

Policy Memo

Taking Advantage of The Demographic Dividend in Indonesia:

A Brief Introduction to Theory and Practice



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Contents

Introduction	1
The demographic transition, changing age structure, and the first demographic dividend	1
Age structure and dependency ratios	3
Economic support ratios	5
Taking advantage of the first demographic dividend	8
Labour supply	8
Savings	8
Human capital	9
Limitations and misconceptions	9
The demographic dividend and the RPJMN 2015-2019..	10
A second demographic dividend?	11
Recommendations.....	13
References.....	16
Appendix: Additional Demographic Data on Indonesia	18

Taking Advantage of The Demographic Dividend in Indonesia:

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Introduction

A population's changing age structure can, under certain conditions, provide a powerful stimulus to economic growth and family welfare. The current demographic conditions in Indonesia are ripe for taking advantage of such a "demographic bonus" or "demographic dividend"¹; in fact, favourable conditions have been in place for some time but the window of opportunity will start to close after another decade or so. "The demographic dividend refers to the accelerated economic growth that begins with changes in the age structure of a country's population as its transitions from high to low birth and death rates" (Gribble and Bremner 2012:2). If the people of Indonesia are to benefit equitably from this demographic dividend then the Government needs to ensure that certain supporting conditions and policies are in place and operating effectively. It is important that implementation of the new *Five-Year Development Plan 2015-2019* be consistent with these requirements.

The purpose of this Policy Brief is twofold. First, to provide a brief and up-to-date account of what a demographic dividend is and how it is produced, based on the latest developments in research and expert opinion; and second, to consider how the associated economic and demographic insights can be applied constructively to development planning and policy in Indonesia today. To meet these objectives we draw on a wide range of both Indonesian and international sources.²

The demographic transition, changing age structure, and the first demographic dividend

Countries around the world in modern times have gone through, or are currently passing through, the so-called demographic transition, whereby a predominantly rural agrarian population characterised by high mortality and fertility rates is transformed into a predominantly urban industrial population

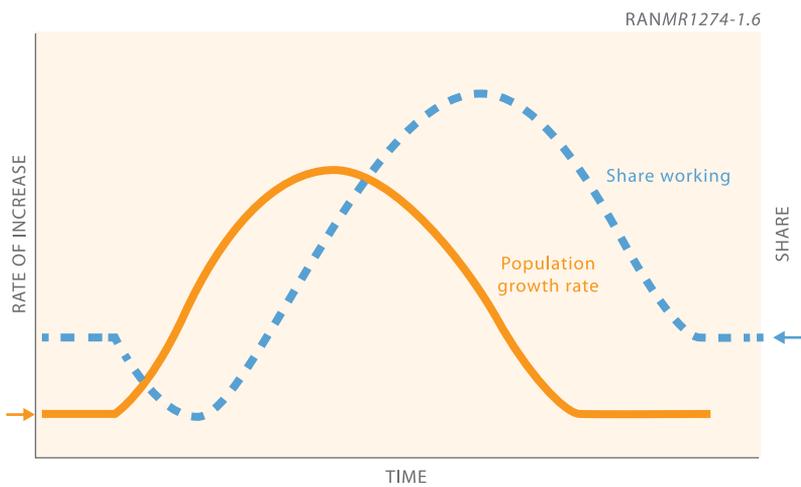
1 The two terms are used interchangeably; "bonus" is used more frequently in Indonesia but "dividend" is more common in the recent international literature.

2 The authors would like to thank the participants at a special meeting organized by UNFPA on 18 February 2015 in Jakarta to discuss a draft of this Policy Memo, especially Sri Moertiningsih Adioetomo, Sonny Harmadi, Razali Ritonga, Riwanto Tirtosudarmo, and Prijono Tjiptoherijanto. Sincere thanks also to Hal Hill, Terry Hull, and Ross McLeod for comments.

characterised by low mortality and fertility. Most Western countries began this transition in the nineteenth century and now already have low rates of mortality and fertility. Most developing countries only began their transition after World War II and are currently spread across a range of transitional stages.

As a country goes through its demographic transition the changes in mortality and fertility inevitably affect other population characteristics. The most obvious is the population growth rate. Since as a general rule the decline in mortality begins before the fertility decline and commences quite steeply, the result is the annual number of deaths is significantly less than the annual number of births and the population grows significantly for several decades. How much it grows and for how long depends on the timing and the rates of decline of mortality and fertility, respectively.³

Figure 1 Population growth and age structure



A second characteristic which inevitably changes as a population goes through its demographic transition is the population age structure, that is, the relative proportion of total population in each age group.⁴ Since people of different ages have different consumption needs and engage in different kinds of productive activities a changing age structure can have massive implications for economic growth and family welfare (Bloom et al. 2003). Figure 1 gives a schematic representation of how the population growth rate and the share of the population in the working ages vary in relation to one another as the population goes through its demographic transition.

