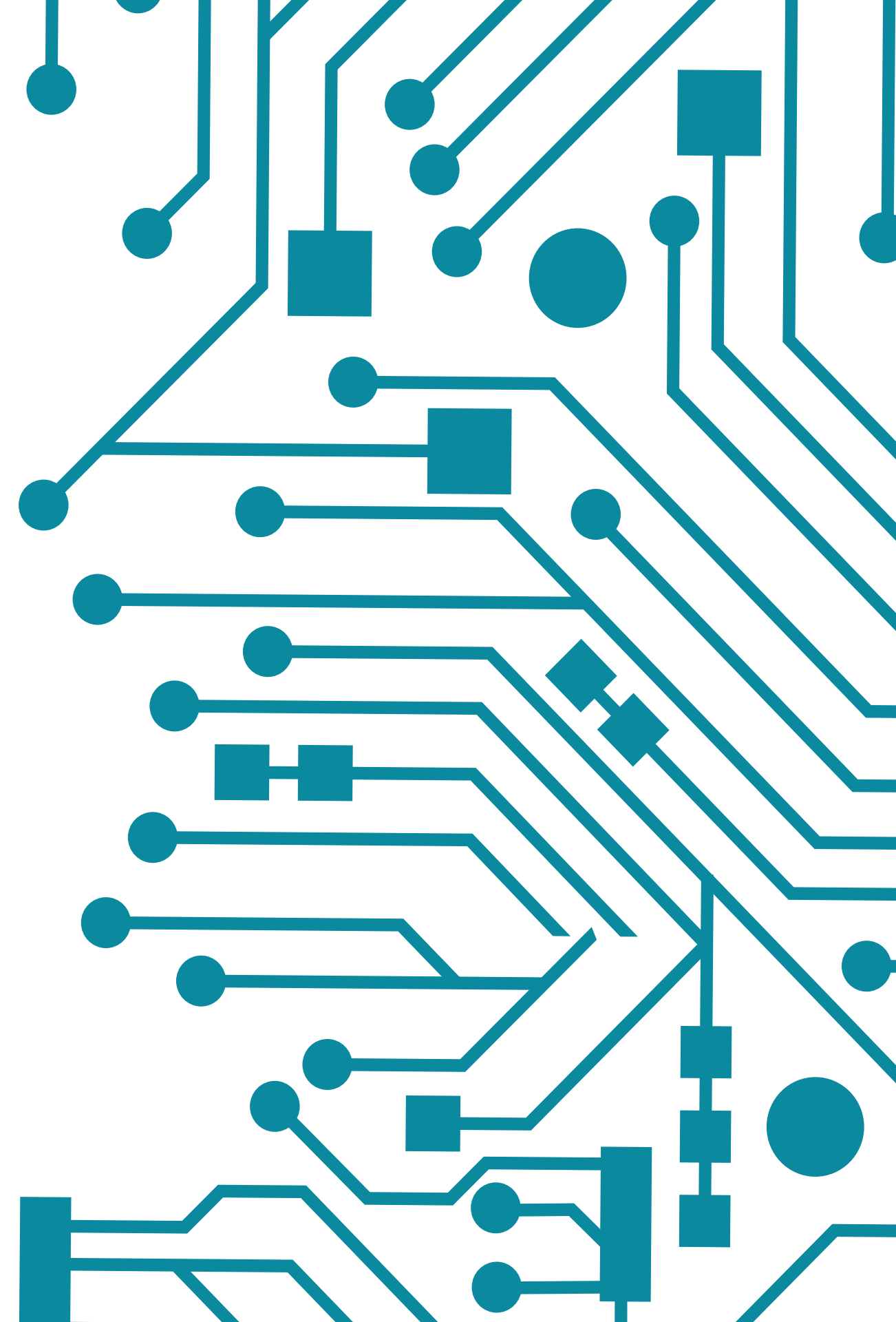# Zoomin

TURNING DIGITAL SKILLS INTO START-UP SKILLS
FOR YOUNG ENTREPRENEURS

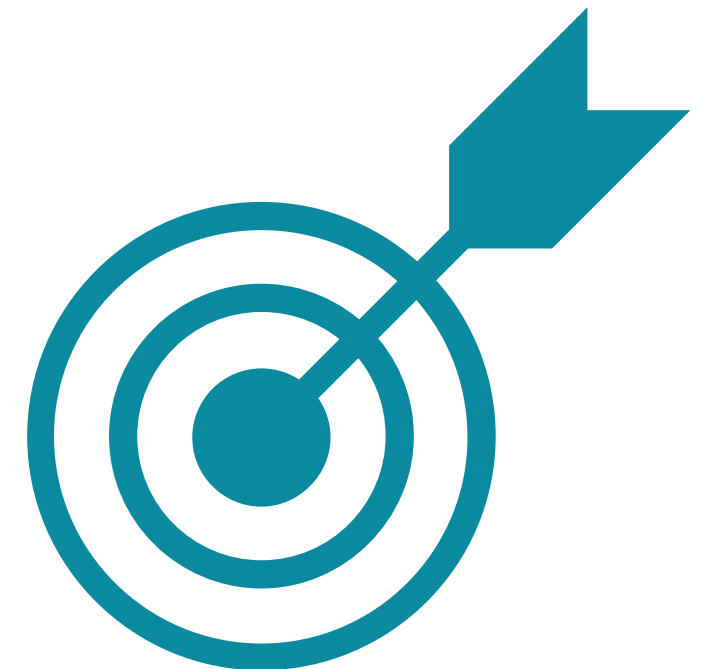**MODULE BUSINESS & FINANCE**

2.5

INTRODUCCIÓN A LAS INVERSIONES

OBJETIVOS DE APRENDIZAJE

Cuando termines este modulo conocerás:

1. **Métodos para calcular el retorno sobre una inversión.**

2. **El impacto del riesgo sobre las inversiones.**

3. **Los elementos a tener en cuenta a la hora de realizar una inversión.**

Contenido del módulo

DEFINICIÓN DE INVERSIÓN.

DEFINICIÓN DE RIESGO.

RIESGO Y RETORNO.

TIPOS DE INVERSIONES E INVERSORES.

TASA DE RETORNO.

