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Economic Gains from Investing in Childcare: the Case of Indonesia

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Economic Gains from Investing in Childcare: the Case of Indonesia

May 2022

This note was prepared by Anna O'Donnell and Kate Shanahan. The modeling results and technical annex for the MANAGE model were provided by Hasan Dudu, Hugo Rojas-Romagosa and Jan Witajewski-Baltvilks. Additional inputs were provided by Jack Britton and Emcet Tas. Valuable feedback on the note was provided by Massimiliano Cali, Indira Hapsari, Achim Schmillen, Habib Rab, Janmejay Singh, Caren Grown, Daniel Halim, Elizaveta Perova, Soumya Kapoor, Monica Maria Wihardja, and Ririn Purnamasari. Financial support for this report was provided by the Government of Australia's Department of Foreign Affairs and Trade through the Australia-World Bank Indonesia Partnership (ABIP). The team thanks the Australian Government for their generous support.

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EXECUTIVE SUMMARY

Investments that unlock women's employment and support human capital attainment could bring additional growth gains to Indonesia. Current rates of female labor force participation in Indonesia are relatively low by regional standards and have remained largely stagnant for two decades. If Indonesia were to reach East Asian averages of female labor force participation, the country could realize an estimated additional US$62 billion to GDP, or around 0.7 percentage points in increased economic growth above business-as-usual scenarios.

Indonesia's current market failures in childcare provision constrain women's economic participation and economic growth. Childcare, defined as services that support caring for children from ages birth to six years old with quality care services to enable parents to work, is likely concentrated in unremunerated family arrangements or informal care in Indonesia. Current expenditures for early childhood development and childcare services in Indonesia amount to 0.04 percent of GDP, well below the recommended expenditure level of 1.0 percent of GDP. The quality of and access to existing services remains constrained. Indonesia's uneven childcare provision for early years misses an opportunity to bring a double dividend of growth through higher levels of female labor force participation, as well as boosting long term human capital.

This policy note estimates the impacts of increased public expenditure on childcare services to the Indonesian economy. Model simulations suggest that increasing Government expenditure on childcare to between 0.1 and 0.5 percent of GDP could increase GDP growth by as much as 0.7 percentage points above baseline scenarios. The simulations see increased women's employment, with female labor force participation projected to reach East Asian averages of 58 percent, which is a 25 percent increase. The model results show that welfare gains from the increased public expenditure would benefit all income groups; however, the impacts would be largest for the lower-income groups in the country. Even if the additional expenditure were estimated to be budget neutral, the model continued to find the policy intervention to positively impact growth and to be overall welfare enhancing and progressive.

To achieve these objectives, the Government could consider (i) developing a roadmap to better align women's employment goals with early childhood care and education services, strengthening national policies, regulations, standards and monitoring systems for all childcare services; (ii) expanding options and the provision of quality and affordable childcare services that are carefully designed, targeted and delivered to meet the needs of families with young children; (iii) investing in the care economy, including in upskilling programs and support to women entrepreneurs for childcare businesses; and (iv) engaging with evolving social norms around care responsibilities through information campaigns and outreach services

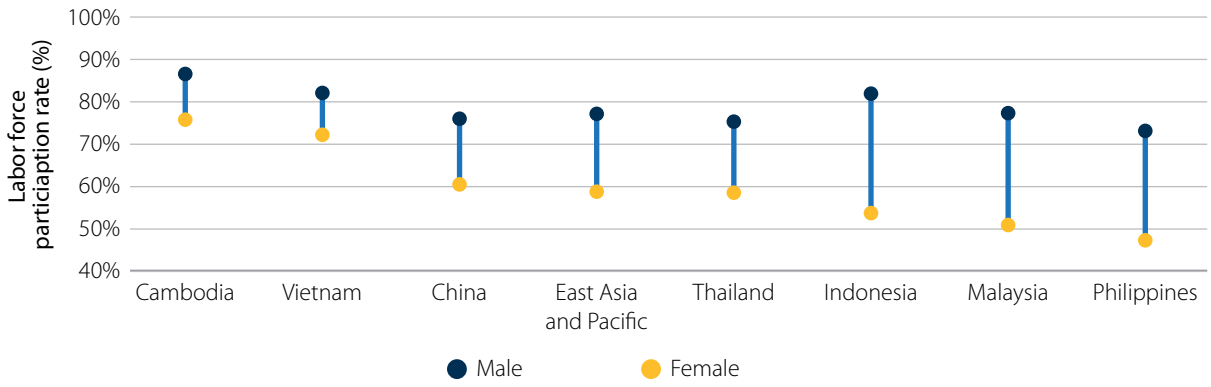
Introduction

Indonesia's female labor force participation has remained relatively stagnant for two decades and is low by regional standards. Female labor force participation rates have hovered around 50 percent for the last 20 years, against a labor force participation rate for males around 80 percent (Figure 1). This gap between male and female labor force participation is one of the highest in the region, at 28.4 percentage points, and is well above the East Asia and Pacific average gap of 17.4 percentage points. Female labor force participation is also below the regional average (around 58.8 percent) and is below almost all East Asian comparators, except for Malaysia and the Philippines. Reducing barriers to female labor force participation in Indonesia could lead to additional growth and productivity benefits to the country.

Indonesia has made several policy commitments to increase women's economic participation. These include a target of 55 percent female labor force participation by 2024 in the new Medium-Term Development Plan (RPJMN) (20202024). In 2014, G20 leaders, including Indonesia, committed to reducing the gender gap in labor force participation by 25 percent by 2025.[1] The International Labour Organization (ILO) estimates that achieving this commitment could increase Gross Domestic Product (GDP) globally by US$5.3 trillion, or 3.9 percent.[2] In Indonesia, recent estimates show that, if a rate of 58 percent were achieved, the country could add US$62 billion to the economy, or around 0.7 percentage point increase in annual growth rates above the baseline projections.[3] By most accounts, under the current policy conditions, Indonesia is unlikely to achieve these targets.[4]

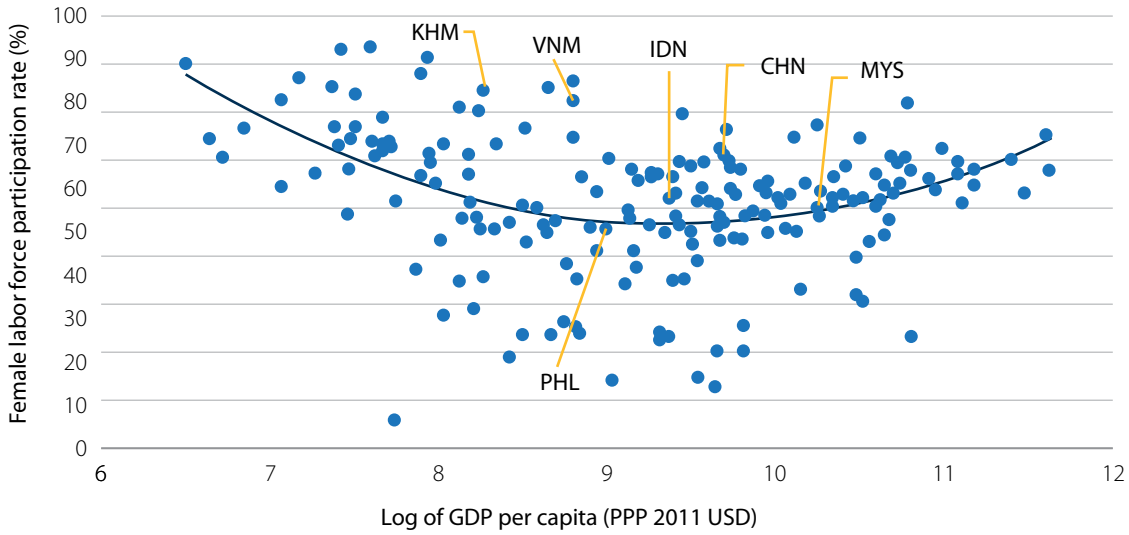
[1] The so-called "25 by 25" commitment.
[2] ILO 2017
[3] Hapsari and Abigail 2020.
[4] Cameron 2018.

Figure 1: Labor Force Participation Rates in Select East Asian Countries (% of total population by sex)(2019)



Source: World Development Indicators.

Figure 2: Global "'U Shape"' in the Relationship between GDP and Female Labor Force Participation Rate in 2018



Source: World Bank (2021).

Factors determining women's employment are complex. Globally, a" U shape" has been observed in the relationship between female labor force participation and GDP per capita (Figure 2). Within this, female labor force initially declines with economic growth brought about by structural transformation from agriculture to industry.[5] Delayed marriage, lower fertility rates, and expanded access to education work alongside economic growth to then boost female labor force participation, with shifts toward services. Indonesia remains just above the trendline, although well below some regional comparators (most notably Cambodia, which shares a similar macroeconomic structure).[6]

Evidence from Indonesia indicates that household structure and care responsibilities are key determinants of female labor force participation. In Indonesia, expanded education for girls, declining early marriage rates, and lower fertility have not translated into impacts on female labor force participation in the same way as in other countries. Instead, studies consistently point

[5] Goldin 1995; Luci 2009; Tam 2011.
[6] Alatas et al. 2020.

to family responsibilities as shaping employment choices;[7] marriage and having children are reliable predictors of women exiting the labor force,[8] and studies have indicated this is true even after controlling for age, education, and other household characteristics.[9] When looking at age effects on women's employment in Indonesia, around 40 percent of women initially working in wage employment are no longer working after marriage and childbirth.[10] Women explicitly attribute dropping out of the labor market because of domestic work or pregnancy,[11] and once women drop out they often do not return to wage work.[12] Elder care is also increasingly becoming a challenge for Indonesia,[13] with the responsibilities for care mostly falling on households and women.