Adults typically engage in the main productive activities of a population and produce more than they consume, whereas the productive activities of children and the elderly are usually secondary or non-existent and people in these age groups are likely to consume considerably more than they produce

³ Figure A1 in the Appendix shows trends in crude birth and death rates for Indonesia.
⁴ The basics are well described in Gribble and Bremner ((2012).

– in this sense they are economic “dependents.” A *demographic dividend* or *demographic bonus* can be said to exist when the demographic conditions favour economic production more than consumption.

The main kind of “demographic dividend” (or “demographic bonus”) which has received growing attention over the last 20 years – and what in this Policy Brief we describe as the “first demographic dividend” – is the case where the age structure is characterized by a high proportion of people in the working ages compared to the non-working ages. “Countries with heavy concentrations of populations in the working ages have an inherent advantage to produce high levels of per capita income” (Mason 2005: 82).

Age structure and dependency ratios

Figure 2a shows the UN Population Division’s estimates and projections for Indonesia’s population by three age groups: infants and children (age 0-14 years), those in working ages (15-64 years), and the elderly (65 years and older).⁵ We see the total population 0-14 peaks around 2010 and then declines, and under the assumptions used by the UN (medium variant) will continue to decline for the rest of the century. The population aged 15-64 is expected to continue to grow until mid-century. Meanwhile the number of people 65 and older will rise considerably during the century, so that by around 2060-70 there will, for the first time ever in Indonesia, be more people over-65 than children under-15. Other things being equal, the period roughly 1990-2050 appears relatively favourable in demographic terms for economic growth: the size of the working-age population is growing rapidly while the largest group of dependents, the under-15s, flattens out and then declines; soon after mid-century, however, the 65+ group overtakes the children and continues to grow rapidly while the working age population declines.

Demographers often describe the changing age structure in terms of changing dependency ratios. Figure 2b presents the same data converted into three dependency ratios, defined as the number of dependents per 100 persons of working age (15-64). The child dependency ratio (i.e. the ratio of the population aged 0-14 to the population aged 15-64) peaks at 81⁶ in 1980 and then continues to decline in the UN projections until it reaches 27 in 2060. The old-age dependency ratio (i.e. the ratio of the population aged 65 years and over to the population aged 15-64), on the other hand, starts from a low of 6 or 7 in the 1950s and only starts rising significantly around 2010; it reaches 11 by 2025 and 24 by 2050; under the UN projections it reaches 45 by the end of the century, and is still rising. When these two dependency ratios are combined to form the total dependency ratio (i.e. the ratio of the sum of the population aged 0-14 and the population aged 65+ to the population aged 15-64), we see

5 The cut-off ages for defining the working ages can obviously be adjusted to fit local practices; we here adopt the UN convention and use 15-64 years.

6 That is, it peaks at 81 per 100 (or a ratio of 81:100), but for ease of expression in accounts like this the ratio is often reduced to a single number where the second term (the consequent) in the ratio is constant.

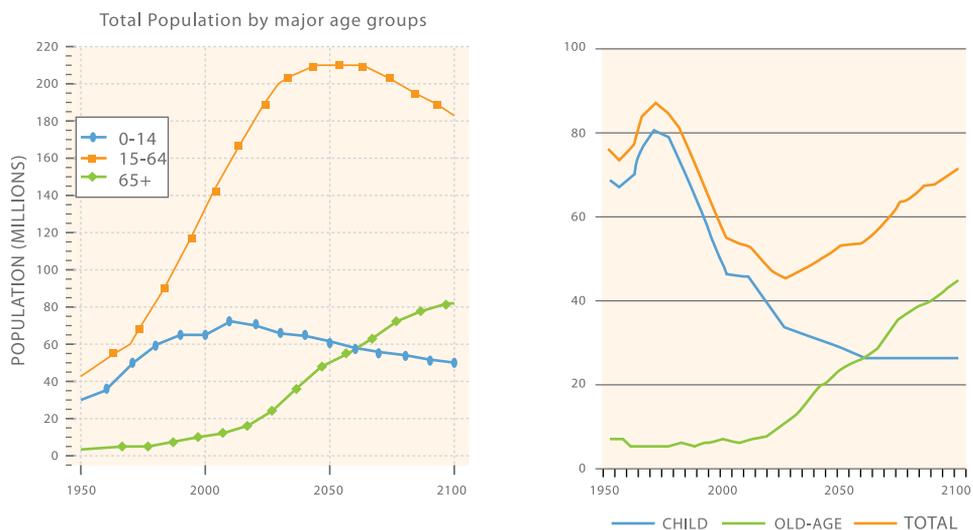
the ratio first reaches a peak in 1970 (similar to the child dependency ratio) with a value 87; it then declines to an all-time low of around 45 in 2025, after which it rises again in response to the rising old-age dependency ratio⁷; by the end of the century its value (72 per 100) is close to what it was in 1950.

