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FINANCIAL INSTRUMENTS
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ΕΙΔΙΚΟΣ ΛΟΓΑΡΙΑΣΜΟΣ ΚΟΝΔΥΛΙΩΝ ΕΡΕΥΝΑΣ

Democritus University of Thrace
SPECIAL ACCOUNT FOR RESEARCH FUNDS

Project Title:

Promotion of Modern Financial Instruments in the Cross-border area

Project Acronym:

FINANCIAL INSTRUMENTS

Work Package 3:

Identification of Current Status in the Cross-Border Area/Networking Activities

Deliverable D.3.2.1.: Identification, Recording and Evaluation of all modern Financial Instruments/Funds currently available in the cross-border area

Delivered by Democritus University of Thrace - (DUTH)

Main conductor: Headway A.E.

* This deliverable is part of the final overall deliverable of the project, where the other partners also participate

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1 CHAPTER 1. Introduction

The specific deliverable is part of the final total deliverable of the project, where the other partners also participate and will be delivered at the end of the project. The Democritus University of Thrace - (DUTH) has contributed to the completion of specific chapters of the final deliverable as presented in this document. More specifically, the partner company Headway has recorded historical data of the financial instruments of the country and the assigned region. Then, he has mentioned the financial tools, from the theoretical point of view. Finally, we focused on evaluating these tools through an evaluation Matrix.

Below is the mail, which was sent the deliverable as requested by the euro advisors

Figure 1: Email from euroadvisor.

FINANCIAL INSTRUMENTS - Deliverable D.3.1: "Identification, Recording and Evaluation of all modern Financial Instruments/Funds currently available in the cross-border area" Εισερχόμενα ×

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Αγγλικά > Ελληνικά Μετάφραση μηνύματος

Dear all,
We have almost completed the writing of the chapters of deliverable D.3.1 that were assigned to us, based on the agreed following distribution:

Table of contents	LB	PP2	PP3-4
CHAPTER 1. Executive Summary	✓		
CHAPTER 2. Introduction	✓		
CHAPTER 3. About the FINANCIAL INSTRUMENTS Project			
3.1. General Data – Work Packages - Deliverables	✓		
3.2. The project Partnership and relevant stakeholders	✓		
3.3. Geographical reference	✓		✓
CHAPTER 4. Financial Tools/Instruments			
4.1. General Definitions	✓		✓
4.2. Historical Data		✓	✓
4.3. Types & Categories	✓		✓
4.4. Technical Description of Financial Tools/Instruments"			
4.4.1. ESPA, RRF	✓		✓
4.4.2. Banks, Funds, Business Angels, Crowd funding, other		✓	✓
CHAPTER 5. Evaluation of Financial Tools/Instruments			
5.1. Methodological Framework		✓	
5.2. Evaluation Matrix – basic elements of tools		✓	✓
CHAPTER 6. Conclusions		✓	✓
Sources - Bibliography	✓	✓	✓

In order to proceed with the production of the final deliverable, please send us your own chapters to add them to the final doc.

Before the final delivery, the complete deliverable will be sent to you for review.

We are at your disposal for any clarifications.

Kind regards,

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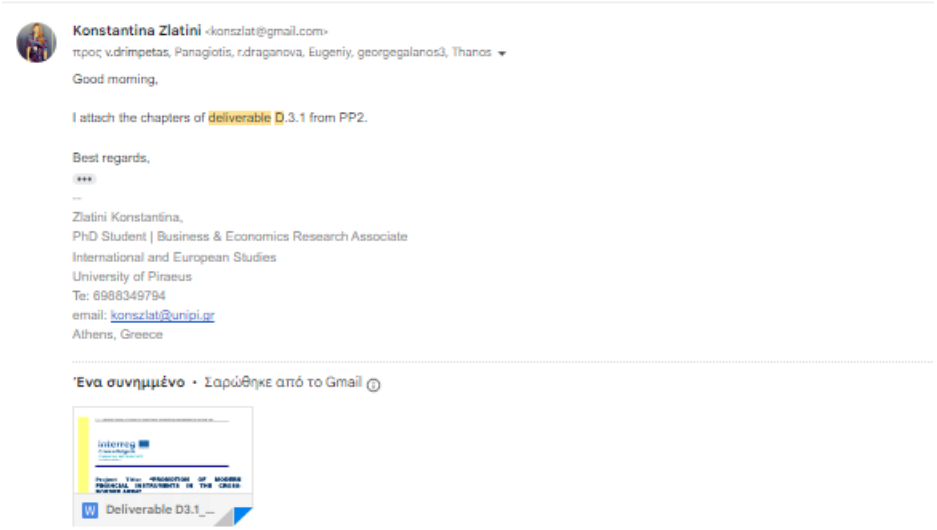
Figure 2: Email response from University of Thrace - (DUTH



2.1 Historical Data

SME Financing in Greece – Historical Data

In this section we present the historical data for Greek SME financing. Our data source is the OECD library (OECD, 2022), which covers the years 2007 – 2020. Consequently, the post-covid period is not captured. SMEs are companies with at most 250 employees, annual turnovers not exceeding EUR 50 million, and/or an annual balance sheet total not exceeding EUR 43 million (in line with the European Commission Definition).