This is in line with global evidence highlighting the need to better understand the work-care nexus in shaping labor force participation of women. Studies at the global level point to the gendered distribution of paid and unpaid work, particularly women's disproportionate responsibility for childcare, eldercare, and other domestic activities, which continue to make women less able than men to enter and remain in the labor force, as well as limiting their choices to informal, part-time, or low-paying jobs.[14] A recent global study showed that household structure, and particularly the presence of children, had an impact on women's labor force participation, but did not impact men in the same way.[15] Further, social norms tend to emphasize women's roles as homemakers and mothers, starting with the development of their aspirations as girls and persisting through their childbearing years.[16] These beliefs lead to widening skills and experience gaps, perpetuate the perception that women are less attached to the labor market, and can result in gender-based discrimination in hiring and promotion decisions. A recent cross-country comparison conducted by World Bank found that, across 22 quantitative analyses of lower- and middle-income countries, all but one study found positive impacts from greater availability of childcare services on women's labor market outcomes.[17]

In this paper, we look at the state of childcare service provision in Indonesia, and then examine the projected impacts of expanding public investments of childcare services. In the next section, we review how childcare is provided in the Indonesian context, with particular attention paid to public investments in preschool and early childhood development services, which provide only a partial solution to childcare needs. In the subsequent section, we explore the impacts of increasing public investments in childcare in Indonesia. Two scenarios are considered: increasing investments in childcare services to 0.5 percent of GDP, resulting in an increase to female labor force participation rates of 58 percent (G20 commitment), and increasing investments to 0.1 percent of GDP, resulting in a female labor force participation rate of 55 percent (RPJMN commitment). The impacts of these policy choices are explored on economic growth, job creation, and overall welfare. The final section of the paper provides some initial policy considerations.

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7 Alatas et al. 2020.

8 World Bank 2020; Cameron L 2018.

9 Alatas et al. 2020

10 Cameron 2018; Lain, Alatas, and Setyonaluri 2020.

11 Alatas et al.2020.

12 Schaner and Das 2016.

13 Glinskaya et al. (unpublished)

14 Globally, an estimated 606 million working-age women consider themselves unavailable for employment or are not seeking a job because of unpaid care work, as opposed to only 41 million men. Across 66 countries representing two-thirds of the world's population, women spend on average 3.3 as much time as men on unpaid care work (Gromada, Richardson, and Rees 2020).

15 ILO 2021. https://ilostat.ilo.org/having-kids-sets-back-womens-labour-force-participation-more-so-than-getting-married/

16 Some evidence suggests that unequal distribution of care work during childbearing years is a relatively stronger factor responsible for women's entering into lower paid occupations, compared to, for example, gender norms internalized during childhood. Chowdhury et al. (2019) find that in Vietnam unequal distribution of care work largely contributes to women's entering into lower-paid occupations, while there is no evidence of lower aspirations among girls

17 Halim, Perova, and Reynolds 2021.

The Work-Care Nexus in Indonesia

Indonesia's current market failures in childcare provision constrain women's economic participation and economic growth. While no comprehensive analysis exists on the demand for different kinds of childcare services in Indonesia, there is some evidence to show that the gaps in quality and affordable childcare services are a key constraining factor to female labor force participation. Indonesia's investments in early childhood care and education services are a small portion of education expenditures and remain well below recommended global spending and comparator country averages.

Current provision of childcare in Indonesia is likely concentrated in unremunerated family arrangements or informal care. While no comprehensive data exist to provide insights into the landscape of childcare provision in Indonesia, several factors point to the concentration of care in informal arrangements. Most discussions on childcare services in Indonesia highlight the role that families and extended networks play in childcare, given the cultural and social norms in Indonesia that shape gender-based roles and responsibilities in the household, with women expected to be the primary caregivers.[18] A 2015 study by the Indonesian Commission on Child Protection (KPAI), for example, found that 73.8 percent of fathers and 74.2 percent of mothers stated that their care responsibilities were assisted by others (i.e., by grandparents, domestic workers, neighbors, community provided care, etc.).[19] Given that there is scant public provision of childcare services, it is not surprising that most of the support to care responsibilities cited was through informal means.

[18] As per the Marriage Law (1/1974), only the man is recognized as the head of household (*kepala keluarga* or KK) for the family, which, some researchers indicate, shapes social norms related to gender roles and responsibilities in the household (especially around care) and household level decision making (see World Bank 2020b); see also Purnamasariet al. 2020.

[19] As cited in Pranawati, R. et al., (2021)

BOX 1: WHAT IS THE DEFINITION OF CHILDCARE?

Global best practices indicate that policies and programs aimed at expanding options to families for quality and affordable childcare alongside supporting needs of working parents bring a range of benefits, including to women's employment, family welfare, child development and productivity and economic growth. But what does childcare comprise? This note defines childcare, in line with recent World Bank reports, to be any service that supports caring for children from ages birth to six years old while parents are working, simultaneously ensuring that children are safe and have opportunities to learn and develop positive relationships with caregivers and peers. Childcare services can be provided through a variety of ways, including public provision; private center-based care; community-based or other non-state solutions; home-based care provided by the parent, grandparent, or a domestic worker; or other unremunerated family arrangements. Public support to childcare can range from government provision, subsidies to stimulate private or non-state provision, support to entrepreneurs to start home-based care, play groups, and parent support services, as well as public financing for part or all of parental leave policies. In most countries, public support for childcare usually entails providing preschool and early childhood development programs. But preschools can only be partial solutions for working parents, given their limited hours of operation. Further, they often tend to cater to the needs of children ages three to six, with families having to rely on their own arrangements to provide care for children ages zero to three. This is the time that most women drop out of the labor force, and any programs to provide childcare for this group, need to work in conjunction with other public support offered including as subsidies, parent support services, or public financing for parental leave.

Indonesia's public investment in children under age six has focused on expanding early childhood education (ECE) programs. The Indonesian Education Law 20/2003 covers the provision of early childhood education (*Pendidikan-Anak Usia Dini*, or PAUD) from birth to six years overseen by a dedicated Directorate General for Early Childhood Development. Expansion of these services has primarily focused on what is termed Kindergarten, or TK, targeting the four to six age group. As of 2020, there are a total of 126,571 TK/Islamic kindergarten (RA) across the country, of which 96% (121,887) are private, with the remaining public. Kindergarten (TK/RA) centers make up just over one-half (53%) of the total number of Early Childhood Education and Development (ECED) centers in the country. Teachers for these centers are public sector employees, with standards and certification set by the Ministry of Education and Culture (MoEC) (for kindergarten (TK)) and the Ministry of Religious Affairs for Islamic kindergarten (RA). All other ECED services are classified as informal services. According to data provided by the MoEC, there are a total of 85,689 playgroups (KB), 2,858 early childhood care and education centers (TPA), and 21,690 other PAUD (SPS) in the country.

Despite an increased policy focus and commitment, the scope and reach of early childhood education programs remain limited. Children between ages three to six years can attend non-compulsory ECED services, but enrollment in these programs was only around 38.1 percent in 2018, well below national targets of 77.0 percent.[20] Much of the focus has been on expanding high quality integrated ECED services for children ages four to six with far less attention on services for children ages zero to three.[21] The Government seeks to ensure that every village has at least one ECED center, but current provision is uneven, poorly regulated, and relies on nongovernmental organizations (NGOs) and community groups.[22]

[20] UNICEF (2020) citing Susenas (2018.)
[21] IL, 2018a.
[22] ILO 2018b.

Table 1: Types of Early Childhood Development Programs in Indonesia

Type of service		Age group	Hours	Total number	Focus of service	Responsible government agency
Formal	Kindergarten *Taman Kanak-Kanak* (TK)	4–6 years old	900 minutes/ week	126,571	Pre-primary education, child development, and school readiness	Ministry of Education and Culture
	Islamic Kindergarten *Rawdhatul Atfal* (RA)	4–6 years old	900 minutes/ week		Islamic based pre-primary education, child development, and school readiness	Ministry of Religious Affairs
Non-formal	Playgroups *Kelompok Bermain* (KB)	2–4 years old	Minimum 360 minutes/week	85,689	Child development	Ministry of Education and Culture
	Childcare *Taman Peniitipan Anak* (TPA)	3 mo–6 years old	5-6 days/ week 8-10 hours/ day	2,858	Care services for children of working parents; in some centers supplemented with child development	Interministries: Ministry of Social Welfare for care and social service component; and Ministry of Education and Culture for policy and guideline development
	Other forms of ECCE services: *Satuan Paud Sejenis* (SPS) includes *Pos PAUD*, *Taman Posyandu* (TP), *Taman Asuhan Anak Muslim* (TAAM)	0–6 years old	Varies	21,690	Child development supplemented with additional program (depends on the institutions)	Various ministries: Ministry of Domestic Affairs, Ministry of Health, Ministry of Women's Empowerment and Child Protection, and National Population and Family Planning Board
TOTAL				**236,808**		

Note: Early childhood care and education centers (TPA) are generally open from 8AM to 4PM to care for the children of working parents. Kindergartens (TK), playgroups (KB), and ECED posts (PosPAUD) typically operate from 8AM to 11AM, while Islamic kindergartens (TPQ) usually open from 2PM to 4PM. Most services are available daily (five to six times per work) although playgroups generally meet only three days a week. Toddler family groups (BKB) meet less frequently, with mothers typically attending one session a month (Alatas H YR).