Figure 2

Population age structure, Indonesia, estimates and projections, 1950-2100

A. by three age groups

B. by three dependency ratios



Source: For 1a, UN Pop. Div. (2012); for 1b, data from UN Pop. Div. (2012). See text for definitions.

What is the significance of these trends for defining the demographic dividend? If, as is commonly the case, the first demographic dividend is identified in terms of the total dependency ratio, then the dividend in Indonesia clearly peaks around 2025 when the ratio is at its lowest; a ratio of 45 dependents (comprising 34 children and 11 over-65s) per 100 people 15-64 means that each dependent is supported by 2.2 people in the working ages. Professor Adioetomo (2005: 25-26), reasoning along these lines, suggests the “window of opportunity” is therefore between 2020 and 2030.⁸

If, however, one chooses to identify the dividend as occurring when some arbitrary threshold of the total dependency ratio is satisfied, then the window of opportunity will not necessarily be evenly spread around 2025. For example, if we decide that the demographic dividend occurs when the total dependency ratio is not higher than 67 dependents per 100 population in the working ages (i.e. for every 2 dependents there should be at least 3 people of working age), then the window of opportunity lasts from 1990 until 2085. If we tighten the

7 Figure A2 in the Appendix shows the pattern is similar if we use the Government’s “official” estimates and projections, but the latter projections only go to 2035.

8 Professor Adioetomo uses UN data from the 2002 Revision of World Population Prospects, so her figures are a little different from those reported here: while the total dependency ratio for 2025 is 45 per 100 based on the 2012 Revision (used in this Policy Brief), Adioetomo (2005: Table 2) gives a figure of 44.3 per 100 using the 2002 Revision.

criteria to a dependency ratio of no more than 60, the open window is reduced to 1995 to 2070; and so on. Alternatively, other commentators focus on the *trend* in the dependency ratio rather than its absolute value, and conditions are interpreted as favourable for economic growth if the ratio is “improving” (i.e. going down) from one year to the next (World Bank 2009: 30). ⁹This interpretation suggests the window of opportunity in Indonesia stretches from 1970 (when the ratio was 87 to 100) to 2025 (when it reaches its lowest point of 45 per 100).

The use of dependency ratios to identify demographic dividends is instructive but limited. Aside from the arbitrariness of establishing age limits to define “working ages” and deciding what values of dependency ratios define a dividend there is also an important substantive issue. Whether the “inherent advantage” of a heavy concentration of population in the working ages actually translates into a heavy concentration of what Bloom et al. (2003) call “share working” (Figure 1) depends on a number of policy-sensitive factors relating to employment and the productivity of labour. We consider some of these factors later. For the moment we note that the crux of the matter is the balance between production and consumption. In order to better understand the relation between changing age structure and economic growth we need to move beyond dependency ratios and consider “economic support ratios.”

Economic support ratios

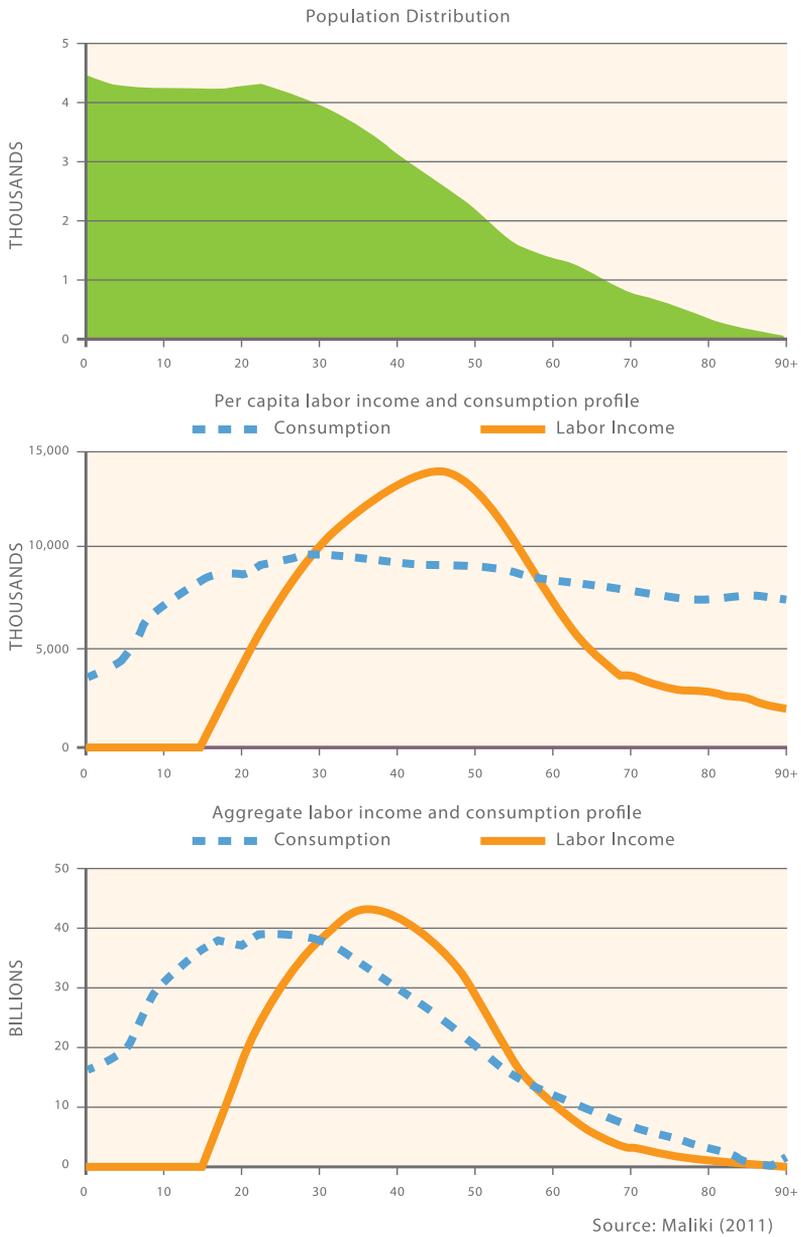
Economic support ratios are defined as the ratio of the effective number of consumers to the effective number of producers. The basic principles can be explained by reference to the Indonesian data for 2005 displayed in Figure 3. The top panel shows the aggregate population distribution by age: the age cohorts are close to one another in size up to around age 25, and then they get progressively smaller as mortality takes its toll so that by age 90 there are very few survivors. We know consumption behaviour and productive labour both vary by age.

