



Online & home tutors Registered business name: itute ABN: 96 297 924 083

2017
Further
Mathematics

Year 12
Financial Modelling
Task

Time allowed: 2 hours plus

Theme: Residential Investment Loans

Required skills/knowledge: Percentage, recursion relations and financial functionalities of technology.

The task: Banks offer different types of loans for residential investment. The interest rates are adjusted according to the prevailing financial situation. As an investor you are to compare the different loan options in terms of repayment amount and loan term from the same bank or between banks.

The tables below show the interest rates for residential investment loan advertised by Bank A and Bank B.

The interest rates can be variable and those appear in the tables are set on the day of the advertisement. Assume that all the variable rates in the tables will decrease by 0.10% a year later and then increase by 0.15% each year after for 9 years.

The interest rates can also be fixed. They can be fixed for 1 year, 2 years, 3 years, 4 years or 5 years. For example if the fixed rate is for 3 years, the interest rate will remain the same for 3 years.

At the end of the term (1 year, 2 years, 3 years etc) the fixed rate loan will become variable rate loan. All repayments are monthly.

If you opted for Interest Only loan, you pay the interest on the loan at the advertised fixed or variable rate. If you opted for Principal & Interest loan, you pay a larger amount to cover the interest and to reduce the principal. The loan is a reducing balance loan.

Bank A

Fixed rate - Residential Investment

Principal & Interest	Interest rate
1 year	4.39% p.a.
2 year	3.98% p.a.
3 year	4.34% p.a.
4 year	4.89% p.a.
5 year	4.89% p.a.

Interest Only	Interest rate
1 year	4.59% p.a.
2 year	4.59% p.a.
3 year	4.59% p.a.
4 year	5.09% p.a.
5 year	5.09% p.a.

Variable Rate - Residential Investment

Principal & Interest	Interest rate
	5.80% p.a.
Interest Only	Interest rate
	6.25% p.a.

Bank B

Fixed rate - Residential Investment

Principal & Interest	Interest rate
1 year	4.34% p.a.
2 year	4.34% p.a.
3 year	4.14% p.a.
4 year	4.74% p.a.
5 year	4.74% p.a.

Interest Only	Interest rate
1 year	4.79% p.a.
2 year	4.79% p.a.
3 year	4.89% p.a.
4 year	5.19% p.a.
5 year	5.19% p.a.

Variable Rate - Residential Investment

Principal & Interest	Interest rate
	5.78% p.a.
Interest Only	Interest rate
	6.32% p.a.

You want to purchase a residential property valued at \$500000 as an investment.

By taking into account your savings, incomes and expenses, decide on the loan amount and the monthly amount that you can afford to repay.

In the following tasks:

Clear working/explanation must be shown to show understanding

Tables/graphs can be used to present your findings

Task 1 Comparing fixed rate (fixed for 5 years) and variable rate for **Interest Only Loan** from Bank A

Determine the monthly repayment amounts, the total interest amount annually and the balance owing at the end of each year for 6 years at fixed rate.

Determine the monthly repayment amounts, the total interest amount annually and the balance owing at the end of each year for 6 years at variable rate.

Task 2 Comparing fixed rate and variable rate for **Principal & Interest Loan** from Bank A

Determine the monthly repayment amounts, the total interest amount annually and the balance owing at the end of each year for 6 years at fixed rate.

Note: You have to choose 3-year fixed rate, 4-year fixed rate or 5-year fixed rate.

Determine the monthly repayment amounts, the total interest amount annually and the balance owing at the end of each year for 6 years at variable rate.

Task 3 Comparing variable rate **Interest Only Loan** from Bank A and Bank B

Bank A: Determine the monthly repayment amounts, the total interest amount annually and the balance owing at the end of each year for 6 years at variable rate.

Bank B: Determine the monthly repayment amounts, the total interest amount annually and the balance owing at the end of each year for 6 years at variable rate.

Task 4 Comparing fixed rate **Principal & Interest Loan** from Bank A and Bank B

Note: You have to choose 3-year fixed rate, 4-year fixed rate or 5-year fixed rate.

Bank A: Determine the monthly repayment amounts, the total interest amount annually and the balance owing at the end of each year for 6 years at fixed rate.

Bank B: Determine the monthly repayment amounts, the total interest amount annually and the balance owing at the end of each year for 6 years at fixed rate.

Task 5

Decide which type of loan among those compared above is the most suitable/economical for your current financial status.

Explain your answer based on your ability to repay in relation to your income and living expenses.

You have to make up some appropriate/reasonable amounts and calculations to support your explanation.

End of task