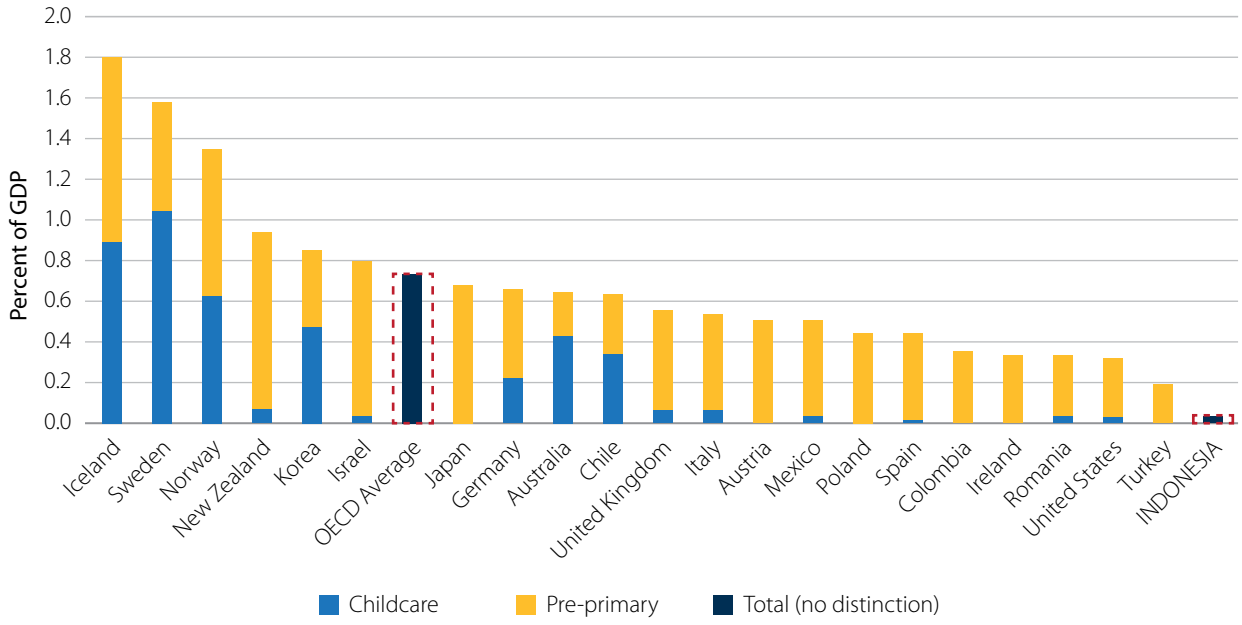
Source: Adapted from Yulindrasari, H. (2018); figures for centers are taken from MoEC https://referensi.data.kemdikbud.go.id/index21.php (accessed November 16, 2021).

Indonesia's overall public expenditure in early childhood care and development programs remains well below international averages. Globally, the Organisation of Economic Co-operation and Development (OECD) recommends that governments invest around 1 percent of GDP in early childhood care and education services. A growing body of evidence identifies positive impacts of quality childcare programs, linking long-term benefits for children both in terms of improvements in human capital, as well as substantial long-term links to economic earnings and opportunities later in life.[23] Indonesia currently spends around 0.04 percent of GDP on early childhood education programs, which is the closest proxy for childcare in Indonesia. This is well below the current OECD average of 0.7 percent. Across these countries, much of the investment is also focused on the preprimary (ages four to six) programming, although some countries increasingly recognize the benefits from investing in programs for children ages zero to three. Figure 3 shows the range of public expenditure on childcare[24] and pre-primary education across a range of OECD member countries.

[23] See, for example, Magnuson and Duncan (2016) and World Bank (2012).

[24] It should be noted that the OECD defines childcare as different from preprimary expenditures, with preprimary focused on preschool expenditures (four to six years old) and childcare covering all public expenditure for other childcare programming.

Figure 3: Public Expenditure on Childcare and Pre-primary Education and Total Public Expenditure on Early Childhood Education and Care (as a % of GDP, 2017 or latest available)



Source: OECD 2018; figure from Indonesia derived from WB calculations.

Uptake of childcare services in Indonesia is linked to the quality of ECED services. Currently, most of the ECED programs are regulated by the MoEC and financed both through national and sub-national budgets.[25] At the national level, there are fiscal transfers to PAUD service providers for registered students. This BOP-PAUD in 2019 was worth IDR 600,000 per child per year (around US$40).[26] However, only registered ECED centers are eligible for this support, and around 80 percent of ECED facilities are not accredited.[27] Another study on early childhood development centers found that around 44 percent were not operating with a license, and that the quality of the services delivered in those facilities was lower as a result.[28] This could also be impacting low trust in center-based care. A recent qualitative study on Java found that women were reluctant to use center-based care services if these were perceived to be low in quality.[29] The current diversity of provision also places pressure on local governments to effectively monitor and regulate the wide range of service providers, and to ensure that quality standards are met.[30]

Affordability challenges limit accessibility, especially for poorer households. Globally, there is evidence linking higher returns to investments in children from disadvantaged environments, as their adverse environments put them at higher risks.[31] In Indonesia, studies point to disparities in accessibility across all income groups and regions in Indonesia, with greater impacts on lower-income quintiles. Specifically, the research shows that children from households in the highest

[25] Denboba. Hasan, and Wodon. 2015; Central and district governments are responsible for developing and managing teachers for the education sector. The funding system involves transfers from the central governments and from district governments, although for ECED household contributions are high, as there are limited subsidies.

[26] World Bank 2020.

[27] UNICEF 2020.

[28] Pranawati, Naswardi and Zulkarnaen 2021:4.

[29] Purnamasari. et al. 2020.

[30] ILO 2018b.

[31] Heckman and Masterov 2007.

income quintile are 1.5 times more likely to attend pre-primary education than children in the lowest income quintile, and close to 52 percent of children in the lowest income quintile do not attend any form of pre-primary education.[32] Despite the fact that ECED facilities are partially subsidized by the government, many families continue to cite affordability challenges.[33]

Unmet demand for childcare services in Indonesia impacts women's decisions in employment. Current early childhood education programs offer only partial solutions for childcare needs, and there is some evidence of unexpressed demand. Proxies of informal childcare— including the presence of other older or inactive women in the household—appear to boost women's likelihood of participating in the labor market.[34] An evaluation of access to state-provided pre-schools[35] using the Indonesia Family Life Survey panel dataset showed that increasing the density of preschools raised the employment of mothers by 6.9 percentage points.[36] This points to the potential to boost female labor force participation through an increased provision of care services.

Indonesia's uneven childcare provision for early years misses an opportunity to bring a double dividend of growth. A growing body of evidence identifies positive impacts early childhood development programs, linking long term benefits for children both in terms of improvements in human capital, as well as substantial long-term links to economic earnings and opportunity later in life. Global evidence suggests a potential return of 7–16 percent annually from high-quality ECD programs targeting vulnerable groups in the United States. Recent estimates also show that expanding preschool enrollment to 50 percent of all children in low- and middle-income countries could result in lifetime gains in earnings ranging from US$14 billion to US$34 billion. While the evidence is clear regarding the returns to preschool and cognitive development, there is emerging evidence pointing to early childhood support systems (e.g. leave policies, parental support) that boost childhood development between ages 0 to 3 as well. Given the potential impacts on human capital development and long-term impacts on children, greater provision of quality care could also provide a double dividend for the country.

[32] OECD and ADB (2015) as cited in ILO 2018b; similar findings were also reported in World Bank (2012).

[33] UNICEF 2020.

[34] Halim, Johnson and Perova 2017.

[35] This refers to Taman Kanak-Kanak, or TK. For a breakdown of different types of preschool and early childhood care and education services; see Table 1.

[36] Halim, Johnson, and Perova 2021.

Simulating Investments to Expand Provision of Childcare in Indonesia

In this section, we estimate the impacts of increased public expenditure on childcare services to the Indonesian economy. Specifically, two scenarios are put forward: the first is if Indonesia were to increase its public expenditure from a baseline of 0.04 percent of GDP to 0.1 percent of GDP. This increase would put Indonesia on par with the lower end of the OECD averages and would allow the country to attain the objectives set out in its medium-term development plan (*Rencana Pembangunan Jangka Menengah Nasional* or RPJMN 2020–2024). The second scenario put forward looks at an overall expenditure of 0.5 percent of GDP, which would bring Indonesia to just below the OECD average for expenditure ratios on early childhood care and education and would permit Indonesia to reach its G20 commitment by 2030. Sensitivity analyses are also done to look at the overall impacts of these scenarios if Indonesia were to maintain budget neutrality for the investments.

Increasing public expenditures on childcare is a well-documented fiscal intervention linked with policy objectives of boosting female labor force participation and economic growth.[37] Increases in female labor force participation impact economic growth through two transmission pathways. First, greater availability of childcare services means that women who are otherwise engaged in domestic and caring work would see their time freed up and would be available to join the labor force. This additional labor supply brings growth benefits by increasing the labor supply to the economy and bringing additional labor income to the

[37] Fabrizio. et al. 2020.

household. A second pathway focuses on impacts to firm productivity. Relaxing time constraints leads to a greater diversity of skills and increasing complementarities to skill sets through more women entering the labor force. This improves skill matching for firms and results in improved worker retention, leading to reduced costs to firms and gains in total factor productivity rates (TFPR).[38] Emerging evidence from Indonesia confirms impacts on productivity; recent analysis conducted on a sample of manufacturing firms found that a doubling of pre-school density from the sample mean is associated with a 58.8% increase in TFPR.[39]

The model: The findings of this note draw on a recursively dynamic single-country general equilibrium model—the MANAGE framework—that has been calibrated to the base year of 2018, employing a social accounting matrix (SAM) that incorporates several innovations to estimate the impacts of childcare on male-female employment, and the economy more broadly. First, the model introduces social reproduction activities,[40] which are a close substitute for childcare activities and uses only labor for production and primarily female labor. Second, female labor force participation increases as childcare services used by different households increase. This is modeled as a reduced form optimization decision by households between using childcare services or continuing to provide social reproduction activities. Third, we consider the positive externality associated with institutional childcare: when one household chooses to use institutional childcare, its value increases for other households (the network effect). To capture this effect in the model, we assume that the reform shifts household preferences in favor of institutional childcare. Fourth, childcare activities are differentiated between zero to two (childcare) and three to six (kindergarten) age groups and are provided by both public and private centers. Fifth, we assume that the reform results in a productivity gain in the manufacturing sector, which hosts a significant number of female workers. For a more detailed technical description of the MANAGE framework, see Appendix A.

The intervention. The fiscal policy introduced in this paper is focused on increased public expenditure to childcare services in Indonesia. The expenditure is introduced both on the consumption and on the production sides; in other words, the subsidy would benefit both the consumers of early childhood care and education, that is families with small children, as well as the providers of those services.[41] The definition of childcare services is for all children between zero to six years old, and irrespective of household income levels.[42] Thus, the model currently assumes the intervention to be universally accessible to all households with children under the age of six.[43] The model simulates what the potential economic gains would be over a baseline scenario where this subsidy is not introduced, and provides insights on how sectors of the economy would respond and the impacts on labor markets, especially on female labor force participation, as well as overall welfare impacts of the interventions.

