Financial Models: Superannuation

Superannuation is the means by which quarterly contributions for a potential pension are invested into a fund and used at retirement later, however some super funds require employers to make contributions monthly and in this investigation task, monthly contribution is used instead of quarterly contributions. (ATO,2020) The main source of income will cease or decrease after finishing a working career and it is therefore critical that adequate funds are available at retirement to maintain a normal lifestyle. It is suggested that you overcompensate and have so much to underestimate and do not have enough to live on within a superannuation fund, as the culmination of a life is often unpredictable. If the balance in a superannuation account falls, the Australian Government offers an age pension to compensate for any financial pressures at retirement. However, the government allows overpayment balances to be overestimated as the money that would go to an old-age pension will now be used in other areas within the economy.

To build more overestimated superannuation balances, the government has lowered the tax rate of a superannuation account to 15 percent. (ATO,2020) In Australia, depending on the gross wage, marginal tax rates could hit as high as 45 percent. It will thus be better to deposit contributions into a superannuation account than to save money outside of a superannuation scheme. Furthermore, the increase in the superannuation balance can be accumulated in various ways, with many options available and investment choices that would suit various financial objectives.

Income could be invested in a few distinct industries, such as bonds, currency, and properties. (Hesta,2020) Different investment options yield distinct financial results and not all investments have the same risk as others have a high risk that could give you a high return and you could lose the cash and get no returns. In order to explore several ways to increase the superannuation balance and increase the proportion of Australian households that will be ready for retirement in the future, a variety of scenarios with different investment options will be presented in this report. Such as 5.5 contribution, numerous fluctuations in the gross salary and the personal contribution deposit.

At 23, Katarina has come to you for financial advice. She has just started her university studies and started full time work, earning $55,000 per annum. She realises that she needs to provide for her retirement. She plans to retire at 65 and wants to be able to live for at least 20 years off the money that has built up in her superannuation fund. To prepare for her retirement, Katarina has chosen HESTA (Health Employees Superannuation Trust Australia) as her superannuation fund, a public Australian industry superannuation fund “for people working in health and community services” (HESTA, 2020).

Part 1: Superannuation

HESTA provides four different ready-made investment pools for their members: Balanced Growth, Conservative, Sustainable Growth and High Growth (refer to Figure 1 in the Appendix). To find out more about the return rates of these investment pools, research was completed on investing $1,000 in each investment choice from 2010 to 2020. Katarina discovered that the Conservative is the safest option as it has the least expanse of fluctuation for annual returns in the past ten years.

In contrast, Sustainable Growth is a risker option and fluctuates greatly. It is also noticed that Balanced Growth and High Growth have very similar trends to one another, providing annual returns of similar value. Considering this information, Katarina has decided to choose Sustainable Growth as her investment choice, deliberating that as she is still currently young, she can afford to take a few risks in favour of higher gain as she has time to recoup any loses. Since inception in 2010, the Sustainable Growth investment option has an average rate of return of 6.55% p.a. (refer to Figure 2 in the Appendix).

Financial Models: Superannuation

Employer's Monthly Contribution

$$= \frac{9.5\%\ x\ 55,000}{12}$$

= **_$435.42_**

Figure 1 Employer's Superannuation Contribution

Katarina's employer would like the frequency of their payments being made into her account to be every month. If the employer must contribute an extra 9.5% of her gross salary into her superannuation fund. Katarina's employer therefore must transfer **$435.42** per month into her superannuation fund

Katarina's account balance in here superannuation account at retirement:

N = (65-23) x 12 = 504

I% = 6.55

PV = 0

PMT = -435.42

*FV =? (1160005.47)

P/Y = 12

C/Y = 12

$\therefore$ Future Value = $1,160,005.47

Figure 2 Katarina's Superannuation Balance

In order for this calculation to be carried out, there are several assumptions that must be made. Katarina is expected to start working at the age of 23 and to retire at the age of 65, without periods of unemployment, such as maternity leave, unpaid sick leave or vacation leave. Katarina is still supposed to work until she retires, and does not change her job or get fired and she will get monthly contribution from her employer. Thus her gross income would stay constant at $55,000, with no pay rise. Furthermore, the superannuation guarantee rate that the employer must contribute, which in this case is 9.5% p.a., must constantly stay at 9.5% p.a. throughout Katarina's working years. Another assumption is that the investment return rate provided by HESTA is constantly 6.55% p.a. and does not fluctuate in the future.

Despite the constraints, these assumptions are required to make a calculation and predict Katarina's account balance at retirement. Therefore, if only the compulsory 9.5% employer contributions are being made into Katarina's superannuation account, the account balance at retirement would be **$1,160,005.47** (refer to figure 2)

Part 2: Living off the income in retirement

At the age of 65, Katarina would like to begin her retirement phase and decides to roll her superannuation balance of $1,160,005.47 into an annuity account from which regular withdrawals are made.

