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CSPS STRATEGY & POLICY JOURNAL
CALL FOR PAPERS

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The Fourth Industrial Revolution, Job Futures and Policy Implications for Reducing Youth Unemployment in Brunei Darussalam

Diana Cheong

Abstract

Reducing youth unemployment is accorded a high priority in the national agenda of most nations. Brunei Darussalam is no exception, with a high youth unemployment rate of 31.7% amongst locals or 9.3% for the general population (Department of Economic Planning & Development, DEPD, 2017). Unemployment imposes economic and social costs – on the individual, the society, and the nation. The problems caused by youth unemployment are obstacles to achieving the three goals of the Brunei Vision 2035 or Wawasan Brunei 2035. With high unemployment, it would be challenging for the people of Brunei to be recognised for the accomplishments of its well-educated and highly-skilled people as measured by the highest international standard (Goal 1); quality of life that is among the top 10 nations in the world (Goal 2); and, dynamic and sustainable economy with income per capita within the top countries in the world (Goal 3).

Youth unemployment affecting Bruneians (Citizens and Permanent Residents) between the ages of 15 and 39 will be the focus of this paper[1]. This age cohort is viewed as the target for policy makers as our youth population (up to 39 years old) comprises approximately 70% of the total population. Furthermore, as the majority and future generation, this is the cohort that requires most policy attention.

This paper examines the extent and main reasons for youth unemployment in Brunei. Describing youth unemployment as a serious problem requiring urgent policy attention, it identifies a number of existing manpower challenges such as mismatches between education and employment, constraints in human resource development and employment practices, an urgent need for attitudinal and mindset change amongst young people, disparities in incentive structures between manual and white collar jobs and between private sector and public sector employment, and a need to improve public infrastructures to enable employment participation, such as in the area

1 Currently, youth in Brunei is categorized as between 15 – 40 years old according to the Brunei National Youth Policy (2002)

of public transportation and childcare support for working mothers. In addition, to increase the effectiveness and sustainability of unemployment reduction policies, the paper proposes the adoption of a more futures-oriented approach involving strategic foresight, taking into account the impact of automation and globalisation, and, the country's emphasis to embrace the Fourth Industrial Revolution (4IR).

Keywords: *youth unemployment, job futures, the fourth industrial revolution, manpower planning, strategic foresight*

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1.0 The Extent of Youth Unemployment

There is a need for more empirical research into this national concern to support policy making as detailed labour force information is limited. The key sources of information are the Labour Force Surveys - LFS (conducted in 1995, 2008, 2014, and most recently in 2017) and the Population and Housing Censuses 2001 and 2011. In the interim, the DEPD compiles the Labour Market Statistics based on administrative data collected by Tabung Amanah Pekerja (TAP - Workers Provident Fund) and the Local Employment and Workforce Development Agency. The LFS and the censuses are the only sources providing reliable information which can be used to estimate the unemployment rate and some of the other key indicators, and the three LFS are the only sources of in-depth information about the labour force. Further, although the LFS report presents a number of other useful labour market statistics, these are at the aggregate level and require further critical analysis of the micro-data to allow for more policy insight into explaining the socio-economic causes of unemployment and other related and quite complex issues requiring policy attention.

Unemployment in official Brunei statistics is defined according to the International Labour Organisation (ILO) formula, reflecting persons not in employment who are available for work and carrying out activities to seek employment over the past one month. Further they must also not have received any payment for work over the past one week. In the LFS 2014, the unemployment rate was estimated at 6.9% for the whole population, and 29.9% among local youth. By the time the next national count was made - LFS 2017, unemployment had gone up significantly to 9.3%, and 31.7% among local young people.

Table 1.

Unemployment Rate by Countries[2]

Country	Unemployment Rate (%)
Brunei	9.3 (2017)
Singapore	2.1 (Dec 17)
Indonesia	5.5 (Sept 17)
Malaysia	3.4 (Jan 18)
Vietnam	2.02 (Sept 17)
Thailand	1.3 (Feb 18)
Cambodia	0.3 (2017)

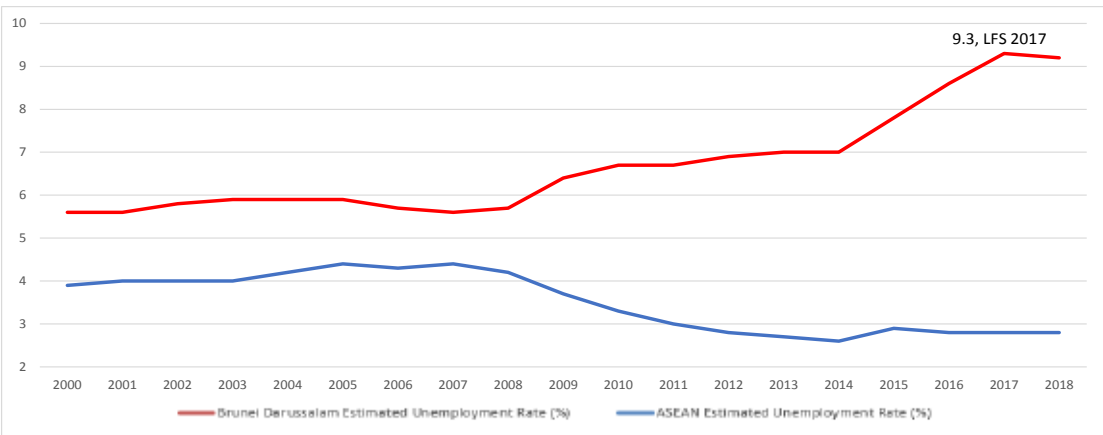
2 Author's compilation using data from International Labour Organisation (ILO)

Philippines	5.7 (2017)
Laos	1.5 (2017)
ASEAN	3.3 (2017)
China	3.9 (Dec 17)
Japan	2.5 (Feb 18)
Hong Kong	2.9 (Feb 18)

Unfortunately, as shown in Table 1, Brunei has the highest unemployment rate in ASEAN. Further, as shown in Figure 1, the unemployment rate in Brunei has been increasing since 2000. In contrast, the unemployment rate in ASEAN as a whole has been falling since 2005. Brunei unemployment at 9.3% is higher than the ASEAN average of 3.3 % and it has been on an upward trend since the year 2000.

Figure 1.

Comparison of Unemployment Rate Between ASEAN and Brunei Darussalam[3]

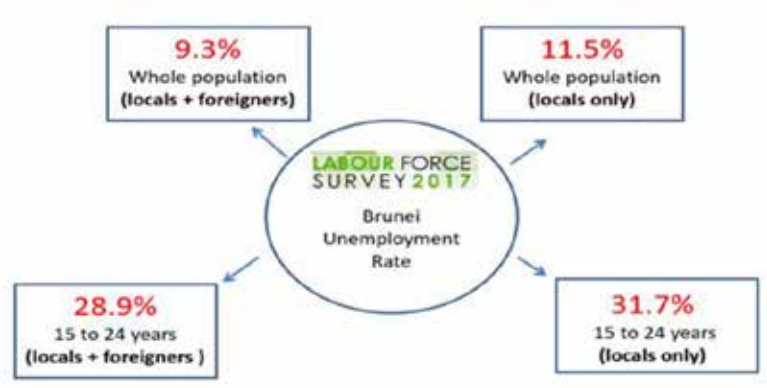


The reason why there is a need to differentiate between locals and the foreign population is that a large proportion of the labour force in Brunei is made up of temporary residents (26%), whose residency is dependent upon them having a job. Therefore, we should note that the unemployed counts are mainly referring to local Bruneians only, making the situation more consequential than it would be comparatively with other countries whereby foreign population may be residing for non-employment purposes. As shown in Figure 2, if we take out the foreign population, the unemployment rate is actually 11.5% (LFS, 2017) amongst locals. It is even more serious when we look at the youth (15-24 years old) unemployment rate whereby the figure is 31.7% (LFS, 2017). Basically, the statistics are saying that one in three young Bruneians will be unemployed.

3 Author's compilation using data from International Labour Organisation and Department of Economic Planning & Development (2017), Brunei Government, Labour Force Survey 2017.

Figure 2.

Unemployment Figures for Brunei Darussalam (DEPD, 2017)



In addition, we should also cover other types of labour underutilisation for policy purposes:

a) Time-related underemployment, when the working time of employed people is insufficient in relation to their willingness and availability to work more hours.

b) Potential labour force, referring to persons not in employment who have an interest in working but for whom the existing conditions limit their active job search or availability.

The problem with the official definition of unemployment at 9.3% is that it may divert policy attention from others who are not in employment but are not counted as unemployed because they are not fully employed or have given up looking for work due to one or more of the following reasons:

- Long term unemployment: National studies have shown that a substantial proportion of youth had been unemployed for six months or more and these persons would be likely to eventually give up an active search for work, which would then mean that they would not be counted as 'unemployed' officially.
- Being underqualified: Each year, a substantial number of out of school youth who lack vocational skills sign on with the job centre as 'job seekers' (Cheong & Lawrey, 2009).
- Being overqualified: Graduate unemployment and underemployment is an increasing problem. There are around 2,098 graduate youth in the I-Ready Apprenticeship Programme (www.brudirect.com, 2019). This represents useful apprenticeship experience and fills the gap for graduates who are unable to find suitable jobs but it is likely that there are those who will find

themselves overqualified and underutilised over the long term.

- Being inappropriately qualified: Mismatch in educational qualifications and manpower requirement is a significant policy issue. For example, CSPS Study 2 indicated a large proportion of graduate unemployed hold an Arts/ Humanities degree (Rizzo, Cheong & Koh, 2016).
- Background factors: Females are more likely to be unemployed and the lack of working mother/childcare provision would mean that they are likely to eventually give up on an active search for work (Rizzo, Cheong & Koh, 2016).

A broader concept of unemployment covering in addition 'time-related underemployment' and the 'potential labour force' is therefore necessary as these are situations which also refers to mismatches between labour supply and demand and translate into an unmet need for employment among the population. Taking a broader view of unemployment, i.e. labour underutilisation, the actual rate is much higher in the LFS 2014, at 46.5% for youth (15-24 years) and 18% for the general population. In the LFS 2017, labour underutilisation had gone up to 23.1% for the general population.

Unemployment, along with labour underutilisation, are therefore key unemployment policy problems requiring urgent attention. The number of unemployed young people is not only high compared to other countries, but there is increasing concern that unemployment is affecting both out of school youths and university graduates at all levels and that this is a pervasive social problem that may become long term if we do not take appropriate policy measures now.

2.0 Some Explanations of Youth Unemployment and Unemployment Reduction Programmes

Why do we have a serious unemployment/underemployment problem amongst our local youth when a large proportion (nearly 30%) of our workforce consists of foreign labour at all levels?

In terms of academic research, the Centre for Strategic and Policy Studies (CSPS) itself pioneered and conducted two and perhaps the only major survey-based studies into the topic of out of school jobseekers and graduate unemployment. The first study (CSPS Study 1) entitled 'A Study of Unemployment Issues among Registered Jobseekers in Brunei Darussalam (2009)' (Cheong & Lawrey, 2009) focused on a sample of 636 out of school jobseekers. The main findings are as follows:

1. The samples were mainly early school leavers with only 2-3 'O' levels.
2. The samples were mainly interested in clerical/white collar office jobs, especially in government, and they shun private sector jobs which are plentiful and occupied by foreign labour.
3. There is a high mismatch between available skills and desired employment as the sample had no vocational skills.
4. Private sector jobs are not seen as attractive and can lack good human resource (HR) practices.
5. The reservation wage of locals is often higher than private sector salaries, bearing in mind the cost of going to work, particularly due to the lack of a viable public transportation system.

The main policy recommendations from this first study were:

1. Increase vocational technical education (VTE) and reduce early school drop outs.
2. Encourage Bruneian youth to have a mindset change, be more productive and work oriented.
3. Encourage Bruneian youth towards manual, semi-skilled and skilled jobs, especially in the private sector.
4. Private sector and non-office jobs must be made more attractive to Bruneians, with better HR practices.
5. Increase professionalisation of manual/crafts jobs through better training, certification of skills and standards, therefore leading to higher salaries and job status.
6. Reduce labour market disparities by improving the attractiveness of the more manual private sector occupations.
7. Improve public transportation for mobility and connectivity to employment.

The second study (CSPS Study 2) entitled 'Unemployment Issues among University Graduates in Brunei Darussalam (2014)' (Rizzo, Cheong & Koh, 2016) focused on 816 unemployed graduates. The main findings are:

1. Significant mismatch between university degrees and labour demand whereby graduates in Arts and Humanities are more likely to remain unemployed.

2. Graduates from top universities (usually overseas) are more likely to find a job.
3. Significant differences between ethnic groups, whereby Malays are more likely to wait for Government jobs and do passive job search.
4. Married women are more likely to be unemployed.

The main policy recommendations from this second study are:

1. Upgrading of local universities, at least in terms of prestige.
2. Develop manpower planning for relevant education and to reduce mismatch between degree provision/scholarship policy and required manpower skills and knowledge.
3. Encourage mindset change and incentive structures.
4. Develop facilities such as crèches, nurseries, childcare to encourage working mothers.

Over recent years, a number of policies and programmes have been introduced to improve manpower planning and to tackle the issue of unemployment along the lines that have been outlined from the CSPS studies. The existing Institute of Technology Brunei was upgraded to university status to provide degree programmes in 2016, adding to Universiti Brunei Darussalam, which was the country's only university before. By 2016, Brunei boasted a total of 7 degree-granting institutions. Vocational Technical Education (VTE) expanded vastly to a total of 13 institutions.

In addition, programs to reduce unemployment have increased and Table 2 shows those that have been introduced recently:

Table 2.

Programs to Reduce Unemployment[4]

	PROGRAMME/ POLICY	OWNERSHIP	DATE OF INTRODUC-TION	DETAILS	HOW DOES IT HELP REDUCE UNEMPLOYMENT?
1.	Establishment of the Centre for Capacity Building	Centre for Capacity Building, Ministry of Energy, Manpower and Industry (MEMI)	2017	A multi-programme skills training institution aimed to produce job-ready graduates.	Avenue for the unemployed to up-skill or re-skill. Provision of conditional offers of employment.
2.	Establishment of JobCentre Brunei	JobCentre Brunei, MEMI	2017	A one-stop employment centre.	Proactive job matching. Career counselling.
3.	Establishment of an Industry Steering Committee	Manpower Strategy Division, MEMI	2017	The Committee consists of private sector companies. Committee informs MEMI regarding the manpower needs of the industry.	Better manpower planning leading to reduced mismatch in labour demand and supply.
4.	Establishment of an Electronic Labour Exchange System (ELX)	JobCentre Brunei, MEMI	2015	An online employment system.	Facilitates job matching.
5.	I-Ready (industry ready) Apprenticeship Programme	JobCentre Brunei, MEMI	2017	A three-year, government funded apprenticeship programme.	Gain job experience to become industry ready. Provision of conditional offers of employment.
6.	Establishment of the Industry Competency Framework (ICF)	MEMI, IBTE, MOE	2013	Defines competencies required in Industry and provides training to acquire those competencies.	Provides opportunities for up-skilling and re-skilling, specifically for Industry. Provision of conditional offers of employment.

4 CSPS compilation from various government agencies

7.	Regularly Organise Job Fairs, CV Writing Clinics, and Walk-in Interviews	JobCentre Brunei, MEMI	n/a	A fair where employers can advertise their job openings and provide walk-in interviews. CV writing and interview clinics are also provided.	Facilitates job matching. Improve CV writing and interview skills.
8.	i-Usahawan	DARe	TBC	Certain Government and GLC contracts are reserved or ring fenced for local SMEs.	Attainment of contract could lead to business expansion and the hiring of more employees.
9.	Introduction of a 'Reasonable Wage' for manual jobs in industry	Manpower Strategy Division, MEMI	2018	Companies in the industry are required to offer a reasonable wage for manual jobs as determined by MEMI (e.g. scaffolders, welders).	Attracts the unemployed into taking manual jobs by raising the status of manual jobs.
10.	Responsible Foreign Displacement	Manpower Strategy Division, MEMI	2021	Medium to large companies in Brunei are required to replace foreign workers with equally able local workers.	Unemployed are able to take up jobs that are currently held by foreigners.
11.	'Bruneisation' Directive	Manpower Strategy Division, MEMI	2018	Requirement that have 90% of employees at each organisational and skill level be local. Applicable for 11 oil and gas operators under MEMI's purview. Plans to extend to non-oil and gas sector.	Unemployed are able to take up jobs that are currently held by foreigners.
12.	Introduction of New Process for Foreign Workers License	Department of Labour, Ministry of Home Affairs	2016	Incorporation of Foreign Workers Recruitment License and Work Pass Recommendations into one process.	Requires employers seeking to hire foreign workers to prioritise locals.

As part of its economic growth and diversification objective, the country has also been active in encouraging foreign direct investment (FDI) for which employment creation for its locals is a primary target. Table 3 shows Brunei recent FDI projects.

Table 3.

Brunei Darussalam's Recent FDI Projects[5]

Source country	Business area	Investment value (US$ mil)	Estimated jobs
Canada	Multi-purpose training centre	102	75
	Halal pharmaceutical manufacturing	26	140
China	Oil refinery	4,000	780
	Carbon steel pipe manufacturing	50	300
	Integrated fisheries	23	125
Germany	Ammonia/urea production	1,300	200
Hong Kong	Container shipping line	26	19
Japan	Methanol production	600	250
	Oil industry tubular goods	50	150
	Microalgae cultivation	15	50
Malaysia	Animal feed mill	12	60
Singapore	Agriculture	17	50
Taiwan	Organic shrimp farming	44	300
Turkey	Margarine manufacturing	30	100
United Kingdom	Molecular diagnostic lab	7	15
United States	Wellhead repair facility	19	32

However, although earmarked to create more job opportunities with locals to be given preference, it must be noted that unfortunately, youth unemployment will still remain quite high as the total number of jobs to be created from the listed FDI is only around 1,600, while there is a total of 18,000 unemployed locals in 2017.

3.0 Social Change and Job Futures

A key factor if unemployment is to be significantly and sustainably reduced is for manpower planning to successfully address social change. Policies to reduce unemployment summarised earlier only address current or existing unemployment problems and situation. A few more jobs may be created; there may be better matching of education and (current) manpower requirements, negative mindsets towards private sector and manual occupations may be discouraged and so on.

But what about job futures? Our future landscape is not static and will definitely change. Likewise,

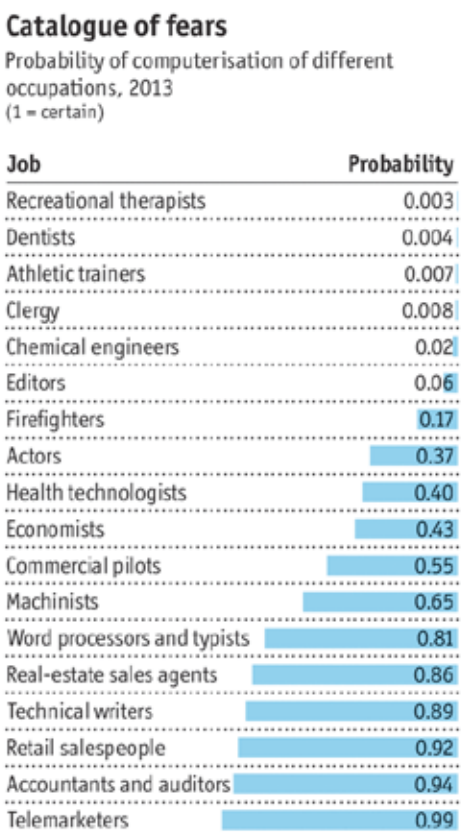
5 CSPS compilation using data from Brunei Development Economic Board (BEDB)

manpower planning and forecasting is not linear and fail proof. As part of a highly interconnected and globalised world system, Brunei will be impacted by major employment game changers. Globally and inevitably locally, the nature and types of jobs have changed and will change dramatically due to automation and related new technology. It is already well documented that automation will cause a loss of 40% of current jobs performed by humans within the next 15 years. Forty seven percent of jobs in Organisation for Economic Co-operation and Development (OECD) countries are highly automatable or will significantly change as a result of automation (OECD, 2018). In Cambodia, Indonesia, Philippines, Thailand, and Vietnam (or 56% labour force), 137 million workers could lose their jobs to automation in the next two decades (ILO, 2016). By 2030, as much as 30% of work done globally could be automated (McKinsey Global Institute, 2017).

Not surprisingly, today's exponential rate of change has shaped at least one "Catalogue of fears" whereby even those in creative industries, such as actors, are seen in terms of "medium range probability" as being replaced by smart algorithms. Educators, translators, editors, designers, writers and many others may meet a similar fate.

Figure 3.

Catalogue of Fears (Frey & Osborne, 2013)



All of these people – or all of us - may join some 200 Wiki entries under "obsolete occupation", the occupations that have already disappeared: Telephone and Switchboard Operators, Typists, Type-setters, Bowling Alley Pinsetters, Human Alarm Clocks, Lamplighter, Factory Lectors, Aircraft Listeners, Elevator Operators, Lady's Companions, and so on. The list of jobs that are currently disappearing is equally long: Meter Readers (water & electricity companies), Travel Agents, Gas Station Attendants, Cashiers, Postmen/Postal Service Mail Sorters/Carriers/Clerks, Film Projectionists, Farmers/Ranchers/other Agricultural Mangers, Agricultural Workers, Fast-food Cooks, Sewing Machine Operators, Data Entry Clerks, Door-to-Door Sales Workers, Street Vendors, Electrical and Electronic Equipment Assemblers, File Clerks, Pre-press Technicians/ Workers, and the list goes on. Indeed, MGI (2013) suggests that "sophisticated algorithms could substitute for approximately 140 million full-time knowledge workers worldwide". While technological progress throughout economic history has largely been confined to the mechanisation of manual tasks, requiring physical labour, technological progress in the twenty-first century can be expected to contribute to a wide range of cognitive tasks, which, until now, have largely remained a human domain. The trend is clear: computers increasingly challenge human labour in a wide range of cognitive tasks.

Anticipated industrial and employment changes may actually occur at an even more accelerated speed, in view of Brunei's recent proclamation to move towards the 4IR. In his National Day address in 2019, His Majesty the Sultan and Yang Di-Pertuan of Brunei Darussalam, for example, stressed the importance for Brunei to keep up with the rest of the world with regards to the digital era.