The second panel uses Indonesian empirical data to estimate the average financial cost of consumption and the average income earned from labour at each age in 2005. These data in effect give the income and consumption profiles of the average Indonesian over his or her synthetic life cycle; the data are cross-sectional so no individual therefore will actually live through the successive age-specific income and consumption levels present in 2005 through their own lifetime, but the data are nonetheless instructive so long as this limitation is not ignored. The data show, for example, that while the average Indonesian starts earning some income at 15 it takes almost another 15 years before they are earning more than they consume. Similarly Indonesians on average start earning less than they consume again slightly

⁹ This is the approach implicitly taken in most econometric modelling of the demographic dividend: See, for example, the way Bloom and Williamson (1998) incorporate both the growth rate of economically active population and the population growth rate in their modified Solow-Swan model of economic growth.

before the age of 60, so economic dependents should be defined more accurately as those below 30 and over 60. If the total lifetime earnings of a person are to cover their total lifetime consumption then the total area under their income curve has to equal (or exceed) the total area under their consumption curve. Some might be surprised to see that the consumption level of the average 80-year old is still around 70 per cent of that of the average 30-year old. At a lower level of development the elderly consume relatively little, but in Indonesia today the elderly consume a lot in the form of health care.

Figure 3 Distribution of population, consumption and labour income by age, Indonesia 2005



The third panel shows the aggregate labour income and consumption profiles for the total population. Thus while the average 90-year old is still consuming a significant amount of wealth, when we look at the aggregate picture the amount of total consumption accounted for by all 90-year olds is very small simply because there are so few 90-year olds in the total population. The data shown in the third panel give a vivid sense of how much wealth has to be transferred between age groups and generations simply in order to keep the population alive and society functioning. Such transfers are constantly taking place within families, and through public and private mechanisms such as pension schemes, social security arrangements, and private savings. Maintaining and adjusting these transfers represents major issues for both families and policy makers. One set of issues concerns whether enough capital is invested in the young so that they will be sufficiently productive workers to earn enough during their adult working ages; another is whether those working are able to produce enough surplus wealth to support those in older ages who consume more than they produce.

The profiles shown in Figure 3 change dramatically for a country as it goes through its demographic transition and develops economically; they also vary significantly among countries with similar levels of development, mainly as a consequence of variations in social policy.

The data used to produce profiles of the kind displayed in Figure 3 come from population censuses and household surveys. Various adjustments have to be made to standardize what counts as effectively “one producer” or “one consumer” before we can calculate the economic support ratio. Methodologies have been developed to standardize measurement as much as possible in terms of the “effective number” of producers and consumers. “The effective number of workers, the numerator of the support ratio, incorporates age variation in labour force participation, hours worked, unemployment, and productivity or wages. In similar fashion, the effective number of consumers, the denominator of the support ratio, allows for age-specific variation in consumption to calculate how the effective number of [consumers] varies over time” (UN Pop. Div. 2013: 10-11). The support ratio is then defined as the effective number of producers per 100 effective consumers.

By now the economic support ratio has become a standard tool for analysing the economic effects of changing population age structure. Work on methodology and alternative definitions continues (Prskawetz 2014). Its use suggests how to make a rigorous assessment of whether a given country has successfully realized its demographic dividend (defined simply as a heavy concentration of population in the working ages) successfully or not. Indeed from an economic perspective (rather than demographic) the prevailing view is that the “first dividend is ... defined as the rate of growth of the support ratio” (Mason 2007: 84).

