Reference Portfolios for Sovereign Funds in Pacific Island Nations

About NZIPR

The New Zealand Institute for Pacific Research (NZIPR) was launched in March 2016. Its primary role is to promote and support excellence in Pacific research. The NZIPR incorporates a wide network of researchers, research institutions and other sources of expertise in the Pacific Islands. The University of Auckland, Auckland University of Technology and Otago University lead the NZIPR. Its support partners include the New Zealand Institute of Economic Research, the University of the South Pacific, the Australian National University, Peking University, the University of Hawaii, the Secretariat for the Pacific Community, the Ministry of Foreign Affairs and Trade and the Pacific Cooperation Foundation.

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The New Zealand Institute for Pacific Research (NZIPR) was launched in March 2016. Its primary role is to promote and support excellence in Pacific research. The NZIPR incorporates a wide network of researchers, research institutions and other sources of expertise in the Pacific Islands. The University of Auckland, Auckland University of Technology and Otago University lead the NZIPR. Its support partners include the New Zealand Institute of Economic Research, the University of the South Pacific, the Australian National University, Peking University, the University of Hawaii, the Secretariat for the Pacific Community, the Ministry of Foreign Affairs and Trade and the Pacific Cooperation Foundation.

One of the five key first-year projects for the NZIPR is examining the roles of Sovereign Funds (SFs) in the Pacific Islands. This reflects the fact that SFs are often the largest single asset owner and investor in the Pacific Islands, and the income stream from these funds can also be a large part of fiscal revenues. They can be an important part of Pacific Island wealth, and may help promote economic development and buffer Pacific Island economies from shocks such as natural disasters.

Pacific Island Funds are amongst the longest established SFs in the World (e.g. Kiribati's Revenue Equalisation Reserve Fund was established in 1956), and Pacific Island SFs tend to have much more dispersed and innovative funding sources than Funds established by larger nations.

We believe there are insights and lessons from the Pacific Islands experience that will be of interest to other small economies considering the role of SFs (for example in the Caribbean), and the wider SF research community. Despite this, research attention on Pacific Island SFs has been limited, and published cross-country studies tend to be dated. Our research aims to provide an updated and comprehensive review of the role of the Pacific Island SFs.

This report is the third in a series of papers on the role of SFs. Our first report set the context of Pacific Island SF and their roles and responsibilities (Drew, 2016). Key findings included that many Pacific Island SFs appear to have multiple economic purposes in practice if not in legislation, and that the historical success rate of them meeting these purposes have been quite mixed. The second report provides an assessment framework that contains criteria that can be used to evaluate the practices of Pacific Island SFs (Drew *et al.*, 2016). These criteria align with the Santiago Principles – a set of best-practice principles that was developed by the International Monetary Fund in conjunction with many SFs.

Some funds have been broadly successful over a long period, but in others poor governance and investment management, along with a lack of fiscal policy control, have led to very poor fund and fiscal outcomes that have had broader negative repercussion for living standards. This highlights the need for more research and assessments of Pacific Island SFs to better

understand their investment processes and how they are meeting their legislative purposes.

One of the key elements in Governance of a fund is having well-defined benchmarks. In this paper we motivate notional simple, low cost passive "reference portfolio" benchmarks for the different types of SFs in the Pacific. In follow up research we will consider in more depth three case studies: the Trust Funds of Tuvalu, Niue and Tokelau. These case studies will be prepared as part of in depth reviews of these funds.

2.   Importance of Benchmarks

The selection of an appropriate benchmark is probably one of its most crucial decisions in terms of defining the future performance of a fund.[1] In selecting and following a benchmark, a fund basically defines its asset allocation, its expected future return and its expected return volatility (i.e. the uncertainty around the expected outcome). Funds can go through various approaches to come up with an appropriate benchmark (e.g. this could be the outcome of a strategic asset allocation decision or the construction of a policy or reference portfolio), where the approach would depend on the purpose of a fund, its size and investment philosophy.

Given the importance of a fund's benchmark for its future performance, it is crucial that benchmarks are chosen carefully, taking into consideration the fund's purpose, the liabilities the fund will have and the consequences of the fund not achieving its target (i.e. the consequences of a shortfall). This report will therefore start with a discussion on the different considerations that go into the selection of appropriate benchmarks. Once benchmarks are selected, they become an important tool for monitoring performance, and appropriate performance metrics become important inputs that can assist the governance of the fund.

We subsequently make the case for why we consider a "reference portfolio" approach to be a good benchmark choice for Pacific Island funds, which are typically small in scale and have limited resources. Key advantages of this approach is that it will build in some best practice features in terms of portfolio construction, and this approach can be implemented cheaply and will result in relatively low cost funds.