> "We need to heed the rapid tech progress brought on by the fourth industrial revolution. As a nation with a vision, we should not be left behind in exploring digital economy," (Xinhua, 2019)

In a similar vein, the Minister of Energy, Manpower & Industry emphasized that:

> "In order to maintain competitiveness, we must not only embrace changes that are brought about by the Fourth Industrial Revolution, but also support its implementation to increase competitiveness of the industry (Borneo Bulletin, 2019)

Moving towards the 4IR and the impact that this will have on job futures, how sustainable then are existing jobs in the long run in Brunei? Referring to Figure 3, what types of jobs are in fact offered in these industries? In view of the inevitability of globalisation and automation one is tempted to argue that aside from a handful of managerial posts, it is likely that the jobs created

will be highly automatable job types. On the other hand, if we do not automate and optimize on new technology to catch up, these industries will be also be likely to be uncompetitive and economically challenging. The new FDI jobs created could possibly be obsolete in the future and employment creation here as a strategy is unsustainable in the long run.

4.0 Job Futures and Policy Implications

So, when we look at future FDIs and job opportunities, we need to also assess the type of industry and to ask:

1. What types of jobs will be established on a long-term sustainable basis?
2. What skills and qualifications are required over the long term for these industries?
3. What proportion of the jobs will remain or be automated over time?

Is the recent expansion of investment in education and training, particularly at higher and tertiary levels addressing the manpower requirements of the future or are these capable of resolving a mismatch of education to address only our current economic profile?

One option is to look at the list of priority industry clusters which the Brunei Economic Development Board together with the Prime Minister's Office have formulated for Brunei to focus on to diversify and grow, as shown in Table 4. The prioritised industry clusters are useful targets for us to project where our future jobs will be.

Table 4.

Brunei's Priority Industry Clusters (BEDB, 2019)

<table>
<tr><th>Halal</th><th>Business Services</th><th>Technology and Creative Industry</th><th>Tourism</th><th>Downstream Oil and Gas</th></tr>
<tr><td>Pharmaceutical and Health Supplements</td><td>Transportation and Logistics</td><td>Data Centre</td><td>Eco-Tourism</td><td>Downstream Oil and Gas</td></tr>
<tr><td>Aquaculture</td><td>Financial Services</td><td>Digital Media Internet of Things</td><td>Medical Tourism</td><td rowspan="4">Petrochemicals</td></tr>
<tr><td>Agriculture</td><td rowspan="3">Business Process Outsourcing</td><td rowspan="3">Biotechnology</td><td>Cultural Tourism</td></tr>
<tr><td>Food Processing, Manufacturing and Distribution</td><td rowspan="2">Hospitality</td></tr>
<tr><td>Cosmetics</td></tr>
</table>

At the same time, it is important to adopt a foresight approach when planning for these industrial clusters as a strategic option for employment creation to include as previously stated, scanning for the types of jobs that will be created, the skills and qualifications required for the identified jobs and the sustainability of these jobs in terms of their likelihood of remaining instead of being automated.

5.0 Beyond Automation: Key Trends for Job Futures

Figure 4.

The Future of Work (Dawson, 2012)

Importantly, scanning for future jobs also requires an identification of the future work structures and work cultures, in addition to the skills and knowledge required. As shown in Figure 4, the whole work environment may have to undergo major transformations, perhaps even a paradigm shift. The main issues which will impact in our planning for job futures and need to be deliberated upon include:

1. Job/Market Polarisation?
2. A Jobless Future?
3. New Types of Jobs?
4. Meaningful and Decent Work?

5. Portfolio Careers?
6. Flexible and Freelance work?
7. Flexible Working Hours?
8. Universal Basic Wage?
9. New Skills, Mindsets & Mentality?
10. Lifelong Education?

The future of work has been predicted to be about "the survival of the most adaptable". A number of trends and emerging issues as listed in Figure 4 are already affecting not just the types but also the nature of jobs globally and will affect Brunei eventually, if not already. With the expectation that automation will cause a loss of 40% of jobs currently performed by humans, on the pessimistic side, a brave new world of work (Beck, 2000) where the employed are polarised into a small minority of professional elites, a small minority of lowly paid workers and a jobless future for the majority are now emerging projections of our future. As observed by the ILO (2016):

> "The world is experiencing an unprecedented acceleration in technological advancement and implementation. Indeed, profound shifts are taking place – entire sectors are accommodating these innovations, rendering several human-performed occupations redundant. In the near future, these positions may be eliminated entirely" (ILO,2016, p. iv)

Experiments with 'universal basic income' for example, whereby an income is guaranteed regardless of work status are already underway in some countries to alleviate the problem of a jobless future. On the less pessimistic side, it is argued that we will not be faced with a jobless future but new types of work will emerge, although manpower planners will need to be more adaptable with dramatically changing patterns of work. New mindsets need to be in place not just amongst our youth but also our policymakers and employers as new skills and training and work culture will need to be established.

A dramatic shift in education provision, expanding and emphasising future-proof skills is definitely to be implied as:

> "New technology adoption drives business growth, new job creation and augmentation of existing jobs, provided it can fully leverage the talents of a motivated and agile workforce who are equipped with future-proof skills to take advantage of new opportunities through continuous retraining and up-skilling" (World Economic Forum, 2018, p.v)

Lifelong education in particular, is integral to the reform of education, replacing formal and conventional education, emphasizing instead continuous up-skilling and re-skilling at all stages of life. As proclaimed by His Majesty the Sultan and Yang Di-Pertuan of Brunei Darussalam:

> "Technological advancement as a result of this Fourth Industrial Revolution, however, will challenge our conventional skills, and that requires the enhancement of existing skills and lifelong learning"[6]

Workers of the future will be expected to have "portfolio careers" and often negotiate several roles at one time. Labour will be casualised and non-contractual, part-time based, multitasking work will be the norm, undermining the "one job" and "job for life" narratives that we have inherited. Office-based jobs are likely to diminish and the concept of 9-5-hour day work may be replaced with flexible working hours, home-based work and crowd sourcing. As already shown in the CSPS studies, for example, negative mindsets at work are quite often a reaction to negative employment practices. Therefore, recognising a highly changing work environment and responding appropriately with a work culture and HR practice that engage and are acceptable to youth and the workforce in general is also very important:

> "The meaning of work to people and what type of work they will be willing to accept in the future is important to national well-being and productivity. There is little consensus on likely future job quality and limited discussion in current policy debates" (Hogarth & Bosworth, 2008 as cited in UK Commission for Employment and Skills, 2014, p. 25)

Given such trends and emerging issues, manpower planners, education providers and employers will indeed be required to look into a range of future and often alternative possibilities and a paradigm shift in thinking and approach. In a nutshell, the potential for all countries, Brunei included, is to harness the employment potential of the 4IR:

> "…depend(s) crucially on the ability of all concerned stakeholders to instigate reform in education and training systems, labour market policies, business approaches to developing skills, employment arrangements and existing social contracts" (World Economic Forum, 2018, p.v)

6 Titah Kebawah Duli Yang Maha Mulia Paduka Seri Baginda Sultan Haji Hassanal Bolkiah Mu'izzadin Waddaulah Ibni Al-Marhum Sultan Haji Omar 'Ali Saifuddien Sa'adul Khairi Waddien, Sultan And Yang Di-Pertuan Of Negara Brunei Darussalam, in conjunction with the New Year 2019

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Measuring and Modelling Financial Literacy in Brunei Darussalam

Giuseppe Rizzo

Abstract

Over the past decade, following the global financial crisis, there has been growing interest in measuring financial literacy and understanding its causes. The issue of financial literacy has emerged as a key policy theme also in Brunei Darussalam. Several financial education programmes have been implemented by the Government through its Ministries and Departments with the purpose of improving financial knowledge and behaviour among the public. In 2015, CSPS conducted the first Financial Literacy Survey to support the formulation of the National Strategy for Financial Literacy for Autoriti Monetari Brunei Darussalam (AMBD). The purpose of this paper is to illustrate the main findings of the survey and to identify the key background characteristics correlating with financial literacy and its key components. Our findings suggest that a significant proportion of the population, between 30 and 40%, have inadequate financial literacy and behaviour, and that age, income, education, employment status, and, to a lesser extent, ethnicity can be used to identify six at-risk groups comprising three-quarters of the financially illiterate population.

Keywords: *financial literacy, financial knowledge, financial attitudes, financial behaviour*

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1.0 Introduction

Several definitions of financial literacy are currently in use in the literature, often associated with other similar concepts: financial education, financial capability and financial inclusion.

Financial literacy is primarily related to "financial knowledge" and in particular it has been defined as "the ability to make informed judgments and to take effective decisions regarding the use and management of money" (Schagen, 1997). Financial literacy can have different meanings for countries at different stages of development: while in developed economies it requires knowledge of relatively advanced financial instruments (such as insurance, pensions, mortgages or credit cards), in developing countries it is more related to the concepts of savings, budgeting and wise borrowing, sometimes including also business skills and knowledge.

The Organisation for Economic Co-operation and Development (OECD, 2005) has defined financial education as "the process by which financial consumers/investors improve their understanding of financial products, concepts and risks and, through information, instruction and/or objective advice, develop the skills and confidence to become more aware of financial risks and opportunities, to make informed choice, to know where to go for help, and to take other effective actions to improve their financial well-being". Financial education thus is the process of building knowledge, skills and attitudes to effectively become financially literate.

Financial capability similarly includes information and knowledge, but it is a broader concept, in that it includes the aspects of attitude and behaviour changes (Kempson et al., 2006). Financial inclusion, on the other hand, includes the institutional side as well, in that it requires that financially literate individuals also have access to user-friendly service providers, and appropriate and affordable products responding to the user's needs. Therefore, financial inclusion can also be seen as a necessary condition for financial capability, since the former allows the individuals to put into practice their skills and knowledge, making them financially capable.

There is global evidence that financial literacy is associated with several demographic characteristics, such as gender, age and levels of income and education; ethnic and geographic disparities are also common. Looking at the benefits of financial literacy, it has been shown that financial literacy is correlated with retirement planning, sophisticated investment behaviour, debt and mortgage outcomes for individuals, as well as, use of basic financial instruments (such as a bank account and insurance). All these aspects clearly contribute to individuals' welfare, improving the ability to manage their own resources and reducing the probability of being financially exploited by financial predators. At the aggregate level, improvement in financial

literacy can positively affect GDP growth, through (Xu et al., 2012):

a) enhancement of decision-making in the workforce, resulting in improved productivity;
b) reduction of capital wastage, with improved decisions on starting new businesses;
c) increase in the funds available for the more profitable businesses;
d) reduced need for public welfare;
e) increased economic opportunities; and
f) increases in national savings.

Financial literacy also reduces the risk of systemic issues, improving macroeconomic stability, because of the reduction in financial exposure and in the probability of loan defaults and asset bubbles. It has been frequently suggested that financial illiteracy had a major role in the development of the recent international financial crisis: the subprime mortgage crisis was the result of poor risk management, reckless financial behaviours of households who took mortgages they would not be able to repay or exposed themselves to investment risks without adequate knowledge. Financial illiteracy also worsened the effects of the crisis, because it led to a drop in confidence in financial institutions and regulators, contributing to household overreactions.

Financial markets have become increasingly accessible and complex for small investors. New products and services are becoming widespread, while increasing responsibility is placed onto individuals for saving for their retirement. Although such increased complexity and accessibility have several potential advantages for financial consumers, an unsophisticated and financially illiterate population may face increasing risk of over-indebtedness and poverty.

In light of the growing interest in financial literacy, several countries have undertaken national surveys of financial literacy across their population. Both the World Bank and the OECD have established financial literacy and capability measurement initiatives. The OECD created the International Network on Financial Education (INFE), with the purpose of sharing country experiences and discussing strategic directions and outputs, building on data collection and policy analysis.

The issue of financial literacy has emerged as a key policy theme also in Brunei. During the 6th Legislative Council in 2010, the Minister of Finance II announced that the credit card roll-over balance in the third quarter 2009 was at BND 343.5 million, with a 100% rise from 2005. It was also stated that 44.3% of total credit cards were issued to the lower income group (with monthly earnings of BND 1,500 and below)[1]. During the 8th Legislative Council in 2012, the Minister of Finance II reported that civil servants alone owed the government BND 485 million in unpaid

1 Majlis Mesyuarat Negara, 16 March 2010 (afternoon session)

housing loans and BND 84 million in unpaid car loans[2]. Despite efforts to increase the level of business loans, as of 2011, household sector loans still accounted for 58.2% of all loans issued (AMBD, 2014). The non-performing loan ratio had historically been high (Oxford Business Group, 2013), and in July 2012, the International Monetary Fund (IMF) reported it at 9% (IMF, 2012).

His Majesty the Sultan and Yang Di-Pertuan of Brunei Darussalam, as the Chairman of ASEAN, in his statement during the 22nd ASEAN Summit in April 2013 also emphasised the importance of financial literacy. In September 2013, Brunei hosted the ASEAN Financial Literacy Conference, in which the member countries, international organisations and government agencies shared and exchanged insights on the best practices in promoting financial literacy.

Several financial education programmes have been implemented by the Government of Brunei through its Ministries and Departments in order to increase financial knowledge among the public. For example, Tabung Amanah Pekerja, Ministry of Finance and Economy, has played an active role by giving several financial planning talks to the public, especially focussing on savings for retirement. AMBD with the collaboration of the Ministry of Finance and Economy and Ministry of Education, has also organised several activities to promote financial literacy, for example, National Savings Day 2016 and Global Money Week 2016.

Several measures introduced by AMBD also stimulate the creation of a savings culture and prudent financial management, such as the establishment of ceilings for credit cards and personal loans as well as the establishment of the Credit Bureau, which creates awareness among the public of their credit-worthiness.

Furthermore, Non-Government Organisations and Professional Associations have also played their role in promoting financial education. For example, Junior Achievement (JA) Brunei has conducted several financial education initiatives targeting students from different age groups.

So far, only one major study about financial literacy has been conducted in Brunei. In 2015, the Centre for Strategic and Policy Studies (CSPS) conducted the Financial Literacy Survey to support the formulation of the National Strategy for Financial Literacy, for AMBD. Hence, the purpose of this paper is to illustrate the main findings of the survey, with specific attention to the at-risk profiles. The paper is structured as follows: Section 2 describes the survey methodology and the respondent characteristics; Section 3 presents the overall results of the survey and some cross-country comparison of the main indicators; Section 4 presents the main correlations between the

2 Majlis Mesyuarat Negara, 12 March 2012 (morning session)

financial literacy indices and the background characteristics of the respondents, with the purpose of identifying the key at-risk groups; and, Section 5 concludes the survey by suggesting some policy recommendations.

2.0 Methodology

The data used for this paper come from the national survey of 1,867 Bruneian adults. A multistage sampling technique was used to cover the four districts proportionately, with oversampling of some rural areas. A total of 70 clusters of neighbourhoods (approximately 80 kampongs) were selected for the sample. For each of the 1,521 sampled households, one adult was interviewed. In addition, in some randomly selected households, one additional woman was interviewed (346 respondents).

CSPS developed the content for the Financial Literacy Survey, which was based on model questionnaires from the OECD (OECD, 2011; Atkinson et al., 2012), together with other model questionnaires from other countries. The questions were further localised to suit the Brunei population.

The final survey consisted of 49 questions. The questionnaire used straightforward formats, including 'select one response' questions, 1-5 scalar ratings to measure attitude and opinions, and numeric entry questions. All questions also included 'don't know' responses. The following themes were addressed:

1. Financial Inclusion: inclusion in the banking system, the holding and use of bank accounts and other financial products.
2. Budget Planning and Savings: planning of the household budget, savings habits, reasons for saving and propensity to consume.
3. Bank Account Management: means of payment, monitoring of bank accounts, knowledge of the terms and conditions associated with a bank account.
4. Selection of Financial Products: reasons and criteria for the choice, knowledge and comparison of conditions, choice and use of loans, credit cards.
5. Financial Understanding: inflation and interest rates, risk diversification, responsibility in the payment of loans.

The demographic characteristics of the sample are presented in Table 1, by district and for the entire population.

The sample is evenly split by gender, with a slightly higher proportion of women in Belait and men in Tutong. The sample is approximately uniformly distributed between 30 and 50 years old, with smaller proportions of young adults (less than 30) and elderly (60 and above); the percentage of elderly is higher in the Belait district (21%).

Approximately 85% identified their ethnicity as Malay (or a subgroup of the Malay ethnicity, according to the official classification), while 11% were Chinese. Reflecting the actual population distribution, Chinese have higher representation in Belait (29%), whereas other indigenous groups, such as Iban, have higher representation in Temburong (17%).

Table 1.

Demographic Characteristics

	Belait	Brunei Muara	Temburong	Tutong	Total
Gender					
Female	54.5%	49.8%	50.0%	41.9%	49.6%
Male	45.5%	50.2%	50.0%	58.1%	50.4%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Age group					
Less than 30	12.6%	10.6%	15.3%	11.8%	11.2%
30-39	16.0%	24.5%	19.6%	20.2%	22.5%
40-49	20.4%	27.3%	22.3%	22.2%	25.5%
50-59	29.6%	23.8%	31.9%	28.5%	25.6%
60 and above	21.3%	13.7%	10.9%	17.3%	15.3%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Ethnicity					
Malay	62.1%	90.0%	79.4%	84.3%	84.5%
Chinese	28.6%	7.7%	1.1%	8.2%	11.0%
Other indigenous	4.4%	0.8%	17.4%	5.8%	2.5%
Others	4.8%	1.4%	2.1%	1.8%	2.0%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Marital status					
Married	76.0%	81.5%	77.5%	81.3%	80.4%
Separated/divorced	2.4%	2.4%	5.2%	0.7%	2.3%
Single	16.6%	12.7%	13.0%	13.9%	13.5%

Widowed	5.0%	3.4%	4.3%	4.1%	3.8%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Employment status					
Full-time Government	17.7%	45.8%	45.6%	46.0%	41.2%
Full-time Private	10.6%	6.8%	4.4%	6.2%	7.3%
Full-time Semi-Government	14.5%	6.0%	0.0%	1.8%	6.8%
Self-employed	13.3%	8.4%	7.9%	7.2%	9.0%
Irregular, Part-time	3.0%	1.7%	2.5%	1.4%	1.9%
Retired	18.7%	14.5%	12.3%	19.8%	15.8%
Inactive	21.2%	13.4%	22.2%	14.2%	15.0%
Unemployed	1.0%	3.4%	5.0%	3.4%	3.1%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Educational level					
University level education	14.8%	20.9%	6.2%	18.4%	19.2%
VTE beyond secondary education	13.5%	14.9%	13.9%	15.5%	14.7%
Completed secondary	37.9%	32.5%	31.8%	41.5%	34.5%
Some secondary	23.5%	24.7%	28.2%	14.2%	23.4%
Completed primary	5.3%	2.7%	13.2%	6.1%	3.8%
Some primary	3.2%	1.9%	4.0%	3.3%	2.3%
No formal education	1.7%	2.3%	2.6%	1.0%	2.1%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Household income categories					
Less than 1,000	13.8%	8.8%	21.8%	13.6%	10.5%
1,000-3,500	33.7%	35.2%	60.4%	36.2%	35.8%
3,500-7,000	28.9%	31.4%	16.2%	33.9%	30.9%
7,000-11,000	11.7%	15.4%	1.6%	10.7%	13.9%
11,000 or more	12.0%	9.1%	0.0%	5.6%	8.9%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Mean (B$)	**5,387**	**5,282**	**2,264**	**4,572**	**5,132**
Household size					
Mean	**5.2**	**6.4**	**4.7**	**5.9**	**6.1**

Eighty percent were married, a proportion that is similar across all districts. More than 40% were employed full-time by the government, with some important variation across districts: the percentage is below 18% in Belait and 45% in the other three districts. On the other hand, the

proportion employed in the semi-government or private sector and self-employed is significantly higher in Belait.

Respondents in Brunei-Muara and Tutong had the highest level of education, with 20% of them having University education; in contrast, 20% of the individuals from Temburong had not gone past Primary education. Individuals from Brunei-Muara and Belait had the highest level of household income (average of around B$5,300), closely followed by Tutong (B$4,600). Respondents from Temburong had significantly lower household income, with an average of B$2,300.

Table 2 shows the cross-distribution of interviewees by gender and education, and by age group and education. Women have a higher proportions of university and completed secondary education than men, as well as more pre-secondary education. A higher proportion of men have more partial secondary education and technical education than women.

The higher education levels are strongly associated with the younger population: the proportion of university degree holders decreases from 36% among the young adults (less than 30) to 8% among the elderly. Among the young adults, more than half have more than secondary education, whereas among the elderly more than half have not completed secondary education. With the exception of adults under 30 years of age, completion of secondary education was most often the highest level of educational attainment achieved by all the age groups.

Table 2.

Distribution of Respondents by Gender, Age and Education Level Attained

	University	VTE/ beyond secondary	Completed secondary	Some secondary	Completed primary	Some primary	Informal education	Total
Gender								
Female	20.0%	11.3%	36.6%	22.1%	3.9%	2.7%	3.4%	100.0%
Male	18.5%	18.1%	32.4%	24.7%	3.6%	2.0%	0.8%	100.0%
Total	**19.2%**	**14.7%**	**34.5%**	**23.4%**	**3.8%**	**2.3%**	**2.1%**	**100.0%**
Age group								
Less than 30	36.1%	18.5%	34.1%	10.6%	0.1%	0.5%	0.1%	100.0%
30-39	25.4%	16.5%	32.7%	20.8%	2.0%	2.3%	0.3%	100.0%
40-49	18.9%	15.0%	38.6%	22.8%	3.0%	1.5%	0.2%	100.0%

50-59	13.7%	15.7%	33.5%	27.5%	5.2%	2.1%	2.2%	100.0%
60 and above	7.7%	7.0%	31.9%	30.7%	7.9%	5.6%	9.1%	100.0%
Total	**19.2%**	**14.7%**	**34.5%**	**23.4%**	**3.8%**	**2.3%**	**2.1%**	**100.0%**

3.0 Overall Results of the Survey

3.1 Financial Knowledge

Financial knowledge and understanding are essential for people to make informed decisions and assume appropriate financial behaviour. The survey questionnaire included one section aimed at measuring various aspects of this concept. Eight questions were designed to measure the understanding of basic financial concepts, and they were equivalent to the ones included in the OECD core questionnaire, in order to allow cross-country comparisons. The other 14 questions were intended to measure the understanding of some legal concepts associated with the most common financial behaviours.

The objective of the core questions was to differentiate between individuals with high and low knowledge of the basic financial concepts, using a mix of easy and difficult questions.

Table 3 reports the distribution of the answers. Most respondents were able to calculate a simple division; however, many failed to add a percentage to the principle: 90% gave the correct answer to the simple calculation, but only 47% managed to correctly calculate a percentage. Even fewer individuals, less than one in four, were able to properly identify the effect of compounding interest[3]. However, 83% of the sample understand the concept of paying interest on a loan.