Taking advantage of the first demographic dividend

If the demographic dividend does indeed translate into a growing economic support ratio (and the economic growth that entails), what are the mechanisms through which this effect is delivered? Bloom et al. (2003: 39-42) argue the most important effects operate by changing labour supply, savings, and human capital. It is especially valuable to distinguish these in the Indonesian context because each is highly sensitive to government policy.

Labour supply

The demographic transition affects labour supply in a couple of ways. The first is the automatic effect of more people of working age means, other things remaining equal, that there will be more people looking for work. Providing the labour market can absorb more workers, per capita production increases. If it cannot, then the large number entering the work force who remain unemployed can become a potent source of social and political instability. Other things being equal, *policies which foster labour market flexibility will increase the numerator in the economic support ratio, and will therefore help in taking economic advantage of the demographic dividend.*

The second mechanism follows from lower fertility and smaller families. These conditions mean more women are likely to enter the labour force. If they do this contributes to a more favourable support ratio. Other things being equal, *policies which encourage women to work (including those with young children and who want to work) will help take advantage of the demographic dividend.*

Savings

The practice of household savings varies considerably by culture as well as economic conditions, but generally it is the employed who are producing more than they consume who have the disposition to save and are in a position to be able to do so, especially when they reach an age when they are no longer likely to be investing in young children. In aggregate these savings improve a country's "prospects for investment and growth." Broom et al. (2003: 40-41) cite multiple studies as evidence of this mechanism but they also note, "Further work is needed, however, to take account of the institutional features of pension systems when assessing the importance of the demographic transition to the determination of national savings." The policy implication is that *policies which encourage private savings are, other things being equal, likely to help the country take advantage of its demographic dividend.*

Human capital

Lower mortality, longer life, lower fertility and smaller families all result over time in changed behaviour and a less fatalistic attitude towards life. "Attitudes about education, family, retirement, the role of women, and work all tend to shift" (Bloom et al. 2003: 41). Parents have fewer children but invest more in each; in Gary Becker's terms there is a trade-off between the quantity and quality of children. "The result of this educational investment is that the labor force as a whole becomes more productive, promoting higher wages and a better standard of living. Women and men therefore tend to enter the workforce later, partly because they are being educated for longer, but they are likely to be more productive once they start working." *Policies which extend access to education and health will, other things being equal, help the country take advantage of its demographic dividend.*

It is crucially important to recognize that without pathways like these in place there can be no effective demographic dividend. Having a favourable demographic dependency ratio cannot lead to economic benefits unless there are causal pathways in place connecting age structure and economic activity

Limitations and misconceptions

As the above discussion makes clear, a decreasing dependency ratio in a national population does not automatically produce an acceleration of economic growth. A whole suite of institutional arrangements and policies needs to be in place if the change in dependency ratio is to translate into a positive change in economic support ratio; and even then, those with jobs need to be adequately productive, and the increase in wealth, at least in part, needs to be invested in future development if it is to contribute to sustained economic growth. With qualifications like these in mind not all experts are convinced that the concept of demographic dividend is especially useful (e.g. Crespo Cuaresma et al. 2013). Some economists point out that since achievement of the dividend requires that good economic policies be in place to begin with (regarding for example labour supply, savings and human capital, as mentioned above), and since sound economic theory suggests these policies need to be in place for economic growth regardless of any changes in age structure, there is little reason, they argue, to single out a change in the dependency ratio as deserving special attention. A change in age structure will affect the balance of forces contributing to production and consumption activities, but so will a host of other factors.¹⁰

The concept of a demographic bonus or dividend has received a fair amount of public attention in Indonesia in recent years and local policy makers are familiar with the basic idea. However discussions in the media are limited in

¹⁰ It is very difficult, of course, to disentangle the causal significance of the different factors affecting economic growth. See the contributors' efforts, and the reviewers' comments, in the special issue of *Asian Economic Policy Review on Demographic Change and Asian Dynamics*, ed. by Ito et al. (2009).

scope and tend to concentrate too narrowly on the concept of favourable dependency ratios, especially regarding the relatively large cohort about to enter the working ages over the next 10 or 15 years. These discussions acknowledge this cohort needs to be educated, skilled and employed if Indonesia is to reap a dividend, and there is also an appreciation that if the jobs are not available there could be widespread instability and lower economic growth. There is little sense in many of these discussions, however, of how the demographic dividend fits within broader patterns and trends in population dynamics, or how the potential benefits might engage with existing patterns of asset transfers between age groups and generations. Moreover attention is often focused on the 2020-2030 decade (when the total dependency ratio will be at an all-time low), with little consideration of how changes in the dependency ratio have already been favourable for several decades, or of the potential effects over a longer time span. Some commentators tend to “reify” the concept, as if it were the label of something tangible; they worry more about measuring the dependency ratio to one or two decimal places, or how it may vary from province to province, than about the more important issue of whether any of the policies are in place to effect a causal link with economic growth.