Finally, we provide some simple alternative reference portfolio constructions that could be considered relevant for Pacific Island funds, depending on their economic purpose. Although the construction of a reference portfolios will be unique for every single fund (as funds will have different objectives/purposes, reside in different currency zones and will have different funding and liability structures), these hypothetical portfolios will provide some indication of what appropriate reference portfolios could look like and outline the process that we will follow in the next step, where we will construct reference portfolios for a select number of Pacific Island Sovereign Wealth Funds.

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1 Note that what we are calling a portfolio benchmark is sometime called a "policy portfolio", a "reference portfolio" or a "strategic asset allocation". Although these approaches differ, the key idea behind them is that there is a portfolio benchmark against which the actual performance of the overall fund and its constituent investment strategies can be assessed.

3.   Fund Governance Benchmarks

Broadly, portfolio benchmarks serve two main purposes.

1. **To formalise its economic purpose(s) into an implementable investment strategy.** In this context, benchmark selection has an ex-ante purpose that includes formalising the risk profile of the fund, the trade-off between risk and return, and the asset allocation decision (in very broad terms, the allocation to growth and income assets). The selection of appropriate benchmarks would take place at the establishment of the fund, but would also be considered at the time of an asset allocation review (at this point in time the fund would review whether the existing benchmark is still fit for purpose, given the current state of the fund, its current objectives, and the current and future expected economic climate).

2. **To provide a portfolio governance benchmark for performance assessment.** In this context, the selected benchmark has an ex-post purpose and allows the Board of a fund and other stakeholders to assess how the actual fund is performing relative to the portfolio benchmark. Using appropriate and relevant metrics, various statistics can be computed to monitor whether the actual decisions made by the fund managers are in line with meeting the funds objectives. Policies and procedures can be developed for this purpose.

Basic formalisation of the investment strategy

The formalisation of an investment strategy largely evolves around defining an appropriate risk profile for a fund. A fund's risk profile should largely be dictated by its economic purpose or purposes. As discussed in our previous report (Drew 2016), Pacific Island Funds with a macro stabilisation purpose will typically have a much lower allocation to risky assets than funds with long-term wealth accumulation, development, or pension funding purposes. In addition to its economic purpose, long-run survivability of the fund should also be considered in defining the risk profile of the fund. For instance, funds with fixed liabilities should consider these liabilities in the setting of its risk level to avoid potential shortfall of meeting its liabilities (see Box 1 for further discussion).

The level of risk reflects the allocation to growth versus income assets. Growth assets cover equities, property, and a range of alternative investments; income assets typically cover corporate and government bonds. Each of these types of assets have specific risk and return profiles, and these characteristics, along with the correlations between the assets classes, are key inputs in the formation of a portfolio benchmark for a fund.

Box 1   The risk- return trade-off

The risk- return trade-off is a fundamental concept in finance. Both finance theory and empirical observation show that there is a positive relation between the riskiness of an investment and the expected return on that investment. Low risk assets generally offer lower expected returns, while high risk assets offer higher expected returns. If an investor has a high required return on an investment, this can only be achieved by investing in high risk assets. Likewise, if an investor has a low tolerance for risk, then an investor cannot expect a high return on that investment.

From a fund's perspective, the trade-off between risk and return will largely be defined by its investment objectives as these objectives will provide some indication of the return that is required on the investment and the tolerance that the fund has for risk. Two approaches can be followed:

1. A fund can consider its required return on its investment strategy and work out the level of risk it needs to take to achieve it.

2. fund can determine its level of risk tolerance and given its risk profile can work out the return it can expect.

A prudent process would consider both approaches.

Example 1

A SF whose investment purpose is mainly for macroeconomic stabilisation would typically have a very low risk tolerance as it would have a strong preference for knowing how much money it can access in the case of adverse events. Consequently, such a fund could not have high expected returns on its investment and would also choose very liquid exposures.

Example 2

A SF whose purpose is mainly for pension reserves would typically have a need for a high required rate of return. These funds typically rely on wealth accumulation over time in order to meet their future obligations to pensioners. The higher the return the fund can make on its investment, the lower the contributions to the fund can be as much of the accumulation comes through the return on invested capital. In addition, given that these funds typically have long investment horizons adverse market movements will be smoothed out over time.

However, it is important for funds not to take undue levels of risk, and a degree of risk tolerance could be determined by evaluating the probability, severity and consequences of a shortfall of the fund in meeting its future obligations. These potential liabilities would have an impact on the risk profile of the fund and should be taken into consideration. In addition, funds may have liabilities that are linked to some economic variable (e.g. to domestic inflation). In the case where a fund has liabilities linked to domestic inflation, it could engage in an inflation-hedging strategy by seeking additional exposure to financial assets that provide this inflation hedge (e.g. domestic government bonds/domestic property). These are additional considerations that need to be taken into account when constructing portfolios.