Two-thirds understand how inflation affects the real value of a fixed amount of cash, and 77% knew what the term inflation means.

3 Notice that, following the OECD procedure, the answer to the compound interest question was considered correct only if the respondent had provided a correct answer to the previous easier question about simple interest.

Most individuals, 82%, understand the relationship between risk and return, and even the concept of risk diversification (77%).

The high number of "don't know" answers may indicate that many individuals did not even attempt to answer some of the questions involving calculations (except for the simple division).

Table 3.

Basic Financial Understanding

	Don't know	Incorrect	Correct
Division	3.7%	6.1%	90.2%
Interest paid on a loan	3.9%	13.5%	82.7%
Risk and return	11.6%	6.3%	82.2%
Diversification	9.1%	13.5%	77.4%
Definition of inflation	14.8%	7.8%	77.3%
Time-value of money	12.8%	20.4%	66.8%
Calculation of interest plus principle	29.0%	24.0%	47.0%
Compound interest	30.8%	45.0%	24.2%

Table 4 reports the comparison of the proportion of correct answers to the knowledge questions for the 14 countries that participated to the OECD study. It should be noticed that some questions were formulated differently or significantly amended. In particular, Norway adopted more complicated versions of some questions, and Hungary significantly changed the questions regarding the calculation of the compound interest rate. In this study, the questionnaire adopted one of the two versions of the question about diversification, without the reference to the stock market, which is absent in Brunei; South Africa adopted the same approach for the same question.

Overall, individuals in Brunei seem to have relatively more problems with the questions involving calculations, especially regarding the calculation of simple and compound interest. On the other hand, they score relatively high in the questions about risk and return and diversification, although the latter was a simplified version of the question adopted in most other countries.

Table 4.

Cross-country Comparison – Financial Knowledge Indicators

	Division	Time-value of money	Interest paid on a loan	Calculation of interest plus principle	Compound Interest	Risk & Return	Definition of inflation	Diversi-fication
Brunei	90%	67%	83%	47%	24%	82%	77%	77%
Albania	89%	61%		40%	10%	77%	81%	63%
Armenia	86%	83%	87%	53%	18%	67%	57%	59%
British Virgin Islands	84%	74%	99%	63%	20%	83%	87%	41%
Czech Republic	93%	80%	88%	60%	32%	81%	70%	54%
Estonia	93%	86%	84%	64%	31%	72%	85%	57%
Germany	84%	61%	88%	64%	47%	79%	87%	60%
Hungary	96%	78%	95%	61%	46%	86%	91%	61%
Ireland	93%	58%	88%	76%	29%	84%	88%	47%
Malaysia	93%	62%	93%	54%	30%	82%	74%	43%
Norway	61%	87%	61%	75%	54%	61%	68%	51%
Peru	90%	63%		40%	14%	69%	86%	51%
Poland	91%	77%	85%	60%	27%	48%	80%	55%
South Africa	79%	49%	65%	44%	21%	73%	78%	48%
United Kingdom	76%	61%	90%	61%	37%	77%	94%	55%

In addition to the question adopted by the OECD study, this survey included other questions aimed at measuring the understanding of other legal and financial concepts relating to common household behaviours.

Table 5.

Financial Understanding of Loan Regulations

	Don't know	Incorrect	Correct
Bankrupt cannot take other loans	5.5%	4.3%	90.2%
Creditor can sue the borrower	7.2%	7.5%	85.3%
Loan guarantor responsibility	3.5%	17.6%	78.9%
Creditor can hire a professional collector	16.4%	25.5%	58.1%
Bankruptcy will stay in the credit assessment	36.2%	7.4%	56.4%
Creditor can tell the Credit Bureau	26.1%	20.5%	53.4%
Creditor can discuss with employer	14.0%	50.3%	35.7%
Bankrupt does not have to pay	19.7%	48.3%	32.0%
Joint loan responsibility	6.0%	67.1%	26.8%

In terms of loan responsibility (see Table 5), almost 80% know that a loan guarantor is liable to repay a loan in case of default of the main borrower. However, only one in four individuals knows that in a joint name loan, either debtor is liable for the entire amount. In fact, over half of the sample believes that each would be liable for only half.

Eighty-five percent of the sample knows that a creditor can sue the borrower in case of default. Only half of the respondents know that a creditor can notify the insolvency to the Credit Bureau, and more than one in four did not try to give an answer, implying a lack of awareness about the institution itself. Half of the individuals think that the creditor can discuss the borrower's debts with her employer, raising some concerns about the prevalence of such practices in Brunei.

Most people know that in case of bankruptcy, the insolvent person would not be able to take out other loans. Fifty-six percent knows that such bankruptcy would stay in their credit assessment records for 5 years, but more than one-third did not attempt to answer this question, therefore reinforcing the need for increasing awareness about the Credit Bureau and its activities.

Table 6 shows the answers to the questions regarding the terms and conditions of credit cards. Sixty percent of the sample knows that the owner of a lost or stolen credit card is responsible for unauthorised charges only until the loss/theft is reported. This percentage increases to 70% among credit card holders. There is more confusion about the timing of interest charges: only one in four individuals knows that they begin after the due date for payment; even among credit card holders, more than half gave the wrong answer, with 20% of them thinking that they begin on the day of transaction.

Table 6.

Understanding of the Terms and Conditions Applied to Credit Card

	Holding credit card		
	No	Yes	Total
Responsibility in case of stolen or lost credit card			
Don't know	27.9%	13.5%	23.0%
Incorrect	17.1%	17.2%	17.1%
Correct	55.0%	69.2%	59.9%
Total	100.0%	100.0%	100.0%
Interest charged on credit card			
Don't know	41.8%	11.8%	31.6%
Incorrect	37.1%	50.7%	41.7%
Correct	21.0%	37.6%	26.7%
Total	100.0%	100.0%	100.0%

Table 7.

Understanding of Car Insurance Coverage

	Comprehensive	Third party	Don't know
Replacement of stolen car	60.4%	89.6%	32.6%
Other person's bodily injury and death	65.0%	15.8%	27.6%
Other person's property damage	56.5%	23.7%	29.3%
Damage to own car from accident caused by oneself	64.7%	83.8%	22.1%

Percentages of correct answers

Most of the sample has a clear idea about the coverage of comprehensive car insurance (Table 7): between 56% and 65% of them understand that it covers replacement for a stolen car, the other person's damages and their own damages. On the other hand, most of the respondents think that a third-party cover does not even pay for the other person's bodily injury or property damage.

3.2 Financial Attitude

The second aspect measured by the survey was related to attitudes and preferences toward long term financial plans. This aspect is important because such psychological traits can affect people's

behaviour, and it may be independent from budget constraints: for example a person who cannot afford to save or plan for retirement may still have an attitude toward planning for the long term whenever the opportunity arises. Measuring such an attitude can provide a more accurate representation of the person's financial literacy.

The questionnaire included the three core attitude statements from the OECD survey, and the results are presented in Table 8. Respondents tend not to live for the day, as almost three-quarters of the sample disagreed with the first statement, and 57% completely disagreed.

Almost two-thirds of the respondents declared having a preference for saving over the long term rather than spending, and one-fifth of the individuals put themselves at the midpoint. Almost half of the sample completely disagreed with the statement.

Table 8.

Attitude Toward Planning for the Future

	Completely disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Completely agree	Total
I tend to live for today and let tomorrow take care of itself	57.1%	16.5%	9.2%	7.0%	10.2%	100%
Instead of having to save money over a long term, I rather spend the money	47.9%	14.8%	20.8%	8.2%	8.4%	100%
Money is there to be spent, and less for saving	26.3%	15.9%	34.6%	9.6%	13.6%	100%

The last statement received more mixed responses; with over one-third putting themselves at the midpoint and almost one-fourth agreeing that they had a preference for spending.

Table 9 shows a cross-country comparison presenting the percentage of the sample disagreeing with the three sentences. There is large variability across countries, especially regarding the last two columns. On average, Bruneians seem to have a strong preference toward planning for the long term, and saving rather than spending. The last section of the paper will analyse how these attitudes vary across the sample, trying to identify the characteristics of the subpopulation with "negative attitudes".

Table 9.

Cross-country Comparison – Financial Attitude Indicators

	Living for today	Prefer spending rather than saving	Money is there to be spent
Brunei	74%	63%	42%
Albania	66%	61%	45%
Armenia	60%	8%	2%
British Virgin Islands	66%	60%	31%
Czech Republic	69%	45%	29%
Estonia	49%	39%	24%
Germany	65%	49%	26%
Hungary	68%	56%	33%
Ireland	54%	38%	30%
Malaysia	57%	47%	26%
Norway		57%	
Peru	72%	64%	45%
Poland	45%	19%	12%
South Africa	60%	48%	39%
United Kingdom	50%	35%	29%

Percentages who disagree with the statement

3.3 Financial Behaviour

The combination of individuals' knowledge, attitudes and external factors ultimately influences individuals' financial behaviour. This is likely the most important component of financial literacy, as it often determines the financial well-being of the individuals.

The OECD core questionnaire included several questions regarding this important aspect. Most of the questions were combined into 8 indicators designed to measure the financial behaviour of individuals. A few additional questions were then added in order to capture further details about some specific behaviour, such as bank account monitoring, credit card repayment schemes, and frequency of overspending.

A financially literate person should at least share some responsibility over the management of household finances, and the planning and budgeting of household and personal spending. Two questions were used to measure this aspect. Table 10 shows that one-fourth of the respondents are

solely responsible for household finance management, 56% share some responsibility, whereas 18% do not share any responsibility. Almost two-thirds of the households have a plan for their spending. These two questions were combined in order to identify those individuals who share responsibility over money management and keep a budget. Overall, 53% of the individuals have responsibility and live in a household keeping a budget.

Table 10.

Household Budget Planning and Responsibility

	Household budget		
	No	Yes	Total
Who is responsible for household finances			
Nobody	0.4%	0.3%	0.8%
Someone in the family	5.5%	11.8%	17.2%
You and someone else	18.6%	**37.6%**	56.2%
You	9.9%	**15.9%**	25.8%
Total	34.4%	65.6%	100.0%

Financial literacy requires that individuals consider whether they can afford potential purchases. Over 90% of the individuals declared that they carefully consider whether they can afford a purchase (see Table 11). Two-thirds of the respondents declared that they usually pay their bills on time, but a significant one-fourth put themselves at the midpoint. Almost 9% of the sample disagreed with the sentence, admitting that they do not pay their bills on time. More than 80% agreed with the third statement, declaring that they keep a close personal watch on their financial affairs. However, more than 10% was at the midpoint, and almost 7% disagreed. The majority of the sample have long term financial goals and strive to achieve them. In contrast, more than 7% do not have long term financial goals, and 12% seem not to consistently work towards these goals.

Table 11.

Qualitative Behaviour Statements

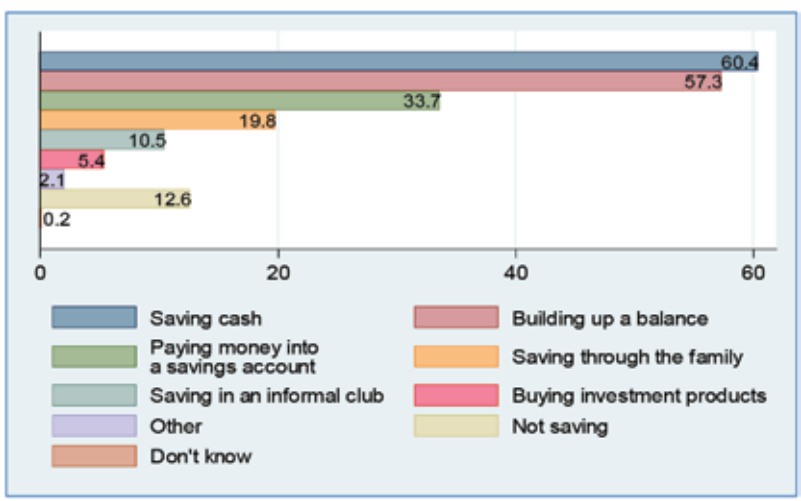
	Completely disagree	**Somewhat disagree**	**Neither agree nor disagree**	**Somewhat agree**	**Completely agree**	**Total**
Before I buy something, I carefully consider whether I can afford it	2.2%	2.3%	5.2%	10.5%	79.7%	100%

I usually pay my bills on time	2.2%	6.4%	24.7%	18.1%	48.6%	100%
I keep a close personal watch on my financial affairs	3.3%	3.3%	10.9%	18.3%	64.3%	100%
I set long term financial goals and strive to achieve them	3.2%	4.0%	12.3%	22.8%	57.8%	100%

A fundamental component of good financial literacy is saving behaviour. Individuals were asked whether and how they have been actively saving in the last 12 months (Figure 1). Eighty-seven percent of the sample had been saving in the previous 12 months. The most common way of saving, however, is saving cash or building up a balance in their bank account. For international comparison, this type of behaviour is not considered as active savings, because individuals are just using a passive approach. Therefore, active saving will include all types of savings except the passive approach of building up a balance in a bank account or in cash. One-third of the sample pays money into a savings account and almost one in five respondents gives money to the family to save on their behalf. Ten percent use informal clubs and only 5% of the individuals buy more sophisticated financial products. Almost 13% of the individuals had not been saving in the previous year.

Figure 1.

Saving Behaviour



The questionnaire also indirectly asked about the total amount of savings, in relation to the normal living expenses. Almost one-third of the sample would be able to cover at least six months of their living expenses, whereas about 60% would manage to cover no more than two months. Table 12

shows how the amount of savings is clearly correlated to the per-capita income groups (defined as the ratio of household income over household size). In the two lowest income groups, most of the individuals would not be able to cover one month of living expenses.

Table 12.

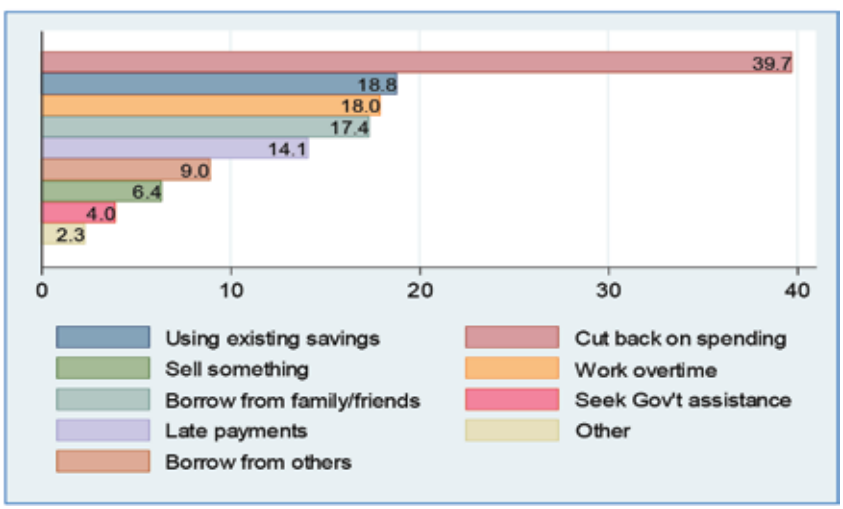
Amount of Savings by Income Groups

	Per-capita income groups					
	Up to $200	$200 - $450	$450 - $1200	$1200 - $2500	Over $2500	Total
If you lost your main income, how long could you cover living expenses						
Less than a week	43.9%	26.0%	18.9%	13.6%	6.1%	21.1%
Two to four weeks	20.5%	22.2%	13.3%	10.6%	8.1%	15.2%
One to two months	17.5%	27.5%	22.9%	23.2%	15.9%	23.1%
Three to five months	5.6%	8.6%	9.3%	9.8%	14.5%	9.2%
Six months or more	12.6%	15.6%	35.7%	42.7%	55.4%	31.3%
Total	100%	100%	100%	100%	100%	100%

The participants were also asked whether in the past 12 months they found themselves spending more than they earn: 55% stated that they had overspent at least once in the previous year. These people were asked how they made ends meet. Almost 40% stated that they cut back on spending (see Figure 2), almost 19% used existing savings, and 18% worked overtime, trying to earn extra money. More than 17% borrowed food or money from family or friends, 14% made late payments, and 9% borrowed from other sources (taking new loans, using cash advances on their credit card, or pawning something). Four percent sought assistance from Government agencies.

Figure 2.

How People Make Ends Meet

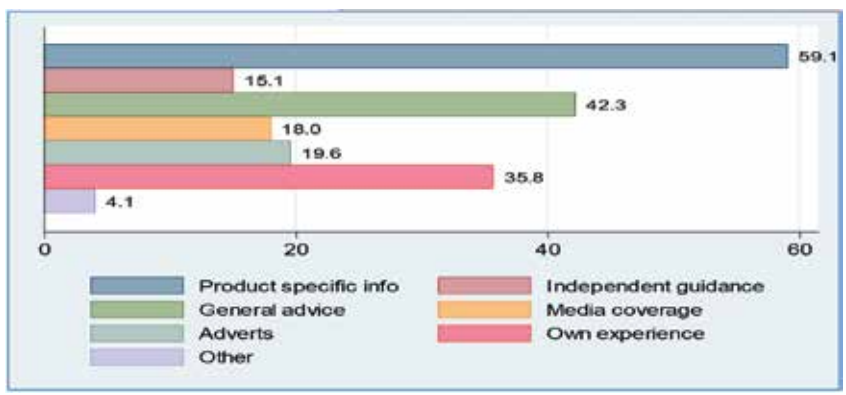


One of the key aspects of the definition of financial literacy is that a person should be able to make informed decisions regarding the management of money. It is therefore essential to investigate how people make their decisions, and what kind of information they use.

Figure 3 shows the sources of information used to make the decision about which financial product to choose. Fifty-nine percent of the sample used information from the specific product they were choosing, such as leaflets or advice from staff at the provider's branch or website. General advice from friends and relatives influenced the decision of about 42% of the respondents. Over one-third of the sample made their decision using their own personal experience. Only 15% of the sample used independent information, such as best-buy guidance from specialised magazines and websites, or recommendations from independent financial advisors.

Figure 3.

Sources of Information About Product Choice



Following the same methodology adopted by the OECD study, an indicator was created awarding one point for people who had chosen a product in the last two years, trying to shop around or gather any information; two points for people who had chosen a product in the last two years, shopping around and gathering independent information. Individuals scored 0 if they had chosen without making any comparison or gathering information, or if they had not chosen any new product. Less than 7% of the sample managed to score 2 points, whereas two-thirds scored 1 point.

Using the eight indicators adopted by the OECD study to measure financial behaviour, Table 13 compares the percentages of individuals having "good behaviour" across the participating fourteen countries and Brunei.

The findings of this survey confirm that in Brunei, as in other countries, there is a lack of active and informed market participation: only 7% of the individuals compare products across different

providers and seek independent information and advice. Although the percentage of individuals making comparisons across providers or gathering some information is relatively high (66%), Bruneians seem to have problems in finding independent financial information and advice.

In Brunei, the relatively small number of people paying their bills on time is a concern: only two thirds of the respondents usually pay their bills on time. Only in South Africa and Malaysia is such a percentage comparatively low.

Another concern is the comparatively low proportion of individuals actively saving: half of the individuals do not actively save, as compared to 15-30% in other high income countries. This finding is also reflected in the relatively low percentage of individuals who do not need to borrow to make ends meet. In Brunei, one-fourth of the individuals have resorted to borrowing the last time their income fell short of their expenditure, as compared to less than 15% in the other developed economies.

Table 13.

Cross-country Comparison – Financial Behaviour Indicators

	Qualitative statements						Financial product choice		
	Making considered shopping	Paying bills on time	Personal watch on finance	Setting financial goals	Having a budget and being responsible	Actively saving	After gathering some info OR shopping around	After shopping around AND using independent info	Not borrowing to make ends meet
Brunei	90%	66%	81%	79%	53%	51%	66%	7%	76%
Albania	87%	77%	71%	30%	59%	42%	49%	2%	69%
Armenia	91%	94%	81%	58%	51%	36%	42%		53%
British Virgin Islands	87%	83%	80%	68%	43%	83%	70%	2%	87%
Czech Republic	75%	85%	76%	36%	37%	72%	28%	10%	89%
Estonia	68%	83%	78%	41%	28%	36%	24%	8%	78%
Germany	82%	96%	87%	61%	22%	86%	52%	5%	96%
Hungary	86%	82%	71%	52%	31%	27%	48%	4%	86%
Ireland	83%	85%	85%	56%	54%	53%	39%	10%	86%
Malaysia	92%	69%	78%	64%	74%	97%	39%	3%	79%
Norway	72%	79%	89%	59%	25%	71%	57%	5%	93%

Peru	91%	86%	82%	71%	49%	62%	52%	4%	73%
Poland	70%	78%	81%	46%	54%	51%	32%	2%	79%
South Africa	83%	61%	65%	55%	43%	53%	56%	3%	74%
United Kingdom	77%	89%	80%	43%	43%	68%	29%	16%	91%

3.4 Financial Literacy Indices

The previous section provided a detailed picture of the various indicators collected through the survey, showing, for the most important indicators, some of the correlations with the demographic characteristics, and a cross-country comparison with the findings of the OECD-INFE study.

In order to provide an overall picture of the levels of knowledge, attitude and behaviour in Brunei, in this section the answers to the core questions are aggregated into three synthetic partial indicators, and one global indicator of financial literacy. These indicators use the same definition and methodology adopted by the OECD study; therefore the resulting distribution can be compared with the other 14 participating countries.

Table 14 reports the descriptive statistics for the three partial indices and the global index. The Financial Knowledge Index (FKI) is determined counting the number of correct answers to the eight core questions measuring the understanding of basic financial concepts, i.e. division, time-value of money, interest paid on a loan, calculation of simple interest, compound interest, risk and return, definition of inflation, and risk diversification. The score is then rescaled to take values from 0 to 100.

The questions regarding the attitude towards planning for the long term were on a five-point scale. The Financial Attitude Index (FAI) is therefore determined by averaging the score achieved in each of the three attitudinal questions and rescaling to take values from 0 to 100.

The Financial Behaviour Index (FBI) is determined counting the number of correct behaviours exhibited by each respondent. The score is then rescaled to take values from 0 to 100. The behaviours considered are the same used by the OECD study, i.e.:

- Making considered purchases.
- Paying bills on time.
- Having a close personal watch on financial affairs.
- Setting long term financial goals.

- Having a household budget and being responsible for the management of it.
- Actively saving.
- Choosing financial products after gathering some information or shopping around.
- Choosing financial products after shopping around and using independent info.
- Not needing to borrow to make ends meet.