HESTA provides seven different income stream investment options: cash and term deposits, diversified bonds, property and infrastructure, international shares, Australian shares. Considering that Katarina is nearing the end of her life span, she needs to be careful in her investments to ensure that she has enough finances to live on. Thus Katarina decides to choose "property and infrastructure" as her income stream choice, with a probable number of 2 to less than 3 returns in 20 years (refer to figure 3 in appendix). Since inception in 2010, property and infrastructure option has an average interest rate of 6.24% p.a. So it is assumed that Katarina would live up to 85 but if she lives past the age of 85, she wouldn't have enough financial support from her annuity account to continue living. This predicted age span is probably going to increase in the future due to improved research in medicine and technology. If Katarina happens to die before the age of 85, the rest of her balance would then be passed on to her family's member.

Financial Models: Superannuation

In addition, it is also presumed that each month Katarina would withdraw from her account, never withdrawing earlier or later. Similarly, her annuity account's interest rate must remain constant for the entire 20 years; it does not change. In addition , the average interest rate of her annuity portfolio is used only to provide a rough idea of how fast the superannuation fund will expand, similar to the rate of return for Katarina's superannuation account. As the interest rate changes constantly, it normally needs an average.

Hence, without considering taxes, Katarina has $8472.05 (refer to Figure 3) available for her to live on each month at retirement.

Payment at Retirement:

N = (85-65) x 12 = 240

I% = 6.24

PV = -1160005.47

PMT =? ($8472.05)

FV = 0

P/Y = 12

C/Y = 12

Figure 3 Katarina's Monthly Payment

Part 3: Effect of Inflation

Despite many assumptions, calculating Katarina's predicted superannuation balance at retirement provides an understanding of how much the superannuation fund will grow and why superannuation is important. To properly analyse Katarina's investments, it is important to consider the effects of tax and inflation. Taxes is a vital source of revenue for most governments enabling them to fund essential services such as communion resources for police and firefighters, and maintaining public areas such as public libraries and parks.

Amount to be Taxed = *Gross Income* – 37,000

= $55,000 – $37,000

= $**18000**

Tax Payable = *Base Amount of Tax + (amount to be taxed x marginal tax rate)*

= $3572 + ($18000 X 0.325)

= **$9422**

Medicare Levy = *Medicare Tax Rate* X *Gross Income*

= 0.02 x 55,000

= **$1100**

Total Tax = *Tax Payable + Medicare Levy*

= $9422 + $1100

= **$10522**

After Tax Return (ATR) = *Gross Income – Total Tax*

= $55,000 - $10522

= **$44478**

$$\therefore \text{After Tax Salary (per month)} = \frac{\$44478}{12}$$

$$= \underline{\$3706.50}$$

Figure 4 Katarina's After Tax Salary Calculation

Financial Models: Superannuation

The rate of tax that Katarina must pay on her interest earned varies on her level of total income, which is called the marginal tax rate. As Katarina has a gross income of $55,000, her marginal tax rate would be 32.5% or 32.5c for each $1 over $37,000, plus $3572 (refer to Figure 4 in the Appendix)

Therefore, Katarina's after tax salary per month is **$3706.50** (refer to figure 4). It is assumed that Katarina's gross income would stay exactly the same throughout her life, with no pay rise or pay cuts. However, her salary is most likely to increase throughout her life., due to inflations and chances of promotion to a higher occupation or a batter job. Another assumption would be that the marginal tax rate would stay at 32.5% and the base amount of tax would always be $3572. In addition, if Katarina receive a job with a higher income, then her income bracket would be different and she may need to pay tax at a higher rate.

Even though, that it is predicted that Katarina is able to live on **$3706.50** per month at the age of 23, however, an average living cost in South Australia is between ***$1320-$2580*** (refer to figure 8 in the appendix). So therefore we assumed that she will be spending ***$1950*** per month (refer to figure 7 in appendix) but her living standards may not be maintained at the age of 65 as inflation has not been taken into consideration. So in order to index her current living costs for inflation, the inflation rate must firstly be considered. After researching the CPI figures from the past few years, Katarina decided to investigate two different inflation rates; the most recent inflation rate (Jun, 2020) and an average inflation rate calculated from the last ten years from 2009-2019 because inflation rate is unpredictable and change every year. (refer to figure 5 in appendix)

$$\text{Average Inflation Rate} = \frac{sum\ of\ annual\ inflation\ rates\ from\ 2007\ to\ 2016}{number\ of\ inflation\ rates}$$

$$= \frac{1.6+1.9+1.9+1.3+1.5+2.5+2.5+1.7+3.3+2.9+1.7}{10}$$

$$= \frac{20.3}{10}$$

$$= 2.03\%\ \text{p.a.}$$

Figure 5 Average Interest Rate from the previous 10 years (2009-2019)