[38] Given the available evidence on total factor productivity increases in Indonesia, the increases in TFPR were included in the model as a function of early childhood care and education supply.

[39] Perova et al. (2022).

[40] Social reproduction activities are constructed by identifying all households where working-age women have children under the age of six and who are not currently working, thus assuming they are engaged in care giving responsibilities.

[41] While the model did not differentiate between the consumption and distribution sides, available literature shows that the form of the subsidy also matters. The literature shows that the impact of social infrastructure expansion on the quality of services and employment is different if the government provides financing and the supply comes from the private sector, versus if the public sector directly provides these services (Fontana and Elson 2014).

[42] While there is some qualitative evidence to show that mothers express reluctance to use center-based early childhood care and education for children ages zero to four (see, for example, Purnamasari et al. 2020), this would need to be further explored, as it may reflect social norms and attitudes, the lack of available quality and affordable care, or other factors that may be reshaped with the availability of quality and affordable center-based early childhood care and education services.

[43] Whether the intervention is ultimately targeted to lower-income households or remains a universal approach is a policy decision that would need to be made should such an intervention be designed, and in line with the policy objectives of the intervention.

Key assumptions and stylized facts. The model presents several key assumptions and stylized facts. First, this model assumes that when women's time is made available through the provision of childcare services, there is some level of market clearing of employment. In reality, labor markets in Indonesia reflect patterns of occupational segregation, with many women in low value-added services, skills mismatches, and potential market failures. In addition, where the model assumes wage increases and employment creation, some studies have shown that gender wage gaps persist even after controlling for the types of jobs.[44] Thus, at this stage, while the model can highlight the increase in labor supply available to the market, it estimates that a portion of this labor would not be fully absorbed through the market, which may or may not break down according to actual demand for these services, as well as significant regional variations. In addition, while the model assumes that wages initially decline with new entrants into the labor market, it then assumes that these wages would rise, in line with market demand, which may or may not be borne out by the market.[45]

Second, the model currently introduces public expenditures to expanding childcare services on both the supply and the demand sides, meaning that the subsidy goes to both childcare providers as well as households seeking childcare services. There is growing global literature showing that the elasticities between the demand and supply of these services may not produce the same impacts on early childhood care and education expansion.[46] Further work may be needed to determine the specific elasticities of supply and demand for early childhood care and education provision in Indonesia, and to undertake further sensitivity analyses on the type of intervention that would maximize efficiency of the expenditure itself. Additionally, the current analysis does not provide further insights to the specific design of the childcare intervention, which is also a key driver in the uptake of these services.[47]

Summary of results. Model simulations suggest that reducing the cost of childcare for all households with children under age six increases female labor force participation and results in overall growth gains to the economy above baseline scenarios. The model estimates a partial subsidy to lower the cost of provision, thereby addressing constraints of affordability and accessibility of these services for all households with children under the age of six. Overall, two scenarios are introduced: under the first scenario, Indonesia would increase public expenditure in childcare services to 0.1 percent of GDP, and under the second, public expenditure in childcare would increase to 0.5 percent of GDP. A summary of the impacts of these scenarios is presented in table 2, with detailed results presented below.

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[44] Lain, Alatas, and Setyonaluri 2021.

[45] The model assumes market clearing of employment, with some frictions introduced in the model. While the precise regional estimate of this absorption is difficult to estimate, the evidence from Indonesia that shows positive labor force participation impacts for women of additional ECED centers—which only provide partial solutions for childcare services—indicates the unmet demand for these services and indicates a dynamic impact on labor force participation and growth from these investments. In addition, it is likely that additional demand for these services would increase supply, thereby also increasing the demand for labor in the childcare sector.

[46] Devercelli, and Beaton-Day 2020.

[47] Devercelli, and Beaton-Day2020.

Table 2: Summary of Key Projected Impacts from CGE Modeling

Cost of intervention	GDP growth (percentage points above baseline) (by 2030)	Female Labor Force Participation Rate (by 2030)	Link to policy commitment
Baseline Scenario: current investment levels are maintained (0.04% of GDP)	—	53.5%	None
Scenario 1: Childcare investments are 0.1% of GDP	0.40%	56.2%	RPJMN (2020–2024) (55%)
Scenario 2: Childcare investments are 0.5% of GDP	0.69%	58.3%	G20 commitment (58%)

Source: WB calculations.

Greater availability of childcare services is projected to boost female labor force participation. The model results estimate that reducing the costs of and boosting provision of childcare services could result in a greater number of households utilizing these services. In line with this, the time constraints, especially of women with children under age six could be reduced, and workers could move to care and education services offered through the labor market. The model assumes that this impact would not be immediate, as the subsidies would take some time for childcare centers to be established and operational and to become widely available for households to utilize their consumption support. The model also incorporates the assumption that not all women whose time is freed up would join the labor force, as either there may not be available or suitable jobs, or women may choose not to join the labor market. It is anticipated that subsidizing the childcare centers could also result in jobs being created in this sector, thereby absorbing much of the available labor.[48]

Expanding public investments could contribute to Indonesia's policy commitments on female labor force participation. The model simulations indicate that if Indonesia were to increase public expenditures to 0.1 percent of GDP, the female labor force participation rates could increase to an estimated 56.2 percent by 2030. The Government's own medium-term development plan sets a target of 55 percent of women's economic participation, which the model estimates could be achieved with this expenditure level (estimated to by 55.5 percent by 2024). Increasing public expenditures from 0.04 percent of GDP to 0.5 percent of GDP could result in even more women joining the labor markets, presuming the availability of quality jobs, and is estimated to result in a female labor force participation rate of 58.3 percent. This would bring the female labor force participation (FLFP) rate in line with regional averages in East Asia and Pacific (EAP) and could contribute to meeting the G20 commitment of reducing the gaps in labor force participation rates by 25 percent.[49] Figure 4 presents the different estimated impacts of expanded public expenditure on childcare services to female labor force participation.

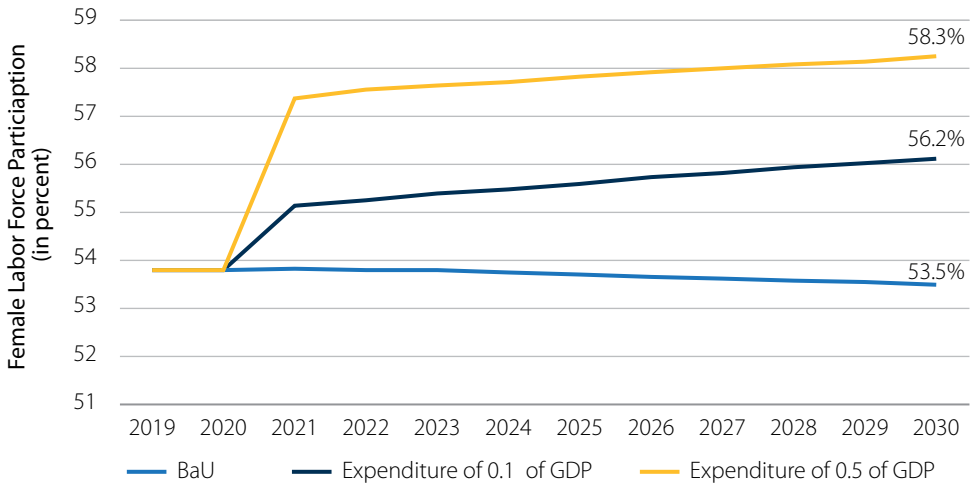
Increasing public expenditures on childcare services could also contribute to GDP growth under both scenarios. Public expenditures that reduce the cost and stimulate greater provision of different childcare services are modeled to impact growth through transmission pathways of increasing labor force participation, especially for women. The model picks up two effects that further

[48] This presumption is aligned with global experiences, given that childcare services is a labor-intensive industry, and much of the labor supply to this sector is highly feminized. Further attention would need to look at actual wages in the sector

[49] It is to be noted that the G20 commitment is to close this gap by 2025. Model simulations indicate that with increased public expenditures to 0.5 percent of GDP, the FLFP rates would be 57.9 percent by 2025. This is close to the G20 commitment of "25 by 25" or a FLFP rate of 58 percent.

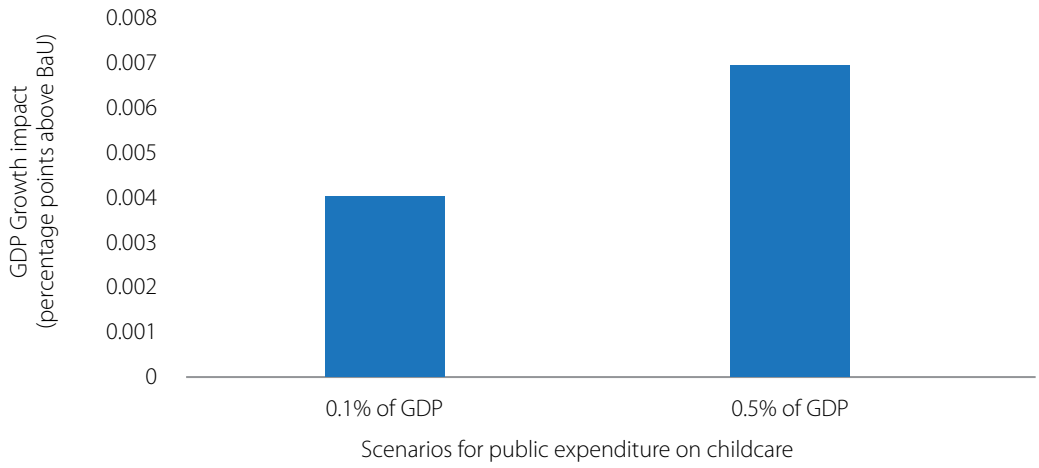
impact growth. The first is that provision of childcare unlocks labor force participation for women, and the additional labor income to those women positively impacts growth. Second, the model also incorporates a dynamic effect which captures the greater availability and diversity of skills that enables better skills matching for firms, leading to lower turnover and fewer transaction costs to firms, thereby increasing productivity. Modeled results indicate that where public expenditure on childcare is increased to 0.1 percent of GDP, the projected impact on GDP is 3.2 percent higher over business as usual (BaU), amounting to a 0.4 percentage point increase over baseline growth. Under a scenario where public expenditure on childcare increases to 0.5 percent of GDP, the projected impact on GDP shows a 5.7 percent increase over business as usual for GDP growth, or 0.69 percentage point increase over baseline growth. Both scenarios show that increasing public expenditure on childcare services could result in positive growth impacts (see Figure 5).

