GROWTH ASSETS OF PENSION FUNDS AND RETIREMENT SYSTEM'S ADEQUACY AND SUSTAINABILITY

March 2019	MELBOURNE MERCER GLOBAL PENSION INDEX

CONTENTS

REPORT HIGHLIGHTS

- Pension funds around the world follow different strategies in asset allocations.

- In terms of adequacy of pension systems, countries with very high allocation of pension assets to growth asset classes do not have high net replacement rate, a key indicator of retirement adequacy. Countries with moderate allocation to growth assets actually are those with top net replacement rate.

- In terms of sustainability of pension systems, there is a positive relationship between the level of growth assets and the overall size of pension assets. Specifically, large pension markets, as measured by pension assets to GDP ratio, tend to have high allocation to growth assets in pension portfolios. It was also observed that pension systems with higher allocation to growth assets earn higher investment rates of return.

- Putting adequacy and sustainability together, we find that top performers in both adequacy and sustainability are those large pension markets with moderate to high allocation to growth assets in pension funds. Countries with very aggressive allocation of pension assets to growth assets do not actually belong to this group. Our observation suggests that the moderate to high level of growth assets held by pension funds could potentially enhance pension system's adequacy and sustainability.

ASSET ALLOCATION OF PENSION FUNDS

There is significant diversity in terms of asset allocation of pension funds across the world. Based on the dataset of pension systems included in the Melbourne Mercer Global Pension Index (MMGPI[i]), the Australian Centre for Financial Studies (ACFS) (2019) has published the report titled "Asset Allocation of Pension Funds"[ii] that explores the drivers and implications of this diversity. Splitting assets into growth versus defensive asset classes, we have showed that on average, over the period of 2010 – 2018, 37.8% of pension assets were invested in growth assets. The allocation to growth assets has been increasing since 2013, reflecting an expectation of a period of good growth across different markets.

We also observed institutional and economic differences among pension markets with high allocation to growth assets versus those with less growth assets. These differences lie in the way the pension system is designed and the level of household debt, household savings and home ownership in each system.

While there is not a single optimal asset allocation formula that would apply in all circumstances, it is worth considering whether various asset allocation strategies of pension funds contribute differently to the level of adequacy and sustainability of the pension systems. This report, therefore, focuses on the following key questions:

(1) How does asset allocation policy of pension funds contribute/link to the overall adequacy and sustainability level of the pension systems?

(2) Is there a trade-off between adequacy and sustainability of pension systems?

ASSET ALLOCATION AND PENSION ADEQUACY

Adequacy of benefits, or the ability to provide adequate retirement income, is the primary objective of any pension system. One of the key criteria to assess the level of adequacy of a system is the net replacement rate for middle income earners[iii], published by the OECD in their series of *Pension at a Glance*. In order to understand if growth assets contribute to retirement adequacy, we choose to examine the association between the level of growth assets held in the pension system and its net replacement rate.
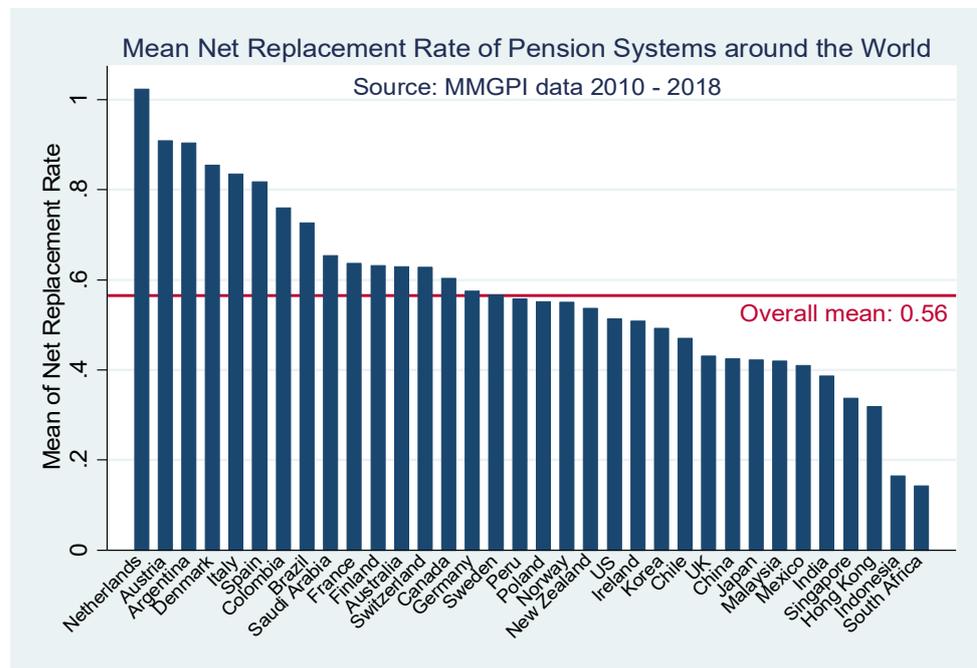