The most recent inflation rate in June of 2020 which is -0.3% p.q. However, we will be using inflation rate from March which is 2.2% because having a -0.3% inflation rate in Australia is extremely rare and this is the first time it had happened in 22 years which is due to Corona Virus. An average inflation rate of the last ten years is also calculated by dividing the sum of annual inflation from 2009-2019 and the number of inflation rates is 2.03% p.q. By comparing these two inflation rates, it would give us a better understanding of inflation rates and their fluctuation can be obtained. When predicting the effect of inflation on an investment, it is unreasonable to assume that the inflation rate will remain constant during the investment period. It is most likely to increase and decrease at unpredicted rates during a working career and throughout retirement. So therefore, Katarina's indexed living costs is calculated by multiplying her after tax salary in Figure 4 by the inflation rate plus one, powered by the number of the years till Katarina's retirement at the age of 65.

$$\textit{Indexed Value} = \$1950 \times (1.022)^{42}$$

$$= \$4863.76\ \textit{per month}$$

Figure 6 Indexed Living Costs with Inflation Rate of 2.2%

$$\textit{Indexed Value} = \$1950 \times (1.0203)^{42}$$

$$= \$4535.30\ \textit{per month}$$

Figure 7 Indexed Living Costs with Inflation Rate of 2.03%

Financial Models: Superannuation

By doing this calculations, the indexed value of Katarina's living cost is **$4863.76** per month when the inflation rate is 2.2% (refer to figure 7). As Katarina's annuity account gives her **$8472.05** each month, she would be able to live comfortably when she retired since she will have an extra of **$3608.29.** Regardless, if the inflation rate is 2.03%, then Katarina would be able to withdraw money each month from her annuity account since she will have an extra **$3936.75**

While Katarina has studied two different interest rates, she wants to discover the optimal rate of inflation that helps her to preserve her equal retirement lifestyle. This will give her an estimate of how much she can withdraw at retirement each month, more or less depending on whether the rate of inflation over this measured amount has risen or decreased. To calculate the required inflation rate, the same formula is utilised in Figure 6 & 7. The future value (FV) is Katarina's monthly payment at retirement ($8472.05). The present value (PV) represents Katarina's monthly payment at 21 ($1950) which is multiplied by 1 plus the unknown inflation rate, to the power of 42.

$$\$8472.05 = \$1950 \times (1 + x)^{42}$$

$$x = \sqrt[42]{\frac{8472.05}{1950}} - 1$$

$$x = 0.03559364942$$

$$\therefore x \approx 3.56\% \text{ p.a.}$$

Figure 8 The Inflation Rate Required for Katarina to Maintain an Equivalent Lifestyle

By doing this calculations, the maximum inflation rate is 3.56% (refer to Figure 8). This if the inflation rate is equal or less than 3.56% p.a. Then Katarina wold be able to maintain her equivalent lifestyle. However, if the inflation rate is higher than 3.56%, then Katarina wouldn't be able to maintain her equivalent lifestyle at retirement and she would need to alter her withdrawals from her superannuation account. However, in this calculation, 15% superannuation tax wasn't included, so in order to predict an accurate superannuation balance in the future.

Part 4: Further Investigation: Considering 5.5% Personal Contribution

It has been calculated that if Katarina income is $55,000 p.a., her retirement balance would be **$1,160,005.47** and would be able to withdraw $8472.05 per month which is enough for her to maintain a stable life with an inflation rate of 1.99% or less. Since she will have $1756.50 to spend, she would like to tribute ***$687.50*** as an individual contribution of her own which she can afford as there will be an extra $381.50 for her to spend.

Personal Contribution

$$= \frac{15\% \; x \; 55{,}000}{12}$$

= **$687.50** p.m.

Amount of Money to Contribute

= $3706.50 - $1950

= ***$1069 p.m.***

Figure 9 Personal Contribution After Tax and the amount of money to contribute

Financial Models: Superannuation

In addition to taxes, fees must also be weighed in order to achieve a more reliable prediction of Katarina 's retirement balance. For different areas and at varying rates, each superannuation fund charges fees. HESTA payments are deducted annually and vary according to the investor 's recent annually activities, such as asking for advice or investing a lump-sum into the account. It will also be difficult to determine fees for Katarina's superannuation balance and will not be considered as the fees may depend on her recent engagement with her account.