TASA COMPUESTA DE RETORNO.
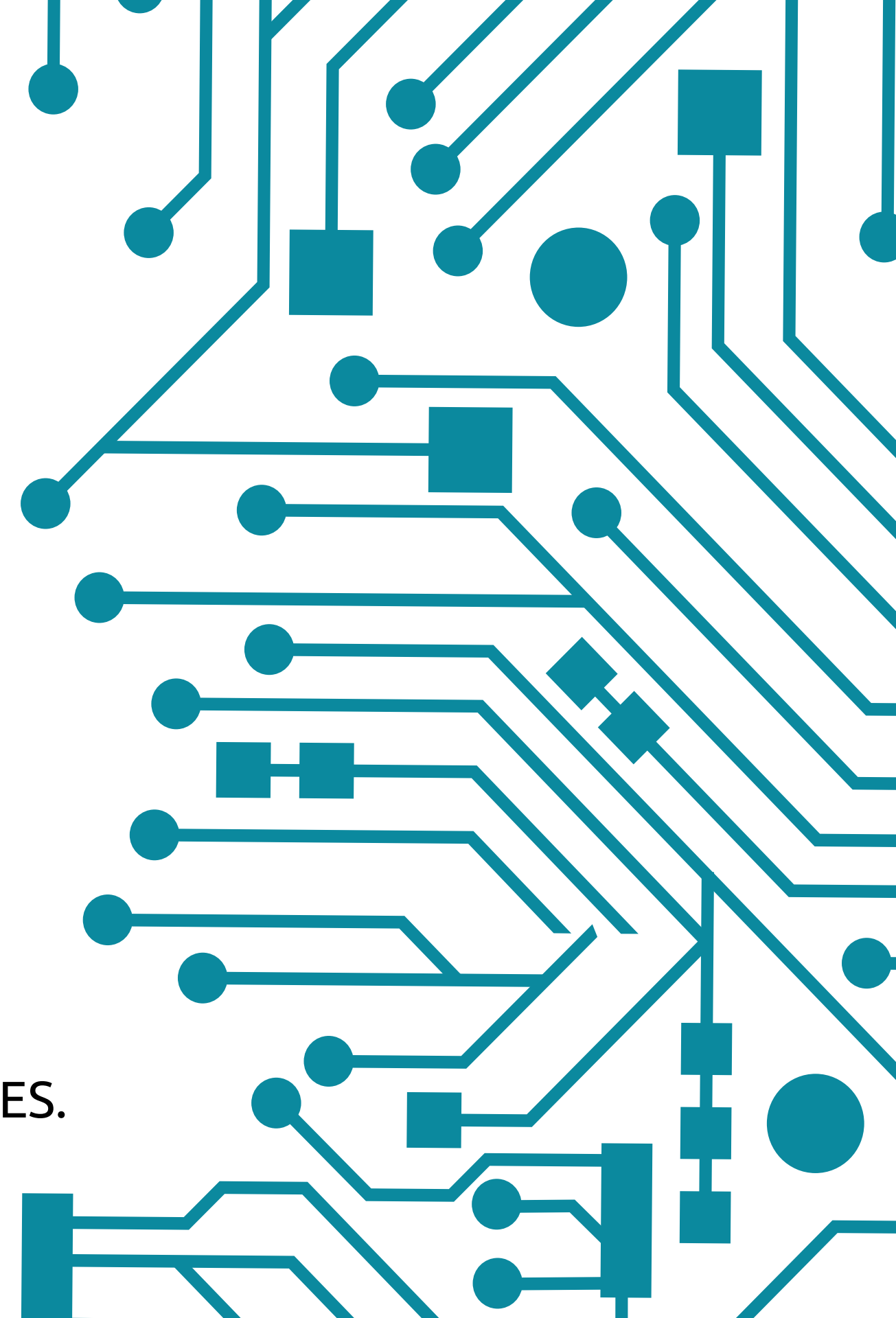
EL VALOR TEMPORAL DEL DINERO.

SABER SI UNA INVERSIÓN MERECE LA PENA.

RATIOS FINANCIEROS.

OTRAS CONSIDERACIONES AL INVERTIR.

TU LISTA DE COMPROBACIÓN SOBRE INVERSIONES.

HERRAMIENTAS DIGITALES PARA INVERTIR.

"How many millionaires do you know who have become wealthy by investing in savings accounts? I rest my case."

Robert G. Allen

"Risk comes from not knowing what you are doing."

"Never invest in a business you cannot understand."

"Only invest in something that you'd be perfectly happy to hold if the market shut down for 10 years."

Warren Buffet

DEFINICIÓN DE INVERSIÓN

The outlay of money usually for income or profit. A capital outlay.

Although it might seem obvious, investors expect to get a return on the capital they put into a business.

The expected return depends on the risk of the investment.

DEFINICIÓN DE RIESGO

Possibility of loss or injury.

The greater the probability of loss (risk), the higher the expected return.

Risk depends on mainly on:

TIME the longer the investment, the higher the uncertainty.

