522	+0.0051
S (H)	0	0	0	−0.0004	0	0	0	−0.0003	0	0	0	−0.0004
S (L)	0	0	−0.0002	−0.0018	0	0	−0.0001	−0.0005	0	0	−0.0001	−0.0002
FT (*pp*)	21-30	31-40	41-50	51-60	21-30	31-40	41-50	51-60	21-30	31-40	41-50	51-60
M (H)	+0.1906	+0.0613	−0.0649	−0.0746	+0.4783	+1.0791	−0.0287	−0.0879	+0.5678	+1.3883	−0.1174	−0.1880
M (L)	−0.2479	+0.1150	+0.1595	+0.0119	+2.3560	+0.4973	+0.3216	+0.0178	+4.1052	+0.5985	+0.4306	+0.0131
S (H)	+0.0035	+0.0365	−0.0034	−0.0078	−0.0305	−0.0192	−0.0036	−0.0088	−0.0318	−0.0301	−0.0038	−0.0091
S (L)	+0.03	+0.0710	−0.0013	−0.0039	+0.0131	−0.0276	−0.0015	−0.0042	−0.0318	−0.1518	−0.0018	−0.0050
HRS (%)	21-30	31-40	41-50	51-60	21-30	31-40	41-50	51-60	21-30	31-40	41-50	51-60
M (H)	+1.60	+1.88	−0.29	−1.51	+6.33	+21.87	+1.69	-1.25	+7.47	+26.81	+0.33	−3.12
M (L)	−1.31	+4.78	+3.44	+0.48	+28.49	+9.42	+4.64	+0.60	+52.70	+11.41	+5.05	+0.14
S (H)	+0.14	+2.66	−0.30	−0.79	−1.26	−1.40	−0.32	−0.89	−1.31	−2.20	−0.34	−0.91
S (L)	+0.55	+2.27	−0.06	−0.25	+0.24	−0.88	−0.06	−0.20	−0.58	−4.86	−0.07	−0.22

Table E.3: **Labor supply responses by married (M) and single (S) female households to universal child-related transfers varied by transfer size** (H: high education, and L: low education)**.**
Notes: Results are reported in terms of percentage changes relative to the levels in the benchmark economy.

Consumption and welfare changes by household type																		
	0.5×Baseline rates						Baseline rates						1.5×Baseline rates					
C (%)	M (H)	M (L)	SM (H)	SM (L)	SW (H)	SW (L)	M (H)	M (L)	SM (H)	SM (L)	SW (H)	SW (L)	M (H)	M (L)	SM (H)	SM (L)	SW (H)	SW (L)
21-30	+3.6	−0.7	−0.1	−0.1	+0.4	+0.8	+4.6	+12.7	−4.1	−3.7	−3.6	−1.1	+5.1	+21.4	−6.2	−5.6	−5.2	−3.8
31-40	+5.0	+3.5	−0.1	−0.1	+3.0	+1.5	+8.6	+6.2	−4.1	−3.9	−1.7	−2.7	+9.9	+9.2	−6.1	−5.9	−3.9	−5.0
41-50	+3.9	+3.5	−0.1	−0.1	+2.9	+1.2	+3.8	+2.4	−4.1	−4.0	−1.0	−2.3	+4.0	+3.3	−6.1	−5.9	−3.0	−4.0
51-60	+3.5	+3.7	−0.1	−0.1	+2.8	+1.2	+2.9	+2.3	−4.0	−4.0	−1.1	−2.3	+3.0	+3.1	−6.0	−5.9	−3.0	−4.1
61-70	+3.8	+4.1	+0.3	+0.3	+3.4	+1.8	+3.0	+2.6	−3.4	−3.1	+0.2	−0.9	+3.1	+3.3	−5.1	−4.7	−1.5	−2.1
71-80	+4.6	+3.8	+2.3	+2.0	+4.2	+2.8	+3.8	+2.5	−0.3	−0.4	+2.3	+1.0	+4.0	+3.3	−1.3	−0.9	+1.7	+0.9
81-90	+4.3	+3.1	+3.7	+2.8	+4.4	+2.9	+3.5	+2.1	+2.0	+1.2	+3.1	+1.7	+3.6	+2.7	+1.5	+1.4	+2.8	+2.0
Welfare (%)	+1.4	−0.02	−0.04	−0.02	+0.4	+0.1	+1.4	+1.3	−1.5	−1.2	−0.7	−0.5	+1.6	+2.6	−2.2	−1.9	−1.3	−0.9

Table E.4: **Household consumption and welfare responses to universal child-related transfers varied by transfer size** (M: Married, SM: Single men, SW: Single women (Single mothers); H: High education and L: Low education)**.**
Notes: Results are reported in terms of percentage changes relative to the levels in the benchmark economy.