In confronting these reservations it is important to remember that the “demographic dividend” is not a “thing” that can be pointed to and easily measured, but is part of a conceptual framework which, like any scientific framework, highlights some interesting questions and inevitably ignores others. As Gribble and Bremner (2012: 2) put it, “Referred to as the ‘demographic dividend,’ this framework helps explain the experience of certain countries in Asia, and later successes in Latin America, and is creating a sense of optimism for improving the economic well-being of developing countries, especially in sub-Saharan Africa.”

The demographic dividend and the RPJMN 2015-2019

It is a positive sign that the demographic dividend is used as an organizing principle in parts of the Government’s latest Development Plan (RPJMN 2015-2019).¹¹ Bappenas (2015: see especially section 3.3) defines the demographic bonus as the accelerated economic growth affected by the changing population structure marked by a decline in the dependency ratio. The document further recognizes that the changing population structure can only produce an economic bonus so long as it is accompanied by increasing labour supply, savings, and human capital. The required policies must maintain the decline in fertility, increase the skills and competencies of workers, and support the creation of employment, labour market flexibility, trade openness,

¹¹ None of the policies of former President Susilo Bambang Yudhoyono’s Government were designed explicitly to take advantage of Indonesia’s demographic dividend.

savings, and infrastructure (Table 1). In other words, the RPJMN emphasizes the importance of having the right policies in place across a range of sectors.

Table 1. Policies to harness the demographic bonus in RPJMN 2015-2019	
Development Aspect	Strategic Policies
Social, cultural, and religious environment	<ul style="list-style-type: none"> • Maintain fertility decline • Increase social health insurance • Expand universal secondary education • Increase access and quality of tertiary education • Increase skill training of labour force through qualification and competence; increase the number of training institutions and the relevance of education system with labour market. • Increase entrepreneurship, youth character education
Economy and Employment	<ul style="list-style-type: none"> • Optimize the global cooperation that consider social and cultural dimension • Expand employment • Increase investment climate and export promotion • Increase the synergy of industrial policy directions • Increase the labour market flexibility and decent work • Human capital deepening and workers education • Increasing women's participation in the labour force
Natural resources and environment	<ul style="list-style-type: none"> • Guarantee food supply by considering the change in consumption pattern and local culture of the community • Guarantee energy supply for industry; science and technology • Science and technology to increase workers' productivity • Increase the tax incentive for research and development
Politics, law and security	<ul style="list-style-type: none"> • Increase labour force participation at regional level • Guarantee the rights and participations of the people in economic development (inclusive growth) • Increase the protection for workers and international cooperation
Regional, land use, and infrastructure development	<ul style="list-style-type: none"> • Develop growth centers that consider the labour force structure and interconnectivity between regions • Spatial planning to anticipate urbanization • Increase infrastructure to support mobility and productivity

Source: Bappenas (2015: 3.13)

What is required now is detailed policy analysis to show how the demographic dividend is not just a good thing in theory, but how it will produce benefits in practice to the Indonesian people, and how different sectors and regions will contribute to this.

A second demographic dividend?

The first demographic dividend is transitory, dependent on the decline in fertility associated with the country's progress through the demographic transition. Policy makers and other commentators are often pessimistic regarding the economic effects of changing age structure once the first dividend is over and the country faces unprecedented high old-age dependency ratios. However in recent years some leading demographers and economists have argued

there is a second demographic dividend which is cause for optimism (Lee and Mason 2006; Mason 2007; Mason and Kinugasa 2008).

“But a second *dividend* is also possible. A population concentrated at older working ages and facing an extended period of retirement has a powerful incentive to accumulate assets – unless it is confident that its needs will be provided for by families or governments. Whether these additional assets are invested domestically or abroad, national income rises.

“In short, the first dividend yields a transitory bonus, and the second transforms that bonus into greater assets and sustainable development. These outcomes are not automatic but depend on the implementation of effective policies. Thus, the dividend period is a window of opportunity rather than a guarantee of improved standards of living. The dividends are sequential: the first dividend begins first and continues to an end, and the second dividend begins somewhat later and continues indefinitely. They certainly overlap” (Lee and Mason 2006).

Ronald Lee, Andrew Mason and others have proposed a simple accounting identity to help determine the economic effects of both demographic dividends and to understand the logical relations between them (Mason 2007: 84). If Y is total output, N the effective number of consumers, and L the effective number of producers, then

$$Y/N = L/N \times Y/L \quad \text{Eq.1.}$$

Y/N gives the output per effective consumer, L/N is the support ratio, and Y/L is productivity per effective producer. In this accounting formula, the rate of growth of output per consumer (left-hand side of Eq. 1) is equal to the sum of the rates of growth of both terms on the right-hand side of the equation. The rate of growth of the economic support ratio represents the contribution of the first demographic dividend, and of rate of growth of productivity per producer is the contribution of the second dividend.