THE NATURE OF THE BUSINESS well known profitable companies in a stable industry are less risky than unknown, new companies coming from an unstable industry.
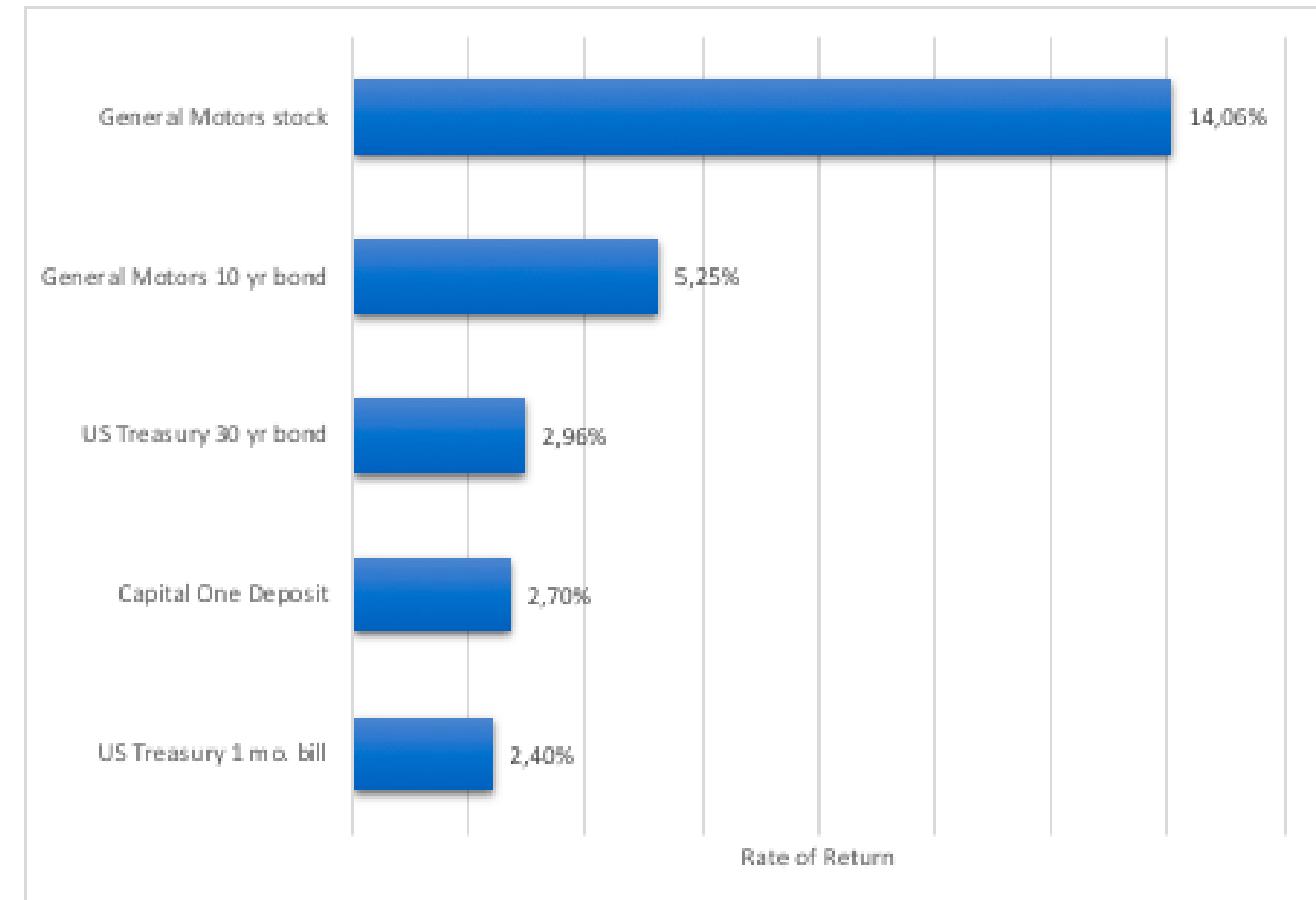
THE INVESTOR'S TOLERANCE TO RISK

RIESGO Y RETORNO

When defining where to invest, the higher the risk the higher return investors demand.

There is not such thing as a totally risk free investment.

However, government debt in developed countries is generally considered risk free, since it is assumed there won't be a default.