The Financial Literacy Index (FLI) is calculated by adding the three raw partial indices. It should be noted that since the three raw indices have different scales, the importance of each is implicitly determined by their maximum levels (9 for the raw FBI, 8 for the raw FKI, and 5 for the raw FAI). Therefore, financial behaviour and knowledge are significantly more important than financial attitude. Indeed, the former two aspects are generally considered the most important as they are the typical target of financial education efforts, and ultimately affect the financial well-being of individuals. The FLI score is then rescaled to take values from 0 to 100.

Table 14.

Descriptive Statistics of the Financial Literacy Indices

	Average	Standard Deviation	Median	Minimum	Maximum
Financial Knowledge Index	68.470	20.825	75	0	100
Financial Attitude Index	68.350	23.564	66.667	0	100
Financial Behaviour Index	63.898	18.030	66.667	0	100
Financial Literacy Index	66.497	14.434	68.254	4.762	100

Table 15 presents a cross-country comparison of the partial and global financial literacy indices. The cross-country comparison is made in terms of average score, percentages of respondents with high score, for each of the three partial indices, and in terms of number of high scores achieved in each component of the Financial Literacy Index.

For the FKI, the average scores put Brunei around the middle of the ranking. It should be noticed that Hungary and Norway used a rather different formulation of the questions. Bruneians seem to score significantly better than some developing countries and slightly less than some advanced economies.

Table 15.

Cross-country Comparison of Financial Literacy Indices

	Average scores				Percentage with high score			Financial Literacy Segments (number of high scores)			
Country	**FKI**	**FAI**	**FBI**	**FLI**	**FKI**	**FAI**	**FBI**	**None**	**1**	**2**	**3**
BVI	68.9	64.0	67.2	67.2	57%	67%	71%	8%	22%	36%	34%
Germany	71.3	60.3	65.8	66.8	58%	63%	67%	8%	27%	33%	32%
Brunei	**68.5**	**68.3**	**63.9**	**66.5**	**53%**	**74%**	**59%**	**9%**	**26%**	**34%**	**31%**
Hungary	76.8	66.0	54.6	65.2	69%	69%	38%	9%	29%	38%	24%
Malaysia	66.4	55.8	66.4	64.4	51%	53%	67%	10%	32%	35%	23%
Ireland	70.4	54.8	62.3	64.0	60%	49%	57%	13%	29%	36%	22%
Norway	64.8	64.0	61.7	63.3	40%	57%	59%	14%	31%	40%	15%
Czech Republic	69.8	61.3	57.6	62.9	57%	62%	48%	15%	27%	33%	25%
Peru	59.0	68.0	63.8	62.8	41%	71%	60%	10%	28%	42%	20%
UK	68.9	53.5	61.3	62.7	53%	49%	51%	17%	33%	32%	19%
Albania	60.1	67.0	54.2	58.9	45%	69%	39%	13%	36%	38%	14%
Estonia	71.5	52.3	50.2	58.7	61%	46%	27%	17%	42%	30%	10%
Poland	65.4	40.5	55.0	56.2	49%	27%	43%	26%	38%	28%	8%
South Africa	57.1	56.3	55.1	56.1	33%	54%	43%	22%	39%	27%	13%
Armenia	63.8	32.8	56.2	54.6	46%	11%	41%	32%	42%	24%	3%

The OECD study classifies those individuals scoring at least 75 as having sufficient financial knowledge, since this is the modal score for most of the participant countries. As in many other countries, nearly half of the Bruneians do not achieve such score. Therefore there is considerable room for improvement in this important area of financial literacy.

In Brunei, most individuals have positive attitudes toward planning for the future. Bruneians actually top the FAI ranking, with nearly three-quarters reaching a high score (above 50, following OECD definition). However, it should be noted that these generally positive attitudes do not necessarily translate into positive behaviours, as shown in the next subsection. Although financial attitude is important, other key factors obviously affect financial behaviour, such as knowledge and financial resources.

In terms of financial behaviour, the average score put Brunei in the second tier of this ranking, behind Germany, Malaysia, and British Virgin Islands. The OECD study classifies the individuals scoring at least 67 as having good financial behaviour. More than 40% of Bruneians do not achieve such a score. These are the individuals that would benefit from initiatives aimed at improving their financial behaviour and literacy.

In terms of overall financial literacy, most countries, including Brunei, score between 62 and 67. The average score of Bruneians put them third in the ranking, with the high financial attitude compensating for the about average financial knowledge.

The population was also segmented according to the number of sufficient partial scores they gained. In Brunei, 10% of the sample has no sufficient score in any of the partial components, and more than one- third has no more than one sufficient score only. On the other hand, almost one -third of the respondents achieved sufficient scores for each component.

The cross-country comparison of the different components of financial literacy shows that overall the Bruneian population does not score significantly below other comparable economies. However, as in the other countries, there are large portions of the population that could benefit from improving their literacy, especially in the knowledge and behaviour components.

4.0 Correlations of Indices and Population Groups

The previous section has shown that in Brunei there is a significant proportion of the population, between 30% and 40%, with inadequate financial literacy and behaviour.

This section presents an assessment of the level of financial literacy across different socio-demographic characteristics and behaviours. Various methodologies are used to identify the statistically significant differences across groups: (a) comparisons of the means (ANOVA), (b) quantification of the population with at least sufficient scores, (c) construction of clusters based on the global and partial indicators, (d) regression analysis in order to gain further insights into the factors correlating with financial literacy.

4.1 Comparison of the Means of the Indices

The comparison of the means of the global Financial Literacy Index (Table 16) shows that:

- There is no significant difference between men and women;

- Age is correlated with FLI: post-hoc comparisons reveal that individuals 60 years old and above have significantly lower literacy than others (61);
- There is significant variation across ethnic groups: Chinese have the highest literacy (71) and other indigenous groups have the lowest (59);
- People living in Temburong have the lowest financial literacy (59); in general, it has been found that people living in rural areas have lower financial literacy;
- Individuals not involved in the management of household finances have the lowest literacy (61); people sharing responsibility with someone else have higher literacy than those who have sole responsibility;
- FLI is correlated with employment status: individuals working full-time have the highest score (70), whereas irregular workers, unemployed, and inactive have the lowest (61, 60, and 58, respectively);
- There is strong correlation between the level of education and FLI: university degree holders have the highest FLI (76), whereas individuals without formal education have the lowest (45).

Table 16.

Financial Literacy Index by Demographic Characteristics

	Mean	Median	p-value
Gender			
Male	67.02	68.25	0.1173
Female	65.97	68.25	
Age group			
Less than 30	66.57	66.67	0.0000
30-39	68.19	68.25	
40-49	68.36	69.84	
50-59	66.45	68.25	
60 and above	60.93	61.90	
Ethnicity			
Malay	66.18	66.67	0.0001
Chinese	70.54	73.02	
Other indigenous	59.47	58.73	
Others	66.27	66.67	

District			
Belait	64.97	65.08	0.0005
Brunei-Muara	67.02	68.25	
Temburong	59.42	60.32	
Tutong	67.16	68.25	
Who is responsible for money decisions			
Someone else in the family	60.74	61.9	0.0000
You and someone else	68.84	69.84	
You	65.50	66.67	
Employment status			
Full-time	69.84	69.84	0.0000
Self-employed	66.95	66.67	
Retired	64.51	66.67	
Irregular, Part-time	60.64	60.32	
Unemployed	59.65	60.32	
Inactive	58.23	58.73	
Educational level			
University	75.75	76.19	0.0000
VTE beyond secondary	71.05	71.43	
Completed secondary	66.42	66.67	
Some secondary	60.46	61.90	
Completed primary	58.48	55.56	
Some primary	54.44	53.97	
No formal education	44.65	42.86	

Table 17 shows that FLI is correlated with income level and stability. The FLI is lowest for individuals with an average per capita income lower than B$ 200 (57) and highest for individuals with per capita income above B$ 2,500 (77). Furthermore, individuals with stable income have the highest FLI (70), whereas individuals with unstable income have low FLI (58).

Table 17.

Financial Literacy Index by Income Group and Stability

	Mean	Median	p-value
Per-capita income groups			
Up to $200	56.63	57.14	0.0000
$200 - $450	59.20	60.32	
$450 - $1200	68.66	69.84	
$1200 - $2500	72.97	74.60	
Over $2500	76.64	76.19	
Stable household income			
No	58.18	58.73	0.0000
Sometimes	63.17	65.08	
Yes	70.38	71.43	

Table 18 shows the comparison of the three partial indices across the different demographic characteristics. It can be noted that each characteristic presents different correlations with the partial indicators. In particular:

- Men tend to have higher knowledge, but lower attitude. There is no significant difference in behaviour. One possible reason why the difference in knowledge is not reflected in behaviour is that behaviours are often undertaken at the household level.
- Similarly to what has been shown for the FLI, all three partial indicators are lowest for the older age group (60 and above). This may be explained by the difficulty of older people in keeping up with financial innovations, by their lower average level of education, and by their different saving behaviour.
- The average FKI and FBI significantly vary across ethnic groups: Chinese have the highest FKI and FBI, whereas the other indigenous groups have the lowest. There is no significant difference in attitudes across ethnic groups.
- District of residence is correlated with FBI and FKI. Individuals from Temburong have the lowest FKI and FBI; people from Belait have low FBI as well.
- Individuals not having any responsibility over the management of household finances have the lowest FKI and FBI. People sharing responsibility with someone else have higher indices as compared to those who have sole responsibility.

- Inactive and unemployed individuals have the lowest FKI and FBI; retired have low financial knowledge; irregular and part-time workers have low attitude, possibly because their unstable income do not allow them to properly plan for the longer term.
- Education level is strongly correlated with knowledge and behaviour, and somewhat less with attitudes. Since education is correlated with income, this may reflect on the one hand a "knowledge effect", and on the other fewer financial resources, which in turn can cause some negative behaviour (need to borrow and lack of savings).
- All three partial indicators significantly increase with income. Some negative behaviour, such as not saving or needing to borrow, are usually linked to the lower income groups, although income itself does not necessarily reduce the ability to gain knowledge and have good attitudes.

Table 18.

Partial Indices by Demographic Characteristics

	FKI	p-value	FAI	p-value	FBI	p-value
Gender		0.0000		0.0072		0.6371
Male	70.97	+	66.61	-	63.69	
Female	65.94	-	70.12	+	64.11	
Age group		0.0005		0.0002		0.0004
Less than 30	69.97		67.34		63.11	
30-39	68.79		70.55		66.6	
40-49	70.78		70.96		65.04	
50-59	69.32		66.91		63.65	
60 and above	61.62	-	63.91	-	59	-
Ethnicity		0.0000		0.3425		0.0193
Malay	68.22		67.82		63.63	
Chinese	73.35	+	72.73		67.06	+
Other indigenous	56.18	-	64.88		59.64	-
Others	67.61		71.04		62.96	
District		0.0008		0.8164		0.0005
Belait	68.75		68.46		60.05	-
Brunei-Muara	69.04		67.98		64.79	+
Temburong	57.61	-	69.85		56.1	-

Tutong	67.28		70.01		65.8	+
Household responsibility		0.0001		0.0171		0.0000
Someone else in the family	64.80	-	65.71		54.93	-
You and someone else	70.74	+	69.63	+	66.79	+
You	65.89		67.27		64.32	
Employment status		0.0000		0.0168		0.0000
Full-time	71.88		70.1		67.91	+
Self-employed	69.8		69.65		63.21	
Irregular, Part-time	67.17		57.71	-	56.14	
Retired	67.21	-	64.81		61.97	
Inactive	58.21	-	66.11		54.71	-
Unemployed	61.22	-	68.84		54.16	-
Educational level		0.0000		0.0000		0.0000
University	80.42	++	74.43	+	72.18	++
VTE beyond secondary	75.28	+	68.67		68.36	+
Completed secondary	67.76		68.69		64.19	
Some secondary	61.25	-	64.57		57.94	-
Completed primary	55.52	-	67.27		56.98	-
Some primary	58.23	-	59.5	-	48.81	--
No formal education	37.01	--	57.53	-	45.71	--
Per-capita income groups		0.0000		0.0002		0.0000
Up to $200	57.39	-	61.16	-	53.87	-
$200 - $450	60.15	-	64.18	-	56.15	-
$450 - $1200	70.45		70.33		66.33	
$1200 - $2500	76.6	+	71.21		70.42	+
Over $2500	79.74	+	75.23		74.5	+

4.2 Identification of the At-risk Groups

In order to identify the at-risk groups, it is first necessary to classify the individuals depending on their levels of knowledge, attitude, behaviour and overall literacy. In this subsection, the respondents were disaggregated, depending on their score relative to the median: individuals with score greater or equal to the median are considered sufficiently literate. This criterion matches the

same used by the OECD for FKI and FBI, because the medians are equal to the scores considered sufficient in that study. The criterion is more restrictive for the FAI, because the median (67) is higher than the score considered sufficient by the OECD (50). The comparisons shown in Table 19 reflect the correlation identified in the previous subsection. However this methodology provides a picture of the proportion of the population that needs to increase their literacy.

More than half of the women need to improve their knowledge. Although the reduced knowledge is not reflected in lower behaviour or literacy, an improvement in the familiarity with certain financial concepts may lead to better decisions and overall well-being.

Table 19.

Percentage of Individuals with Sufficient Score by Socio-Demographic Characteristics

	Literacy	Knowledge	Attitudes	Behaviour
Gender				
Female	50.17	47.84	67.54	58.95
Male	50.92	58.45	63.4	59.99
Age group				
Less than 30	48.41	54.89	67.35	61.68
30-39	55.25	53.18	70.68	66.22
40-49	55.77	56.93	69.38	60.66
50-59	50.35	54.15	62.96	57.29
60 and above	36.81	44.06	53.97	49.62
Ethnicity				
Malay	49.58	52.74	64.74	58.56
Chinese	62.54	64.29	71.05	67.93
Other indigenous	31.54	23.99	59.96	55.07
Others	49.19	47.12	71.34	57.34
District				
Belait	45.18	52.06	65.83	51.24
Brunei-Muara	52.26	54.87	64.93	61.5

Temburong	27.24	26.34	71.31	38.9
Tutong	53.31	51.04	66.62	63.71
Employment status				
Full-time	59.37	60.52	69.91	69.36
Self-employed	49.36	54.84	65.29	52.33
Irregular, Part-time	34.23	53.27	59.08	56.29
Retired	48.56	51.5	54.81	56.64
Inactive	28	31.51	60.82	35.97
Unemployed	27.86	33.91	67.13	37.44
Educational level				
University	75.53	78.35	75.03	77.91
VTE beyond secondary	64.02	67.42	68.28	68.12
Completed secondary	50.11	50.28	65.3	60.65
Some secondary	31.01	38.2	59.83	44.61
Completed primary	29.91	21.15	62.48	46.37
Some primary	23.53	35.77	49.18	32.04
No formal education	16.56	13.62	44.13	25.76
Per-capita income groups				
Up to $200	24.78	35.51	52.93	38.01
$200 - $450	29.21	34.23	58.62	41.09
$450 - $1200	56.46	57.73	69.25	65.21
$1200 - $2500	69.3	68.47	70.44	74.05
Over $2500	76.47	77.61	74.07	81.54

Only one-third of the older age group and less than half of the younger group have sufficient financial literacy. For the former group, this is a result of lacking knowledge, attitudes, and behaviour. For the younger age group, this is largely explained by certain negative behaviour, in particular, these individuals – although already adults – do not usually share any responsibility in the management of household finances, even if they are economically active and well educated.

Almost 70% of the individuals of the other indigenous groups have low literacy, and more than three-quarters have limited knowledge. As for knowledge, indigenous people are extremely lacking in the basic numeracy skills (division, calculating a percentage), but somewhat more familiar with the concepts of inflation and risk diversification. Indigenous people have worse attitudes and behaviour as well, with a significant propensity to make impulsive purchases.

Around 75% of the respondents from Temburong have insufficient literacy and knowledge, and almost two-thirds have negative behaviour. This difference can be partially explained by the higher representation of indigenous groups in this district, and by the lower average income. Indeed, they are significantly lacking in numeracy skills, similarly to what has been found for the indigenous people. Furthermore, in terms of behaviour, they tend to have less savings and to rarely keep a personal watch on their financial affairs.

Almost three-quarters of the inactive and unemployed have low literacy, and around two-thirds of them have low knowledge and behaviour. These groups are lacking in every aspect of financial knowledge, and tend to show almost all the identified negative behaviours.

Between 70% and 85% of the individuals who have not completed secondary education have low financial literacy and knowledge. Among the individuals who have not completed primary education, 70% have negative behaviours, and more than half have negative attitudes as well. These groups are lacking in every aspect of financial knowledge, and tend to show all the identified negative behaviours.

Three quarters of the individuals with a per capita income lower than B$450 have low financial literacy, two-thirds have low financial knowledge, and 60% have negative financial behaviour. These groups are lacking in every aspect of financial knowledge, and tend to show all the measured negative behaviours; in particular, they often need to borrow to make ends meet and they rarely manage to save.

Table 20 summarises the groups with sufficient and insufficient scores, i.e. the groups where at least half of the respondents achieve or did not achieved respectively the median score in the global FLI and the three partial indices.

Table 21 summarises the groups with the best and the most concerning scores, i.e. the groups where at least two-thirds of the respondents achieve or did not achieved the median score in the global FLI and the three partial indices.

Table 20.

Population Groups with Sufficient and Insufficient Scores

	Sufficient Over half of the group gains at least the median score	**Not sufficient** Over half of the group gains less than the median score
Literacy	Between 30 and 59 years old Chinese From Brunei-Muara or Tutong Full-time employees At least completed secondary Income over B$ 450 p.c.	Less than 30 and over 60 years old Malay and others From Belait or Temburong Not full-time employees, retired, inactive Less than completed secondary Income less than B$ 450 p.c.
Knowledge	Men Less than 60 years old Malay and Chinese Not from Temburong Workers or retired At least completed secondary Income over B$ 450 p.c.	Women Over 60 years old Other ethnic groups From Temburong Inactive and unemployed Less than completed secondary Income less than B$ 450 p.c.
Attitude	At least completed primary	Less than completed primary
Behaviour	Less than 60 years old Not from Temburong Workers At least completed secondary Income over B$ 450 p.c.	Over 60 years old From Temburong Inactive and unemployed Less than completed secondary Income less than B$450 p.c.

Table 21.

Population Groups with the Best Scores and Concerning Scores

	Best scores Over two-thirds of the group gains at least the median score	**Concerning scores** Over two-thirds of the group gains less than the median score
Literacy	University degree holders Income over B$ 1,200 p.c.	Other indigenous From Temburong Inactive, unemployed Less than completed secondary Income less than B$ 450 p.c.
Knowledge	University degree and VTE Income over B$ 1,200 p.c.	Other indigenous From Temburong Inactive Up to completed primary

Attitude	Women Less than 50 years old Chinese and other ethnic groups From Temburong Full-time or unemployed University degree and VTE Income over B$ 450 p.c.	
Behaviour	Chinese Full-time employed University degree and VTE Income over B$ 1,200 p.c.	Less than completed primary

4.3 Cluster Analysis

In addition to the classification of respondents into high and low literacy groups, cluster analysis was used to identify the different profiles of the at-risk groups. Cluster analysis is a methodology used to aggregate the interviewees into groups of individuals (clusters) based on the available information. It summarises the interactions between the variables into dominant patterns, and classifies the respondents based on these. The clusters are formed in such a way that individuals in the same group are more similar to each other than to individuals in other groups. The advantage of this approach is that the groups are naturally derived from the data, rather than generated using non-statistical methods.

The cluster analysis was conducted on the standardised FKI, FAI, and FBI, in order to control for the heterogeneity of mean and variance. A two-step cluster analysis was conducted[4], combining: (i) a hierarchical clustering (Ward's method), identifying the basic structure and the number of clusters, and (ii) a non-hierarchical clustering (K-means method), maximising the similarity within and differentiation between clusters.

The use of this approach results in the creation of 5 clusters. Table 22 describes the five groups, showing the size of each cluster, and the average score in the three partial indices and the global FLI. The first group, consisting of less than one-third of the sample, includes those who achieve high scores in each of the three components of financial literacy. Individuals in the other four groups lack at least one of the key components of financial literacy.

4 For a similar approach to cluster analysis of financial literacy data, see Fünfgeld et al. (2009).

Table 22.

Description of the Five Clusters

	% of sample	Financial Knowledge	Financial Attitude	Financial Behaviour	Financial Literacy
High literacy	30.7%	85.4	81.2	78.4	81.6
Low knowledge	20.5%	51.7	80.6	72	65.9
Low attitude	19.2%	73.1	37.7	62.3	61.7
Low behaviour	17.8%	74.3	78.6	46.2	63.1
Low literacy	11.7%	36.8	48	41.4	40.9
Total	**100.0%**	**68.5**	**68.4**	**63.9**	**66.5**

The group with low knowledge, one-fifth of the sample, includes individuals having above average attitude and behaviour, but they are significantly below the average in terms of financial knowledge. People in this group tend to have the right behaviours (active saving, not needing to borrow) and have a preference for saving over the long term; however since they lack financial knowledge, they are at risk of making wrong financial decisions, either because of over confidence or under confidence. In the first case they may take unnecessary risks, whereas in the latter they may act too defensively, making less than optimal decisions.

The group with low attitude, consisting of almost one-fifth of the sample, consists of people with financial attitudes significantly below the average and slightly above the average in terms of financial knowledge. These individuals, although having sufficient financial understanding, have a rather negative attitude towards saving for their future, resulting in just average financial behaviour scores. Improving their attitude could lead them to higher savings, which in turn would result in a reduced need to borrow in case of necessity.

The fourth group, comprising 18% of the sample, includes people with sufficient financial knowledge and attitude, but with poor financial behaviour. Having good knowledge and positive attitude, for them, is not sufficient to guarantee positive behaviour. The reason may be related to external factors, such as limited financial resources or income instability.

The last group, including 12% of the respondents, consists of the individuals most likely to be at risk, having low scores in each of the key components of financial literacy.