Figure 1: Net Replacement Rate of Pension Systems around the World

According to the OECD, the net replacement rate is the individual's net pension entitlement divided by net pre-retirement earnings, taking into account personal income taxes and social security contributions paid by workers and pensioners. On average, the net replacement rate of MMGPI pension systems during 2010 – 2018 was 56.51%.

While top countries achieved a mean net replacement rate above 80% (the Netherlands (>100%), Austria, Argentina, Denmark and Italy), in certain countries like Indonesia and South Africa, pensioners only receive less than 20% of their pre-retirement earnings.
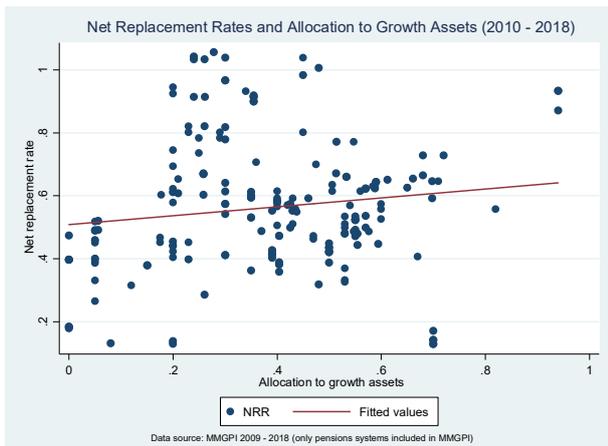
Figure 2: Net replacement rate and allocation to growth assets of pension funds
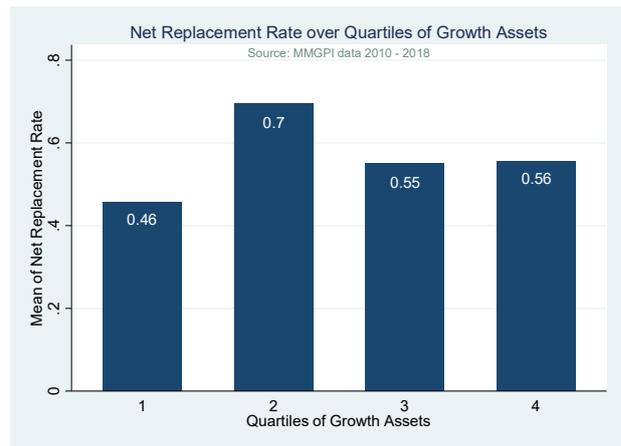