Katarina's account balance in her superannuation account at retirement (after tax)

N = (65-23) x 12 = 504

I% = 6.55

PV = 0

PMT = -687.50

FV =? 1831573.56

P/Y = 12

C/Y = 12

∴ Future Value = **$1,831,573.56**

Figure 10 Katarina's account balance in her superannuation account at retirement (after tax)

Therefore, the calculations wouldn't be as accurate as it could be since fees have not been taken into consideration. However, it is practical that if fees are to be deducted, then the superannuation balance would be less than predicted which also means that Katarina would have less to live on when she retires. Despite this, the predicted value that Katarina would have when she retires is **$1,831,573.56**

So as Katarina's true superannuation balance is now predicted as she contributes her personal attribution which is **$687.50**, it also means that she would have more money to withdraw every month. Following from the previous income stream option, we are assuming that Katarina would stay with "property and infrastructure" and that she dies at the age of 85. So therefore, Katarina would have **$13,376.81** to spend on per month. This is assumed that the rate would stay the same and Katarina would withdraw the money every month. While referring to figure 8, Katarina would be able to maintain an equivalent lifestyle when she retires. As when the inflation rate is 2.2%, she would need to be able to withdraw at least $4863.76 which is she can afford since she will be able to withdraw $13,376.81.

Katarina's Balance at Retirement (After Tax)

N = (85-65) x 12 = 240

I% = 6.24

PV = -1831573.56

PMT =? (13376.81)

FV = 0

P/Y = 12

C/Y = 12

∴ Payment = **$13,376.81**

Figure 11 Katarina's Balance at Retirement (After Tax)

$Fv = Pv(1+i)^{n}$

$\$13376.81 = \$3706.50 \times (1 + x)^{42}$

$x = \sqrt[42]{\frac{13376.81}{3706.50}} - 1$

∴ x ≈ 3.10% p.a.

Figure 12 Maximum Inflation rate with tax

By considering taxes, the maximum inflation rate has increase from 1.99% to 3.10%. Having an inflation rate of 3.10% would make Katarina able to maintain a stable live when she retires. Unless the interest rate would be more than 3.10%.

Financial Models: Superannuation

Part 4: Further Investigation (The effect of wage increases/decreases)

Initially, at the age of 23, Katarina started working full time with a gross income of $55,000. It is then assumed that she worked for the company for ***7 years*** as a normal employee before being promoted to a higher occupation as a Supervisor ($79,000) at the age of 30. She then works as a supervisor for ***9 years*** before being promoted to a manager ($100,000) at the age of 39. Katarina then spends most of her working career as a manager for ***26 years***. Therefore, what is the balance of Katarina's money in her superannuation account at retirement. Following on from previous situations, Katarina decides to stick with her initial investment choice at HESTA, the Sustainable Growth option which provides a return rate of 6.55% p.a.

Employer's Monthly Contribution as an Employee

$$= \frac{9.5\% \, x \, 55{,}000}{12}$$

= $435.42 p.m.

Figure 13 Employer Monthly's Contribution as an Employee

Employer's Monthly Contribution as a Supervisor

$$= \frac{9.5\% \, x \, 79{,}000}{12}$$

= $625.42 p.m.

Figure 14 Employer's Monthly Contribution as a Supervisor

Employer's Monthly Contribution as a Manager

$$= \frac{9.5\% \, x \, 100{,}000}{12}$$

= $791.67 p.m.

Figure 15 Employer's Monthly Contribution as a Manager

The calculations for the employer's monthly contributions as an employee is **$435.42 p.m.** while as a supervisor is **$625.42 p.m.** while as a manager is **$791.67 p.m.** Utilising this information, we then could calculate Katarina's superannuation balance at retirement with different wage values.

Calculation 1: Katarina's superannuation balance after 7 years of work as an employee

N = 7 x 12 = 84

I% = 6.55

PV = 0

PMT = -435.42

*FV =? (46245.90)

P/Y = 12

C/Y = 12

∴ Future Value = **$46,245.90**

Calculation 2: Katarina's superannuation balance after 9 years of work as a supervisor

N = 9 x 12 = 108

I% = 6.55

PV = -46,245.90

PMT = -625.42

*FV =? (174939.17)

P/Y = 12

C/Y = 12

∴ Future Value = **$174,939.17**

Financial Models: Superannuation

Calculation 3: Katarina's superannuation balance after 26 years of work as a manager and at retirement

N = 26 x 12 = 312

I% = 6.55

PV = -174939.17

PMT = -791.67

*FV =? (1603649.37)

P/Y = 12

C/Y = 12

∴ Future Value = **$1,603,649.37**

Figure 16 Katarina's Superannuation Balance at Retirement, with Varying Wages

Katarina 's balance is thus $1,603,649.37 (refer to Figure 16) in her superannuation account at retirement with varying salaries after tax. It is clear that, relative to the initial scenario where Katarina earns a constant gross income, Katarina will have a higher retirement balance by changing occupations or having different wages.