Table 23 shows the proportions of individuals belonging to each identified cluster by socio-demographic characteristics:

- Gender: Women tend to be overrepresented in the Low Knowledge cluster (23% versus 20% of the general population).
- Age group: Young adults and elderly are underrepresented in the High Literacy group. People above 60 years old are overrepresented in the Low Literacy cluster.
- Ethnicity: 44% of the Chinese belongs to the High Literacy cluster; by contrast, only 9% of the other indigenous group belongs to the High Literacy cluster. Indigenous are overrepresented also in the Low Knowledge and Low Attitude groups.
- District: Only 10% of the individuals from Temburong belong to the High Literacy group. Respondents from Temburong are overrepresented in all the other groups, except the Low Attitude group. People from Belait tend to be overrepresented in the Low Behaviour group.
- Employment: Full-time employees are the group most likely to belong to the High Literacy cluster. Unemployed and inactive are overrepresented in the Low Behaviour and Low Literacy clusters. Irregular and part-time workers tend to belong either to the Low Behaviour or to the Low Literacy groups. Retired are overrepresented in the Low Attitude and Low Literacy clusters.
- Education level: Individuals with higher education tend to belong to the High Literacy group. People with secondary education tend to be overrepresented in the Low Knowledge or Low Behaviour clusters. Respondents with lower levels of education generally belong to the Low Literacy group.
- Income: Around half of the respondents with a per capita income above B$ 1,200 belongs to the High Literacy cluster; by contrast, around one quarter of those with less than B$ 450 belong to the Low Literacy cluster.

The characterisation of the individuals belonging to each cluster confirm the findings of the previous correlation analysis, identifying the typical characteristics of the people lacking some or all the components of financial literacy, thus demonstrating the robustness of those conclusions.

Table 23.

Cluster Characterisation

	High Literacy	Low Knowledge	Low Attitude	Low Behaviour	Low Literacy
Gender					
Male	32.0	18.1	21.2	18.4	10.3
Female	29.5	22.9	17.3	17.2	13.2
Age group					
Less than 30	29.3	22.0	19.8	17.9	11.0
30-39	32.6	24.0	18.6	16.8	8.1
40-49	34.8	20.3	18.7	18.7	7.5
50-59	31.3	17.8	20.3	18.1	12.4
60 and above	21.5	19.0	18.9	17.1	23.6
Ethnicity					
Malay	29.6	21.0	19.5	18.4	11.6
Chinese	44.5	14.2	16.8	13.2	11.4
Other indigenous	9.5	29.6	25.3	17.1	18.5
Others	30.4	24.3	16.3	19.6	9.5
District					
Belait	30.0	16.3	16.3	23.1	14.3
Brunei-Muara	31.3	21.0	20.5	16.6	10.5
Temburong	10.3	29.4	12.3	25.1	22.9
Tutong	33.3	21.2	17.3	15.6	12.6
Employment status					
Full-time	38.1	21.8	19.0	15.6	5.5
Self-employed	27.2	18.8	21.3	21.3	11.4
Irregular, Part-time	25.8	10.3	26.5	17.5	20.0
Retired	28.2	18.6	21.7	14.6	16.8

Inactive	13.3	19.5	16.5	24.2	26.5
Unemployed	10.7	24.1	15.9	29.6	19.7
Educational level					
University	55.4	13.4	16.3	13.9	1.1
VTE beyond secondary	40.1	17.2	23.4	16.1	3.2
Completed secondary	28.9	23.7	18.8	18.5	10.1
Some secondary	14.3	24.1	19.9	21.8	19.9
Completed primary	13.1	23.2	18.2	21.8	23.7
Some primary	11.5	11.2	21.5	16.9	38.9
No formal education	6.2	19.2	16.7	2.3	55.7
Per-capita income groups					
Up to $200	12.3	16.9	22.8	19.7	28.3
$200 - $450	12.6	22.6	18.9	24.0	21.9
$450 - $1200	33.7	22.9	19.4	17.5	6.5
$1200 - $2500	47.8	16.4	19.1	12.0	4.8
Over $2500	56.3	16.3	14.2	12.8	0.5
Total	**30.7**	**20.5**	**19.2**	**17.8**	**11.7**

4.4 Multivariate Analysis

The previous subsections have identified the main correlations between socio-demographic factors and the different components of financial literacy. However, some of the individual characteristics are correlated with each other, therefore confounding the effects that each variable may have on the overall literacy. For example, the level of education is strongly correlated with the household per capita income; the age group of the respondents is typically correlated with education and income, therefore making it difficult to understand which variables have the strongest association.

Multivariate analysis, using regressions, allows the identification of the relationships between the characteristics and the indices, controlling for the correlations between the individual characteristics. However, although it is possible to control for such correlations, the available dataset does not allow the identification of causality links between the indices themselves.

This section presents the findings of a regression analysis aimed at identifying the personal characteristics associated with the three partial indices (Knowledge, Attitudes, and Behaviour) and the global Financial Literacy Index. The approach follows the same methodology used by Atkinson (2012) to analyse data from the OECD participating countries. The OLS regressions take into account socio-demographic and personal characteristics that have been commonly found to be associated with financial literacy (gender, age, ethnicity, income, education, attitude to risk, and employment status).

The findings summarised in Table 24 indicate the variables that are significant after controlling for the correlations between the individual characteristics. It is possible to notice that:

- Gender is not significantly associated with global literacy; however women have significantly lower knowledge, and better attitudes and behaviour.
- Marital status is significantly correlated with all indices. Married individuals are more literate than singles or widowed individuals.
- Age is associated with overall literacy and attitude. Young adults as well as elderly have a worse attitude toward saving for the long term.
- Ethnicity is significantly associated only with financial knowledge. People from other indigenous groups have lower financial knowledge.
- District of residence is only associated with financial behaviour. Individuals from Belait show negative behaviours after controlling for the other characteristics.
- Education level is significantly correlated with all indices except financial attitude. On the other hand, those individuals who have studied in fields related to economics and finance tend to have better attitude, but surprisingly not better knowledge than others (after controlling for the level of education).
- Self-assessed mathematics and English skills are significantly associated with financial knowledge and overall literacy.
- Income is a significant factor associated with all indices. Households with higher income have better financial literacy. Furthermore, income stability significantly affects financial behaviour, as individuals with a stable income tend to show better behaviour.
- Employment status is correlated with behaviour and overall literacy. Full-time workers have better behaviour and higher literacy than irregular workers, retired, unemployed, and inactive people.

- Attitude towards risk is significantly correlated with knowledge, behaviour and overall literacy. Individuals who are risk-seeking have higher knowledge and better behaviour.

Table 24.

Regression Findings

	FLI	FKI	FAI	FBI
Female		-2.728** (-3.00)	3.726** (2.76)	2.558** (3.39)
Married	3.721*** (3.96)	4.521** (3.24)	4.580* (2.44)	2.842* (2.47)
Indigenous ethnic groups		-5.868** (-2.75)		
Age	0.523* (2.43)	0.595 (1.87)	0.870* (2.54)	
Age squared	-0.00597* -2.62)	-0.00640 (-1.90)	-0.0110** (-3.08)	
Log-Per capita income	3.06*** (7.41)	3.699*** (5.86)	4.196*** (5.41)	3.224*** (6.23)
Unstable income	-2.556* (-2.56)			-6.040*** (-4.12)
Somewhat stable income	baseline			baseline
Stable income	2.849*** (3.70)			4.145*** (3.64)
Years of schooling	0.675*** (4.47)	1.024*** (4.77)		0.741*** (4.66)
Study in Economics, Business, Finance, Administration or Law			5.658* (2.31)	
Mathematics skills good	1.490 (1.96)	4.840*** (3.94)		
Mathematics skills sufficient	baseline	baseline		
Mathematics skills weak	-3.711*** (-3.64)	-6.332*** (-3.48)		
English skills good	1.681 (1.92)	3.788* (2.37)		
English skills sufficient	baseline	baseline		
English skills weak	-2.375* (-2.15)	-1.286 (-0.83)		
Risk seeker	1.791* (2.58)	2.071* (2.26)		2.919** (3.29)

Full time worker	1.916* (2.35)			4.110*** (4.45)
Belait				-5.077*** (-4.81)
Brunei-Muara				baseline
Temburong				-3.907 (-1.14)
Tutong				0.714 (0.39)
Constant	22.01*** (4.09)	14.93 (1.87)	20.14 (1.85)	26.36*** (7.70)
N **R-squared**	1708 0.332	1730 0.254	1844 0.056	1710 0.225
t statistics in parentheses *** p<0.05, ** p<0.01, *** p<0.001**				

5.0 Conclusion

This paper presented an analysis of the various indicators included in the Brunei Financial Literacy Survey 2015, and the main correlations between the indices and the socio-demographic characteristics of the individuals, identifying the most vulnerable groups and at-risk behaviours.

In order to provide an overall picture of the levels of knowledge, attitude, and behaviour in Brunei, the answers to the core questions were aggregated into three synthetic partial indices, and one global index of Financial Literacy. These indices use the same definition and methodology adopted by the OECD cross-country study on adult financial literacy; therefore the resulting distribution can be compared with the other 14 participating countries.
Key findings of the survey include the following:

- As in many other countries, nearly half of the sample does not achieve a sufficient score in the Financial Knowledge area. In particular, respondents seem to be particularly lacking in the numeracy skills required to make simple calculation of percentages, and understanding of the compound interest mechanism. Less than half of the sample was able to calculate simple interest, and less than one-fourth had a proper understanding of compound interest.
- Most individuals in our sample have positive attitudes toward planning for the future. However, it should be noted that these generally positive attitudes do not necessarily translate into behaviour change. Although a good financial attitude is an essential

condition for savings behaviour, other key factors obviously affect financial behaviour, such as knowledge and financial resources.

- More than 40% of the sample do not achieve a sufficient score in the Financial Behaviour area. These are the individuals that would benefit from initiatives aimed at improving their financial behaviour and literacy. Some of the most relevant at-risk behaviours include: lack of active and informed market participation; late payment of bills; lack of active savings and a high proportion of people unable to make ends meet; poor bank account and expenses monitoring behaviour.

The sample was segmented according to the number of sufficient partial scores they gained. Ten percent of the sample have no sufficient score in any of the three partial components, and more than one third has no more than one sufficient score only. For each literacy area, the at-risk groups can be identified as follows:

- In terms of financial knowledge, the groups most likely to be at risk in our sample are: women, over 60 years old, from indigenous ethnic groups, living in Temburong, inactive or unemployed, with not completed secondary school, and with income below B$ 450 per capita.
- In terms of financial attitude, respondents with less than primary education are the most likely to be at risk.
- In terms of financial behaviour, the groups most likely to be at risk in our sample are: individuals over 60 years old, living in Temburong, inactive or unemployed, with not completed secondary school, and with income below B$ 450 per capita.
- In terms of overall financial literacy, the groups most likely to be at risk in our sample are: individuals from indigenous ethnic groups, living in Temburong, inactive or unemployed, with less than secondary education, and with income below B$ 450 per capita.

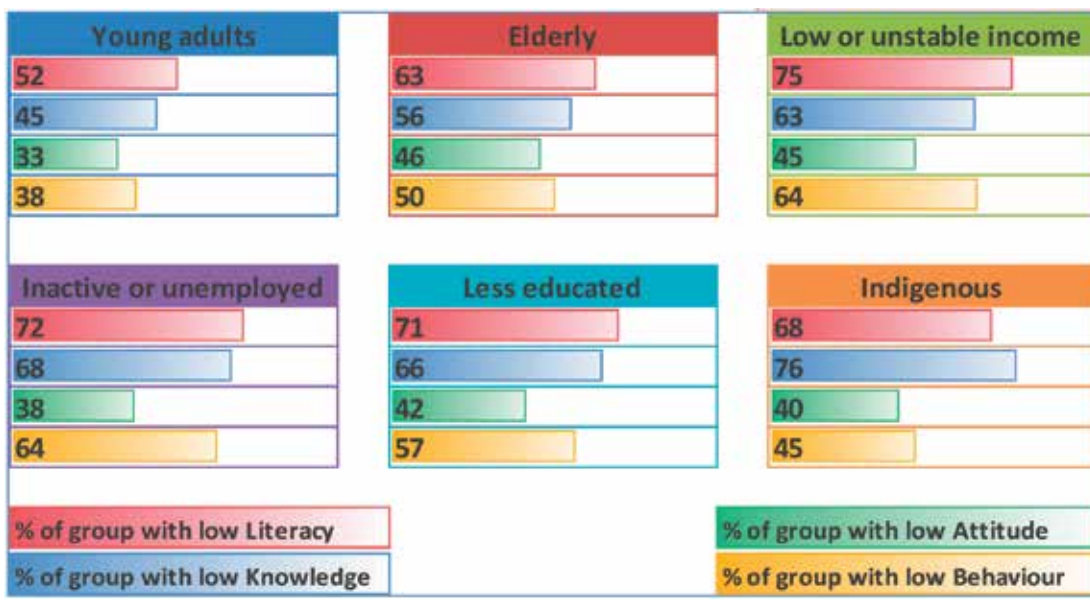
Following in-depth discussions with the main stakeholders of the study, the Brunei National Strategy for Financial Literacy identified six target groups (Figure 3). From the national survey, it can be estimated that three-quarters of the individuals with low overall Financial Literacy belong to at least one of these six segments:

- Young adults (less than 30 years old): 52% of them have low Financial Literacy.
- Elderly people (60 years old and above): 63% have low Financial Literacy, 56% low Financial Knowledge, and 50% have low Financial Behaviour.

- People with low (less than B$ 200 per capita) or unstable income: 75% have low Financial Literacy, 64% low Financial Behaviour, and 63% have low Financial Knowledge.
- Inactive or unemployed adults: 72% have low Financial Literacy, 68% low Financial Knowledge, and 64% low Financial Behaviour.
- People with lower education (less than secondary education): 71% have low Financial Literacy, 66% low Financial Knowledge, and 57% low Financial Behaviour.
- Indigenous groups: 68% have low Financial Literacy and 76% low Financial Knowledge.

Figure 4.

Target Groups Identified by the Brunei National Strategy for Financial Literacy



Based on the findings of this survey, and discussions with key stakeholders, a number of policy recommendations were developed and included in the national strategy. The recommendations can be classified under four strategic themes:

1. Improving and coordinating the financial education efforts of various stakeholders. Financial education aims at facilitating behavioural change, acting on knowledge, attitudes, and motivations. Policies under this theme focus on providing lifelong learning opportunities to improve skills, knowledge, awareness, attitudes, and motivations required to achieve behavioural change. These policies include in-school education, starting from Year 1 using age-appropriate approaches; workplace training; community learning to reach those who are not working and are out of school, with a particular focus on the target groups; and professional development for trainers.

2. Strengthening the provision of financial information and advice. These initiatives aim at providing free, credible and independent information and advice, in order to improve accessibility, transparency and provide support and motivation. Policies under this theme will also aim at keeping people engaged in the learning and behavioural change process. Suggested initiatives include: a financial literacy website and mobile apps, awareness campaigns, and provision of financial counselling.

3. Review of the regulations affecting financial behaviour. These initiatives aim at improving the environment within which consumers and SMEs take financial decisions, facilitating positive behavioural change. Policies under this theme include the use of regulatory strategies and behavioural incentives to improve financial inclusion and promote financial well-being.

4. Developing a governance operating model. Dedicated governance should be established to monitor and evaluate the implementation of the strategy, and to coordinate the efforts. These initiatives highlight the importance of stakeholder networking and research-based interventions to achieve the ultimate goal of promoting behavioural change. Key strategic initiatives include: establishing a centralised taskforce, increasing stakeholder participation and networking, systematic impact evaluation of the initiatives and knowledge sharing, and periodic monitoring and review of the financial literacy strategy.

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Maternal Employment in Brunei Darussalam: The Role of Family Policies

Azrinah Rahman

Abstract

This paper aims to look at the role of family-friendly policies and their effect on female employment, by comparing family policies in Nordic OECD countries to the Southeast Asian states of Brunei Darussalam, Malaysia, and Singapore. While governments in Nordic OECD countries have taken great initiatives to support mothers in employment in their responsibilities at home and at work, governments in Asian countries in their attempts to protect traditional Asian family values and the strong belief that care should that take place within the family are more cautious in providing policies, limiting their role in relation to the care needs of the population. This is one main reason for the non-implementation of family policies in Brunei. The fact that informal support is still strong as employed mothers can tap into assistance provided by family members, especially grandparents, and the ability to hire foreign domestic helpers to ease women of their dual burden, means that family policies will continue to remain low on Brunei's policy agenda.

Keywords: *maternal employment; family policies, division of labour, care work*

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1.0 Increasing Female Employment Rate and the Expansion of Family Policies

The rise in female labour force participation has been one of the most notable global social trends and economic developments of the past century (World Bank, 2016; OECD, 2017). The share of women who are part of the labour force is higher today than half a century ago due to the recognition that national development cannot occur without an active contribution from women. In many countries, this change has been driven by the large and sustained increase in married women's labour force participation. The International Labour Organisation (ILO) reported that the global female labour force participation rate was at 48.5 percent in 2018.[1]

> "Giving women a chance to contribute to the economic welfare of themselves and their families through labour force engagement has been proven to bring gains in nearly all areas of development, including poverty reduction, the spread of reproductive rights and associated declines in fertility and the redistribution of responsibilities and rights within the household" (ILO, 2010, p.11).

Women's growing labour force participation has been the main driving force behind the work–family reconciliation policies that have been introduced across the developed countries in the past few decades (Mahdizadeh, 2011). While greater labour force participation itself creates the demands for more family policies to help reconcile work and family life, "the fact that such policies themselves promote further labour force participation is a secondary factor in their introduction" (2002, p. 23). Therefore, family policies are designed to ease the structural inequalities women face in combining work with their family responsibilities, rather than on reshaping the labour force to achieve greater participation or balance.

In the past few decades, societies in Asia have experienced rapid and dramatic changes in their economic, social, demographic and political spheres (Raymo et al., 2015). Given their wide diversity, it is understandable that the manifestation, extent and impact of these changes vary from country to country (Thambiah, 2018). The rise in dual-income families, most notably through women's increased full-time labour force participation reflects a variety of economic and family-driven push–pull factors, including economic necessity, gender role expectations and the incompatibility of work and family norms.

1 The number was estimated at 1.3 billion in 2012, – about 40 per cent of the total labour force of 3.3 billion (ILO, 2012). The Organisation's explanation of the increase in adult women's labour force participation rates from 50.2% in 1980 to 52% in 2012 is due to the combined effects of "economic development, increasing education, declining fertility and other structural and institutional changes" (ILO, 2012, p. 20).

> "Work-family conflicts are widespread in the Asian region, and insufficient policy actions have been taken to reduce them and to facilitate the concomitant commitment to family and work, from both of which people achieve pride in their self-worthiness and obtain a sense of a meaningful life" (Tsai & Chen, 2017, p.16).

Comprehensive literature reviews have determined that there is considerable international research conducted on the challenge of trying to combine work and family in the West and parts of Asia (Brooks, 2016; Stockman, Bonney & Sheng, 2016), but there has been nothing to date on this aspect of Bruneian women's experiences as employed mothers. The focus on women, especially mothers, acknowledges that women are primary home makers and care givers, and that their additional role as workers in the paid labour force has caused considerable conflict in both dimensions of their lives: at home and at work. Much has been written on women in paid labour in the Western context, but this issue has only emerged as an area of policy concern in Asia in the last 10 years, where governments have intervened by introducing various sets of family policies to support employed mothers. While employed mothers engage in paid work, their responsibilities to the family continues to play an important role.

The 'work-life collision' remains a prevalent feature of late modern societies with their increased demands on personal life (Pocock, 2003). According to an OECD report (2017), when questioned on the most effective ways to tackle barriers to female employment, the most common response cited by 23 countries was (i) more accessible childcare, (ii) equal earnings for men and women, (iii) increase flexible working arrangements and (iv) increase access to better quality jobs. Work-family policies received increased attention in the 2000 – 2010 decade, with research taking a decidedly more nuanced approach to the empirical investigation of policy contexts (Bianchi & Milkie, 2010). However, work–family conflicts are also apparent in developing countries, and they look set to grow. To support families in their work and family decisions, governments use different policy instruments. Thévenon (2011) distinguishes between six different aims of family policy, namely poverty reduction and income maintenance, direct compensation for the economic costs of children, promotion of employment, promotion of gender equity, support for early childhood development and increasing fertility.

2.0 Public Policies

Public policies play a central role in managing work and family conflict (Folbre, 2012). According to Kossek et al. (2011), 95 percent of work-family interface studies are based on the Western context. Hence further research studies are needed in an Asian context as the three key global trends, including decreasing fertility rate, women's participation in the labour force and an ageing

population, are all issues affecting most Asian states, some at an alarming rate (Lo, 2017). The increase in dual-income families, single-parent households and the sandwich generation (which has care-giving responsibilities for children and ageing parents), has led to a growing interest in how work and family responsibilities can be effectively balanced in the Asian region (Sung, 2003; Chandra, 2012; Jamadin, Mohamad, Syarkawi & Noordin, 2015; Noor & Mohd, 2015; Tsai & Chen, 2017). In general, family policy may include services, cash and fiscal benefits (Kamerman & Kahn, 1997).

There have been extensive discussions on the interpretations and definitions of family policy since the 1970s. While there are some variations into the definition of family policies, broader ones include those by Robila (2012) who has "interrelated policy choices that address issues such as family care, poverty, domestic violence, and family planning" (p.32), Kamerman and Kahn, who defines it as "'everything that government does to and for the family"' (1991, p. 3), and Neyer (2006) in her definition, which includes family law in family policy. For the purpose of this paper, I have chosen to use three definitions as follows:

- Moen and Schorr (1987), who define it as a set of objectives developed by states for families,
- Aldous and Dumon (1990), who limit the definition of family policy to actions by state and government for families, and
- Kamerman and Kahn (1978), who define policies into implicit and explicit terms.

Implicit policies do not specifically target families, but create indirect results that benefit family well-being such as increasing women's labour participation rates, strengthening the rights of children in education and health protection, minimising child poverty and enhancing individuals' family and work balance, whereas explicit policies are designed specifically to achieve certain goals related to families. Based on her studies in Asia, Quah (1994) observed that policies tend to affect families in a nation explicitly and implicitly. She indicated that:

> "Family policy may be defined as a comprehensive plan of action formulated to reflect shared social values and to attain defined social goals concerning the nation's families…it is more common to find in any given country an array of policies and regulations that affect the family either directly… or indirectly…" (Quah, 1994, p.125).

3.0 Family Policies in OECD Countries

The OECD report "Babies and Bosses" consists of a series of reports regarding work-family reconciliation policies and recommendations in the following OECD countries: Australia, Denmark and the Netherlands; Austria, Ireland and Japan; New Zealand, Portugal and Switzerland; Canada, Finland, Sweden and the United Kingdom; and South Korea. The 2007 report summarises the main findings and presents broad policy recommendations for OECD countries.