Figure 3: Net replacement rate over Quartiles of Growth Assets

On the overall sample, there appears to be a weak positive association between the level of growth assets and the net replacement rate. However, our analysis by quartiles of growth assets actually shows that net replacement rate is highest (mean = 70%) for countries in the second quartile of growth assets, of which the mean allocation to growth assets is approximately 32%.
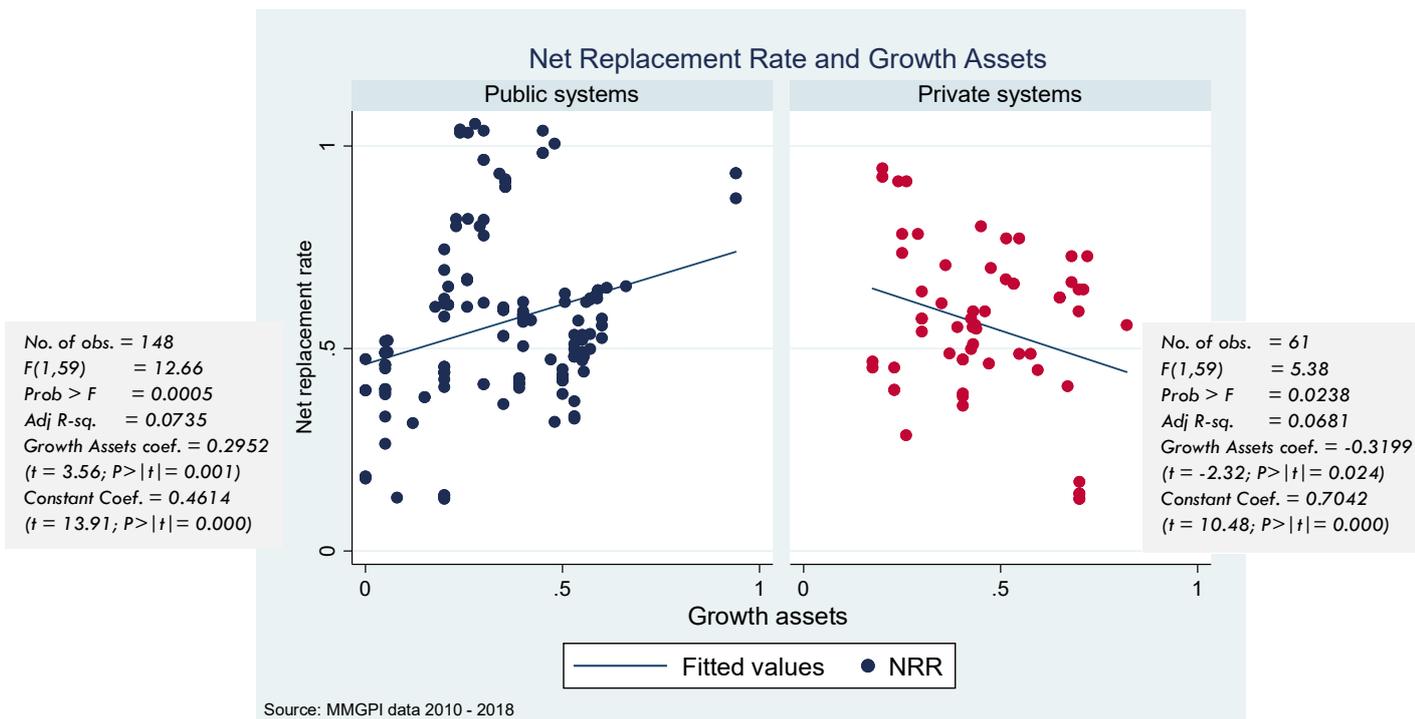

Figure 4: Net Replacement Rate and Growth Assets by Pension System Design

Looking into the subsamples of public or private pension systems by design, we, however, discovered an interesting difference between the two subsamples. For public pension systems, we observed a positive association between net replacement rate and growth assets, meaning that countries with high pension assets in growth asset classes

tend to have high net replacement rate. However, for private pension systems, the association between these two variables was negative.

Our findings suggest that private pension systems that are aggressive in investing their pension assets in growth assets are *not* necessarily the ones that provide highly adequate retirement income. Those countries with *moderate* growth assets in pension funds seem to outperform others in terms of net replacement rate, an indicator of adequacy.

ASSET ALLOCATION AND PENSION SUSTAINABILITY

The sustainability of a pension system depends on the growth of the economic importance of the pension system and investment rates of return among other economic and demographic factors driving the labour force.

In this research, we documented a strong link between the level of growth assets held by pension funds and size of pension assets and the investment rates of return.

Size of the pension system

We examine the size of the pension system as measured by the ratio of pension assets over GDP[iv]. Pension assets include all private pension arrangements, public pension reserve funds, protected book reserves and pension insurance contracts. When expressed as a percentage of GDP, the level of pension assets represents a good indicator of an economy's ability to meet future pension payments.