Given the risk- return trade-off and other requirements (e.g. the need for liquidity in assets) a decision around the asset allocation can be made. The general process for this is there is a formation of some belief regarding the risk and return profile for each asset class and the correlations between them. These beliefs are typically formed on the basis of historical data, financial theory (such as the Capital Asset Pricing Model) and judgment.

Once the asset allocation decision has been made, appropriate benchmarks should be selected within each of the asset classes. If the investable universe is chosen such that it only contains assets that are traded in financial markets, then in most cases, broad, well-diversified indices will be available for those asset classes and become appropriate benchmarks for those asset classes. We discuss issues with benchmark choices further below.

Performance Measurement and Monitoring

Once the investment objectives have been set and a portfolio benchmark is selected for the fund, this benchmark becomes a key tool for performance measurement and governance. This includes the performance of the overall fund and performance of its constituent strategies.

In measuring the performance of the fund vis-à-vis its benchmark it is important not only to report on returns and return differences, but also to report on the riskiness of the fund's actual exposures. Reporting of risk levels is crucial as many investment strategies would claim to "outperform" a benchmark, but may in fact end up simply taking higher risk than the benchmark in pursuit of this. In addition, a range of metrics suitable to the investment philosophy of the fund should be reported and commented on.

Best practice here would be to have policies developed that specify the metrics that will be used to report on, and to specify limits on those metrics that define an acceptable range of the metric and a range where actions needs to be undertaken. In addition, there should be procedures that specify the

actions that will be taken when the limit of a specific metric is exceeded. For instance, in the case of a fund that has a philosophy based on active management, a Board or delegated fund authority (e.g. a fund's Investment Committee) might set limits in terms of how much active risk a fund is allowed to take. This includes the overall level of active risk, and the active risk on constituent investment strategies. For passive strategies, the aim is to minimise the active risk (or tracking error) of its investments, and limits could be set on how much tracking error is acceptable.

Reporting should comment on performance, relevant metrics and provide explanations when investment performance (whether positive or negative) versus benchmarks is more than should be expected. It should also report on when an exposure (whether internally or externally managed) breaches any other conditions of its mandate. Breaches of limits can occur for various reasons, and it is crucial to understand why those breaches have occurred, the likely consequences for the fund, and the actions being taken.

4. Strategic Asset Allocation versus Reference Portfolios

Although there are various approaches to allocating assets and constructing a portfolio benchmark, the most common approach is a Strategic Asset Allocation (SAA). This is a top-down approach that starts the portfolio construction process by making an allocation decision at the asset class level.

A Reference Portfolio (RP) approach is very similar to an SAA approach, but essentially imposes some limits on how benchmarks are selected, and thus which asset classes can be considered. The RP approach was adopted by the New Zealand Superannuation Fund in 2010 and is becoming more widespread.

The New Zealand Superannuation Fund describes the key features of a RP as follows (Brake et al., 2015):

- **Simple, cheap and passively managed:** A RP should be a simple portfolio that can be passively managed and is cheap to implement. This ensures that a fund could seek exposure to the asset classes in the RP without requiring a very high skill set from its investment management team or external suppliers.

- **Well diversified:** Given benchmark indexes are constrained to broad market options, the fund investment strategy inherently builds in a high level of diversification.

- **Appropriate risk level for the fund given its purpose:** A reference portfolio should be constructed with a risk profile in line with the fund's purpose.

- **Relevant to its home investors:** This refers to the fact that the portfolio needs to be considered from a home market perspective. Factors that are important in this regard include: (i) the extent to which there is an advantage being over-weight in domestic assets (e.g. because of tax considerations); (ii) relevant legislative constraints such as a specification to hold a certain fraction of the fund in domestic assets; and (iii) the extent to which the portfolio should be hedged back to domestic currency terms, and the practical constraints of doing so.

- **A long run concept:** The portfolio should reflect a long-term perspective or expectation of how the different asset classes and thus the overall portfolio should perform.

The RP approach has features we think would make this approach particularly suitable for small Pacific Island SFs with limited assets under management, resources, and depth of expertise in financial markets and portfolio management:

1. As above it limits choices to traditional asset classes that are broadly diversified, easily and cheaply traded in financial markets (e.g. ETFs), and relatively easy to understand.