TIPOS DE INVERSIONES

OWNERSHIP INVESTMENTS.

Investing in your own startup or in a company's equity to become an owner.

FINANCIAL INVESTMENTS.

Bank deposits, government debt, private debt and equity securities, currencies, funds, commodities, real estate, derivatives, art.

CAPITAL INVESTMENTS.

The investments made by a company in assets in order to grow or become more profitable.

Despite the type of investment made, a return is expected, and the investor will have to assume a certain level of risk.

TIPOS DE INVERSORES

PERSONAL INVESTORS

Family, friends, personal relationships.

BANKS

Are not investors, they don´t become owners, but are the most common source of funds for a company. It is a complicated source for a startup, but cheaper than other sources.

PEER-TO-PEER LENDERS

Made of individuals groups of investors, offer loans to small businesses and startups mainly (an [example](#)).

TIPOS DE INVERSORES

BUSINESS ANGELS

Wealthy individuals or groups that invest in startups. Besides giving cash, offer advice or become active in the management (read [article](#)).

VENTURE CAPITAL

Firms that manage individual investors' money (more).

CORPORATE INVESTORS

Large companies may be inclined to invest idle cash in new companies, in order to improve return, diversify, find talent or identify trends and opportunities.

FUNDS

Firms that invest in a number of different companies for their owners. They generally don't invest in startups.

CROWDFUNDING

You may seek contributions or donations from customers, suppliers, partners or the community. Watch this [video](#) and read this article.

INCUBATORS

Offer mainly space (facilities), training and mentoring and special conditions to sartups. Check out some [examples](#).

GOVERNMENT INVESTORS

Governments have a number of programs that give loans or managerial advise to startups.

TASA DE RENTABILIDAD (TR)

If you want to start a business you will have to make investments, and will probably look for funding.
Either way, first you need to know the basics about investing, including how to calculate the return on an investment (RoI) or Rate of Return (RoR).

Definition of RoR:
The gain or loss on an investment over a specific period of time.

There are different ways to calculate it. Let's start from the beginning.

TASA DE RENTABILIDAD (TR)

$$RoR\ (\%)= \frac{(Ending\ value\ of\ the\ investment - Initial\ value\ of\ the\ investment)}{(Initial\ value\ of\ the\ investment)}\ x100$$

EXAMPLE 1

You buy a house for 300,000 €, and you sell it for 345,000€ three years later.
RoR (%)=(330,000€ −300,000€)/300,000€ x 100=10%

EXAMPLE 2

You buy a house for 300,000€, you rent it for two years at a price of 12,000€ per year, and you sell it for 330,000€ three years later.
RoR (%)=(330,000€+12,000€+12,000€ −300,000€)/300,000€ x 100=18%

TR ANUAL VS TR COMPUESTA

When an investment lasts more than one year, it is better to find the return per year in order to compare it with other investments. A simplified way of finding the RoR would be to divide the gain by the number of years.

However, this arithmetic average is not normally used when finding out the RoR for investments over one year.

Instead the Compound Annual Growth Rate (CAGR) is used, because normally gains on an investment would be reinvested.

The Compound Annual Growth Rate (CAGR) is the annual rate of return of an investment in which it is assumed that gains are reinvested.

EXAMPLE 1 (ANNUAL RATE OF RETURN):

You buy a house for 300,000 €, you rent it for two years at a price of 12,000€ per year, and you sell it for 330,000 € three years later.

Annual RoR (%)=(330,000€+(12,000€x2) −300,000€)/300,000€ x100= (18%)/3= 6%

EXAMPLE 2 (CAGR):

$CAGR$(%)= (($Ending\ value\ of\ the\ investment$)/ ($Initial\ value\ of\ the\ investment$))^[1/$np$] −1 x 100

Where np stands for number of periods, in this case the number of years. Coming back to the previous example, the result would be:

$CAGR$(%)= ((330,000€+12,000€+12,000€)/300,000€)^[1/3] −1 x 100= 5.67%

The CAGR is more widely used, since allows to give a more accurate picture when in gains vary from one year to the next, even when it smooths the return.