Since the most important part of the second demographic dividend concerns the savings (of the growing population segment interested in accumulating assets for their retirement) it is helpful to incorporate this element into Eq. 1. If Y (aggregate output) is assumed to equal aggregate income, and C represents aggregate consumption, then $C = (1 - s)Y$, where s is the savings rate (S/Y). Thus we can derive the so-called “consumption identity” (Mason 2013):

$$C/N = L/N \times [(1 - s) \times (Y/L)] \quad \text{Eq.2.}$$

These equations allow estimation of the contributions of the two dividends to economic growth. Table 2 shows Mason’s estimates of the dividends’ contributions for major world region’s during 1970-2000 (Mason 2007). The striking finding is that in all regions except Sub-Saharan Africa the second dividend contributed more to growth than the first. In East and Southeast Asia

actual growth in GDP per effective consumer averaged 4.32 per cent per year. The first dividend contributed 0.59 percentage points and the second 1.31; in total the two dividends contributed 1.90 percentage points, amounting to 44 per cent of growth.

Region	Demographic dividends			Actual growth in GDP/N	Actual minus dividend
	first	second	total		
Industrial	0.34	0.69	1.03	2.25	1.22
East Asia and Southeast Asia	0.59	1.31	1.90	4.32	2.42
South Asia	0.10	0.69	0.80	1.88	1.08
Latin American	0.62	1.08	1.70	0.94	-0.76
Sub-Saharan Africa	-0.09	0.17	0.08	0.06	-0.02
Middle East and North Africa	0.51	0.70	1.21	1.10	-0.11
Transitional	0.24	0.57	0.81	0.61	-0.20
Pacific Islands	0.58	1.15	1.73	0.93	-0.79

Source: Mason (2007: 94).

It needs to be remembered, however, that these estimates derive from the use of an accounting equation. The fact that different dividends can be attributed to different terms in the equation is not the same as proving causality. Many development experts who believe there is merit to the idea of the first demographic dividend remain unpersuaded when it comes to the second. Nevertheless the growing literature on the second raises important policy questions about harmonizing Indonesia's changing age structure after the decline of the first dividend with economic opportunities for growing prosperity over the longer term. Attention to the potential benefits from the first dividend should not be pursued at the expense of ignoring issues raised by population ageing over the longer term.

Recommendations

Despite the fact that economic *benefits* do not flow automatically from favourable demographics there is no doubt that the economic *effects* of changes in population age structure are real, and that Indonesia is currently in a relatively good position to take advantage of some of these positive effects. It is also clear from a growing body of research that converting the inherent advantages of a demographic dividend into real economic growth and improved family welfare depends on whether appropriate policies are in place.

So what can be done now? As a general point, government policy makers and public intellectuals need to extend the debate about the demographic

dividend in at least two directions. First, the discussion about dependency ratios in Indonesia needs to be complemented with more systemic discussion of economic support ratios and their consequences. This is essential if the discussion is to move beyond vague references to the potential benefits of the demographic dividend, towards an evidence-based discussion of the actual macro- and micro-economic benefits, and towards a careful assessment of what policy interventions are needed in order to protect and expand these benefits. An important component of the necessary analysis is already underway at Bappenas as part of the large international project on National Transfer Accounts (see Lee and Mason 2011; Maliki 2011; UN Pop. Div. 2013), but much additional analysis is needed.

Second, the discussion needs to be extended to embrace a longer time frame, so as to include the issues now seen as comprising a second demographic dividend by some experts. Although the two dividends can be perceived as sequential the reality is that they overlap, and it is certainly not too soon for policy makers to begin considering the second. This is especially relevant for Indonesia since most economists agree it is a lack of investment in infrastructure and human capital during the last decade which is currently serving as a brake on the country's economic development. Improving productivity is key to future growth (Woetzel et al. 2014). A skilful exploitation of the second dividend, particularly at a time when Indonesia's consuming classes are already growing rapidly (Hayes 2014), has the potential to make a massive change to domestic savings and investment.

More specifically, to take advantage of both dividends policy makers need to consider adjusting policies in a number of areas (Bloom et al. 2003; Gribble and Bremner 2012):

- Labour market The labour market needs to be as flexible as possible if it is to absorb the large cohort entering the working ages in the next 25 years. Policies need to be flexible regarding terms of employment, minimum wages, flexi-hours (especially important for couples with young children), etc., while at the same time protecting the rights of employees.
- Household savings Policy makers need to consider incentives to encourage those in the peak earning years to save and build assets to protect their standard of living when they retire. Whether the ambitious infrastructure and human resource plans envisaged by the Government of Joko Widodo are realised or not could well depend on whether aggregate domestic savings grow quickly enough and are well invested in the country's future.