2. It would encourage Pacific Island SFs to be sceptical about the ability of managers to add value over a benchmark, and focuses attention on the costs of active management. There is an abundance of academic literature showing that most active managers fail to exceed their benchmarks net of costs, and that for those who *do* exceed, performance is not persistent. The literature also

suggests it is very difficult to identify skilled managers – even for large Sovereign and other funds who have proximity to major markets and asset managers.

3. As a long run construct it removes the temptation to formulate a benchmark that is overtly influenced by short-term "tactical" considerations and risks. Again, the literature suggests that many of these considerations are very difficult to predict with accuracy and profit from.

4. Since the asset classes considered are traditional and traded in financial markets, benchmark indexes will be readily and freely available, simplifying the process of performance measurement and monitoring. This in turn may lessen the requirement to engage relatively expensive external consultants to monitor and assess Fund performance.

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5. Simple Reference Portfolios for Different Types of Pacific Island Fund Purposes

In this section, we present potential RPs for the four main economic purposes of SFs. Since the inputs to the construction of reference portfolio are designed to replicate specific benchmarks, we first discuss the benchmark selection process. We then discuss the asset allocations to these benchmarks.

We note that in this process, we abstain from considering any liability matching issues or liquidity/funding issues. These issues will undoubtedly have an impact on the actual asset allocation decision, but will be unique to every fund and thus will need to be a consideration that is taken into account when constructing actual RPs for funds. However, we can make some general comments in terms of how liability matching and funding issues will impact the construction of a reference portfolio. Funds with given liabilities, and those liabilities linked to specific economic variables (e.g. inflation) can seek additional exposure to instruments that hedge against those economic variables. However, in the context of many of the Pacific Island SFs, these instruments may not be available. In some cases a second-best alternative may be found, but in many cases we expect that no hedging instruments will be available. In terms of funding issues, the probability of shortfall can be taken into consideration in the asset allocation decision, where funds with higher probabilities of shortfall may end up with an investment strategy that turns out to be a bit more conservative. As these issues are unique to each fund, they will be addressed in the actual case studies on the sovereign funds.

In Table 1 key desirable characteristics of a benchmark index are presented, as discussed in detail in Brake et al. (2015). In short, a benchmark is seen as desirable if its construction rules are transparent, it covers the market, the index is replicable, and investable, and there is a broad acceptance of the index by institutional investors.

There are a raft of index providers who provide a multitude of indexes for various asset classes. The two largest and generally accepted index providers are Morgan Stanley Capital Indexes (for equities) and Barclays Capital (for Fixed Income). Our assessment is that the benchmark indices shown in Table 2 would meet the criteria listed above. Further information about these indexes is provided in Appendix B.

Table 1 Desirable characteristics of a benchmark index

Characteristic	Description
Objective selection criteria	Published rules and subject to a transparent governance structure.
Completeness	Should reflect the complete investable universe and should not selectively exclude assets based on some subjective criteria
Replicability	An investor should be able to closely replicate the index performance.
Investability	An investor can readily trade the constituent stocks with minimum market impact and transaction costs.
Acceptance by investors	Well recognised and widely used and that derivatives based on the index are traded in liquid markets.

Source: Brake et al. (2015)

Table 2 Broadly replicable and recognised market benchmarks that could comprise RP constituents

	Benchmarks	Hedging Alternatives
Income Assets		
Fixed Interest	Barclays Global Aggregate	Unhedged, NZD, USD and AUD hedged
Sovereign Bonds	Barclays Global Treasury	Unhedged, NZD, USD and AUD hedged
Investment Grade Corporate Bonds	Barclays Global Aggregate – Corporate	Unhedged, NZD, USD and AUD hedged
High yield bonds	Barclays Global High Yield	USD hedged and AUD hedged
Emerging Market Bonds	Barclays Emerging Markets Local Currency Government Index	Unhedged
Growth Assets		
Developed Market Equities	MSCI World Investable Market Index	Unhedged, NZD, USD and AUD hedged
Emerging Market Equities	MSCI Emerging Markets Investable Market Index	Unhedged
Listed Property	FTSE EPRA/NAREIT Global	Unhedged, USD, NZD and AUD hedged

We also show the alternative hedging choices that are available for these indexes. In principle, it should be possible to construct a RP benchmark that is relevant to the Islands given different combinations of these hedging choices, even though in most of the Islands that have local currencies it is very difficult to hedge exposures directly back to them.

For example, in the case of Islands that use New Zealand dollars (e.g. Cook Islands, Tokelau, Niue) a blend of unhedged and NZD exposures would likely offer the best risk-return trade-off and be relevant to their domestic circumstance. In the case of Islands who issue their own currency generally these currencies are pegged to a basket of NZD, AUD and USD. As such, in principle forming a RP with a combination of these currency exposures would meet their domestic circumstance.