EL VALOR TEMPORAL DEL DINERO

Now, in order to continue, you need to understand the importance of time on the value of money, and thus on the return on an investment.

A given amount of money today is worth more than the same amount in the future, because:

- We can invest the money and obtain a return.
- Inflation will make that in the future things cost more, therefore, money will lose value*.

*During the explanations we will not consider inflation,
but we will refer to it at the end of the module.

VALOR FUTURO DEL DINERO

In order for you to know the value of an investment made today in the future use the Future Value formula.

Future Value (FV)=Present Value (PV) x (1+i)^np

Where np* is the number of periods and i is the annual interest rate (RoR).

EXAMPLE

You are given the opportunity to be given 2,000€ today or 2,100€ in 4 years time. Which alternative do you choose? Well, it will depend on your gain if you invested that amount.

If you can put that money in a savings account, at an interest of 2.5% for 4 years, and the interest earned every year were reinvested you would end up with:

FV=2,000 x (1+0.025)^4=2,207.63€

Much better to receive 2,000€, right ?

* In order to simplify the example we have taken n to be 4 annual periods. However, when working with compound interest rates, generally months are considered. Therefore, i would be the monthly of interest rate, and n the number of months.

EL VALOR ACTUAL DEL DINERO

Let's do it the other way around. If we are given 2,100€ in four years time, what would be the equivalent know? We can use the Present Value (PV) formula:

$Present\ Value\ (PV) = (Future\ Value\ (FV))/[(1+i)]^{np}$

Where np* is the number of periods and i is the annual interest rate.

In our example:

$Present\ Value\ (PV) = 2,100€/[(1+0.025)]^4 = 1,902.49€$

*In order to simplify the example we have taken n to be 4 annual periods.
However, when working with compound interest rates, generally months are considered.
Therefore, i would be the monthly of interest rate, and n the number of months.*

EL TIPO DE DESCUENTO

In the previous example, we took the interest rate (i) of a savings account in order to determine whether we prefer to be given 2,000€ today or 2,100€ four years from now.

The interest rate (i) in this case is the rate of return (RoR) of investing that money over 4 years. When deciding on making an investment, there is a minimum rate of return we will accept, which is called the discount rate (r).

The PV formula and the discount rate (r) are used to determine whether an investment will be profitable. It is what investors call the discounted cash flow analysis.

VALOR ACTUAL NETO (VAN)

Let's go one step further. When an investment is made, the process is the following:

There is an initial cash outflow (the amount invested).

There are subsequent cash inflows (gains) or outflows (losses or additional investments).

A final cash inflow if the amount invested can be recuperated*.

The Net Present Value is today's value of all the cash inflows and outflows of an investment at a given discount rate.

If we invest in a savings account, we can take out the amount invested at the end of the investing period. However, it is not always the case. For example, if you buy machinery that can't be sold at the end of its productive live, there wouldn't be a final inflow.

The formula:

$$NPV = CF0 + CF1/(1+r)^1 + CF2/(1+r)^2 + ... + CFn/(1+r)^n$$

$$NPV = \sum\nolimits_{(n=0)}^{N} CFn/[(1+r)]^n$$

Where CF0 is the amount invested, CF1-CFn periodical cashflows and r is the discount rate.

UN EJEMPLO DE VAN

Remember this example?

You buy a house for 300,000 €.

You rent it for two years at a price of 12,000€ per year.

You sell it for 330,000€ three years later.

You have to make sure we can earn more than from a savings account offering a 2.5% annual interest rate (that would be the discount rate) because it's riskier.