- Health A nation's prosperity goes hand-in hand with improved population health. The health sector in Indonesia needs to adjust to the changing age structure of the population, with more services for the treatment and prevention of chronic life-style diseases. The large numbers of people smoking and the current shifts towards an unhealthy high-calorie diet are not consistent with taking maximum advantage of demographic dividends. New public health campaigns and services are needed. Family planning and reproductive health services need to be upgraded (Hull and Mosley 2009). More attention also needs to be given to the social determinants of health inequality.
- Education A high-quality work force is essential for future prosperity, but educational facilities and services are still remarkably low (Suryadarma and Jones 2013). Tertiary education (university and vocational training) needs to be expanded if tomorrow's work force is to be skilled and innovative, and universal access needs to be achieved if development is to take full advantage of Indonesia's rich and diverse cultural heritage.

The detailed design of the necessary policies will require further analysis and debate. The burgeoning economic and demographic literatures on demographic dividends reviewed in this Policy Brief provide a wealth of theoretical and practical insights to guide the process.

Care needs to be taken to ensure that the economic benefits gained from the dividends are shared equitably and not allowed to contribute to the country's growing inequality (Papanek et al. 2014:44), and that the policies implemented are consistent with the principles of sustainable development (Hayes 2013). That said, there is more than enough reason to be optimistic. Our understanding of how demographic change affects economic development has grown considerably since the turn of the century. Indonesia is in a good position to take advantage of its changing age structure in order to enhance the growth of economic prosperity among all its citizens.

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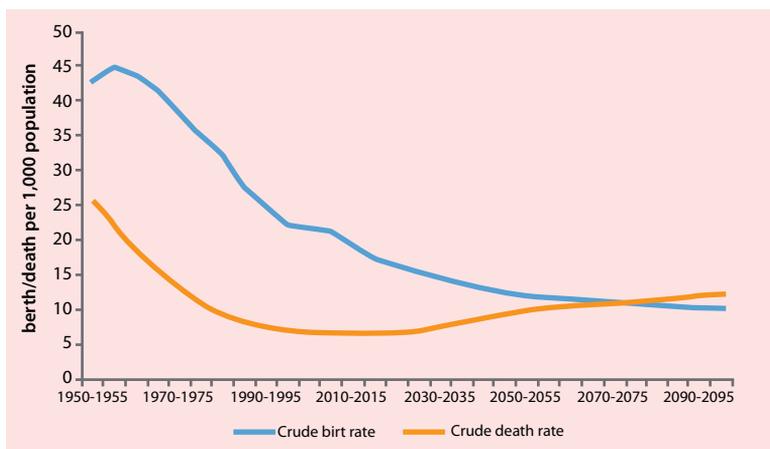
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Appendix: Additional Demographic Data on Indonesia

The (first) demographic dividend is related to changes in the age structure of a country's population brought about by its transition from high birth and death rates to low. Figure A1 illustrates this transition in the case of Indonesia.

Figure 4

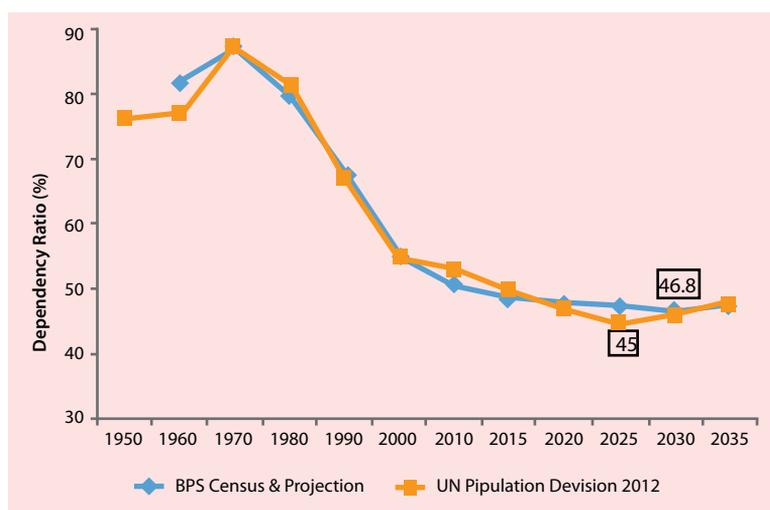
The demographic transition in Indonesia: Crude birth rate and crude death rate, estimates and projections (medium variant) 1950-2100



Source: UN Pop. Div.(2012).

Figure 5

Total dependency ratio, Indonesia, 1950-2035



Source: Statistics Indonesia (1971-2010); Bappenas, Statistics Indonesia, and UNFPA (2013); UN Pop. Div. (2012).

Figure A2 shows the total dependency ratio, using both the UN Population Division's data set and data from the Government of Indonesia's "official" estimates and projections (Bappenas, Statistics Indonesia, and UNFPA 2013).



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