Figure 4: Estimated Impacts of Expanded Public Expenditure on Female Labor Force Participation Rates (in percent)



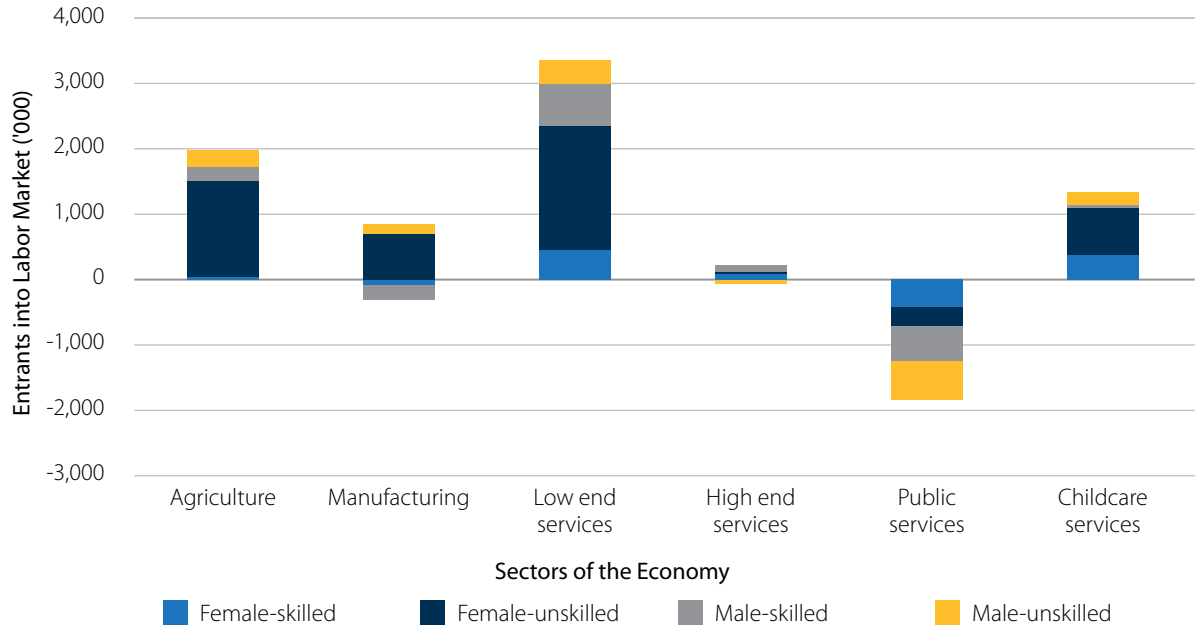
Source: WB calculations.

Figure 5: Estimated Increase in GDP Growth (in percentage points) above Baseline Growth between 2022 and 2030



Source: WB calculations.

Figure 6: Sectors Where Additional Entrants into Labor Markets Are Likely to Work with Expenditure of 0.5 Percent of GDP (by male/female and skilled/unskilled) (by 2030) (in thousands)



Source: WB calculations.

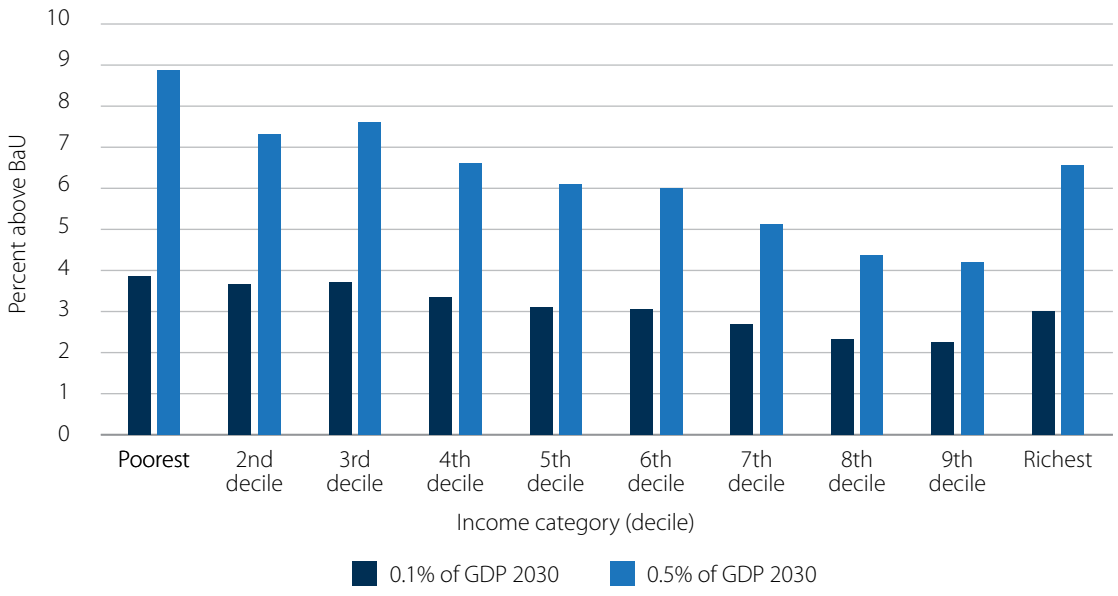
Greater public expenditure in childcare services could contribute to increasing labor supply, which is projected to be absorbed in different sectors of the economy. The model simulated four categories of labor for the projected impacts, including skilled and unskilled labor differentiated by females and males (Figure 6). Overall, the increase in childcare provision frees up time especially of women currently engaged in social reproduction work (i.e., out of the labor market with children under the age of six), whose time is then freed up, and are then able to join the labor market. The model assumes that not all would either choose to join the labor market or be absorbed by the labor market due to regional variations in jobs, potential limitations in mobility, or other factors. As such, the model estimates that around 50,000 female workers would enter the labor market, with some proportion of workers ending up in the childcare sector. The model shows that much of the labor would end up in low end services, followed by agriculture and the childcare services sector. Manufacturing would absorb some additional unskilled labor but would see skilled men and women leave the sector. The public sector would also see skilled and unskilled labor leave the sector, presumably for better opportunities in other sectors. Overall, under all scenarios, there is positive impacts on all sectors of the economy which expand and absorb additional labor.

Increased public expenditure on childcare services is shown to be a progressive policy intervention. The model's results show that welfare gains from the increased public expenditure benefits all income groups; however, the impacts are larger for the lower-income groups in the country. This is despite the fact that wages initially fall with public expenditure on childcare—greater availability of childcare is assumed to make more labor available to employers, and wages initially fall before eventually rising to match labor demand. However, given the overall constraint to childcare services in the country, there is a positive welfare impact across all income categories. The welfare impacts are higher under a larger public expenditure (0.5 percent of GDP), with average welfare impacts across all income categories of 5.4 percent by 2025 and 6.6 percent by 2030 over business as usual. The highest welfare impacts accrued to the lowest three income deciles, with the poorest realizing welfare impacts of 8.9 percent

over business as usual by 2030. Increasing public expenditure on childcare to 0.1 percent of GDP still shows welfare impacts of 2.4 percent by 2025 and 3.1 percent by 2030 over business as usual. Here too the welfare impacts were highest for the poorest income decile, with 3.9 percent over business as usual by 2030.

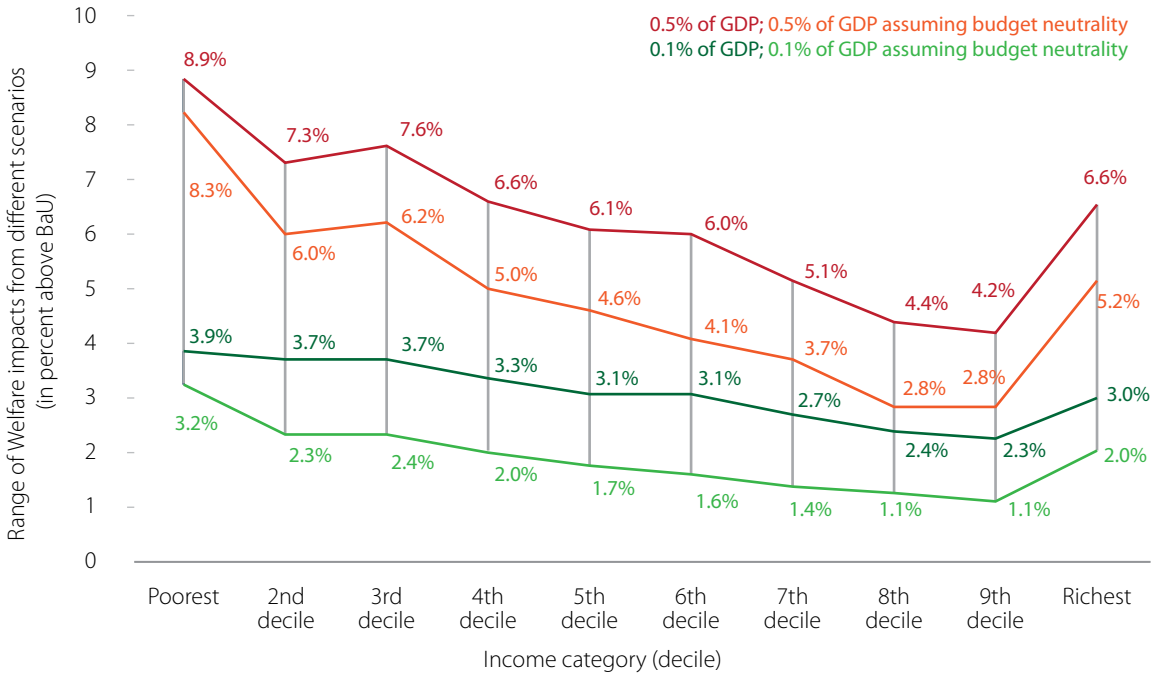
Additional sensitivity analyses estimated the impacts on welfare when the subsidy is modeled to be budget neutral. In order to bring budget neutrality to this scenario, the model assumes that increases in tax revenue from personal income taxes, corporate income taxes, and sales (value added) taxes would finance the public expenditure, and there would be no increases to the public debt. It is worth noting here that additional female labor force participation would likely result in additional tax revenue from personal income and other taxes, which could help offset the cost of the intervention. Raising taxes to ensure budget neutrality typically reduces welfare impacts, as there is an added tax burden on households. Figure 8 shows the overall range of welfare impacts for four different scenarios: raising the public expenditure to 0.1 and 0.5 percent of GDP and raising public expenditure to 0.1 and 0.5 percent of GDP, assuming budget neutrality. The lowest welfare impacts come from an increase of public expenditure of 0.1 percent of GDP, assuming budget neutrality, and the highest end of each income decile range represents the projected welfare impacts from a public expenditure of 0.5 percent of GDP (no budget neutrality). It is interesting to note in Figure 8 that, even with a lower public expenditure and assuming budget neutrality, the overall impacts of the fiscal policy is welfare enhancing across all income categories (lower bound within each income category). Overall, even the introduction of assumptions requiring budget neutrality through increased taxation shows that the overall welfare impacts are welfare enhancing. The policy continues to be progressive, with project impacts expected to especially benefit the lower-income categories.