Construction of Reference Portfolios

The second step in the construction of a reference portfolio is to combine appropriate benchmark indices into a RP that meets the needs of the specific fund.

As discussed in Drew (2016), macroeconomic stabilisation funds generally have a low risk profile. Thus an allocation that is predominantly towards fixed interest securities would be appropriate.

Pension funds have a balanced to high risk profile as their liabilities will have longer duration and there is no (unpredictable) short term need to withdraw funds. For such a fund it would therefore be more appropriate to have a greater allocation towards growth assets.

Intergenerational wealth funds also have a high risk profile, as the duration of "liabilities" would be even longer than for pension funds. Hence these types of funds would typically allocate even more to growth assets.

Economic development funds would have a slightly different profile from the other three types of funds. This is because these types of funds would not necessarily have maximisation of risk-adjusted returns as their sole objective, but may also have developmental/social objectives. In principle, it is still appropriate to construct a RP that is broadly diversified across asset classes, but there will be an inherent home bias (greater allocation towards domestic assets) in the portfolio.

In Table 3, we provide a set of indicative RPs compositions for the different economic purposes of Pacific Island SFs. We also show indicative expected long run returns and risk levels. These have been calculated using the long run risks and return assumptions detailed in Brake *et al.* 2015. Further details on these RPs are provided in Appendix B.

Table 3 Indicative Reference Portfolios

Risk Level	Purpose	RP Composition	Expected Return	Expected Risk Level
Low	Macroeconomic stabilisation	Barclays Global Treasury (70%) Barclays Global Aggregate – Corporate (20%) Foreign Cash (NZD, USD or AUD) 10%	5.5%	4.2%
Medium/High	Pension Reserve	Barclays Global Aggregate (35%) MSCI World IMI (52.5%) MSCI EM IMI (7.5%) EPRA/NAREIT Global (5%)	7.5%	11.3%
High	Intergenerational Wealth	Barclays Global Aggregate (20%) MSCI World IMI (65%) MSCI EM IMI (10%) EPRA/NAREIT Global (5%)	8.0%	13.4%
High	Economic Development	Barclays Global Aggregate (10%) Barclays EM Local Debt (10%) MSCI World IMI (50%) MSCI EM IMI (25%) EPRA/NAREIT Global (5%)	8.3%	15.0%

Reference Portfolios for Funds with multiple economic purposes

For funds with multiple economic purposes (e.g. the Trust Funds in Tuvalu, Tokelau and Niue) a single RP is not sufficient. Instead, a RP should in principle be constructed for each of the fund's economic purposes. The overall asset base that the fund has to manage will then be a weighted average of these RPs, with the weights reflecting the resources required to meet these different purposes.

Ideally, these weights will be easy to determine from legislation and a fund's policy documents, i.e. there is clear understanding by the fund and its stakeholders of the economic purposes, the resources that need to be committed to meet them, and how these purposes interact with government policy. A core part of our assessment framework will be to assess whether or not this is in fact the case.

Where the boundaries are not as clearly defined, it is more difficult to ascertain the overall asset mix. In this case, the RP construction process could be seen as an opportunity to test with stakeholders the weight they would place on these different objectives.

6. Summary and Next Steps

This report has provided an overview on the importance of selecting appropriate benchmarks for funds in terms of formalising its investment objectives and monitoring performance. In addition, we have made the case for using reference portfolios to come up with appropriate benchmarks for Pacific Island Sovereign Funds, and have demonstrated how such reference portfolios can be constructed in a relatively simple way. As we highlighted in this discussion, these are hypothetical portfolios that serve a purpose of illustration of how reference portfolios could be constructed. There are other considerations (unique to funds), such as liability matching and funding issues that will need to be taken into consideration as well, which would likely lead to some variation in the actual reference portfolios of funds.

In the next step, we will be conducting case studies on four specific Sovereign Funds: the Tuvalu Trust Fund; the Tuvalu Pension Fund; the Nuie Trust Fund; and the Tokelau Trust Fund. A full assessment of these sovereign funds will be conducted as detailed in Drew *et al.* (2016). In addition, tailor-made reference portfolios taking into consideration fund objectives and liabilities will be constructed.