Figure 5: Pension Assets as a Percentage of GDP in 2018
Source: MMGPI data

In terms of the average pension assets as a percentage of GDP in 2018, while the top countries have pension assets much larger than their GDP such as Denmark (205%), the Netherlands (183%) and Canada (171%), see Figure 5, for some countries like Indonesia, India and China, pension assets represent a tiny fraction of GDP, only 3.5%, 5.7% and 8% respectively. For the growth of pension assets of each country during the 2009 – 2018 period, please see Appendix 1.
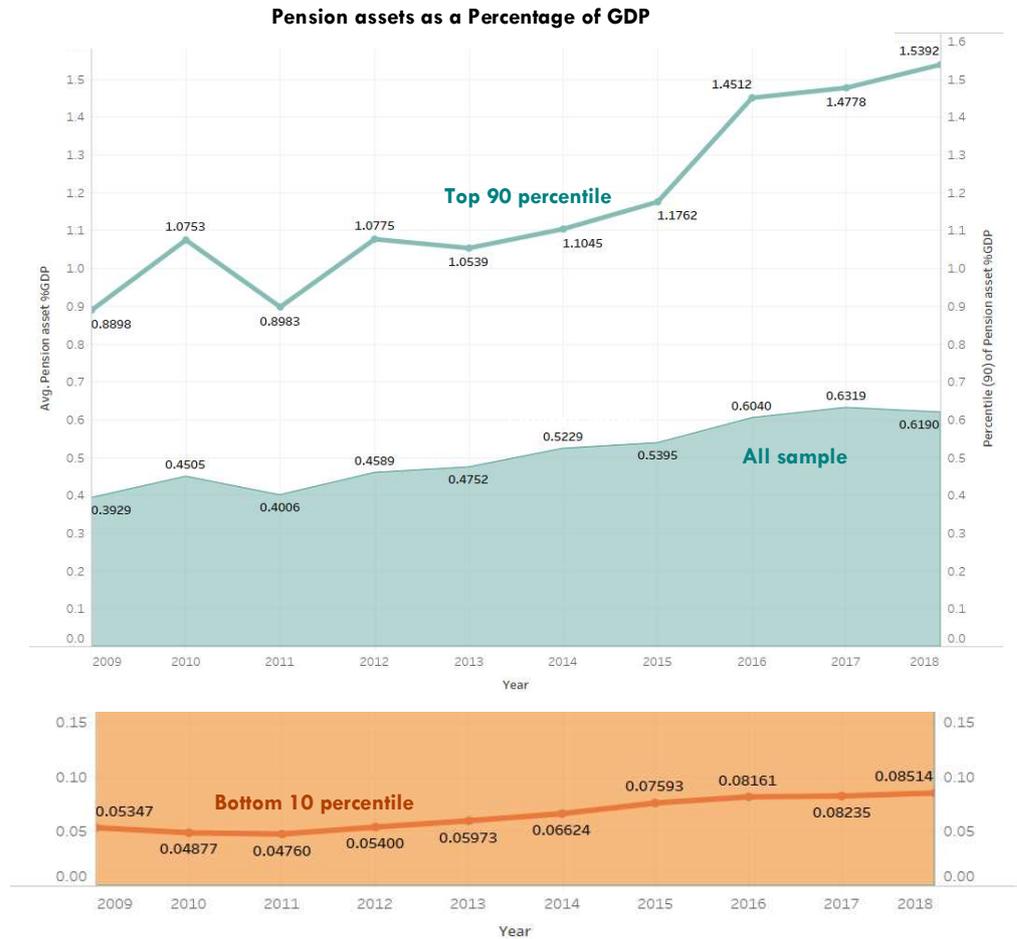
Pension assets as a Percentage of GDP

Figure 6: The level of pension assets - The 90 and 10 percentiles

Over the last ten years, for all MMGPI systems, illustrated by the "all-sample" line in Figure 6, the level of pension assets, on average, increased from 39.3% to 61.9% of GDP. At a much faster pace, the top systems in the 90th percentile, the teal line, such as the US, the UK, Switzerland and the Netherlands, have grown their pension assets impressively from 89% to 154%. However, during the same time period, a very modest growth of pension assets, from 5.4% to 8.5% of GDP, has been observed for pension systems in the10th percentile, indicated by the orange line. Systems with slow growth in assets include Austria, China, India, Indonesia and Italy.

