Is a Stock Overvalued or Undervalued?

▼ Introduction

This application calculates the fair value of a stock, given the current market prices and several growth assumptions. Simply pick an industry, stock exchange, and then a company.

Maple then downloads the current market share price, EPS (for the trailing 12 months) and dividends (for the trailing 12 months) from Yahoo Finance (hence a connection to the web is needed). Given a series of growth assumptions, a fair value is then calculated. The valuation process is described at the bottom of this application, and is most appropriate for stable companies with a history of dividend payments.

The stock is undervalued If the fair value is greater than the current market price, and vice-versa.

This application comes with an Excel spreadsheet with a list of over 25000 companies across multiple industries and international exchanges, and their corresponding ticker symbols. This spreadsheet is used to populate the interface with industries, exchanges and companies, and must be saved in the same location as the Maple worksheet.

Industry	Exchange	Company
Major Integrated Oil & Gas	NYQ	Exxon Mobil Corporation

Ticker	XOM
Current Market Price	90.00
P/E ttm	11.32
EPS ttm	7.95
Dividends ttm	2.70
Book Value	42.65

Growth Assumptions

EPS Growth Rate

4.0 %

Desired Annual Return.

7.7 %

Holding Period

Current price needed for good value	70.46
Is the stock overvalued or undervalued?	Overv...

7 years

▼ Valuation Process

This application uses a method of calculating the fair value of a stock that is most appropriate for stable companies with a long history of dividend payments. Other methods should be used to value companies undergoing significant distruptive challenges or structural changes.

Let's run through a worked example - are shares of Exxon Mobil worth buying at the present time?

▼ Growth Assumptions

We'll need to make some financially conservative estimates about Exxon Mobil's future growth prospects

Expected EPS growth rate

> $EPSGrowthRate := 0.05$:

Desired annual rate of return

> $DesiredReturn := 0.05$:

Holding period in years

> $HoldingPeriod := 3$:

▼ Download Financial Data

We'll first download the following financial quotes from Yahoo Finance

> ticker := "XOM" :

Diluted EPS for the trailing 12 months (the diluted value takes into account outstanding options that would reduce the share price)

> $str := cat(\text{"http://download.finance.yahoo.com/d/quotes?s="}, ticker, \text{"&f=e"})$:

> $EPSttm := ImportMatrix(str)_{1,1}$

$$EPSttm := 7.94900000000000 \qquad (2.2.1)$$

Dividend per share for the trailing 12 months

> $str := cat(\text{"http://download.finance.yahoo.com/d/quotes?s="}, ticker, \text{"&f=d"})$:

> DividendPerSharettm := ImportMatrix(str)$_{1,1}$

$$DividendPerSharettm := 2.70000000000000 \qquad (2.2.2)$$

Most recently traded share price

> str := cat("http://download.finance.yahoo.com/d/quotes?s=", ticker, "&f=l1") :

> PriceCurrent := ImportMatrix(str)$_{1,1}$

$$PriceCurrent := 91.8300000000000 \qquad (2.2.3)$$

▼ Forward PE

The forward PE over the holding period is assumed to be the current price divided by the earnings per share over the trailing twelve months;

> $PEForward := \dfrac{PriceCurrent}{EPSttm}$

$$PEForward := 11.5523965278651 \qquad (2.3.1)$$

▼ EPS Growth Over the Holding Period

The EPS over each year of the holding period

> $EPSProjected := seq\left(EPSttm \, (1 + EPSGrowthRate)^i, i = 1 .. HoldingPeriod\right)$

$$EPSProjected := 8.18747000000000, 8.43309410000000, 8.68608692300000 \qquad (2.4.1)$$

Hence the total earnings per share over the holding period

> $totalEPS := add(i, i = EPSProjected)$

$$totalEPS := 25.3066510230000 \qquad (2.4.2)$$

▼ Present Fair Value

Expeced share price at the end of the holding period

> ExpectedSharePrice := EPSProjected$_{HoldingPeriod}$ PEForward

$$ExpectedSharePrice := 100.345120410000 \qquad (2.5.1)$$

The dividend payout ratio is the current dividend per share divided by the EPS in the final year. We're using the EPS in the final year in order to be conservative and calculate a lower dividend payout ratio.

> $DividendPayoutRatio := \dfrac{DividendPerSharettm}{EPSProjected_{HoldingPeriod}}$

$$DividendPayoutRatio := 0.310841927318346 \qquad (2.5.2)$$

Hence the total dividends per share paid out over the holding period

> TotalDividends := totalEPS DividendPayoutRatio

$$TotalDividends := 7.86636817796211 \tag{2.5.3}$$

Expected share value at the end of the holding period

> ExpecedShareValue := ExpectedSharePrice + TotalDividends

$$ExpecedShareValue := 108.211488587962 \tag{2.5.4}$$

Given the desired return, the present price for fair value

> $PresentSharePriceGoodValue := \dfrac{ExpectedSharePrice}{(1 + DesiredReturn)^{HoldingPeriod}}$

$$PresentSharePriceGoodValue := 86.6818878393262 \tag{2.5.5}$$

▼ Should I Invest?

> piecewise(PresentSharePriceGoodValue < PriceCurrent, "Overvalued. Do not invest.", "Undervalued. Buy buy buy!")

$$\text{"Overvalued. Do not invest."} \tag{2.6.1}$$