Throughout these calculations, various assumptions had to be made in order for the calculation to continue, such as the wages for the supervisor and the manager or the payment that is used in Calculation 1, which is $435.42. It is likely, for instance, that Katarina would ask for pay increases over Katarina's twenty-six years as a manager in order to keep up with inflation. She could also quit before the age of 65 or keep on working till she can no longer work. Therefore, it is impossible to estimate an accurate balance in Katarina's superannuation account at retirement due to inflation and the frequent change in payment wages. With the new superannuation balance of ***$1,603,649.37*** And it is assumed that Katarina rolls her balance in the same income stream which is "property and infrastructure" with an interest rate of 6.24%. So with the new superannuation balance, Katarina is able to withdraw ***$11,712.18*** every month (refer to figure 17).

Payment at Retirement:

N = (85-65) x 12 = 240

I% = 6.24

PV = 1603649.37

PMT =? (-11712.18)

FV = 0

P/Y = 12

C/Y = 12

Figure 17 New calculation with different wages at retirement

$Fv = Pv(1+i)^n$

$\$11712.18 = \$3706.50 \times (1 + x)^{42}$

$x = \sqrt[42]{\frac{11712.18}{3706.50}} - 1$

x = 0.02777250125

∴ x ≈ 2.8% p.a.

Figure 18 Maximum Inflation Rate

Furthermore, the maximum inflation rate is 2.8% (refer to figure 18) which shows that Katarina would be able to live comfortably at retirement if the inflation rate is equal or below 2.8%. However, if the inflation rate is higher than 2.8%, then Katarina wouldn't be able to maintain an equivalent lifestyle.

In summary, Katarina's superannuation figures have improved substantially from the previous scenario by considering rises in Katarina's gross salary. Katarina 's

initial balance of her superannuation account was **$1,160,005.47** increased to **$1,603,649.37.** Which also means that her withdraws at retirement increase from *$8472.05* to *$11712.18* which is ***$3240.13*** extra to spend. Furthermore, her inflation rate also increased from 1.99% to 2.8%. These results show that there are several options available for investors to raise the balance of their superannuation, and a potential alternative is to increase their income salary.

Part 4: Further Investigation (Considering Inheritance Money)

By making her own personal contributions to her account, Katarina chooses to improve her superannuation balance. The sums an individual contributes to their super fund from their after-tax profits are personal contributions. Interest would develop on the increased investment by making a personal investment to her superannuation account and her balance will therefore increase. Let's assume that at age 23, Katarina has gained an inheritance from her grandma, a total of $50,000 ($42,500 after tax) and she deposited it into her superannuation account at the start of the working career.

Value of Inheritance after tax:

= $50,000 x 0.85

= $42500

Figure 19 Value of Inheritance after tax:

Calculation 1: Katarina's superannuation balance after 7 years of work as an employee

N = 7 x 12 = 84

I% = 6.55

PV = -42,500

PMT = -370.11

*FV =? (39309.33)

P/Y = 12

C/Y = 12

∴ Future Value = **$106,447.81**

Calculation 2: Katarina's superannuation balance after 9 years of work as a supervisor

N = 9 x 12 = 108

I% = 6.55

PV = -106,447.81

PMT = -531.61

*FV =? (269,561.90)

P/Y = 12

C/Y = 12

∴ Future Value = **$269,561.90**

Calculation 3: Katarina's superannuation balance after 26 years of work as a manager and at retirement

N = 26 x 12 = 312

I% = 6.55

PV = -269,561.90

PMT = -672.92

*FV =? (2023625.25)

P/Y = 12

C/Y = 12

∴ Future Value = **$2,023,625.25**

Figure 20 Amount of Katarina's superannuation fund if she deposits the inheritance at early working stage

Therefore, if she deposits the inheritance at the age of 21, Katarina earns the largest superannuation balance of **$2,023,625.25**. After adding the situations of different increases in earnings and depositing

a personal payment of $42,500 (after tax) at the age of 21, Katarina's balance is transferred over to a retirement annuity account.

Payment at Retirement:

N = (85-65) x 12 = 240

I% = 6.24

PV = 2,023,625.25

PMT =? (-14779.46)

FV = 0

P/Y = 12

C/Y = 12

∴ Payment = $14,779.46

Figure 21 Katarina's Monthly Payment with the Inheritance

$Fv = Pv(1+i)^n$

$\$14,779.46 = \$3706.50 \times (1 + x)^{42}$

$x = \sqrt[42]{\frac{14,779.46}{3706.50}} - 1$

x = 0.0334804163

∴ x ≈ 3.35% p.a.