The largest P7 markets have consistently exhibited strong growth in pension assets, as shown in Figure 7, at a much higher rate compared to that of the non-p7 markets.
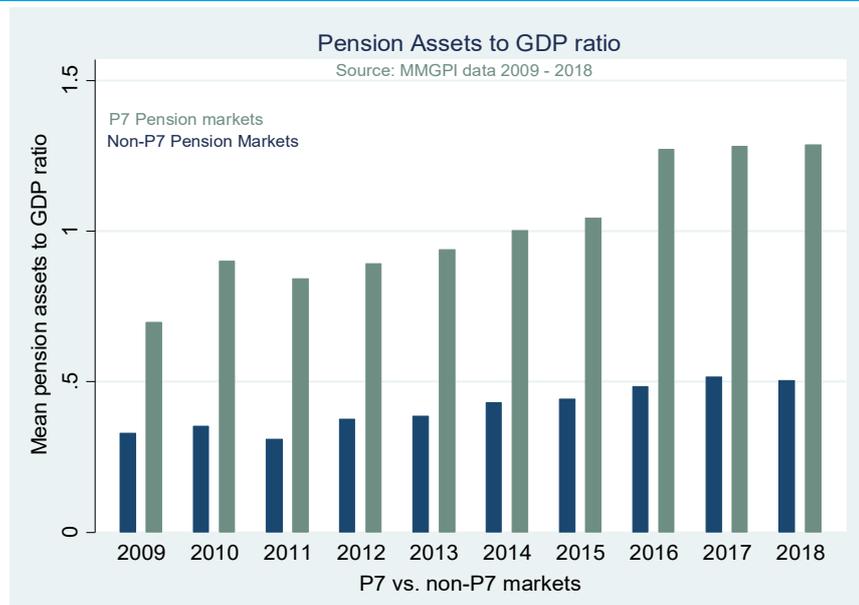
Figure 7: Pension assets in P7 vs. non-P7 markets

We examined the average size of pension assets across quartiles of growth assets and the association was clearly shown in Figure 8 and Figure 9 below.

Pension systems with higher allocation to growth assets, such as Australia, Canada, Saudi Arabia, Switzerland, the US and the UK, have larger pension assets (mean = 93.7%). In contrary, pension systems with the most conservative asset allocation like China, France, India and Indonesia, have significantly small level of pension assets (mean = 26.4%). The difference in pension asset size between Quartile 1 and Quartile 4 of growth assets was significant with t-statistic of -9.06 and p-value of 0.0000.

The scatter plot depicted in Figure 9 also demonstrates the same positive relationship between the level of growth assets and the level of pension assets relative to GDP.
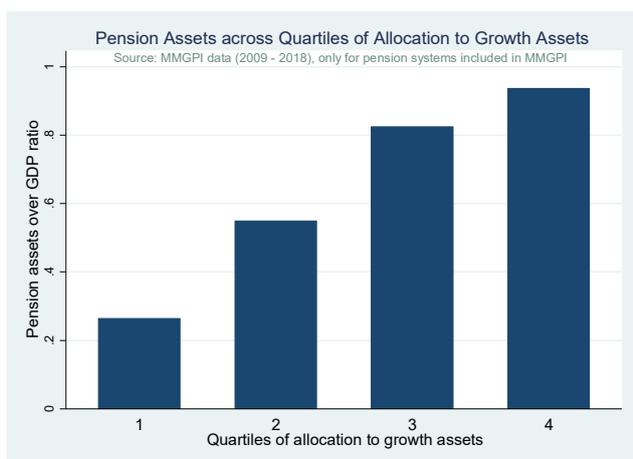

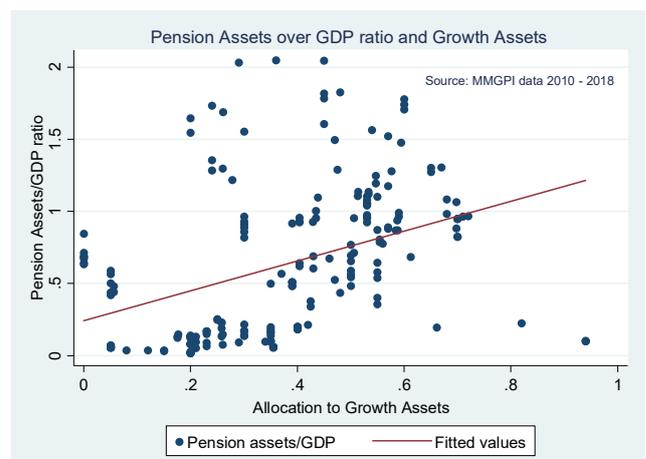*Figure 8: Pension Assets/GDP across Quartiles of Growth Assets*