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Appendix A Pacific Island Sovereign Funds

Table 4 Economic Purposes of Current Pacific Island Sovereign Funds

Nation	Macro stabilisation	Inter-generational wealth	Pension Reserves	Economic development
Cook Islands	No	No	Yes	No
Fiji	No	No	Yes	Via pension funds
Kiribati	Yes	Yes	Yes	No
Marshall Islands	Yes (from 2024)	No	No	No
Micronesia (FSM)	Yes (from 2024)	No	No	No
New Zealand	No	No	Yes	Via pension funds
Niue	Yes	Yes	No	Yes
Nauru	No	No longer	No	No
Papua New Guinea	Yes[1]	Yes[1]	Yes	Via pension funds
Samoa	No	No	Yes	Via pension funds
Solomon Islands	No	No	Yes	Via pension funds
Timor-Leste[2]	Yes	Yes	No	No
Tonga	No	No	Yes	Via pension funds
Tokelau	Yes	Yes	No	Yes
Tuvalu	Yes	Yes[3]	No	No
Vanuatu	No	No	Yes	Via pension funds

Source: Al-Hassan et al. 2013, various other

1. The newly minted SWF for Papua New Guinea has stabilisation and wealth objectives.

2. Timor-Leste is included in the sample despite not usually being grouped as a Pacific Island nation given its cultural linkages to Melanesia and Polynesia and the similarity of its economic challenges to the large Melanesian islands.

3. The Tuvalu Trust Fund is focussed on macro stabilisation but is broadly seen as also having an inter-generational wealth purpose.

Appendix B Index Descriptions and Reference Portfolio Constructions

Barclays Global Aggregate Index

The Barclays Global Aggregate Index is a multi-currency index that tracks the performance of global bonds from 24 countries (mostly developed market, but also some emerging markets). The index includes treasury, government-related, corporate and securitised fixed rate bonds that are considered to be of investment grade (Baa3, BBB-, BBB- or higher based on the ratings of Moody's, S&P and Fitch). There are clear rules around the calculation and construction of the index (https://index.barcap.com/Home/Guides_and_Factsheets).

Barclays Global Treasury Index

The Barclays Global Treasury Index is an index that tracks the performance of government debt from 37 countries (both developed market and emerging markets). The index includes government fixed rate securities that are considered to be of investment grade (Baa3, BBB-, BBB- or higher based on the ratings of Moody's, S&P and Fitch). There are clear rules around the calculation and construction of the index (https://index.barcap.com/Home/Guides_and_Factsheets).

Barclays Global Aggregate - Corporate Index

The Barclays Global Treasury Index is an index that tracks the performance of corporate issued of investment grade quality (Baa3, BBB-, BBB- or higher based on the ratings of Moody's, S&P and Fitch). The index has clear rules around the calculation and construction of the index (https://index.barcap.com/Home/Guides_and_Factsheets).

Barclays Global High Yield

The Barclays Global High Yield Index is an index that tracks the performance of global high yield bonds (either corporate or government) covering both developed market and emerging markets. The index includes fixed rate securities that are considered to be of grade Ba1, BB+, BB+ or higher based on the ratings of Moody's, S&P and Fitch. There are clear rules around the calculation and construction of the index (https://index.barcap.com/Home/Guides_and_Factsheets).

Barclays Emerging Markets Local Currency Government

The Barclays Emerging Markets Local Currency Government Index tracks the performance of government debt from emerging market countries (some emerging markets are not considered due to investability issues). The emerging markets classification is based on the World Bank and IMF country classifications (currently the index includes 18 emerging markets). There are clear rules around the calculation and construction of the index (https://index.barcap.com/Home/Guides_and_Factsheets).

MSCI World Investable Market Index

The MSCI World Investable Market Index tracks the performance of stocks listed in 24 developed markets that are deemed to be investable. The index covers about 98% of free-float adjusted market capitalization of each country that is included.

(https://www.msci.com/resources/factsheets/index_fact_sheet/msci-world-imi.pdf)

MSCI Emerging Markets Investable Market Index

The MSCI Emerging Markets Investable Market Index tracks the performance of stocks listed in 23 emerging markets that are deemed to be investable. The index covers about 99% of free-float adjusted market capitalization of each country that is included.

(https://www.msci.com/resources/factsheets/index_fact_sheet/msci-emerging-markets-imi-net.pdf)

FTSE EPRA/NAREIT Global

The FTSE EPRA/NAREIT Global index tracks the performance of global listed real estate companies and REITs (real estate investment trusts). The index is free-float adjusted and its constituents are screened for investability.

(http://www.ftse.com/Analytics/FactSheets/temp/09aa69a4-f46f-419e-97d2-cc264bd95c4b.pdf)

Macroeconomic stabilisation funds

A RP for a stabilisation fund will hold broadly diversified low-risk and liquid fixed income securities and some cash (in local currency) that can be accessed immediately in case of adverse events.

An indicative reference portfolio could thus be made up out of 10% cash (local currency), 70% the Barclays Global Treasury index, and 20% in the Barclays Global Aggregate – Corporate index.