Child-related leave policies have an important influence on the timing of parents re-entering the workforce. Across the OECD countries, there are different types of child-related leave, which generally offer employment protection during absence from work to care for children. In almost all OECD countries except for the United States, there is a statutory paid maternity leave with mothers being paid 100 percent of their earnings (OECD, 2007). The ILO convention on maternity leave stipulates the period of leave to be at least 14 weeks. The Scandinavian countries of Denmark, Norway and Sweden have been deemed the most successful countries in implementing family policy through their extensive support for families with children and have some of the longest parental leaves. Sweden allows the longest parental leave with 69 weeks, Denmark with a total leave of 52 weeks, and Norway has 47 weeks, which can be shared between mothers and fathers. In all the Nordic countries except Denmark, a section of this leave period is reserved for fathers.

Despite the variation, all the Nordic countries are on the generous end of the spectrum in a European survey of parental leave arrangements (Wall & Escobedo, 2013). Wall and Escobedo (2013), in a comparison of parental leave arrangements in 22 European countries, identified the five Nordic countries in the two most comprehensive models: the "one-year leave gender-equality-oriented model" (Sweden, Iceland, Denmark and Slovenia) and the "parental-choice-oriented model" (Norway, Finland, France, Belgium).

Leave entitlements immediately around childbirth are likely to increase job continuity and strengthen female labour force attachment. Maternity leave provisions are essential for a working woman to effectively complete the transition from pregnancy to motherhood to perform mothering work. A shorter maternity leave may have undesirable consequences as some studies often cite early return to work as one of the reasons for premature termination of breastfeeding (Poduval & Poduval, 2009). Shorter maternity leaves were also associated with less sensitivity in interaction with the infant and more maternal depressive symptoms (Clark et al., 1997; Ryan et al., 2006). By contrast, prolonged long periods of leave may harm long-term earnings prospects. The Nordic countries have tried to address this by giving fathers a post-partum leave period as well as by

making a section of the parental leave period reserved for fathers only as non-transferable or "daddy quotas". The effects of daddy quotas have been notable, to the point that they have been credited with promoting a "father revolution" (Lammi-Taskula, 2006, p.83). Uptake of parental leave by Norwegian fathers after the quota was introduced jumped from four to 90 percent and Iceland fathers from less than one to more than 80 percent (Grødem, 2014).

Early childhood is an important stage for human capital investment (UNESCO, 2007). While government policies on childcare usually address care and education separately, the Nordic countries have integrated both elements into their services for children as early childhood education and care (ECEC). In Denmark, Sweden and Norway, childcare is considered a benefit provided to the child, independently of the parental work situation, whereby children from a certain age are guaranteed a place in the childcare system (Rostgaard & Eydal, 2013). Denmark's investment in the provision of childcare is largely due to the belief that childcare should take place in an institutional setting, not as family day care or in the home of a child-minder (Kremer, 2007). Children in Denmark have a guaranteed place in childcare after 26 weeks old, in Sweden at the end of parental leave and in Norway from the age of 1.

Nordic countries discussed above have been successful in achieving high levels of female labour force participation across all age groups. This is mainly due to its family-friendly employment and labour market policies, particularly in the provision of generous parental leave and affordable and reliable public childcare services. Several OECD member states have taken steps to improve their childhood provision and care (OECD, 2017). Countries including Canada, New Zealand, the Slovak Republic and Poland have addressed the issue of childcare affordability through increases in subsidies and, occasionally, through the introduction or expansion of free childcare (e.g. Norway and the United States).

In the next section, I review the current family policies in the Southeast Asian countries of Singapore, Malaysia and Brunei.

4.0 Family Policies in Southeast Asia

4.1 Singapore

While Singapore has the most long-standing and comprehensive policies to encourage marriage, boost fertility and family support provision in Southeast Asia (United Nations, 2017; Sen, 2018), it has still been unable to raise its ultra-low fertility rate. Fertility rates in Singapore reached

below replacement level in 1975, and declined further to "ultra-low" levels in the early 2000s. In 2017, Singapore's total fertility rate (TFR) was only 1.16 births per woman. Although the policies have been generous, they are, however, focused on limiting the government's role in relation to the care needs of the population. "The government argues that these interventions are necessary to avoid the otherwise inevitable excesses of the welfare state and the harmful effects of 'westernisation' on traditional Asian family values" (Lyon, 2017, p.55). The government's goal is thus to assist families to manage the competing demands of care work and paid employment by subsidising the care that takes place within the family (Sun, 2012).

Women are allowed 16 weeks of paid maternity leaves while men are allowed 2 weeks of paid paternity leaves. Under a new three-year pilot project, public-sector officers and their spouses get an additional 4 weeks of unpaid infant-care leave per parent (Channel News Asia, 2017). Parents in Singapore can apply for childcare subsidies from the government once a baby is born. A Baby Bonus Scheme was set up to provides $8,000 for the first and second childs, $10,000 for the third and subsequent child. A basic subsidy of S$300 for child care ands $600 for infant care is provided by the government to Singapore citizens in childcare centres licensed by the Early Childhood Development Agency. An additional subsidy is also given depending on household income level for a combined monthly income of S$7,500 or less. This additional subsidy can cover up to 99 percent of the childcare fees.

In Singapore, most child care takes place at home and is performed by a family member (by the mother or a grandparent) with the help of a foreign domestic worker (Baird et al., 2017). The Singapore Housing Board prioritises applications for apartments that enable married persons and their families to live in close proximity to help ease caring work (grandparents to care for grandchildren and adult children to care for their elderly parents). The Singapore Government also provides tax relief of S$3000 to working mothers using grandparents to take care of their children in recognition of their role in childcare. Due to the family-focused models of care, foreign migrant labour is considered the most viable long-term solution to Singapore's care needs (Baird et al., 2017). The employment of domestic workers from foreign countries is strongly affected by government policy. Singapore encourages the importation of domestic workers as part of its policy to increase the female labour force (Ueno, 2008). The country has projected an increase of foreign domestic workers demand to 300,000 by 2030, to take up childcare and eldercare roles (Østbye et al., 2013). While many Singaporeans are perturbed by the presence of a growing migrant workforce, this strategy has been favourably received among the large middle class, who view the employment of one or more foreign domestic workers as an essential feature of their growing affluence.

4.2 Malaysia

In 2017, the World Bank report showed that the participation of Malaysian women in the labour force was about 54 percent, and considered the lowest in the Asean region and below the expected level given the country's level of development. This has been in part caused by the conflict of working mothers and family role especially in terms of childcare. In Malaysia, via the 5-year development plans, the government has instituted a number of policies to encourage more women into the labour force. The policy and legislative initiatives in Malaysia can be broadly divided into three categories: (i) leave policies, (ii) flexible work arrangements, and (iii) childcare policies (Noor & Mahudin, 2016).

Under the parental leave policies introduced in 2010, women in the public sector are allowed 90 days of paid maternity leave, an increase from the previous 60 days (Noor & Mahudin, 2016). Female employees in the private sector are entitled to only 60 days of paid maternity leave. Paid paternity leave of 7 days is also available to public sector workers. However, parental leave policy is an issue most employers, especially in private organisations, are reluctant to take up, as it represents substantial additional costs to the organisation. In 2007, a policy was implemented to allow working mothers to take unpaid leave for up to 5 years to perform childcare duties. Another 3 years of unpaid leave was also introduced for women to accompany a spouse on an overseas posting to ensure that families can stay together, highlighting the importance of family well-being.

Malaysia started introducing flexible working hours policies to civil servants in June 2007. The first policy consisted of staggered working hours. The second arrangement introduced in October 2008 was a work from home policy. The third flexible work arrangement introduced in October 2010, is part-time employment which offers the same benefits and provisions as full-time workers (Subramaniam, Ali & Overton, 2010). While these flexible work arrangements aim to facilitate a better work-life balance for Malaysians, especially working mothers, they have not been fully implemented by all government departments and some arrangements are only available for selected groups (Noor & Mahudin, 2016). Based on several studies (Subramaniam & Selvaratnam, 2010; Subramaniam, 2011), the reaction from private organisations in Malaysia has been even more unwelcoming, showing a lack of effort to change the work patterns that would reduce work and family conflict.

The formulation and adoption of childcare policies form the basis for the establishment of workplace-based childcare centres, hence, directly recognising the importance of childcare support in enabling parents, especially mothers, to work. The government provided various incentives

to encourage the establishment of child nurseries at the workplace, including the granting of RM180 per month for childcare fees for each child of an officer with monthly household income below RM5,000. The government has also offered fiscal incentives in terms of a 10 percent corporation tax exemption to encourage employers, especially those in the private sector, to set up their own childcare centres. As of June 2018, there are 4,293 child nurseries registered throughout the country. With 2.6 million Malaysian children aged between 0 and 4 years (Department of Statistics Malaysia, 2018), this suggests that there are at least 65,000 childcare centres or nurseries operating unregistered (Singh, 2018). The issue of childcare has been high up the new government agenda after a series of infant deaths that were under the care of private unlicensed child minders reported in 2018. The Women, Family and Community Development Ministry is targetting January 2019 as the date for all government agencies to set up a child nursery at their workplaces (The Sunday Daily, 2018). Even with the increasing number of registered day care centres available in Malaysia, many working parents still opt for alternative options. A study by Noor et al. (2004) showed that working parents outsource their childcare needs (24.1 percent to family members, 22.8 percent to neighbours and friends, 10.1 percent to domestic helpers and only 14.9 percent to childcare centres). The main reason is usually the high costs associated with registered childcare centres, which charge more than twice the cost of private childcare (Zainal, 2018).

4.3 Brunei

In Brunei, family policies are still far from meeting the genuine childcare needs of working parents. The piecemeal policies and services are described in this section. The main benefit for employed mothers in Brunei is related to their maternity leave provision, with very limited direct support in childcare services. With the increasing labour participation of Bruneian women, policy makers have shown concerns regarding the declining fertility rate of local women, the increasing divorce rate and the increasing difficulty that local Bruneian Malay and Chinese women have in finding potential men to marry (Anaman & Kassim, 2006; Garip, 2002).

Currently, the most important family policy put in place by the Brunei Government is the paid maternity leave. There was no maternity leave until it was introduced in the 1970s when paid maternity leave was allowed for only 28 days (Taib, 2014). In December 2010, the Prime Minister's Office through the Maternity Leave Order 2011 introduced a policy change. The circular states that maternity leave offered to civil service officers and staff who are legally married according to the laws of Brunei was increased to 15 weeks or 105 days of leave, which must begun two weeks before the expected delivery date. Previously, women in the government were only entitled to 56 days of maternity leave. No policy has been introduced with regard to paternity leave. During a

mother's maternity leave, she is assumed to be the main caretaker of her baby even though she may get help from supporting caretakers.

No forms of childcare support to facilitate working mothers after maternity leave have been introduced by the government. Formal, centre-based provision for children under the age of 3 years is currently provided by private organisations. As of 2019, 30 child daycare centres are registered with the Department of Community Development (JAPEM), Ministry of Culture, Youth and Sports. Only a small proportion of children throughout the country are attending licensed childcare centres. The number was estimated at only 262 children in 2011 (Brunei Government, 2012).

5.0 Women and Employment in Brunei

With an estimated population of 417,200 (DEPD, 2015)[2] and a labour force of 198,515. (DEPD, 2014), women's participation in the labour market is identified as necessary to drive the country in achieving its goals[3]. The push from the Brunei Government has translated to a huge jump in women's labour market participation rates in the past 40 years. In 1971, only 20 percent of women were employed compared to 58 percent in 2012 (World Bank, 2013). Following the world trend, education has been the main factor for the increase in Bruneian women's participation in the labour market. Based on the data from the Brunei Department of Economic Planning and Development (DEPD), more females are engaged in tertiary education than men. In 2015, 2068 females were enrolled in higher institutions in Brunei compared to 1286 males (DEPD, 2015).

The dependence of the Brunei economy on oil and gas resources has led to larger government sector employment and hence a high proportion of women are working in this sector (IMF, 2013). The Brunei Government employs about 60 percent of the total labour force, and almost 50 percent of the female labour force on a full-time basis (DEPD, 2014)[4]. A new graduate enters the public service as a Division II officer. In 2011, DEPD reported a total of 9588 officers are working in Division II with 3812 males and 5776 females. These reflect the higher number of female entering tertiary education and posing higher qualifications. In the same year, the total number of officers in Division I were 941, with 668 males and 273 females. This pattern offers evidence

2 The population is mainly made up of Malays at 66%, followed by Chinese 10% and 24% categorised as others (DEPD, BDSY, 2015).

3 The public sector is the largest employer in Brunei, providing jobs for 50,737 persons, of which 23,813 were males and 26,924 were females in 2015 (DEPD, 2015). From these figures, it is clear how important women's participation in the workforce is.

4 Previously, only women with a degree or higher would be offered a permanent job with the government and therefore this may have been a push for women to obtain higher academic qualifications in obtaining a secure job. Only in December 2008 was this ruling overturned as an initiative by the country to provide equal opportunities for women to work for the government, whereby temporary employment for married female officers and staff was abolished (Saim, 2010). This means that all jobs offered by the government are on a permanent basis for women with educational qualification below a degree.

that more males are holding higher position in the government than females despite the higher education level of females in the country. One possible reason for women in Brunei's inability to advance in their career development is the incompatibility for women, especially mothers, to manage the conflict of work and home.

As more Bruneian women enter the labour force, the traditional male breadwinner model, previously a norm, no longer applies to a typical Bruneian household. Only a small number of families in Brunei adhere to the traditional male breadwinner model while the majority are dual earner households (based on a higher female employment rate of 58 percent in 2012). One feature of the high female employment in Brunei is that a large proportion of working mothers work full-time and rarely leave the workforce even after giving birth. Therefore, only a small portion of the women population are full-time stay at home mothers while the rest have to manage their roles between work and family.

Although women's involvement in paid labour is a positive move towards greater gender equality, economic independence and empowerment, traditional gender roles still remain a barrier for women when discussing family labour. Family labour referred to as domestic or unpaid labour, is defined as "unpaid work done to maintain family members and/or a home" (Shelton & John, 1996, p. 300). There are three main types of family labour: household tasks, childcare, and emotion work (Coltrane, 2000; Shelton & John, 1996).

Employment is seen as an essential component in entering married and family life in Brunei with the average age of women entering into marriage being 25 years old (Ahmad, 2018; World Economic Forum, 2013). Although a larger family size was the norm and was preferred in the past with a higher Bruneian female fertility rate of 6.5 in the 1960s. Fertility rates in Brunei declined to 2.4 in early 2000 and decreased further to 1.9 in 2016, showing evidence of preference for a smaller family size. The increase in the female labour force in Brunei and lower fertility rates, however, have not been supplemented by more discussion on family policy implementation to help reconcile work and family life, in support of maternal employment.

6.0 Why Family Policies Are Under-Developed in Brunei

In Southeast Asia, the female labour force participation rate has remained stagnant over the past few years: Malaysia at 54.7 percent (Department of Statistics Malaysia, 2017), Singapore at 60.47 percent and Indonesia at 51 percent in 2017 (World Bank, 2017). Brunei also experienced the same trend in the past 10 years where no substantial increase in the women labour force participation rate is seen.

Traditional views of women as carers still hold them mainly responsible for household work and care work regardless of their working status. In a family system, different societies allocate various roles and responsibilities among family members according to their specific beliefs and gender norms (Davidson et al., 1996; Bogenschneider & Corbett, 2004; Jackson, 2008).“These are societies where the family roles of wife and mother are traditionally believed to define a woman’s life above and beyond any other life goals she might have” (Quah, 2015, p.5), which include countries such as Mongolia, Malaysia and Brunei (Quah, 2015), where the proportion of single women is low. Therefore, when a Malay couple marries and forms a family, while having their own careers, there is still expectation for both to fulfil gendered roles and responsibilities (Jamil Osman, 2013).

One distinctive feature of Asian family life is the importance of intergenerational co-residence (Esteve & Liu, 2014). Multigenerational households, either in the form of stem or joint families, are more widespread in Asia than in any other parts of the world (Bongaarts, 2001; Bongaarts & Zimmer, 2002; Ruggles & Heggeness, 2008). Brunei has one of the highest household sizes in Asia. According to United Nation statistics (2017), 44 percent of households in Brunei have more than 6 members, compared to 11 percent in Singapore, 29 percent in Malaysia, and 17 percent in Indonesia. The basis of multigenerational households is the exchange of emotional and financial support from adult children to the elderly, while the adult children benefit from household or economic support from their parents. And with rising female labour force participation, the demand for services that can be provided by elders such as childcare and housework also rises (e.g. Morgan & Hirosima 1983; Chamratrithirong, Morgan, & Rindfuss 1988; Hirschman & Minh 2002; Sasaki 2002).

Childcare in Brunei mostly takes place in the private realm of the home. Families determine the context of a member’s place in his or her social sphere and provide a capacity for shared resources. The large household size in Brunei supports the fact that intergenerational co-residence is still a norm. Here I argue that one reason for the underdeveloped family policies in Brunei is due to high social capital within the family. Based on the capital theory, social capital refers to non-financial resource based on networks, relationships and connections among people (Bourdieu, 1986). Bourdieu (1986) emphasises that social capital provides individuals with the social connections and network that an individual can utilise. Here Bruneian women, especially employed mothers, have the ability to tap into informal support from grandparents for household and childcare responsibilities.

In the Bruneian context, the growing number of women participating in paid work, particularly in professional and managerial positions, indicates that the number of middle-class families has increased, although there are no official statistics available to confirm this. Hiring foreign

domestic helpers is also common in Brunei. An increase in demand has been seen in countries with increasing numbers of women entering paid work, therefore providing a demand for substitutes in the domestic area (Yeoh & Huang, 2016, 2015, 1996a; Islam & Cojocaru, 2016; Song, 2015). Brunei government regulations allow for the recruitment of private house helpers to those who have children and elderly to care for. Foreign domestic helpers in Brunei come predominantly from Indonesia and the Philippines. Foreign domestic helpers in Brunei tend to come from poor families, with low educational backgrounds looking for a better life in neighbouring countries. An Indonesian domestic helper in Brunei earns about BND350 while a Filipino domestic helper earns about BND600.

In 2016, an estimated 30,000 Indonesians are working as domestic helpers (Brunei Times, 2016). Foreign domestic helpers play a major role in sustaining the social reproduction of everyday life. In some cases, families are fully reliant on their maids for everything from cooking and cleaning to attending to children's needs. The ability of most households in Brunei to purchase the cheap services of foreign domestic helpers to ease the burden of household work and childcare will continue be one reason for the lack of family policy attention in the country.

7.0 Conclusion

Female employment rates in the Nordic region range from 68 percent to 83 percent (OECD, 2017). In comparison, the gap in female employment rate between Nordic countries to those in Southeast Asia countries including Brunei is quite large. One of the main reasons for the Nordic countries high female employment rate is the generous provision of family policies in these countries (in terms of continuum of support to families with children, generous paid parental leave; subsidised and high-quality early childhood education and care; and out-of-school-hours care). This has translated to more women, especially mothers, engaging in the workforce, adding as much as 20 percent to economic growth per capita in these countries (OECD, 2017).

The main reasons for the lack of policy initiatives by the government are due to the strong informal support from family and the continuous presence of foreign domestic helpers in Bruneian households, relieving employed mothers of their dual burden. However, that being said, falling fertility rates in the country are evidence that work and family may not be as compatible in contemporary times. The country needs to reassess its approach in order to ensure a demographic crisis will not occur in the future. Brunei's family policy is still far from adequate, even when compared to the neighbouring countries of Malaysia and Singapore who share similar Asian values. The supports from the Brunei Government are mainly implicit in nature, and still frame women to be the main carers without addressing the division of labour through more gender equity. The government's generous housing scheme and placements represent crucial implicit

policy that supports women's employment yet have more to do with ensuring family cohesion and enabling the continuation of intergenerational co-residence. While this policy is somewhat successful in easing the burden of traditional female roles, the sustainability of provision in the future is questionable as land is a finite resource. The other crucial policy is the ability to recruit foreign domestic helpers to 'replace' wives and mothers in their daily work. Additionally, while foreign domestic helpers in their role serve to ease women's household responsibilities, it may impact and be one of the reasons for delay in much needed social changes within the family, particularly in men's involvement in domestic work. In Brunei's attempt to increase its economic growth and reach the Wawasan 2035 goals, a closer look at providing better family policies may be necessary, considering (i) the higher number of educated females in the country when compared to males and (ii) the increasing rate of female employment, especially mothers.

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Implicit Inflation Target in Brunei Darussalam?

Jason Lih Cheng Kok

Abstract

A New Keynesian model in the spirit of Ben Aissa and Rebei (2012) has been developed in order to estimate the influence that subsidies and price controls have in Brunei Darussalam's economy. Specifically, the model is aimed at investigating whether government intervention in pricing has created an implicit inflation target by the government. Results indicate that this is the case with an implicit inflation target of 0.0% +/- 1.0%. Further examination reveals the joint contribution of this result from both subsidies as well as the exchange rate policy adopted by the country. Discussion of policy implications of this result are then explored.

Keywords: *Brunei Darussalam, inflation, price controls, subsidies, New Keynesian*

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1.0 Introduction

The inflation dynamics of Brunei Darussalam is an area of macroeconomic research that has not received much attention. This may be due to the country's relatively small size with a population of around 400,000 or the relatively low, stable inflation experienced by the country over an extended period of time, namely a 1.2% average annual inflation between 1983 and 2014 (Department of Economic Planning and Development (DEPD), 2012; IMF World Economic Outlook Database, April 2015).

The economy of Brunei has a significant portion of items in its Consumer Price Index (CPI) which have been subject to government intervention in the form of subsidies and prices controls since at least 1996 (Dao, 1996). This salient feature of the economy precludes a standard inflation model from being applied to the country. It is in this context that this paper hopes to add to the literature on the understanding of Brunei's inflation whilst also contributing to the knowledge base of inflation dynamics in economies with sizeable levels of government intervention in the pricing of goods and services.

1.1 Description of Subsidies and Price Controls in Brunei

This sub-section will briefly describe the subsidies and price controls available in Brunei. These subsidies represent efforts by the government to enable the population to share in the revenues obtained from the exploitation of oil and gas resources in the country (Shimizu & Sidgwick, 1998). The availability of these items varies based on each product, with some only being available to citizens whilst others may be purchased and consumed by both residents and non-residents. These subsidies are financed with government revenues. There are a total of seven goods and services that are subsidised by the Government of Brunei, namely rice, water, electricity, fuel, education, healthcare and housing. Details of these items are listed in the appendix.

In terms of price controls, the Brunei Government via powers under the Price Control Act (Chapter 142) 2002 and the Price Control Act (Amendment) Order, 2012, sets maximum prices for passenger motor vehicles; powdered infant milk; condensed and evaporated milk; kerosene; bottled liquefied petroleum gas; sugar; plain flour; cooking oil; and construction materials (reinforcement bars, sand, stone, cement, bitumen, asphalt, ready-mix concrete, bricks).