Figure 9: Pension Assets/GDP ratio and Growth Assets

Growth assets and investment rates of returns

Growth assets provide the pension portfolio with the benefits of diversification and the potential for higher returns. In this prolonged low interest rate environment, some exposure of pension assets to growth assets is essential for pension funds to seek positive real investment returns. Therefore, we analysed the real annual net investment rates of returns of funded and private pension arrangements for the period of 2010 to 2017, as reported by OECD in its publication *Pension Markets in Focus 2018*.
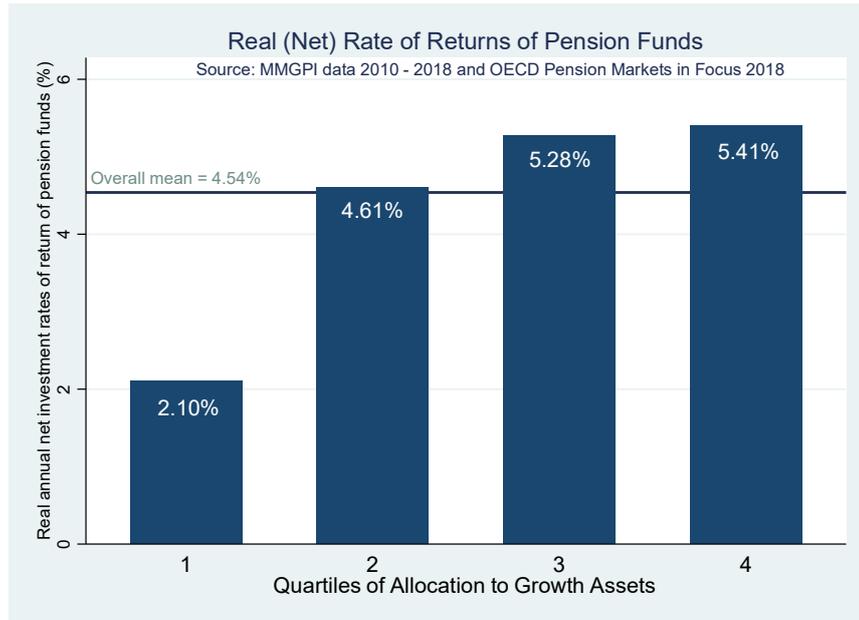

Figure 10: Real net investment rate of returns and allocation to growth assets 2010 - 2017

We confirm that more aggressive allocation of pension assets to growth asset classes is coupled with higher real investment rates of returns, after considering all investment and operating expenses. On average, pension funds in our sample earned a real net return of 4.54% per annum. However, as it can be seen from Figure 10, pension systems with lowest allocation to growth assets only earned 2.10% whereas the top growth asset holders earned 5.41% on real terms.

So pursuing strategies with more growth assets allows pension portfolios to be compounded over the long term at a higher average rate of return, which is the key to grow their pension assets. Growing the level of pension assets and enhancing their investment rate of returns are key factors to build the capacity to pay future benefits of each retirement system.

While the preference of growth assets may seem contradict to the perceived conservative investment mandate of pension funds within a traditional view of risk being volatility of returns, in a retirement-specific view of risk which defines risk as adequacy risk and longevity risk, high allocation to growth assets may actually reduce retirement risk and improves the sustainability of the system.

