# TopCompare Home loan simulator

## Use cases

### Total upfront cost of an acquisition

For this use case, the simulator can be used to compute the ‘administrative’ fees that are required upfront on purchase of real estate.

Required parameters of the simulation

* Value of the acquired property
* Region where the property is located
* For a property located in Wallonia, whether the cadastral-income-based discount on registration fees is applicable

Results of the simulation

* Base registration fees
* Discount on registration fees
* Notary fees, split into fixed and variable (depending on property value) fees
* Total acquisition cost

Additionally, a scenario of mortgage financed acquisition can be simulated.

Additional parameter

* Own funds of the buyer

Additional results

* Home loan fees, split into fixed and variable (depending on property value) fees
* Total acquisition cost comprising home loan fees
* Monthly repayment for the loan
* Repayment schedule for the loan

### Maximum loan amount for a given household

Generally, banks only allow their customer to pay up to 1/3 of their available income (income – fixed expenses) as repayment for their loan. The simulator can be used to compute the amount banks would accept to lend, regardless of the upfront costs of the acquisition.

Required parameters of the simulation

* Income
* Expected expenses (e.g. the current rent should not be included)
* Duration of the loan

Results of the simulation

* Maximum affordable loan amount for this household

Alternatively, the user should also be able to adjust the monthly repayment without reaching the ‘1/3 of available income’ threshold.

Alternative set of parameters

* Preferred monthly repayment
* Duration of the loan

Result of the simulation

* Maximum affordable loan amount given the monthly repayment

### Maximum property value for a given household

The user should be able to compute to maximum value of the property they can afford given their current situation. This use case takes the various upfront fees involved by the acquisition into account.

Parameters (set 1)

* Income
* Expenses
* Duration
* Region where the property is located
* For a property located in Wallonia, whether the cadastral-income-based discount on registration fees is applicable

Result of the simulation

* Maximum affordable property value for this household

Similarly, the user should be able to adjust the monthly repayment and see the impact on the property value.

Parameters (set 2)

* Monthly repayment (instead of ‘Income’ and ‘Expenses’)
* Region where the property is located
* For a property located in Wallonia, whether the cadastral-income-based discount on registration fees is applicable

Result of the simulation

* Maximum affordable property given the monthly repayment

## Code documentation

### Structure

The file ‘financial-plan-lib.js’ defines the JavaScript object ‘FinancialPlan’.

‘FinancialPlan’ has constants related to the Home loan market and to financial realities, and an auxiliary function to help retrieve values from matrices, stored as attributes, they should not be modified during a simulation.

‘FinancialPlan’ has x data attributes for the simulations. Before running a simulation, the attributes that serve as parameters must be set/updated before the calculations. The results of the simulations are directly written in the corresponding attributes. (e.g. propertyValue may be a parameter to assess ‘Total Acquisition Cost’ and may also be the result for ‘Max Property Value’)

Finally, ‘FinancialPlan’ has 3 methods to run the calculations and update the corresponding attributes

* updateAcquisitionCost
* updateMaxLoan
* updateMaxProperty

### updateAcquisitionCost

Before calling updateAcquisitionCost, the parameters that should be updated are

* propertyValue
* region
* firstProperty
* walloniaDiscount

The attributes that are updated and meaningful after this function are

* monthlyPayment
* notary[Fixed | Variable | Total]Fees
* registration[InitialFees | FeesDiscount | DiscountedFees]
* totalAcquisitionCost

Additionally, if the parameters below are also updated

* ownFunds
* durationYears

Then, attributes related to the mortgage are updated and meaningful

* mortgage[Fixed | Variable | Total]Fees
* totalAmountWithMortgage
* repaymentSchedule