The equation would be the following:

$$NPV = \sum_{n=0}^{N} CF_n / [(1+r)]^n$$

$$NPV = -300{,}000€ + 12{,}000€/(1+0.025)^1 + 12{,}000€/(1+0.025)^2 + 342{,}000€/(1+0.025)^3$$

$$NPV = 40{,}710€$$

The NPV is positive, which means that buying the house would be a more profitable investment than putting the money in the savings account (it should, since it is riskier).

TASA INTERNA DE RENTABILIDAD (TIR)

The Internal Rate of Return (IRR), is the discount rate that makes the NPV of an investment equal to zero.

$NPV=0=CF0+CF1/(1+IRR)^1 +CF2/(1+IRR)^2 +CF3/(1+IRR)^3 +...+CFn/(1+IRR)^n = \sum_{(n=0)}^N CFn/[(1+IRR)]^n$

In our previous example, the IRR would be 7.102%:

$NPV=-300,000€+12,000€/(1+0.07102)^1 +12,000€/(1+0.07102)^2 +342,000€/(1+0.07102)^3 =0$

The IRR is not easily calculated, since there are a number of periods and the average rate must be found. Using spreadsheets and specific software will allow you to do it.

COSTE DE CAPITAL PROMEDIO PONDERADO (CCPP)

References to decide the discount rate:

1. Inflation and government debt.

2. Other alternatives yielding a higher return than government debt with an acceptable risk that may be more appropriate.

3. When the investment is targeted at improving a company's bottom line or performance, the discount rate should be equal or higher than the company's cost of:

Obtaining external financing (debt) or, using internal resources (equity).

In certain cases calculating the discount rate is can be complicated.

That is why many companies use the Weighted Average Cost of Capital (WACC) to be used in deciding on new projects or investments.

The WACC takes into consideration the cost of both external (banks) and internal (equity) financing.

More on WACC.

RATIOS FINANCIEROS

When analyzing a company, a number financial ratios that have to do with return are commonly used, mainly:

$R.\,on\,Equity = (Net\,income)/(Shareholders^{\wedge\prime}\,equity)\%$

$R.\,on\,Investment = (Net\,income)/(Invesment\,made\,on\,the\,company)\%$

$R.\,on\,Assets = (Net\,income)/(Total\,Assets)\%$

More on financial ratios.

OTRAS CONSIDERACIONES

When deciding whether to invest on a certain project or asset, there are three important aspects to include in your calculations:

1. Transaction costs.

For example, if you buy a house you should include in the cost taxes, registration procedures, improvements, etc.

2. Inflation.

Inflation makes money lose value in the future. The real return on an investment takes into account inflation, the nominal doesn't. In order to properly calculate the effect of inflation on a given investment, use the following formula:

$$Real\ RoR(\%) = ((1 + nominal\ rate))/((1 + inflation\ rate)) - 1$$

3. Foreign exchange rates.

Exchange rates increase the risk (are unpredictable). There are instruments to prevent the effect of exchange rates but will add an extra cost.

TU LISTA DE COMPORBACIÓN SOBRE INVERSIONES

This is your checklist of things you must consider when looking for investors or making an investment:

- ✅ **Make sure you know all the costs of investing.**

- ✅ **Have a clear perception of the risk (time, kind of business, investors' profile).**

- ✅ **Calculate the RoR, NPV and IRR of any investment.**

- ✅ **Consider the return of possible alternatives and use references in order to know the discount rate for an investment.**

- ✅ **This is an introduction to investment. There is a lot more you can learn (Betta, portfolios, etc.).**

HERRAMIENTAS DIGITALES PARA INVERTIR

There are a number of programs and digital tools that will help us with calculating RoR and to manage investments, but most are for stock portfolio investment.

Microsoft Excel (and other similar spreadsheets) can help you a lot with investments, since it features most financial equations.

example [video](#)

REFERENCIAS Y ENLACES

Praxis MMT

Investopedia

Bytestart

Alphagamma

Forbes

Corporate Finance Institute

Wall Street Mojo

Youtube