PUTTING ADEQUACY AND SUSTAINABILITY TOGETHER

While it seems that there is a natural tension between adequacy and sustainability in that pension systems with generous benefit payments is unlikely to be sustainable, we observed a positive association between the average adequacy and sustainability scores of pension systems during the period of 2010 – 2018.
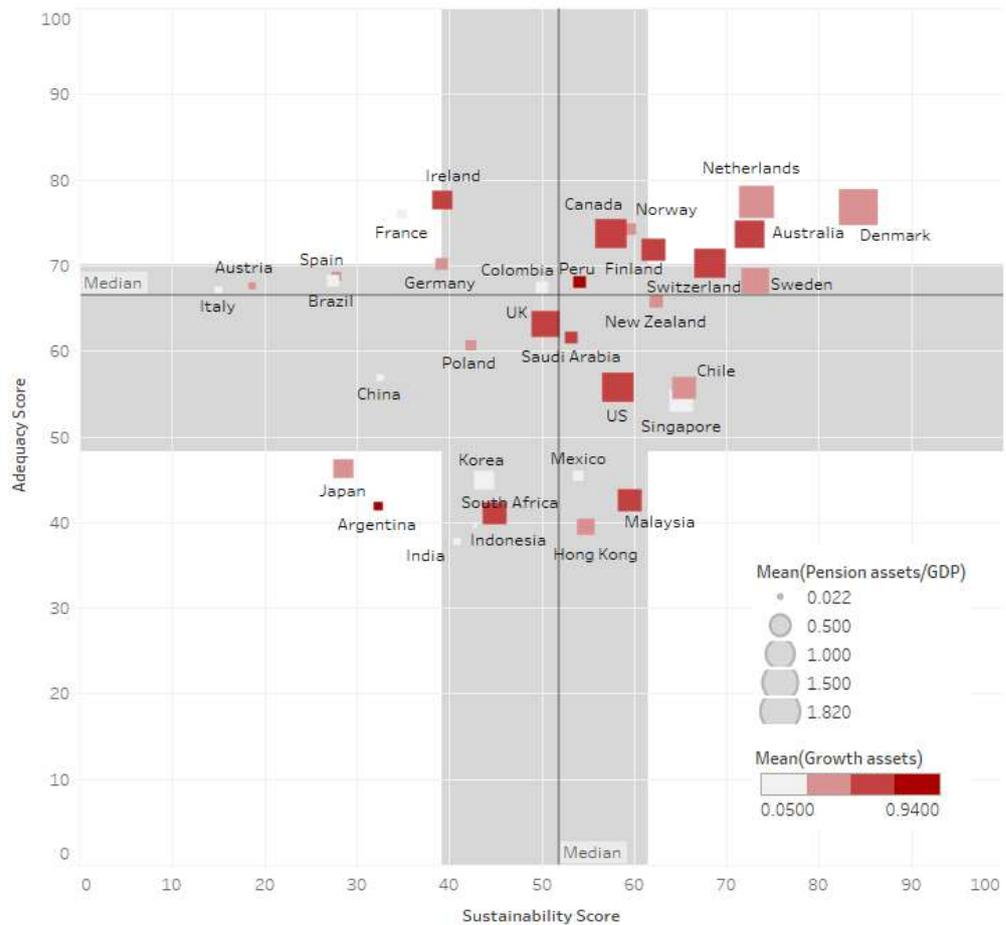
Figure 11: Adequacy and Sustainability Scores of Pension Systems

Figure 11 highlights the medians and the interquartile ranges of adequacy and sustainability (in the grey shaded areas). Each pension system is represented by a square, the size of which reflects the level of pension assets indicated by the pension assets to GDP ratio. The systems are differentiated by shades of colour representing different level of growth assets held by pension funds.

It is interesting to look at the top performing pension systems in the first quadrant (top right) between the two median lines in Figure 11. These systems achieved higher

adequacy and sustainability scores than the whole sample's medians. As highlighted by size of the square representing each system, most of the pension systems in the best performing quadrant are large pension systems by pension assets/GDP ratio. Most of them were highlighted in light red or red colour for having *moderate to high* allocation of pension assets to growth assets.

On the contrary, pension systems with low allocation to growth assets, shaded in grey, concentrate more on the left-hand side of the sustainability median line. These countries have lower level of pension assets.

Our observation suggested that large pension markets tend to have moderate to high allocation to growth assets, high adequacy and sustainability scores. Pension markets with very conservative asset allocation have limited ability to grow their pension assets and tend to have low sustainability score.

CONCLUSION

Whilst there is no single answer to the optimal asset allocation that suits all pension systems, it is important to recognise that the level of growth assets in pension portfolios could be linked to a system's adequacy and sustainability.

Top pension systems in terms of both adequacy and sustainability are those with large pension assets and moderate to high allocation to growth assets in pension funds. Countries with very aggressive allocation of pension assets to growth assets do *not* belong to this top performing group. Countries with very low allocation to growth assets tend to have small pension assets and low sustainability score.

Our observation suggests that the moderate to high level of growth assets held by pension funds could potentially enhance pension system's adequacy and sustainability.