Figure 7: Estimated Welfare Impacts of Increased Public Expenditure on Childcare Services across Income Deciles (in percent above business as usual)



Source: WB calculations.

Figure 8: Estimated Welfare Impacts of Increased Public Expenditure on Childcare Services Comparing Different Expenditure Levels and Including Budget Neutrality (in percent above business as usual)



Source: WB calculations.

Based on the initial results from potential subsidies to expand early childhood care and education services, additional research could be undertaken, depending on interest. For example, the initial computable general equilibrium (CGE) model assumes a generic cost structure for social reproduction and early childhood care and education services based on the assumption of a large share of female labor. This cost structure can be updated to reflect particularities of the sector that restrict the supply of early childhood care and education services, including social trust issues with private early childhood care and education, which in turn might require certifications, upskilling, and other regulatory procedures for certain workers to provide this service. Including these additional data can have effects on the early childhood care and education supply responses to the 20 percent production subsidy. On the other hand, the price elasticity of demand of early childhood care and education services is also generic, and we can run simulations using different elasticity values to test how sensitive early childhood care and education demand services are to the 20 percent consumption subsidy.

Policy Recommendations

Initial results from this research indicate potential returns from investments that would expand early childhood care and education services in Indonesia. Selected fiscal policy interventions considered in this note demonstrated that Indonesia's large and diverse set of skills available in its underutilized labor pool could contribute significantly to growth and productivity. Ensuring Indonesia is a strong and competitive economy will necessitate investments in childcare to make higher levels of especially the female labor supply and their diverse skills available to the market, to, in turn, drive growth and expand the economy. Public expenditure in childcare can support the expansion of a potentially diverse set of quality services to households with small children, addressing a key constraint in the market. The effectiveness of this expenditure would depend on carefully designing the targeting of these interventions to meet the needs of intended beneficiaries and lead to intended results. Further analysIs would be needed in this regard.

Expanding quality and affordable early childhood care and education services in Indonesia could include four broad areas. Overall, should Indonesia wish to pursue subsidizing expanded early childhood care and education services, there are generally four areas that are recommended for further consideration:

1. **Develop a comprehensive vision and roadmap that outlines national policies, targets, and objectives, and clarifies roles and responsibilities of participating ministries behind goals of supporting childcare.** Current approaches to childcare—including preschool programs, childcare services, and parental leave policies—remain institutionally fragmented in Indonesia. At least three ministries issue regulations and guidelines on early childhood care and education facilities,[50] and they pose high barriers to entry for many private providers.[51] There is currently no broad government vision or strategy to support objectives of improving the quality and accessibility of childcare, leveraging different options for provision. There is an opportunity to capitalize on dual gains in economic growth from both greater women's employment alongside the human capital gains from investing in quality early childhood development. This strategic roadmap could look at all options to expand childcare services and focus on results areas to improve coordination of policies, develop standards, improve monitoring, leverage private sector participation, and ensure affordable and accessible services for all families with children under the age of six.

2. **Design fiscal stimulus for childcare services to expand services, especially targeting low-income and disadvantaged children.** There is significant global literature on the need to carefully design and deliver subsidies to meet the intended policy goals. Currently, much of the early childhood education provision—including financing, regulating, and delivery—is the responsibility of the district governments.[52] In this highly decentralized education delivery system, the capacity of local governments in managing or delivering these subsidies should also be considered. Further research should be undertaken to support carefully designing these fiscal stimulus interventions in a way that best targets the disadvantaged and lower-income groups, with a view to ensure equitable access to quality childcare services. The design and delivery of such a fiscal expenditure should also aim to expand the range of possible care options targeting the diverse needs of working parents. The Government could consider making use of existing national and subnational financial support systems already in place—such as potential support or revamping of social insurance funds to cover parental leave, better targeting of the BOP-PAUD, and prioritizing village funds—with a view to leverage these sources in the expansion of childcare services across the country. Subnational fiscal transfers utilizing results-based monitoring could also be considered. It is important to note that the way this fiscal stimulus is designed and rolled out will be critical to its success, and careful design and testing could be undertaken in different contexts to see what works.

3. **Invest in the entire care economy.** Expansion of childcare will have forward and backward linkages in the economy that will necessitate support to different inputs to the sector. As a labor-intensive industry, it is likely that any fiscal stimulus focused on expanding childcare will also necessitate significant labor and other support services to significantly grow the sector. Investments to expand childcare services could be complemented with targeted skill development programs and learning and certification services for both center-based and home-based care services. The expansion of childcare services also would necessitate targeted support to entrepreneurs, especially women entrepreneurs, to establish and

[50] Including the Ministry of Education and Culture, which has issued Ministerial Regulation No. 84/2014 regarding Establishing PAUD Units which says:"TPA is a nonformal form of PAUD that provides educational programs for children from birth (0)–6 years old and prioritized for children from 0–4 years"; the Ministry of Social Affairs, which published a 2008 regulation on establishing early childhood care and education and playgroup facilities; and the Ministry of Women's Empowerment and Child Protection, which issued guidelines on developing "Child-Friendly Daycare."

[51] Prosperaet al. (forthcoming); MAMPU and KOMPAK 2016.

[52] Law No. 23/ 2014 on Regional Governance saw the responsibility for a PAUD split between the central and regional governments. The central government is responsible for accrediting PAUD facilities, establishing national quality standards, and establishing national PAUD curriculum. District/City governments are responsible for PAUD education management, licensing PAUD facilities, and establishing local content for PAUD curriculums.

run childcare businesses. Different models such as cooperative or community-based care may require support systems for training and mentoring services. Ensuring the availability of trained and qualified staff will require investments in skill development programs and training programs, which could potentially be offered through the country's network of vocational training facilities or other educational facilities. A focus on labor market information systems and adequate job matching services for graduates in this high growth sector could also be considered. Attention in this area could also look to the classification of early childhood care and education workers,[53] if relevant, to address any projected wage gaps or risks of low pay leading to low quality and caliber of workers.

4. **Engage with evolving social norms through information campaigns and outreach services.** Current social norms in Indonesia that overall see women as wives, mothers, and caregivers have been reinforced through both formal and informal mechanisms[54]. Gendered beliefs about the role of men and women in families and in society are the primary social norm constraining women's economic empowerment. Even where a woman earns the larger share of household income, she is likely to see herself—and be seen by others— as a secondary earner.[55] Thus, social norms relating to mothers who rely on formal early childhood care and education continue to pose a challenge to women's work.[56] However, norms are evolving in Indonesia, and there is an opportunity to engage and shape norms around care.[57] The Government could consider supporting a widespread information and socialization campaign to shape attitudes and norms around care,[58] by normalizing early childhood care and education services and highlighting the potential benefits to both children and families.

[53] Under Law No. 14.2005 on Teachers and Lecturers, TPA educators are considered non PAUD educators, and therefore also are not eligible for teacher salaries and allowances. This stipulation of TPA as nonformal PAUD appears in Article 28 of Law No. 20/2003 on the National Education System.

[54] World Bank 2020b.

[55] Ford 2018.

[56] Purnamasari et al. 2020.

[57] For example, a Social Norms and Attitudes Survey (SNAP) conducted in 2018 found that among young urban people, women have similar professional ambitions to men, and men were starting to share housework and early childhood care and education (Investing in Women 2019).

[58] As Purnamasari et al. (2020) suggest, behavioral and social media campaigns—such as giving examples of fathers and mothers sharing household chores, showcasing female role models, and displaying male and female role models moving into predominantly female- and male-dominated fields, for example, male nurses or female engineers—may help change perceptions of what men and women can do.

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Appendix A: Technical Note of the MANAGE Framework—a CGE Model for Indonesia

The MANAGE framework is a recursively dynamic single-country computable general equilibrium (CGE) model developed by the World Bank. As with all standard single-country CGE models, it is designed to take full advantage of any special features and specific dimensions of each country's social accounting matrix (SAM). This provides the model with flexibility on the number of production activities, commodities, production factors, economic agents, and accounts it can handle. Therefore, although the model was originally designed to examine energy, greenhouse gas emissions, and climate change issues, the current version of the model has been extensively modified to analyze childcare and gender employment topics in Indonesia.