Figure 22 The Inflation Rate Required to Maintain an Equivalent Lifestyle with Inheritance

So if an inheritance of 42,500 is deposited into Katarina's superannuation account

Therefore, if she deposits the inheritance at the age of 21, Katarina earns the largest superannuation balance of **$2,023,625.25.** After adding the situations of different increases in earnings and depositing a personal payment of $42,500 (after tax) at the age of 21. Therefore, she would be able to withdraw **$14,779.46** which is $4824.06 more than Katarina's last payment of $*9966.40*. Even the maximum inflation rate increase from 2.38% to 3.35%. Meaning that she could maintain her equivalent lifestyle if the inflation rate is equal or lesser than 3.35%

Conclusion

	Employer's Monthly Contribution (p.m.)	Superannuation Balance	Monthly Withdrawals at Retirement	Maximum Inflation Rate (p.a.)
Original Scenario: No Added Investments or Constraints	$435.42	$1,160,005.47	$8472.05	1.95%
Scenario 2: (Considering 15% (5% Personal Contribution))	$687.50	$1,831,573.56	$13376.81	3.10%
Scenario 3: With Varying Gross Wages	Employee: $435.42 Supervisor: $625.42 Manager: $791.67	$1,603,649.37	$11712.18	2.8%
Scenario 4: Inheritance of $50,000 ($42,500)	Employee: $370.11 Supervisor: $531.61 Manager: $672.92	$2,023,625.25	$14,779.46	3.35%

Figure 23 Summary Table of All Scenarios Explored Within this Investigation

Financial Models: Superannuation

In this study, three separate circumstances investigated the impact of superannuation and retirement funds in order to add real-life context: the 15% superannuation tax, varying gross wages, and personal contribution. It has been seen from the examination of these different cases that the balance of a superannuation account can still be improved by incorporating various methods together to resolve the finances lost due to taxes and fees. As you can see from the table the fourth scenario produced the highest superannuation balance of $2,023,625.25 and the highest inflation rate of 3.35% by a combination of investments.

This folio is limited in that it addresses the highly accurate superannuation and retirement period scenarios that are intentionally created in order to make estimates. Since superannuation can vary according to personal financial considerations, several other different conditions can be generated to strengthen superannuation and to incorporate other approaches. Due to the various variations and choices available, the outcome of superannuation at retirement can be very difficult to predict. Many variables influence each other and are always carried out in conjunction with each other, making the balance of a superannuation account far more difficult to estimate. When wage raises and the deposit of a personal contribution in the scenario are combined, this is apparent. On top of this, many unforeseen incidents, such as family conflicts or inevitable accidents, may happen at any moment. Consequently, as an emergency, the finances will have to be removed and the balance of superannuation will be affected. In addition, for concerns such as maternity leave, there may be periods of ill health or unemployment that are more likely to arise and decrease the anticipated superannuation balance.

Personal Reflection:

While doing this task, there are few complexities such as finding the superannuation fund in Australia and doing the calculations. However, at the end of the day, I have learned new stuff that I have never look at before, so by doing this investigation, I would have a rough idea on what to do when I start working and would have a plan on where to start. This research has shown that it can be useful to use financial models in forecasting future balances and preparing for retirement. Because of unpredictable life events and fluctuating prices, such as interest rates, inflation rates, and wages, financial models are recommended to be used consistently to verify the efficiency of a superannuation account and to adjust financial strategies accordingly to maximise returns.

Financial Models: Superannuation

Appendix:

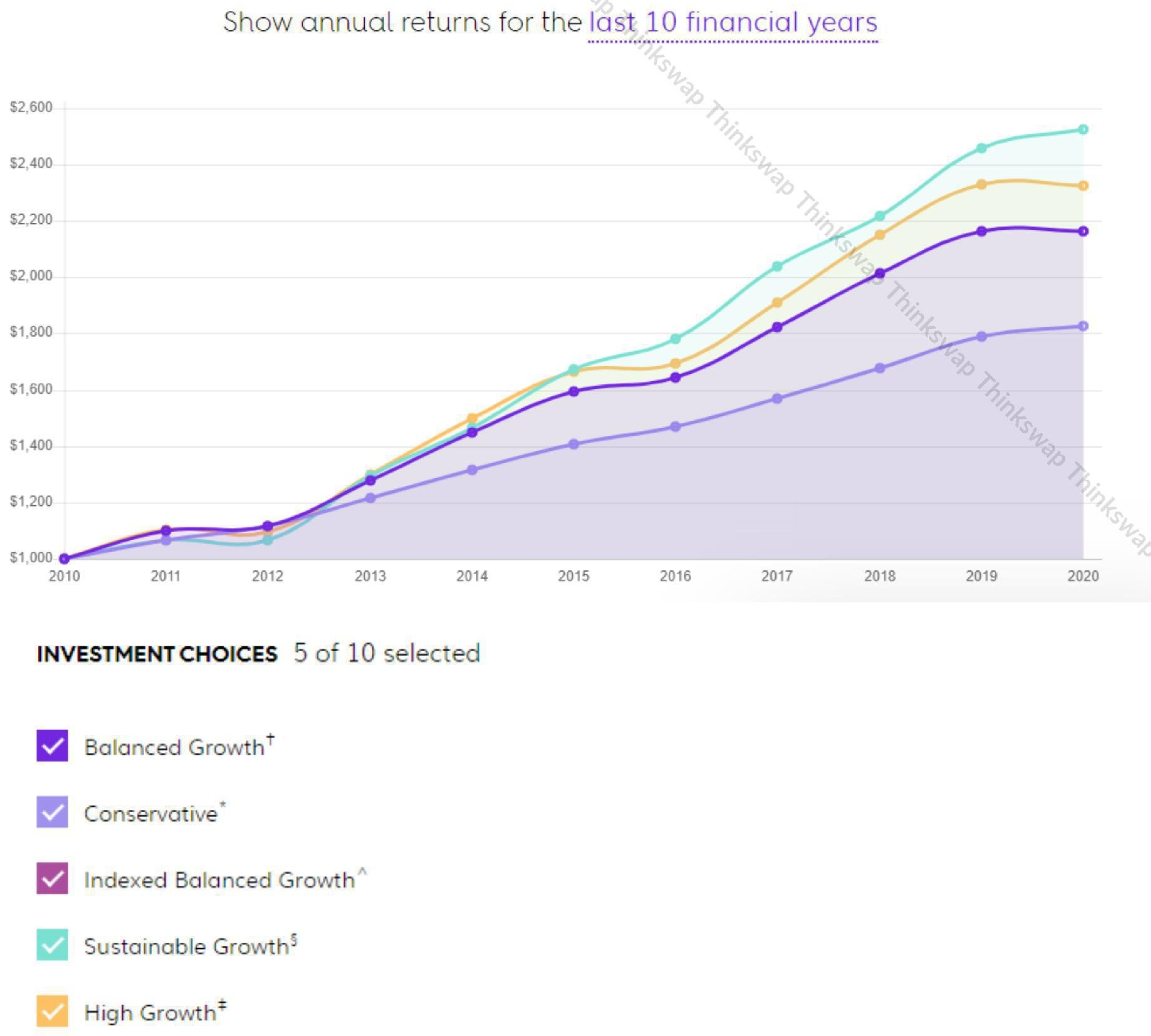

Figure 1 Graph of the Annual Returns for the Last 10 Years of HESTA's Five Ready-Made Investment Pools (HESTA, 2020)

READY-MADE OPTIONS

Returns to 30 June 2020	Since inception p.a.	10 year p.a.	5 year p.a.	3 year p.a.	1 year p.a.
Balanced Growth†	8.50%	8.01%	6.27%	5.84%	0.00%
Conservative*	6.35%	6.20%	5.33%	5.19%	1.99%
Indexed Balanced Growth^	-	-	-	-	-
Sustainable Growth§	6.55%	9.71%	8.61%	7.39%	2.66%
High Growth‡	8.28%	8.81%	6.91%	6.81%	-0.06%

Figure 2 The Rate of Returns of HESTA's Four Ready-Made Investment Pools (HESTA, 2020)

YOUR CHOICE OPTIONS

Returns to 30 June 2020	Since inception p.a.	10 year p.a.	5 year p.a.	3 year p.a.	1 year p.a.
Cash and Term Deposits*	3.25%	2.53%	1.71%	1.53%	0.95%
Property and Infrastructure^	6.24%	7.14%	6.18%	4.03%	-3.63%
Diversified Bonds±	5.36%	4.91%	3.95%	4.01%	2.46%
International Shares#	4.96%	9.52%	7.01%	7.19%	2.34%
Australian Shares#	4.96%	8.22%	6.18%	5.31%	-5.19%

Figure 3 The Rate of Returns of HESTA's Five Your Choice Investment Pools (HESTA, 2020)

Resident tax rates 2020–21

Taxable income	Tax on this income
0 – $18,200	Nil
$18,201 – $37,000	19c for each $1 over $18,200
$37,001 – $90,000	$3,572 plus 32.5c for each $1 over $37,000
$90,001 – $180,000	$20,797 plus 37c for each $1 over $90,000
$180,001 and over	$54,097 plus 45c for each $1 over $180,000

The above rates **do not** include the Medicare levy of 2%.