APPENDIX 1
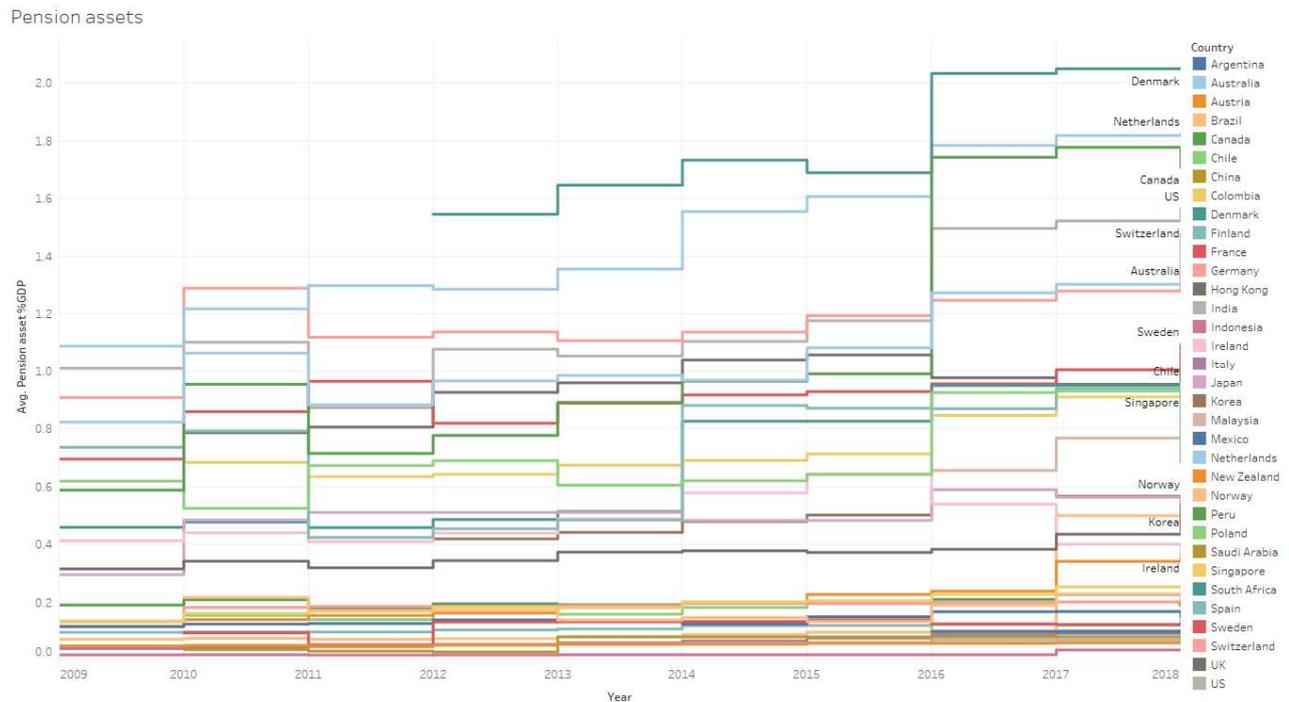
Pension assets

The trend of average of Pension asset %GDP for Year. Color shows details about Country. The marks are labeled by Country.

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[i] The Melbourne Mercer Global Pension Index reviews and ranks international pension systems in terms of their adequacy, sustainability and integrity. Since its inception in 2009, the index has grown from 11 to 34 systems in 2018. Data on allocation to growth assets of pension funds, however, were only available from 2010. The MMGPI project is jointly conducted by the Australian Centre for Financial Studies (Monash Business School) and Mercer and funded by the Victoria Government of Australia. Annual MMGPI reports are available at: https://australiancentre.com.au/projects/melbourne-mercer-global-pension-index/

[ii] Link to the report is to be inserted.

[iii] The net replacement rate is produced by the OECD in their biennial publication Pensions at a Glance. However, OECD changed the reported figure from the net replacement rates for median income earners to average income earners in 2015.

[iv] The data on the level of assets was collected by Question S2 (under the Sustainability sub-index) of the annual MMGPI survey: *What is the level of pension assets, expressed as a percentage of GDP, held in private pension arrangements, public pension reserve funds, protected book reserves and pension insurance contracts?*

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