We introduce five novel features in the MANAGE model for the purposes of this study. First, we introduce social reproduction activities, which are a close substitute for childcare activities, and which uses only labor for production, that is, primarily female labor. Second, female labor force participation increases as childcare services used by different households increase. This is modeled as a reduced form optimization decision by household between using childcare services or keep providing social reproduction activities. Third, we consider the positive externality associated with institutional childcare: when one household chooses to use institutional childcare, its value increases for other households (the network effect). To capture this effect in the model, we assume that

the reform shifts household preferences in favor of institutional childcare. Fourth, childcare activities are differentiated between zero to two (childcare) and three to six (kindergarten) age groups and are provided by both public and private centers. Fifth, we assume that the reform results in a productivity gain in the manufacturing sector, which hosts a significant number of female workers. This productivity effect is taken from the study by Perova, E., et al (forthcoming). The precise technical implementation of each feature is further explained below.

For this study we develop several scenarios related to changes in childcare policies in Indonesia. In our first scenarios, we assume that the government provides a subsidy on the consumption and production of childcare services to support and expand these services. These subsidy rates are targeted to values that expand the government childcare expenditure derived directly from this subsidy to reach 0.5 percent and 0.1 percent of GDP. This initial government expenditure increase is financed by internal debt. In a second group of scenarios we maintain budget neutrality, and thus, assume that the childcare expenditure expansion is financed by an increase in corporate income taxes (CIT) and direct income. Finally, in the last set of scenarios we reduce the Total Factor Productivity Rate (TFPR) impact of childcare in manufacturing to 50 percent of the original value. This provides a sensitivity test on the importance of this effect in the overall results.

Overview of the MANAGE CGE model

CGE models include a large number of economic activities, commodities, production factors and household types. The core of the model relies on micro-founded neoclassical theory on demand and production optimization decisions. On the demand side, the model provides detailed mechanisms for the consumption optimization process of households based on non-homothetic preferences, initial consumption baskets, and relative prices of final goods and services. Production is modeled as the cost optimization of firms, which implies that each sector chooses labor of different worker types, capital, and energy to minimize overall production costs based on the relative prices of all factors and intermediate inputs. The production structure of the economy is based on the input-output tables included in the SAM. The magnitude of the growth- and policy-related shocks through the economy is determined by price elasticities derived from the literature and the substitution possibilities between production factors (i.e., capital, different worker types, land) and intermediate inputs in production. Consumption changes are governed by demand elasticities for domestic and foreign goods and services that are also taken from the literature.

The MANAGE model captures the direct effects of different shocks, but also the general equilibrium (indirect) effects that stem from the complex economic interrelationships among several economic agents (such as firms, government, and several household types), several economic activities and production factors, and in the labor and capital markets. These include, for instance, the effects on output for all sectors, labor demand for each skill level in each sector, wages, and final consumption prices for all commodities. These effects, in turn, change the real income of each household type through the changes in wages and final consumption prices, conditional on the specific labor endowments and consumption basket of each household. The model, moreover, keeps track of macroeconomic identities (e.g., overall investments must equal overall savings, product and factor markets must clear, as well as the government budget and the current account), and endowment constraints (labor supplied by household equals labor demanded by firms and the government for each worker type).

MANAGE is a dynamic model, using mainly a neoclassical growth specification. Labor growth is determined by working-age population growth, capital accumulation derives from savings and investment decisions, and there is a wide range of productivity assumptions, including total factor and labor productivity. To project labor supply growth, the model tracks population by different age groups based on the United Nations forecasts.

It calculates the labor force as the number of working-age people aged between 15 to 64 years, multiplied by the labor force participation rate for the most recent year. In the standard version of the model this implicitly assumes that labor participation and unemployment rates are kept fixed at their initial level. These assumptions can be relaxed, as in this study, to allow for changes in labor participation rates over time that stem from policy and household preference changes. In the framework, capital accumulation is derived from savings and investment choices. The framework facilitates flexible productivity assumptions, including autonomous advancements in energy efficiency that can vary across different agents and energy carriers. This framework has a vintage structure for the capital stock that allows for putty or semi-putty assumptions facilitating sluggish mobility of installed capital.

Childcare specific features of the model

In this section we explain the five novel features in the MANAGE model that were included to deal with childcare activities and related policy changes.

The first new feature is that social reproduction activities are included in MANAGE. These activities, moreover, are a close substitute for childcare activities and employ only labor for production, that is, primarily female labor. As explained in the following section, these activities are introduced into the SAM and it implies that there are two types of jobs in the model: market jobs with explicit wage payments and social reproduction jobs with an implicit economic value for each household. The movement between one job type to the other directly changes the market-based labor force and labor participation rates.

The second feature is that female labor force participation increases as childcare services used by different households increase. This implicitly assumes that there are high substitution possibilities between social reproduction activities and childcare services. At the household level, this implies a decision between domestic provision of childcare or external use of childcare services. Hence, based on their budgetary constraints, preferences, and labor market possibilities, households decide if they provide childcare domestically or if they outsource it to public or private childcare centers. Furthermore, once childcare is outsourced there is also a decision to enter the market-based labor market or to stay at home. This household decision, moreover, directly accounts for the final cost of childcare services that they need to pay and their opportunity costs in terms of forgone wage income. The final childcare price is a combination of the price charged by public and private childcare providers (which includes any production subsidy provided by the government) and the final consumption price that households will pay for the service (which includes any consumption subsidies). Once a household decides to use childcare services, the household member previously providing domestic childcare has the option to enter the labor market (at the average wage rate and assuming there is work available) or to remain at home doing non-childcare services (cooking, housekeeping, education tasks, elderly care, etc.). In this last case, the model accounts this as a reduction in the number of workers in social reproduction activities.

The ultimate household decision, at an aggregate level, is modeled in MANAGE as a reduced form decision of these micro-level optimization processes. In particular, the decision to move from social reproduction activities to the labor market is determined as a function of the overall intake of childcare services and the elasticity of substation between domestic and external provision of childcare. The combination of these two elements determines the number of people moving from social reproduction activities to the labor market. As the number of households using public or private childcare services increases, more workers move from social reproduction services to the labor market, and the rate of this labor market absorption is decided by the value of this elasticity. The higher the elasticity, the higher the number of workers entering the labor force, which in turn yields higher labor participation rates. This elasticity will then reflect individual, social, and cultural preferences, labor market conditions, adjustment

costs to particular jobs, and particularities of the childcare services sector that can be restricting the supply of childcare services. These may include social trust issues with private childcare, which might require certifications, upskilling, and other regulatory procedures for certain workers to provide this service. The ultimate aggregate labor market response to an increase in the use of childcare services, therefore, is determined by this substitution elasticity.

The precise value of this elasticity is an aggregate indicator that is hard to estimate quantitatively. As an initial step, we calibrate this elasticity to target an overall labor absorption into market jobs of around 5 million people by 2030. On average, Indonesia creates around 450,000 jobs a year, which in the timespan of the implementation of the childcare subsidy in our study (2021–2030) represents around 4 million new jobs by 2030. Thus, we are implicitly assuming that the childcare subsidy can roughly double the number of jobs currently generated on a yearly basis.

The third new feature of the model is that we consider the positive externality associated with institutional childcare: when one household chooses to use institutional childcare, its value increases for other households (the network effect). To capture this effect in the model, we assume that the reform shifts household preferences in favor of institutional childcare, and this is reflected in a gradual increase over time in the value of the aforementioned substitution elasticity between social reproduction and childcare services.

The fourth feature that we introduce in the model is that childcare activities are differentiated between zero to two(childcare) and three to six (kindergarten) age groups and are provided by both public and private centers. The cost structures and differences between each type of childcare provider are taken from the education services cost structure in the input-output tables and additional information on employment, as explained in the following section.

The fifth and final new model feature is that we assume that the reform results in a productivity gain in the manufacturing sector, which hosts a significant number of female workers. This productivity effect is estimated as the increase in manufacturing TFP associated with an increase in the intake of childcare services. This estimation is based on manufacturing firm–level survey data and the density of childcare services in the economy. The study by Cali, M. et al (2022) finds that the average annual increase in pre-school density in the sample is associated with a 2.2% increase in TFPR. We implement this TFP in the model using the endogenously determined increase in childcare services over time.

It is important to note that when households start switching from social reproduction to childcare services because of the subsidy, the labor initially employed in social reproduction is released and made available to the rest of the economic activities in the model. This mechanism implicitly assumes that there are no transition nor adjustment costs between being an unpaid household worker (employed in social reproduction services) and being employed as a paid worker in other sectors (including childcare services). However, these adjustment costs can be substantial enough to limit the transition from reproduction services to the rest of the economy, while segmented labor markets can also constrain the movement of workers to other sectors. These include skilling costs (formal and informal education, and on-the-job training), job searching and matching costs, and the emotional and psychological costs related to the changes into new work and lifestyle routines. The model currently assumes that most of the skilling costs are implicitly assumed by the childcare providers using the production subsidies. However, these costs can also involve public educational and certification programs, new regulations, and supervision activities for the newly created childcare centers, among others. In the current version of the model, part of these adjustment and transition costs are accounted for by the elasticity of substitution

between social reproduction and childcare services. However, a model extension can explicitly account for these labor market characteristics and adjustment costs to provide more accurate estimates of the transition from household-based reproduction services to other economic activities.

Description of the SAM for Indonesia

The MANAGE model is calibrated to the base year of 2018 by employing a gender-specific social accounting matrix (SAM) for Indonesia. The previous SAM relied on 2010 data, while the updated 2018 SAM uses the 2018 input-output (IO) table from the Asian Development Bank (ADB), 2018 macroeconomic indicators, the 2010 detailed IO table, and household survey data. The SAM is gender specific in the sense that it differentiates female and male labor based on household survey data as well as the Gender Disaggregated Labor Database (GDLD) developed by the World Bank. The 2018 SAM has 192 activities aggregated into 37 broad sectors: 7 agriculture, 19 manufacturing, and 11 services (including private and public childcare, kindergarten, and social reproduction). Furthermore, the 187 commodities in the SAM are aggregated into the same 37 sectors. There are four types of labor categorized by skill level and gender type. Finally, it comprises five types of land, one type of capital, and one natural resource factor. There are 10 household groups classified by income decile.