In addition, in the lead up to the Islamic religious celebration Hari Raya Aidilfitri, the DEPD with the Department of Agriculture and Agrifood, Ministry of Primary Resources and Tourism, also set maximum prices for selected food items, including chicken, eggs, beef, buffalo, butter, margarine, ghee, cashew nuts, chocolate hazelnut spread, santan (coconut milk), chilli shrimp floss, and popia (spring roll) skin (DEPD, 2015a).

This extensive and elaborate listing of subsidised and price controlled items allows for a straightforward classification of these items within the CPI basket, as will be explored in Section 5.

2.0 Literature Review

Government policy in terms of subsidies and price controls is not unusual in a global context, particularly for oil and gas producing countries, as well as in Asia in general. Subsidies to consumers for energy, electricity, water and food are common among GCC countries, whilst Asian governments such as India, Indonesia and Thailand subsidise petroleum, natural gas and electricity (Espinoza, 2012; Asian Development Bank 2016). In terms of price controls, Saudi Arabia, Qatar and UAE are among the oil producing countries to introduce price controls of retail food items to reduce inflation (Oxford Business Group, 2008; Woertz, 2013). China has also implemented price controls in some form or another since the 1970s with two forms of price controls: government-set (fixed) prices and government guidance prices (floor and ceiling prices) (United States International Trade Commission, 2007). Subsidies in terms of government provision of education and healthcare can be thought of as indirect subsidies due to these items of government expenditure being financed from oil and gas revenues rather than taxes. Subsidised or public housing is also commonly provided by a wide number of countries worldwide (Wakely, 2014). Thus, the subsidies and price controls adopted by the Brunei Government are not unique compared to the experience of other countries around the world.

The methodology adopted by Ben Aissa and Rebei (2012) is the inspiration for this paper. In their paper, a New Keynesian model with two intermediate goods sectors (Subsidised Sector and Non-Subsidised Sector) is developed and estimated with Metropolis-Hastings Markov Chain Monte Carlo algorithms in order to derive optimal inflation targeting rules. They examined fourteen countries with significant evidence of government subsidisation (minimum 20.0% weight in CPI) from 1990 to 2008 and compared Taylor rules which targeted headline, core (non-subsidised), and subsidised goods inflation. Ben Aissa and Rebei (2012) concluded that headline inflation targeting is strictly suboptimal and the choice of which inflation measure to target depended upon the relative importance of government subsidies in the respective economies.

The theoretical literature on optimal inflation rates also served to motivate this paper. According to the Friedman rule, with nominal frictions in the demand for money and optimal inflation being negative, the optimal real interest rate is also negative, i.e. deflation (Friedman 1969; Schmitt-Grohe & Uribe, 2010). An alternative consideration of optimal inflation comes from the New Keynesian Phillips Curve: with imperfect competition and nominal price stickiness, the optimal inflation rate is zero (Goodfriend & King, 1997; Schmitt-Grohe & Uribe, 2010).

However, this paper is not primarily concerned with evaluating the optimal inflation rate for Brunei or to derive an optimal monetary policy rule in the presence of government subsidisation. Rather, this paper aims at taking the methodology of Ben Aissa and Rebei (2012) and adapting it to represent the economy of Brunei. The model will then be used to assess whether the resulting observed inflation matches an outcome that could have been achieved by a theoretical inflation targeting regime. This will then lead credence to the postulation that the Brunei Government has created an implicit inflation target with the existing subsidies and price controls, given that the current monetary policy of the country, which is a currency board against the Singapore dollar, remains intact. The Monetary Authority of Singapore (MAS), the central bank of Singapore, adopts a managed float exchange rate regime with a "Basket, Band and Crawl" system of the Singapore Dollar Nominal Effective Exchange Rate (S$NEER) (Khor et al. 2004). The literature on optimal inflation rates provides an insight that the results should not be pre-supposed to be an inflation target of 2.0%, as it is not clear what level of inflation is optimal with a seeming disagreement between theoretical predictions and actual outcomes of central bank policy. A more detailed literature review is contained in Kok (2015), which is not repeated here due to word limit constraints.

3.0 Model

The salient features of Brunei's economy that influence the formulation of the model are described below. The main equations of the model are presented in the appendix and a detailed formulation of the model is contained in Kok (2015).

The government derived 89.1% of its revenue in 2014 from the oil and gas sector (DEPD, 2014a). The country's largest oil and gas producer, Brunei Shell Petroleum, is 50% owned by the Brunei Government (Shimizu & Sidgwick, 1998). There is no personal income tax for either short-term or long-term residents (KPMG, 2013). Only short-term Sukuk Al-Ijarah (Islamic government bonds) are issued by the government to domestic commercial banks, which is aimed at financial development rather than to finance government deficits (Autoriti Monetari Brunei Darussalam (AMBD), 2015). The central bank of the country, AMBD, manages a currency board with the Brunei dollar pegged to the Singapore dollar at par (AMBD, 2011). Subsidies have established a fixed price that has prevailed since the 1990s, with the exception of electricity tariffs, which were adjusted in 2012 (Department of Electrical Services (DES), 2015). Price controls are enacted on an administrative basis with no transfers made from the government to the relevant firms.

A number of modifications were made to the model in comparison to Ben Aissa and Rebei's (2012) paper to better reflect the domestic economy and for the sake of simplification. The relevant equations are listed in the Appendix with further elaboration available in Kok (2015). These adjustments are described below.

Households provide labour in return for wages as well as profits from ownership of firms, which are both used for consumption of a final good. There is no capital in the model for the sake of simplification and also due to data limitations. Final good producers are perfectly competitive and combine intermediate goods in order to produce final goods.

Intermediate goods are divided into four categories:

1. "Home sector": these goods are not subject to subsidies or price controls and are produced domestically. Firms in this sector are assumed to be perfectly competitive.
2. "Foreign Sector": these are foreign produced goods that are not subject to subsidies or price controls. Firms in this sector are assumed to be perfectly competitive.
3. "Price Controlled Sector": these are domestically produced goods subject to price controls. Price controls are assumed to be imposed by the government in order to correct for the price markup due to the existence of a monopoly in this sector. The government sets the maximum price (price control) on an irregular basis with imperfect information of developments in the firms' marginal costs, subject to a participation constraint by the firm. The resulting price developments suggest an asymmetric distribution with large price increases occurring less frequently than large price decreases.
4. "Subsidised Sector": these are domestically produced goods subject to subsidies. Prices are fixed with any excess of marginal costs above price being paid for by government transfers to firms in this sector.

It is assumed that the "Price Controlled Sector" and "Subsidised Sector" are completely domestically produced, whereas in reality some of these items are foreign produced. In the case of the "Subsidised Sector" the transfers by the government to ensure the prices remain fixed remove any possible influence of the exchange rate on prices in this sector. On the other hand, for the "Price Controlled Sector", it is assumed that the government accounts for the effect of exchange rates in its imperfect estimation of the firms' marginal cost price evolution.

Price stickiness is due to the assumed representation of the "Price Controlled Sector" and "Subsidised Sector" rather than the imperfect competition and Calvo (1983) sticky prices used by Ben Aissa and Rebei (2012).

Monetary policy is a currency board regime with Purchasing Power Parity (PPP) assumed to hold at all times for the "Foreign Sector". For simplification, it is assumed there are no imports from the anchor currency. The government sector obtains revenues from profits as a result of its ownership of firms in the economy, which is spent on the subsidy programme as well as on government expenditure. No government bonds are issued. No taxes are imposed.

The resulting model suggests an evolution of the price of the final good as follows:

$$\Delta p_t = (1 - \alpha - \gamma - \delta)\,\Delta p_t^H + \alpha\,\Delta s_t + \alpha\,\Delta p_t^{F^*} + \gamma\,\Delta p_t^{PC} + \delta\,\Delta p_t^S \quad \textbf{(Equation 1)}$$

where p_t is the price of the final good

p_t^H is the price for the "Home sector"

$p_t^{F^*}$ is the price for the "Foreign Sector", denominated in foreign currency

p_t^{PC} is the price for the "Price Controlled Sector"

p_t^S is the price for the "Subsidised Sector"

s_t is the exchange rate defined as home currency per unit of foreign currency

α, γ and δ are the weights for the "Foreign Sector", "Price Controlled Sector" and "Subsidised Sector" respectively

It is assumed that the prices of all intermediate goods and the exchange rate evolve with a random walk. However, the error term of the "Price Controlled Sector" is assumed to have a gamma distribution to capture the model's asymmetric price evolution in this sector. An upward adjustment of 0.07 or 7.0% is made to the inflation rates in the "Price Controlled Sector" to ensure all values are strictly positive. This value was chosen as the lowest recorded value of this sector was -6.9% (rounded to -7.0%).

Putting it all together, the resulting distribution of is assumed to be a sum of independent normal and gamma distributions with first and second moments as follows:

$$E(\Delta p_t) = (1 - \alpha - \gamma - \delta)\,\mu^H + \alpha\,\mu^{ex} + \alpha\,\mu^{F^*} + \gamma\rho^{PC}\beta^{PC} - 0.07\gamma \quad \textbf{(Equation 2)}$$

$$Var(\Delta p_t) = (1 - \alpha - \gamma - \delta)^2\,\sigma^{H^2} + \alpha^2\,\sigma^{ex^2} + \alpha^2\,\sigma^{F^{*2}} + \gamma^2\rho^{PC}\beta^{PC^2} \quad \textbf{(Equation 3)}$$

where μ and σ represent the means and standard deviations of the sectors denoted as superscripts

ρ^{PC} and β^{PC} are the shape and scale parameter respectively for the gamma distribution

ex superscript is for the exchange rate

Estimation of the two equations above and the subsequent interpretation serve as this paper's main argument for the existence of an implicit inflation target in Brunei. A normal distribution is adopted, assuming that inflation and exchange rates are explained by a random walk, where there is no reason to believe that inflation will be asymmetric in these sectors given that the central bank maintains a currency board and cannot asymmetrically respond to shocks in these sectors. A gamma distribution is chosen to provide an asymmetric response to the "Price Controlled Sector"

whilst maintaining a simple and tractable distribution. This is reasonable given the details of the presumed government decision process outlined in the formulation of the model.

4.0 Data

Monthly CPI data published by DEPD for January 2010 until April 2015 were chosen to represent the price of the final good. This dataset is available in detailed categorical breakdown according to the United Nations' Classification of Individual Consumption According to Purpose (COICOP), which allows a more straightforward division of the data into the four sectors proposed in the model presented in the previous section (DEPD, 2015b).

The use of a single bilateral exchange rate to represent the exchange rate in the model is not seen as realistic. However, there is no formally established nominal effective exchange rate for Brunei. A suitable alternative is the S$NEER, which is the policy instrument of the MAS, and has data published regularly by MAS. Considering that Brunei operates a currency board, this can be seen to represent an exogenous monetary policy.

5.0 Model Estimation and Results

5.1 Estimation of Sectoral Weights

This paper proposes a breakdown of the categories under the CPI published by DEPD to conform to the four sectors proposed by the model. Table 1 below lists the weights for the respective categories.

Table 1.

Estimated Sectoral Weights

Parameter	Description	Estimated value
$1-\alpha-\gamma-\delta$	Weight of "Home sector"	0.4109
α	Weight of "Foreign Sector"	0.2699
γ	Weight of "Price Controlled Sector"	0.1316
δ	Weight of "Subsidised Sector"	0.1876

The total weight for "Price Controlled Sector" and "Subsidised Sector" is 31.92% of the CPI, which is higher than the 20.0% threshold used in the Ben Aissa and Rebei (2012) paper. The categorisation of "Price Controlled Sector" and "Subsidised Sector" is relatively straightforward based on the official listed goods and services by the Brunei Government. The breakdown of the two remaining sectors ("Home Sector" and "Foreign Sector") required some subjective judgment. In general, all remaining services were assumed to fall under the "Home Sector" and

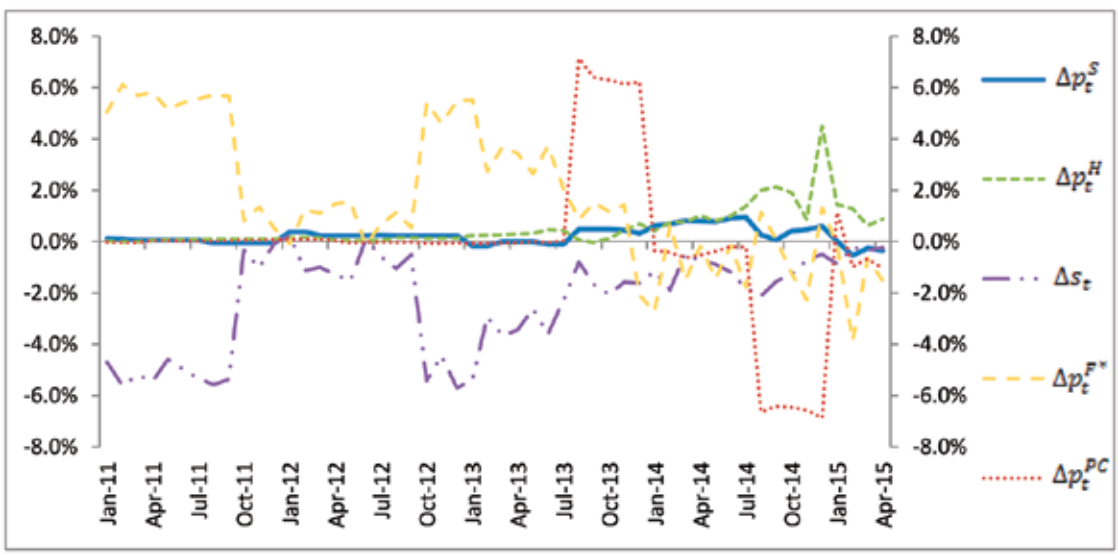
manufacturing products were assumed to be in the "Foreign Sector". A more elaborate description of the breakdown process and reasoning, as well as a detailed list of the categorical breakdown is available in Kok (2015).

5.2 Estimation of Sectoral Inflation Rates

With the sectoral breakdown as in sub-section 5.1, consolidated sectoral inflation rates are calculated based on a simple weighted sum. However, the inflation rates in the "Foreign Sector" () are in domestic currency and our model requires estimates for. With the PPP assumption, it follows that , therefore given data on exchange rates from the S$NEER, is assumed to take values to ensure that the PPP equation holds at all times. Chart 1 below illustrates the inflation developments of the four sectors.

Chart 1.

Sectoral Inflation Rates in Brunei Darussalam (January 2011 – April 2015)



Source: DEPD; Author's own calculations

It can be observed from the chart that the "Subsidised Sector" is the most stable with the lowest rate of inflation. However, changes in the inflation rate are reported due to the presence of private market providers that are not subsidised. Generally, the "Home Sector" reports a positive inflation rate with the spike in December 2014 being due to a one-month peak and fall in passenger transport by air and package holidays/pilgrimages.

The exchange rate maintained a general appreciation over the entire period and was relatively more volatile. The "Foreign Sector" was a mirror of the exchange rate for the first half of the period

studied but experienced higher volatility towards the end of the period. It must be noted again that the figures for the"Foreign Sector" are calculated as a residual and thus may not precisely reflect actual foreign inflation levels. The sharp rise and decline in 2013 in the "Price Controlled Sector" was due to a rise in the prices of chicken and motor cars. The subsequent deflation in 2014 was due to the high base effect of the previous years' inflation.

5.3 Bayesian Estimation and Results

The model developed in Section 3 is estimated with Bayesian techniques, specifically Monte Carlo simulation to generate estimates of the first and second moments of the four sectors. EViews was then utilised to create a vector of 1,000 sample estimates of the parameters derived from 10,000 draws of the posterior distribution repeated 1,000 times. The choice of prior distributions and Bayesian estimates of the parameters is listed in Table 2.

Table 2.

Prior Distributions and Bayesian Estimates of Parameters

Parameter	Prior distribution	Estimated
μ^H	Uniform	0.005285
μ^{ex}	Uniform	-0.022754
μ^{F^*}	Uniform	0.016979
σ^H	Jeffreys non-informative prior	0.0079570
σ^{ex}	Jeffreys non-informative prior	0.0195270
σ^{F^*}	Jeffreys non-informative prior	0.0272010
β^{PC}	Gamma	0.0122258
ρ^{PC}	-	Assumed known and estimated from data with value of 5.64

Taking these estimates and plugging them into the equation of the first and second moments in section 3 yields,

$$E(\Delta p_t) = 0.000475 \; or \; 0.0475\% \qquad \textbf{(Equation 4)}$$

$$Standard\ deviation\ of\ \Delta p_t = 1.0342\% \qquad \textbf{(Equation 5)}$$

Now, let us turn to an interpretation of these results in the context of whether they suggest that there is an implicit inflation target by the Brunei Government. At first glance, the model's implied inflation rate appears quite low and stable with a mean of around 0.05% and a standard deviation of around 1.03%. It is argued that such a result could have also been derived from a hypothetical

inflation targeter with a band centred on 0.0% +/- 1.0%. The specific estimates obtained by the model represent simply one draw from the distribution of this hypothetical inflation targeter.

This result is robust to changes in the weights as the weights for "Subsidised Sector" and "Price Controlled Sector" are effectively fixed with the listing of goods and services under subsidies or price controls by the Brunei Government. Thus, the only shifting of weights would be between the "Home Sector" and "Foreign Sector", which taken in the aggregate can be seen as a remainder in the inflation function expressed in Equation 1. Thus, this would not change the overall mean and standard deviation but simply those of the sectoral estimates. The choice of prior distributions is consistent with the underlying distributions proposed. The proposed underlying distribution of normality made for exchange rates and the sectors, except the "Price Controlled Sector", is consistent with the economic theory of inflation and exchange rates being explainable by a random walk. A departure from this would likely occur given an asymmetric central bank response function, which is not relevant in this case as Brunei operates a currency board. A consideration of the fit of these distributions is made in Kok (2015), which highlights some areas of concern. However, without a more extensive dataset and being able to provide a solid basis for violation of normality in the absence of active monetary policy, there appears to be no theoretical argument against assuming normality. The choice of gamma distribution for the "Price Controlled Sector" may be easily changed to another asymmetric distribution which would only serve to slightly change the overall result given that draws are made from the underlying data, which would not change.

Martínez (2008) highlights the frequency with which inflation targetting central banks breach their announced targets, which occurs relatively frequently. Thus, the setting of a hypothetical band width of 1.0% is reasonable as in a normal distribution 68% of data points lie within this range, i.e. 32% of cases breach the bands, which is plausible considering the reality of inflation targetters' experience. However, the extent to which this implied inflation target is due to the Brunei Government's subsidies and price controls is not yet clear. This will be further examined in the next section.

6.0 Scenario Analysis of Results

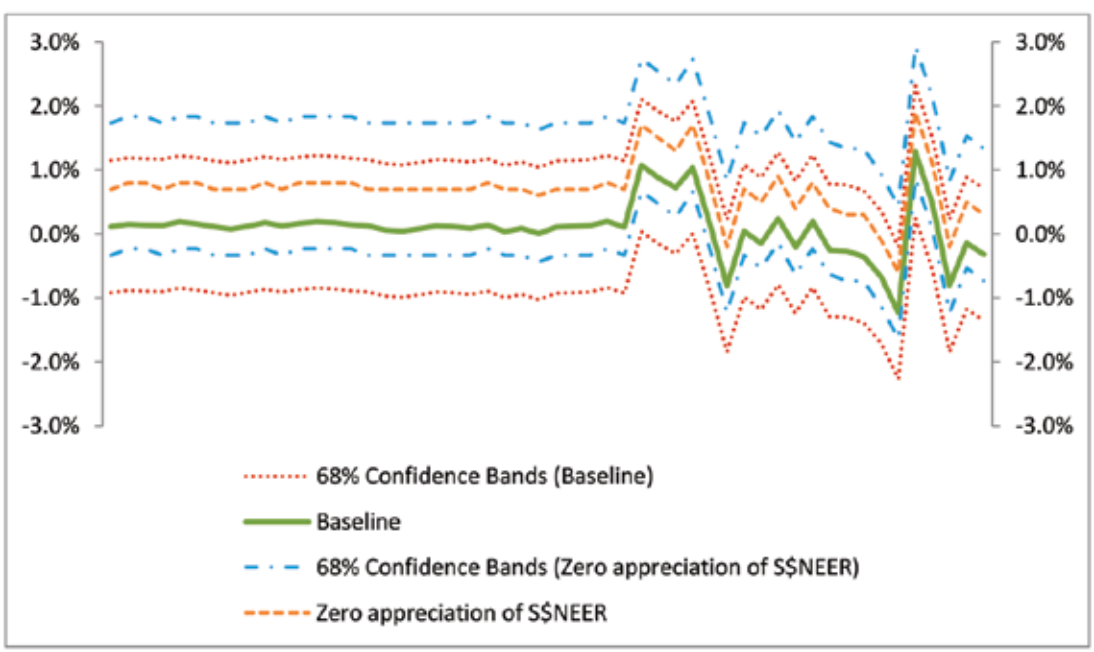
To consider whether this implied inflation target is due to government intervention in the pricing of goods and services, it would be useful to consider the situation should these policies not be in place. We begin this scenario analysis considering that price controls are optimal in that they redistribute monopoly profits to consumers and should be thus kept in place. This simplifies the scenario analysis considerably. A more detailed description of alternative scenarios 1 and 2 can be found in Kok (2015).

6.1 Alternative Scenario 1: Subsidies are Replaced with "Private Market" Prices

In order to derive "private market" prices, a number of key assumptions are made. It is assumed that the cost of respective government departments responsible for the provision of subsidised services is derived from the annual budgets with no costs relating to items not relating to the provision of these services. Further, it is assumed that changes to these costs are passed on to consumers with full pass-through. For the purposes of this paper, a cost or "private market" price of each unit of subsidised services is not calculated. Rather this paper is interested in the percentage changes of this cost over time, i.e. inflation. The relevant departments for water, electricity, education and healthcare are the Public Works Department, Department of Electrical Services, Ministry of Education and Ministry of Health respectively. The "private market" price of fuel and liquefied bottled gas is assumed to be related to the official selling price of Brunei's oil and gas. Similarly, this paper is only interested in the percentage change of prices over time rather than the specific level of the "private market" price. Finally, rice prices are assumed to follow the United Nations Food and Agriculture Organization (UNFAO) All Rice Price Index. Data availability limits the ability to carry out this scenario analysis until December 2013.

Chart 2.

Alternative Scenario 1: "Private Market" Prices



Source: DEPD; UNFAO; Author's own calculations
Baseline – observed inflation rates.
"Private market" prices – prices of subsidised goods and services replaced with implied prices derived from costs, official selling prices or global price benchmarks.