Given risk and return expectations of these indexes and their correlations we can calculate an expected return on an indicative RP.[2] The assumptions we use are based on Brake et al. (2015). The expected NZD return of a macroeconomic stabilisation fund is 5.5%, or 0.5% above the long run NZ 90-day rate interest rate assumption of 5%.

As shown in the table below, both Global Sovereign bonds and Global Corporate Bonds have a higher risk level than the overall reference portfolio. This indicates there is a diversification benefit by combining these assets in a portfolio.

[2]Note that this portfolio is constructed from a NZD perspective and the numbers used in the calculations are based on NZD hedged figures. Portfolios from different currency perspective will have different assumptions regarding the risk free-rate, local currency risk premium and degree of exchange rate hedging. As this is specific to each nation, we do not provide these figures at this stage, but would do this analysis when doing the full analysis on specific SFs.

Table 5 Indicative RP macroeconomic stabilisation fund

| | Weight | Expected Return | Standard Deviation | Correlations | | |
				Global Sovereign	Global Corporate	NZ cash
Global Sovereign	70%	5.4%	4.5%	1		
Global Corporate	20%	5.9%	6.0%	0.8	1	
NZ 90 day rate	10%	5%	-	0	0	1
Indicative RP		5.5%	4.2%			

Source: Brake et al. (2015), author calculations

Pension Reserve Funds

Given that the risk profile of a pension reserve fund is medium to high, the fund would allocate its investment to a mixture of fixed income and growth assets, with minimal cash holdings (assuming drawdowns that must be paid out each period could not be more than offset by contributions).

An indicative reference portfolio could be made up out of 35% Global Bonds, 52.5%

Global Developed Markets Equity, and 7.5% Global Emerging Markets Equity, and 5% Global Property.

The expected NZD return of this RP is 7.5%, or 2.5% above the NZ cash rate assumption. Again we note the less than perfect correlations between asset classes implies that diversification benefits can be gained by combining these assets in a portfolio, putting the overall risk level of the fund at 11.3%.

Table 6 Indicative RP pension reserve fund

| | Weight | Expected Return | Standard Deviation | Correlations | | | |
				Global Agg	Global DM	Global EM	Property
Global Aggregate[1]	35%	5.7%	5%	1			
Global DM	52.5%	8.5%	16.0%	0.4	1		
Global EM	7.5%	9.5%	26.0%	0.3	0.7	1	
Property	5%	7.8%	16%	0.35	0.8	0.6	1
Indicative RP		7.54%	11.33%				

Source: Brake et al. (2015)

[1]Brake et al. (2015) do not report the figures for Global Aggregate Bonds. We assume that Global Aggregate Bonds contains 50% government bonds and 50% corporate bonds, and base our numbers on those provided by Brake et al. (2015)

Intergenerational wealth fund

Given that the risk profile of an intergenerational wealth fund is high, the fund would allocate its investment predominantly to growth assets, with some exposure to fixed income to ensure diversification benefits.

A possible RP would look similar to that of a pension reserve fund, but with a greater allocation to growth assets. As the fund has no immediate need for cash, there is no need to hold funds in a cash account. An indicative reference portfolio could thus be made up out of 20% Global Bonds, 65% Global Developed Markets Equities, 10% Global Emerging Markets Equities, and 5% in Global Property.

The expected NZD return of this RP is 8.0%, or 3% above the NZ cash rate assumption. The overall risk level of this RP is 13.4%.

Table 7 Indicative RP intergenerational wealth fund

	Weight	Expected Return	Standard Deviation	Correlations			
				Global Agg	Global DM	Global EM	Property
Global Aggregate[1]	20%	5.7%	5%	1			
Global DM	65%	8.5%	16.0%	0.4	1		
Global EM	10%	9.4%	26.0%	0.3	0.7	1	
Property	5%	7.8%	16%	0.35	0.8	0.6	1
Indicative RP		8.0%	13.4%				

Source: Brake et al. (2015)

[1]Brake et al. (2015) do not report the figures for Global Aggregate Bonds. We assume that Global Aggregate Bonds contains 50% government bonds and 50% corporate bonds, and base our numbers on those provided by Brake et al. (2015)

Economic development fund

Economic development funds have a high risk profile, and include concentration risks which are not borne in a RP. Investments are predominantly to growth assets, with some exposure to fixed income to ensure some diversification benefits.

A possible RP would look similar to an intergenerational wealth fund, but arguably with a greater allocation to emerging markets. This reflect the fact Pacific Islands are developing economies, and an appropriate benchmarks would hence seek a greater exposure to emerging markets (both in income and growth assets).