Figure 4 Individual Income Tax Rates in Australia (Australian Government, 2020)

Historical Inflation Rates for Australia (2010 to 2020)

Last Update: July 29, 2020

Next Update: October 28, 2020

Start Year 2010 End Year 2020 Get Inflation Rate History

Year	mar	jun	sep	dec	ann
2020	2.2%	-0.3%			
2019	1.3%	1.6%	1.7%	1.8%	1.6%
2018	1.9%	2.1%	1.9%	1.8%	1.9%
2017	2.1%	1.9%	1.8%	1.9%	1.9%
2016	1.3%	1%	1.3%	1.5%	1.3%
2015	1.3%	1.5%	1.5%	1.7%	1.5%
2014	2.9%	3%	2.3%	1.7%	2.5%
2013	2.5%	2.4%	2.2%	2.7%	2.5%
2012	1.6%	1.2%	2%	2.2%	1.7%
2011	3.3%	3.5%	3.4%	3%	3.3%
2010	2.9%	3.1%	2.9%	2.8%	2.9%

Additional resources:
Consumer Price Index (CPI) for Australia

Financial Models: Superannuation

Figure 5 Australia's Inflation Rates from 2009 to 2019 (Rate Inflation, 2020)

	Cash and Term Deposits	Diversified Bonds	Property and Infrastructure	International Shares	Australian Shares
Investment Objective	Over the long term, to earn an after-tax return, after investment fees and indirect costs, equivalent to or higher than the return (net of tax##) of the Bloomberg Ausbond Bank Bill Index	Over the long term, to earn an after-tax return, after investment fees and indirect costs, equivalent to or higher than the return (net of tax##) of the combination of: • 50% Bloomberg AusBond Composite 0+ Year Index • 50% Barclays Capital Global Aggregate ex Australia Index Hedged to $A.	Over the long term, to earn an after-tax return after investment fees and indirect costs, equivalent to or higher than CPI + 3.0%.	Over the long term, to earn an after-tax return, after investment fees and indirect costs, equivalent to or higher than the return (net of tax##) of the combination of: • 77.5% MSCI World ex Australia Index in $A Net Dividends Reinvested • 22.5% MSCI Emerging Markets Index in $A Net Dividends Reinvested • 50/50 $A Hedged/Unhedged.	Over the long term, to earn an after-tax return, after investment fees and indirect costs, equivalent to or higher than the return (net of tax##) of the S&P/ASX 300 Accumulation Index
Type of Investor	Very cautious Or, an investor seeking to create their own diversified portfolio, who would like to include cash, cash products and term deposits.	An investor seeking to create their own diversified portfolio, who would like to include debt and other fixed interest investments.	An investor seeking to create their own diversified portfolio, who would like to include property and infrastructure.	An investor seeking to create their own diversified portfolio, who would like to include international shares.	An investor seeking to create their own diversified portfolio, who would like to include international shares.
Description	Invests in a range of at-call bank deposits and short-dated term deposits, and may have a small allocation to other cash investments. It is expected to deliver a return above the official RBA cash rate over the long term.	Invests in Australian and international government bonds and other debt. This option aims for returns that typically outperform cash, but is more stable than shares in the short to medium term.	Invests in Australian and global property and infrastructure, along with some cash. This option aims to achieve medium to long term growth with some possible ups and downs, but is expected to be more stable than shares in the short term.	Invests in a range of companies listed on stock exchanges around the world. This option aims to achieve strong growth over the long-term, with possible short-term ups and downs.	Invests in a range of companies listed on the Australian stock exchange, as well as a few that aren't. This option aims to achieve strong growth over the long term, with possible short-term ups and downs.
Probable number of negative annual returns over 20 years	Less than 0.5	1 to less than 2	2 to less than 3	4 to less than 6	6 or greater
Suggest minimum	Less than 1 year	1 to 3 years	5 to 7 years	7 to 10 years	7 to 10 years

investment timeframe					

Figure 6 Investment Options for HESTA –Information as at 1 October 2020 (

Average Living Cost:

$$= \frac{\$1320+\$2580}{2}$$

= **$1950**

Figure 7 Average Living Cost

Average weekly living costs in Adelaide:

Expense	Weekly	Monthly
Accommodation (shared or single)	$120 - $380	$480 – $1520
Groceries	$90 - $130	$360 - $520
Telephone/internet	$15 - $40	$60 - $160
Transport	$20 - $40	$80 - $160
Electricity/Gas	$35 - $50	$140 - $200
Clothes/Entertainment	$50+	$200+
Total	$330 - $645	$1320 - $2580

Figure 8 Average Living Cost in Adelaide

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