Due to data limitations, and as a first approximation, we employ a generic cost structure for social reproduction and childcare services based on the assumption of a large share of female labor. The cost structure of childcare services is taken from the cost structure of the education services activities in the original input-output table. The social reproduction production structure, however, had to be approximated by information from other countries related to the share of skilled and unskilled women, of around 25 percent and 75 percent, respectively, and a very low share of unskilled men (around 1 percent). The total number of employed people in social reproduction activities was estimated using the total number of unemployed working-age women in the country, and this total was assigned to each skill type based on the cost structure shares mentioned above. The economic value of these social reproduction activities is then estimated as the total employers multiplied by the average economy-wide wage for each skill type.

When available, this cost structure can be updated with household data on hours employed in different social reproduction activities and complemented with more sophisticated valuation methodologies. Another possible expansion of the SAM is to separate labor between rural and urban workers. This will allow to distinguish differences between rural and urban provisions of childcare services, household services, and distinct labor opportunities for rural and urban workers. Adding this worker classification, nonetheless, will require a data-intensive processing of using household survey data to link specific workers to their geographic location and to the activities they are employed in.

Descriptive analysis of the 2018 Indonesian SAM

Intermediate inputs and unskilled female labor constitute the highest share in the total consumption for public and private childcare, public and private kindergarten, and social reproduction sectors (Figure A1). Among these sectors, intermediate consumption is the highest in public kindergarten and public childcare. Similarly, skilled female labor also contributes significantly to all the sectors and its share ranges from 7.5 percent to 23.5 percent in these sectors. In contrast, the shares of skilled and unskilled male labor are quite low in all the sectors, ranging from 0 percent to 8.7 percent, respectively. It appears that the private sector (both kindergarten and childcare) employs more capital stock and has relatively lower intermediate consumption and labor costs, which seems an indicator of the higher marginal productivity of capital in the private sector. The social reproduction sector is dominated by the skilled and unskilled female labor inputs, which represent 23.5 percent and 75.5 percent of total costs, respectively.

Figure A.1: Cost Structure of Childcare, Kindergarten, and Social Reproduction

Source: Indonesian SAM 2018.

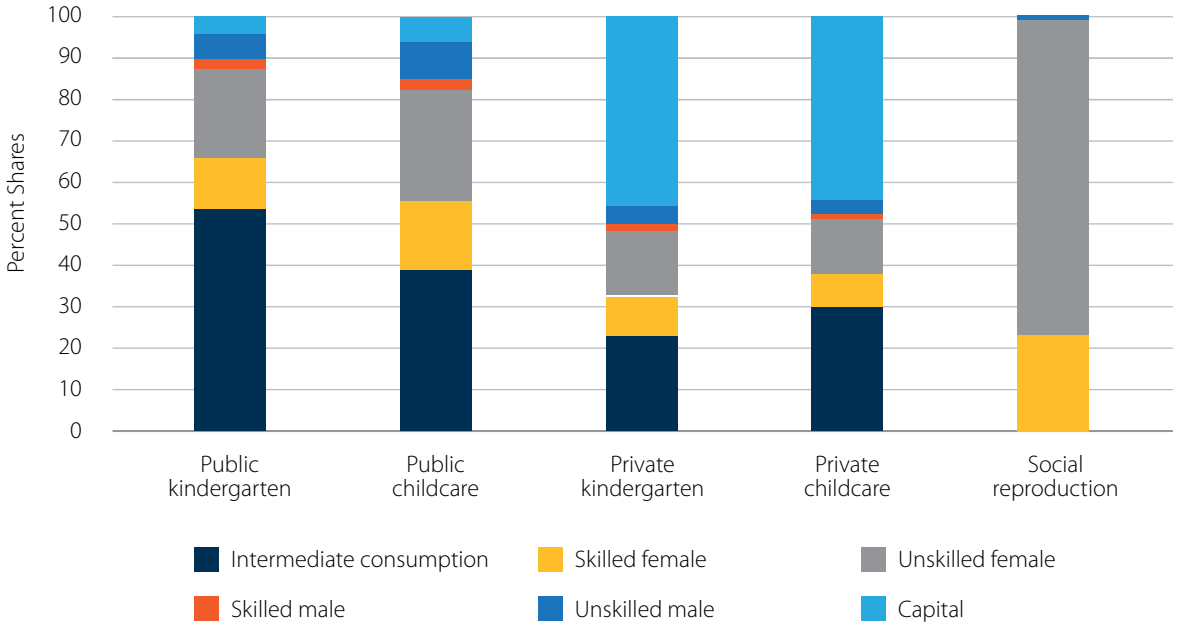
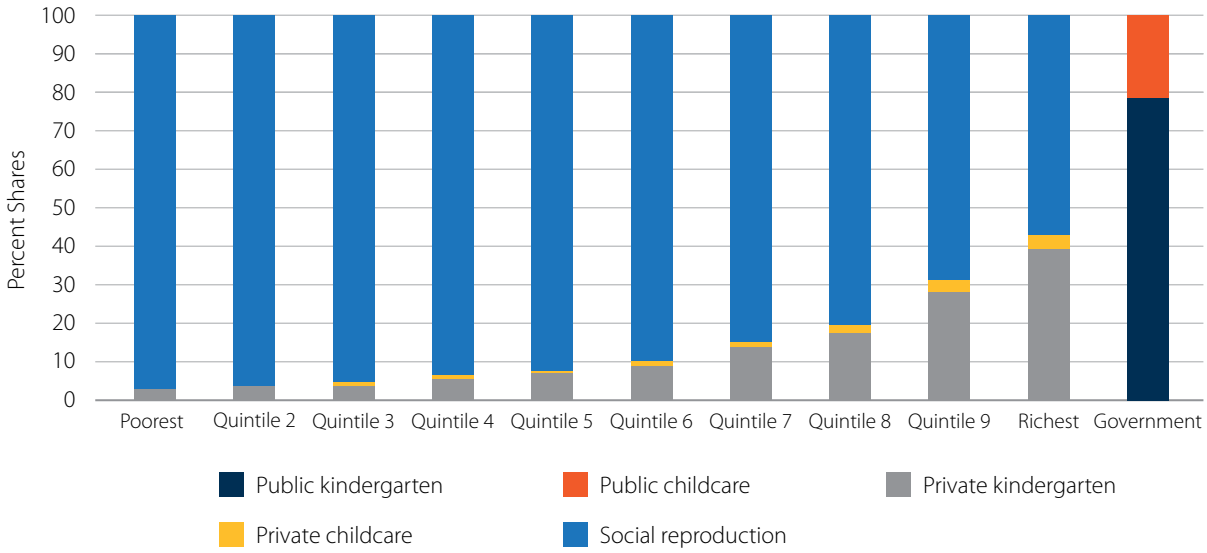


Figure A.2: Consumption of Childcare, Kindergarten, and Social Reproduction by Economic Agents

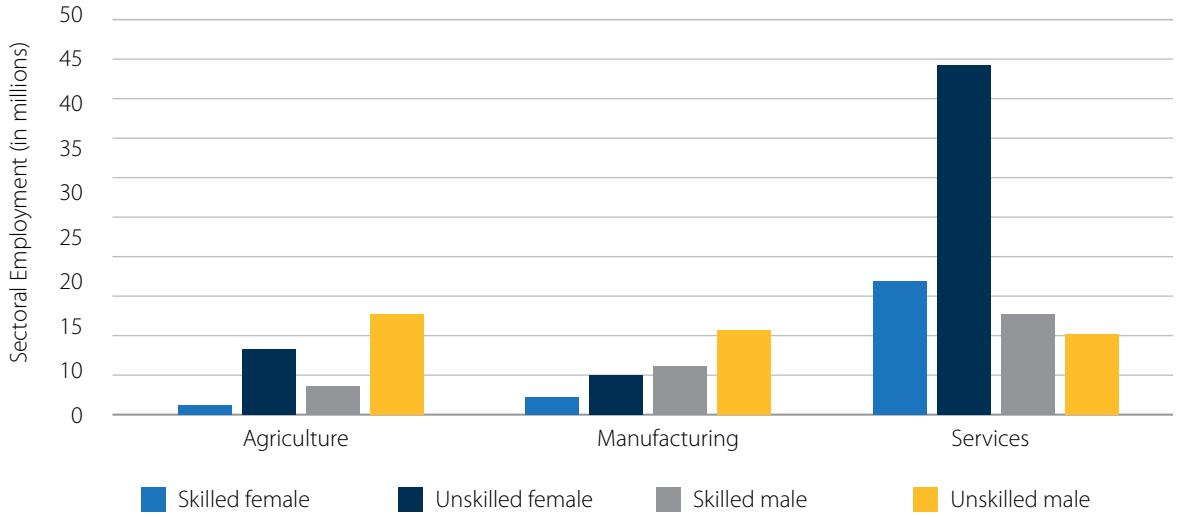


Source: Indonesian SAM 2018.

Various households from different income groups primarily rely on private kindergarten and private childcare, and there is almost no dependence on public services such as public childcare and kindergarten (Figure A.2). These public services are used mainly by the government. Moreover, wealthy households allocate more of their budget to private kindergarten and private childcare than poor households. A household with a higher income level has a lower tendency for social reproduction, i.e., richer households allocate less of their labor endowment for childcare. The poor households allocate more of their resources to social reproduction compared to the rich.

The service sectors are the major employers of the labor force in Indonesia with more than 63 percent of the total labor force in the country, followed by agriculture and manufacturing sectors (Figure A.3). Service activities are dominated by unskilled and skilled female workers: 44.2 million and 16.8 million, respectively. On the other hand, the agriculture sector employs mainly unskilled male (12.5 percent) and female workers (8.1 percent). Finally, the manufacturing sector is dominated by the unskilled and skilled male labor force of 10.5 million and 6.1 million workers, respectively.

Figure A.3: Sectorial Employment



Source: Indonesian SAM 2018.