An indicative RP could comprise 10% Global Bonds, 10% Emerging Markets Local Debt, 50% Global Developed Markets Equity, 25% Global Emerging Markets Equity, and 5% in Global Property.

The expected NZD return of this RP is 8.4%, or 3.4% above the NZ cash rate assumption. The overall risk level of this RP is 15%, considerably higher than the level of risk expected for the intergenerational wealth RP.

Table 8 Indicative RP economic development fund

				Correlations			
	Weight	Expected Return	Standard Deviation	Global Agg	Global DM	Global EM	Property
Global Aggregate[1]	10%	5.6%	5%	1			
EM Local Debt2	10%	7.4%	11.7%	0.4	1		
Global DM	50%	8.5%	16.0%	0.4	0.5	1	
Global EM	25%	9.4%	26.0%	0.3	0.65	0.7	1
Property	5%	7.8%	16%	0.35	0.25	0.8	0.6
Indicative RP		8.3%	15.0%				

Source: Brake et al. (2015)

[1]Brake et al. (2015) do not report the figures for Global Aggregate Bonds. We assume that Global Aggregate Bonds contains 50% government bonds and 50% corporate bonds

[2]Brake et al. (2015) do not report the figures for Emerging Markets Local Debt. We obtain estimates for these figures from the 2015 Horizon Actuarial Services Survey of Capital Market Assumptions, http://www.horizonactuarial.com/blog/uploads/2015/08/Horizon_CMA_Survey_2015_v0731.pdf

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Authorship

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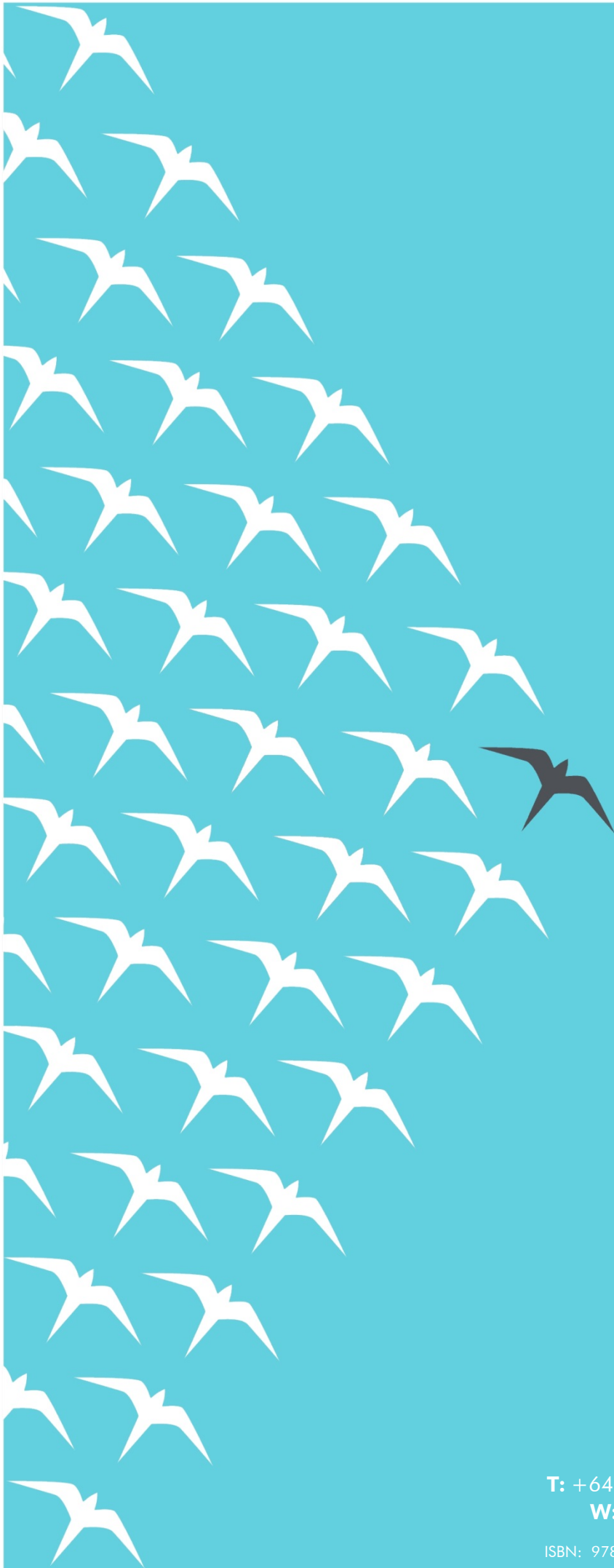
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