E.3 Relaxing the CCS phase-out rates

C (%)	M (H)	M (L)	SM (H)	SM (L)	SW (H)	SW (L)
Age 21-30	+1.59	+1.89	+0.98	+0.76	+0.95	+1.06
Age 31-40	+1.72	+1.25	+0.99	+0.86	+1.15	+0.77
Age 41-50	+1.48	+1.12	+1.01	+0.92	+1.02	+0.54
Age 51-60	+1.30	+1.13	+1.02	+0.96	+1.05	+0.60
Age 61-70	+1.22	+1.07	+1.05	+1.00	+1.17	+0.76
Age 71-80	+1.20	+0.99	+1.16	+1.03	+1.16	+0.87
Age 81-90	+1.15	+0.93	+1.19	+1.01	+1.13	+0.88
Welfare (%)	+0.42	+0.40	+0.34	+0.24	+0.26	+0.18

Table E.5: **Heterogeneous household consumption and welfare responses to halving the CCS taper rates** (M: Married, SM: Single men, SW: Single women (Single mothers); H: High education and L: Low education)**.**
Notes: Results are reported in terms of percentage changes relative to the levels in the benchmark economy.

Labor supply responses by mothers to the removal of FTB and CCS programs											
LFP (pp)	21-30	31-40	41-50	51-60	61-70	**FT** (pp)	21-30	31-40	41-50	51-60	61-70
M (H)	+0.0454	+0.2091	+0.0777	+0.0177	+0.0012	M (H)	+0.1740	+0.4243	+0.2189	+0.0687	+0.0025
M (L)	+2.2350	+1.3731	+0.4436	+0.1798	+0.0290	M (L)	+2.7824	+2.5401	+1.0656	+0.6916	+0.0955
S (H)	0	0	0	0	0	S (H)	+0.0013	+0.0075	+0.0004	+0.0012	+0.0015
S (L)	0	0	0	+0.0002	+0.0008	S (L)	+0.0159	+0.0647	+0.0091	+0.0151	+0.0112
			Hour (%)	21-30	31-40	41-50	51-60	61-70			
			M (H)	+12.36	+48.96	+22.06	+7.64	+1.25			
			M (L)	+83.20	+60.50	+20.12	+15.65	+8.80			
			S (H)	+1.08	+10.98	+0.74	+2.07	+6.13			
			S (L)	+2.57	+17.76	+2.89	+4.77	+9.28			

Table E.6: **Labor supply responses by married (M) and single (S) female households to the elimination of all child-related transfer programs** (H: high education, and L: low education)**.**

Notes: Results are reported in terms of percentage changes relative to the levels in the benchmark economy.

C (%)	Couples (H)	Couples (L)	Single Men (H)	Single Men (L)	Single Women (H)	Single Women (L)
Age 21-30	+8.12	+15.74	-0.11	-0.07	-7.74	-11.55
Age 31-40	+14.59	+14.83	-0.06	-0.06	-3.04	-6.88
Age 41-50	+9.65	+6.71	-0.03	-0.01	-4.20	-9.39
Age 51-60	+6.80	+6.59	+0.03	+0.07	-3.22	-8.03
Age 61-70	+6.24	+5.69	+1.12	+1.44	-1.32	-6.00
Age 71-80	+6.61	+4.10	+6.10	+6.36	+1.66	-3.09
Age 81-90	+5.48	+1.80	+9.83	+9.11	+2.13	-3.06
Welfare (%)	+1.35	-0.22	+0.02	+0.06	-4.03	-6.53

Table E.7: **Consumption and welfare effects by demographic due to the elimination of all means-tested child-related transfers** (H: High education and L: Low education).

Notes: Results are reported in terms of percentage changes relative to the levels in the benchmark economy.