Chart 2 shows the result of this scenario analysis, where it is clear that inflation from 2011 until mid-2013 is more volatile compared to the baseline. The relevant first and second moments then change to,

$$E(\Delta p_t) = 1.5\%$$

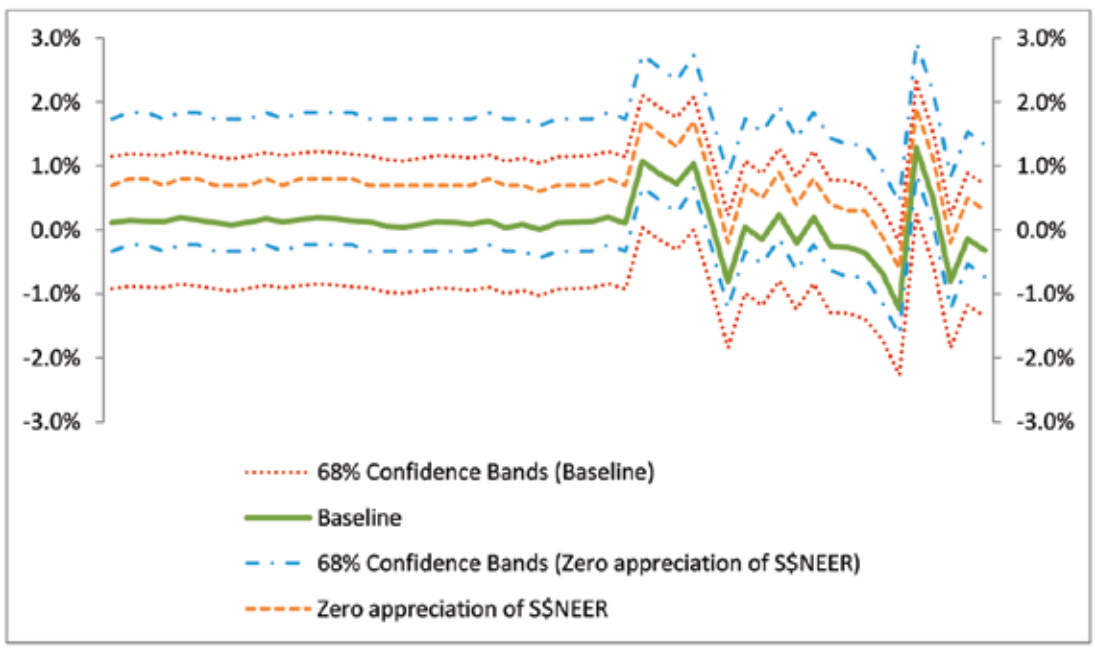
$$Standard\ deviation\ of\ \Delta p_t = 2.8\%$$

6.2 Alternative Scenario 2: Zero Appreciation Path of S$NEER

This paper further explores another alternative scenario where the S$NEER has a zero appreciation bias, i.e. average appreciation of 0.0%. The specification of this scenario as well as the scenario in the following sub-section just serve to highlight the influence that monetary policy has in this implied inflation target. This scenario essentially changes the mean of the exchange rate parameter while maintaining the same standard deviation.

Chart 3.

Alternative Scenario 2: Zero Appreciation of S$NEER



Source: DEPD; Author's own calculations
Baseline – observed inflation rates.
Zero appreciation of S$NEER – implied appreciation bias of the S$NEER adjusted to zero while maintaining observed volatility.

Chart 3 graphs the result where it can be seen that the inflation rate shifts up with the first and second moments of the implied model being,

$$E(\Delta p_t) = 0.6\%$$

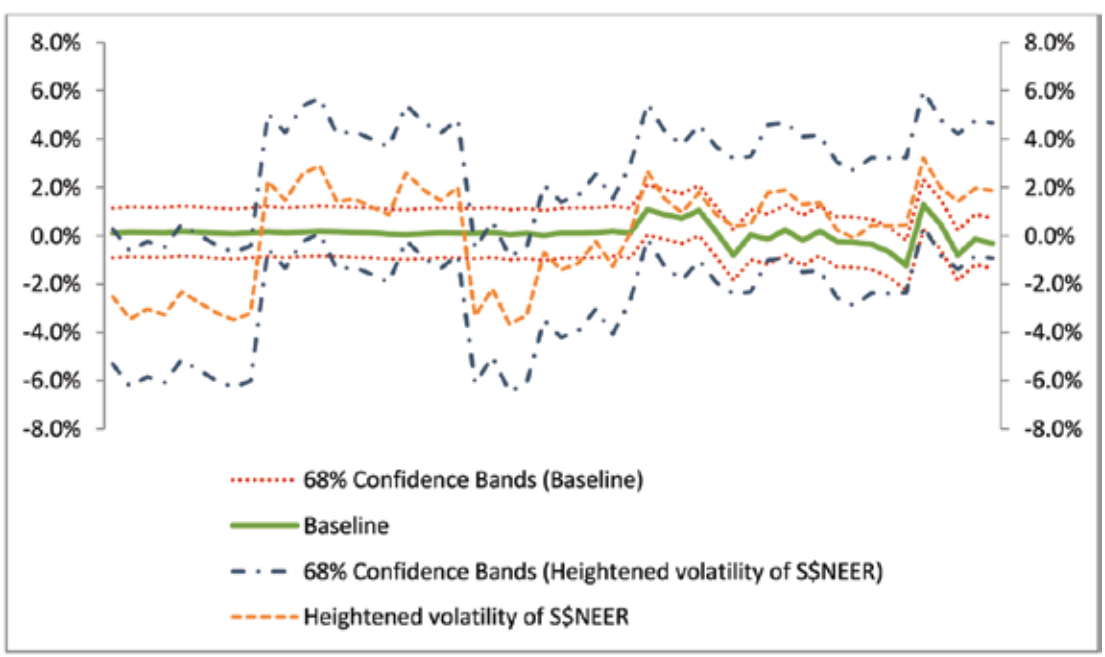
$$Standard\ deviation\ of\ \Delta p_t = 1.03\%$$

6.3 Alternative Scenario 3: Heightened Volatility of S$NEER

This final alternative scenario considers the situation of heightened volatility of the S$NEER. The estimated standard deviation of the exchange rate in the model is around 1.95%. This alternative scenario will consider a situation where this standard deviation is increased fivefold to approximately 9.75%. The standard deviation of bilateral exchange rate movements of the USD/EUR, USD/GBP and USD/JPY over the period of study were 9.8%, 5.7% and 12.1% respectively. Thus, the specification of the alternative scenario is not unreasonable and may be thought of as a significant widening of the S$NEER or a move towards a more flexible but volatile exchange rate. The average appreciation is unchanged and taken to just represent a long term trend in the exchange rate. Divergences from the mean in the underlying S$NEER data are multiplied fivefold to generate the alternative standard deviation specification. This maintains some link to the observed data rather than generating a new set of data with the relevant probability distribution function.

Chart 4.

Alternative Scenario 4: Heightened Volatility of S$NEER



Source: DEPD; Author's own calculations
Baseline – observed inflation rates.

Heightened volatility of S$NEER – volatility of S$NEER increased fivefold while maintaining observed average appreciation bias.

Chart 4 shows a more volatile projected evolution of inflation than was observed. The first and second moments of the implied model would be,

$$E(\Delta p_t) = 0.05\%$$

$$Standard\ deviation\ of\ \Delta p_t = 2.8\%$$

6.4 Discussion of Alternative Scenario Results

The three alternative scenarios explored above help to better elaborate the influence that the Brunei Government's subsidies have had on the implicit inflation target (assuming price controls are optimal and maintained). A shift to "private market" prices significantly increased the level and width of the implicit inflation target (represented by the first and second moments). A zero appreciation of the S$NEER was unable to lift the implicit inflation target to the same level, suggesting that for monetary policy to achieve the same result, a depreciation is required. However, according to data from the IMF's World Economic Outlook database April 2015, Brunei has maintained an average current account surplus of approximately 49.7% of GDP from 1985 to 2013. This may suggest that a depreciation of the domestic currency, which would theoretically increase this current account surplus, may not be feasible. In addition, a relatively drastic fivefold increase in volatility of the S$NEER was required to replicate the shift to "private market" prices.

Alternative specifications of the S$NEER helped to illustrate the significant role that Brunei's monetary policy via the currency board contributes to the implicit inflation target estimated in this paper. However, the major contributor is seen to be the Brunei Government's subsidies. This is because of the fixed price nature of subsidised goods and services, which results in inflation in this sector effectively starting from zero mean and zero standard deviation. Thus, a shift to eliminate subsidies would significantly influence inflation and the implicit inflation target of 0.0% +/-1.0% would be effectively abandoned. A change to price control policies is likely to be less disruptive to inflation as it operates to introduce asymmetry to price developments in the "Price Controlled Sector", which may be taken to reflect asymmetric preferences by policymakers. The following section will highlight policy implications before concluding.

7.0 Policy Implications

An important policy implication of this paper is regarding the choice of an inflation target for the country's long term development plan, Wawasan 2035. DEPD (2015c) lists primary objectives

for the Brunei Government of a real GDP growth target of 5-6% with an inflation target of 2% in order to achieve the nominal GDP per capita required for Brunei to be in the top 10 countries in the world in 2035. This paper's results suggests these targets should be revisited. If the implicit inflation target from the combination of the subsidies, price controls and currency board is centred on 0.0%, then the official government target for inflation is missspecified and may be more appropriate to be set at zero. This has implications for the real GDP target, insofar as CPI inflation and the GDP deflator are related. Assuming they are approximately equal, then the real GDP target should be 2 percentage points higher; 7-8%. This suggests that Brunei is underperforming the growth target by much more than the DEPD's analysis in DEPD (2015c).

However, the usage of Purchasing Power Parity for international comparison of nominal GDP per capita between countries complicates matters beyond this. Given an implicit inflation target centred on 0.0% when effectively the rest of the world is on a 2.0% or higher observed/targeted inflation means it may be that the prices of goods and services used in the Purchasing Power Parity basket rise slower in Brunei compared to other countries. In this case, the nominal GDP per capita of other countries would be adjusted downwards relative to Brunei. Within this context, the real GDP growth target may actually be overestimated wherein a lower real GDP growth target may actually be sufficient to achieve the top 10 per capita income target of Wawasan 2035. From the IMF's World Economic Outlook Database October 2015, the implied PPP conversion rate in 2014 (i.e. the local currency per unit of PPP adjusted US dollars) is 0.658 for Brunei compared to 0.859 for Singapore. Despite the two countries having a fixed exchange rate of 1:1 under the Currency Interchangeability Agreement, there is a difference in the implied PPP conversion rates. This means that every B$1/S$1 of nominal GDP per capita equates to a PPP-adjusted $1.52 for Brunei and $1.16 for Singapore. Further research is needed to better understand the details of the PPP adjustment and its links to the results of this paper. Upon initial examination, the results of this paper suggest that the implicit inflation target of 0.0% for Brunei may be contributing to more generous PPP adjustments that boost the nominal GDP per capita (PPP adjusted) for the country. Thus, the real GDP growth target of Brunei may be overestimated. This postulation goes against the statements made in the previous paragraph and further study should be undertaken in terms of better determining which effect is stronger and adjusting the real GDP growth target of Brunei accordingly.

Another important policy implication is in the definition of price stability by AMBD, which acts as the country's central bank. Price stability is one of the four objectives of the central bank as stated in its legislation, the Autoriti Monetari Brunei Darussalam Order, 2010. However, it has yet to be officially declared what the official definition of price stability is as understood by the central bank. This paper's results serve to inform these discussions, providing one possible definition, which is headline inflation centred on 0.0% with a +/- 1.0% band, with space to allow

for deviations up to +/- 2.0%, which is reasonable based on the experience of other central banks. Significant and prolonged departures from this price stability objective may then be one of the prerequisites before the monetary policy of the country is reconsidered. The consideration of alternative monetary policy arrangements for Brunei is well beyond the scope of this paper.

Efforts by the Brunei Government to adjust the subsidies and price controls programme are likely to have significant effects on inflation as suggested by the results of this paper, specifically Scenario 1 in the previous section that resulted in inflation centred on 1.5% +/- 2.8%, which is much more volatile than the current experience. Significant adjustments that may be carried out for fiscal consolidation purposes may push inflation into a new normal that no longer meets the price stability objective of the central bank. Thus, extensive adjustments to subsidies and price controls should be considered in concert with the central bank as these adjustments may result in the central bank being forced to reconsider the most appropriate monetary policy for the country. Such joint discussions will help to reduce disruptions to the macroeconomy from adjustments to the subsidies and price controls programme.

Additionally, the results of this paper of an implicit inflation target centred on 0.0% may help in discussions of retirement income and wages in the country. Zero inflation effectively means that even if retirement income and wages were indexed to inflation, there would be on average no change. This may help to explain why the salary scale in Brunei has been effectively stagnant since the 1990s. The case for retirement income may be more complicated as retirees typically have a different consumption basket than the CPI. The stagnant salary scale may also be contributing to the 0.0% implicit inflation target whereby these two factors reinforce each other, i.e. since inflation is zero, salaries do not need to adjust and since basic salaries are not rising there is limited inflationary pressure. However, this ignores the impact of hidden inflation in terms of reduced quality or quantity with prices remaining the same. Also, there is a positive wage pressure on inflation despite the fixed salary scale due to population growth and educational attainment. With a growing population that is increasingly better educated and thus starting higher up in the salary scale (which is stagnant), average wages in the country would be rising and thus putting a positive pressure on inflation. This may be one of the factors contributing to the positive inflation in the "Home Sector".

A final policy implication is the consideration of an optimal inflation rate for Brunei. The current understanding based on the DEPD's official inflation target in DEPD (2015c) was that inflation in Brunei should be 2.0%. However, this paper's results suggest that this may be inappropriate and that the optimal inflation rate may be closer to 0.0%. This then feeds into considerations of the Non-Accelerating Inflation Rate of Unemployment (NAIRU), whereby the unemployment rate of 6.9% in 2014 may be mainly structural rather than cyclical, which means the natural rate of

unemployment may be around this level. The lack of reliable historical series for unemployment figures prevents a more comprehensive consideration of the NAIRU for Brunei. More detailed research and analysis is required to better understand optimal inflation and natural unemployment in the country along with its interlinked dynamics. Should the 0.0% implicit inflation target put forward by this paper prove to be the optimal inflation rate, then it may be the case that a 5-6% unemployment rate for Brunei is normal and simply reflects structural unemployment present due to the workings of the economy and labour market. Efforts to reduce unemployment below its natural rate would be inflationary and unsustainable in the long term.

8.0 Conclusion

It must be noted that the results of this paper are highly dependent on the specification of the model. It is argued that the model is seen to reasonably approximate reality, but the adjustment of any of the assumptions, parameters and distributions is likely to influence the results. For instance, Kok (2015) highlighted the possibility of misspecification of the price developments of the four sections, but a lack of an extensive dataset inhibits any precise judgments.

However, this paper has succeeded in illustrating that, given the model specified, Brunei is able to replicate the inflationary outcomes of an inflation objective with a target range of 0.0% +/-1.0% via the use of subsidies and price controls. Thus, an implicit inflation target has been created in Brunei which is not completely under the control of the central bank. This suggests a dual policymaker role in combatting inflation in Brunei with the central bank, AMBD, maintaining the currency board while the Brunei Government continues its subsidy and price control programme.

Finally, policy implications of the results of this paper were explored with wide ranging implications for Wawasan 2035, monetary policy, fiscal policy, wages, retirement, optimal inflation rates and the natural rate of unemployment. Further research is required to better understand the scope of these implications in the context of the results found in this paper.

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Appendix: List of subsidies provided by the Government of Brunei Darussalam

Item	Subsidised price
Rice	Thailand fragrant rice (B$12.50) Siam white rice (B$8.50) Glutinous rice (B$7.60) (The Brunei Times, 2008)
Water	B$0.11/m3 for first 54m3 B$0.44/m3 for every subsequent m3 (Bandial, 2012)
Electricity	B$0.01/kWh for first 600kWh B$0.08/kWh for 601-2000kWh B$0.10/kWh for 2001-4000kWh B$0.12/kWh for every subsequent kWh (DES, 2015)+
Fuel	RON97 B$0.53/litre RON92 B$0.519/litre RON85 B$0.36/litre Diesel B$0.31/litre (Hamid, 2008; Masli, 2010)
Education	Free for all citizens attending government schools for 14 years of schooling (1 year preschool, 6 years primary school, 5 years secondary school, 2 years GCE 'A' level). Brunei Government scholarships are available for citizens attending higher education institutions in Brunei Darussalam and overseas. (Oxford Business Group, 2011; International Council for Open and Distance Education, 2015)
Healthcare	B$1.00 per doctor's consultation. Medicines prescribed for free. Free overseas medical treatment for illnesses unable to be treated in Brunei Darussalam. (Han, 2007; Hab, 2013)
Housing	Two social housing schemes with around 50% of development costs subsidised by the government; National Housing Scheme (for citizens) and Landless Indigenous Citizens Housing Scheme (for citizens from indigenous tribes). (Oxford Business Group, 2013) The government also provides a subsidised housing rental scheme for government officers based on their salary scale and number of occupants. (Public Service Department, 2015)

+ This data differs from the original as in Kok (2015) due to an inconsistency discovered whereby the officially listed tariffs differed from those reported in the media. This change has no implications for the model and its results.

Appendix: List of equations

Households' utility maximisation problem

$$\sum_{t=0}^{\infty} \beta^t U(c_t, h_t) \quad \textbf{(Equation 6)}$$

where β^t is a discount factor, $\beta \in (0,1)$

c_t is consumption

h_t is hours worked, $h \in (0,1)$

Households' budget constraint

$$w_t h_t + \emptyset_t^{house} \geq p_t c_t \quad \textbf{(Equation 7)}$$

where w_t is the wage rate

$\emptyset_t^{house}$ is the portion of firms' profits received from households' ownership of firms

p_t is the price of consumption goods

Final goods producers' production function

$$y_t = (y_t^H)^{1-\alpha-\gamma-\delta}(y_t^F)^{\alpha}(y_t^{PC})^{\gamma}(y_t^S)^{\delta} \quad \textbf{(Equation 8)}$$

where y_t^H is a composite index of home produced intermediate goods that are not subject to subsidies or price controls. **("Home Sector")**

y_t^F is a composite index of foreign produced intermediate goods. α is the weight of y_t^F in the production function. **("Foreign Sector")**

y_t^{PC} is a composite index of home produced intermediate goods subject to price controls. γ is the weight of y_t^{PC} in the production function. **("Price Controlled Sector")**

y_t^S is a composite index of home produced intermediate goods subject to subsidies. δ is the weight of y_t^S in the production function. **("Subsidised Sector")**

Solving the profit maximisation problem yields an equation for the final good price similar to the result of Ben Aissa and Rebei (2012) extended to four intermediate goods sectors,

$$p_t = (p_t^H/(1-\alpha-\gamma-\delta))^{1-\alpha-\gamma-\delta}(p_t^F/\alpha)^{\alpha}(p_t^{PC}/\gamma)^{\gamma}(p_t^S/\delta)^{\delta} \quad \textbf{(Equation 9)}$$

"Home Sector" profit maximisation subject to budget constraint yields an equilibrium real wage equal to marginal productivity of labour,

$$w_t^H / p_t^H = F_h(h_t^H) \qquad \textbf{(Equation 10)}$$

"Foreign Sector" profit maximisation subject to budget constraint yields an equilibrium real wage equal to marginal productivity of labour,

$$w_t^F / p_t^F = F_h(h_t^F) \qquad \textbf{(Equation 11)}$$

"Price Controlled Sector" is a monopoly price-setter with constant price elasticity of demand (η<-1),

$$p_t^{PC} = \theta MC_t^{PC} \qquad \textbf{(Equation 12)}$$

where MC_t^{PC} is the marginal cost for home produced intermediate goods subject to price controls

θ is the markup above marginal cost, $\theta = \eta/(1+\eta) > 1$

With the government setting a maximum price $p_t^{PC^*}$ with probability ψ, the price of goods produced in this sector are

$$p_t^{PC} \begin{cases} p_t^{PC^*} \; with \; probability \; \psi \\ \theta MC_t^{PC} \; with \; probability \; 1-\psi \end{cases} \qquad \textbf{(Equation 13)}$$

$$\psi > 0$$

Subject to the monopoly firm's participation constraint,

$$p_t^{PC^*} \geq MC_t^{PC} \qquad \textbf{(Equation 14)}$$

And assuming the government wishes to reduce monopoly profits,

$$p_t^{PC^*} < \theta MC_t^{PC} \qquad \textbf{(Equation 15)}$$

Prices in the "Subsidised Sector" are set at $\overline{p_t^S}$ with a perfectly horizontal supply curve, i.e. $\Delta p_t^S = 0$.

PPP holds at all times,

$$p_t^F = s_t p_t^{F^*} \quad \textbf{(Equation 16)}$$

The government's budget constraint is given as follows,

$$\emptyset_t^{govt} = Sub_t + Exp_t \quad \textbf{(Equation 17)}$$

where $\emptyset_t^{govt}$ is the portion of firms' profits received from the government's ownership of firms

Sub_t is government expenditure on subsidising intermediate goods

Exp_t is government expenditure excluding subsidies

Prices of intermediate goods and the exchange rate evolve following a random walk,

$$p_t^H = \mu^H + p_{t-1}^H + \varepsilon_t^H, \quad \varepsilon_t^H \sim N(0, \sigma^{H^2})$$

(Equation 18)

$$or\ \Delta p_t^H = \mu^H + \varepsilon_t^H$$

$$p_t^{F^*} = \mu^{F^*} + p_{t-1}^{F^*} + \varepsilon_t^{F^*}, \quad \varepsilon_t^{F^*} \sim N(0, \sigma^{F^{*2}})$$

(Equation 19)

$$or\ \Delta p_t^{F^*} = \mu^{F^*} + \varepsilon_t^{F^*}$$

$$p_t^{PC} = p_{t-1}^{PC} - 0.07 + \varepsilon_t^{PC}, \quad \varepsilon_t^{PC} \sim Gamma(\rho^{PC}, \beta^{PC})$$

(Equation 20)

$$or\ 0.07 + \Delta p_t^{PC} = \varepsilon_t^{PC}$$

$$s_t = \mu^{ex} + s_{t-1} + \varepsilon_t^{ex}, \quad \varepsilon_t^{ex} \sim N(0, \sigma^{ex^2})$$

(Equation 21)

$$or\ \Delta s_t = \mu^{ex} + \varepsilon_t^{ex}$$