1 Greek Enterprises in Numbers

The breakdown of the Greek entrepreneurial landscape is as follows according to data from the European Commission:

- 99.9% (718,558) enterprises, are defined as SMEs,
- 94.6% (680,038) are micro-enterprises employing less than 10 employees
- 4.8% (34,701) are small enterprises
- 0.5% (3,819) are medium-sized enterprises
- 0.1% (522) are large enterprises.

When it come to the workforce:

- 46.9%, of the workforce is employed by micro-SMEs.
- 83% of the workforce is employed by SMEs.
-
- With regards to the value added in the economy:
  - Micro-SMEs account for 19.7% of the value added in the economy.
  - SMEs account for 56.7% of the value added in the economy.

Compared to the EU-27 average, SMEs and especially micro-enterprises are more numerous and more important to the Greek economy.

Table 1 Distribution of firms in Greece and in the EU for the year 2021

Distribution of firms in Greece, 2021						
By firm size						
% Share	Number of enterprises		Number of employees		Value added	
	Greece	EU-28	Greece	EU-28	Greece	EU-28
Micro	94.60%	93.30%	46.90%	29.60%	19.70%	18.70%
Small	4.80%	5.70%	23.30%	19.70%	15.90%	17.00%
Medium	0.50%	0.90%	12.80%	15.80%	21.10%	17.30%

SMEs	99.90%	99.80%	83.00%	65.20%	56.70%	53.00%
Large	0.10%	0.20%	17.00%	34.80%	43.30%	47.00%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100

Source: OECD, 2022

2 Trends in Greek SME lending and financing

SME lending has been materially influenced by the pandemic as well as the lending facilities offered to banks for the year 2020 and the gradual economic recovery in the period 2014-2019 as well as the financial crisis in the years preceding them. More specifically:

- In 2020, new business lending to Greek SMEs increased 1.75 times in relation to 2019.
    - The significant acceleration of bank lending to enterprises was also facilitated by the improvement of the conditions under which banks derived financial resources from the Eurosystem, as well as by the significant support provided by bank lending/co-financing schemes and guarantees offered by the Hellenic Development Bank.
- Despite the increase in new lending, outstanding credit to all businesses and to SMEs fell for the eighth year in a row, reaching EUR 66.6 billion in 2020, mainly attributed to:
    - The severe contraction of new business SME lending as a result of the financial crisis.
        - In 2008 and 2009, banks lent over EUR 12 billion to Greek SMEs. This figure decreased by 91.8% cumulatively from 2009 to 2016.
    - The continual decline of SME outstanding stock of loans due to a moderate economic recovery between 2014 and 2019.
        - 2014 marked the return of economic activity to positive growth rates (+0.8% year on year for Q12014) after six consecutive years of deep recession. Investments, strong absorption of EU structural funds, tourism and exports contributed to Greece's year-on-year economic growth, as well as higher exports of goods and services and higher private consumption.
        - In 2018, financial institutions in Greece lent EUR 1.16 billion to SMEs, a slight increase from 2017, which in turn saw an increase of 6% compared to 2016.
    - The decline in 2020 in the outstanding stock of SME loans primarily driven by a significant removal of non-performing loans (NPLs) from Greek banks' balance sheets (from 36.1% of total loans in 2019 to 28.5% of total loans in 2020) through the introduction in late 2019 of the "Hercules" asset-protection scheme.

New business lending for all enterprises followed a similar trajectory, decreasing by 84.2% from EUR 36.5 billion in 2008 to EUR 7.3 billion in 2017 followed by an increase to 11.4 EUR billion in 2018, almost the double of 2016 figures.

- To tackle the impact of the COVID-19 pandemic on SMEs, the Greek government put in place several measures:
  - One of the measures in place was the "COVID-19 guarantee Fund" providing a guarantee coverage of up to 80% per loan.
  - During the first cycle, the guarantee rate was set at 80% per loan, while the maximum guarantee was set at 40% for a loan portfolio to SMEs and 30% for a loan portfolio to large companies.
  - An additional budget of EUR 780 million was added on the second cycle of the COVID guarantee fund, so the total available funds of the two cycles amounted to EUR 1.78 billion.
  - In the second cycle of the Fund the provision of the guarantee paid by the companies is fully subsidized.
  - 75% to 90% of the new loans of the second cycle of the Guarantee Fund are addressed with priority to Micro-SMEs.

2.1 Interest rates and credit conditions

Interest rates for both SMEs and large firms fell for the eighth year in a row in 2020, reaching 3.94% and 2.83% respectively, but the spread between the two increased (1.11) compared to 0.85 in 2018.

- This explains the risk-averse approach of Greek banks against SMEs particularly during the pandemic.
- Credit conditions tightened significantly and access to finance continues to be a central problem for Greek SMEs, according to the most recent ECB Survey on Access to Finance of Enterprises (SAFE), with 18% of Greek SMEs citing access to finance as the most important problem they currently face, compared to an EU-28 average of 9%.
- Furthermore, Greece shows the highest percentage of SMEs reporting difficulties in accessing bank loans (22%) and the highest proportion of SMEs reporting fear of application rejections in the EU.

The proportion of Greek SMEs that required collateral when they applied for a loan to a bank continued to decrease, to 18.4% in 2020 compared to 20.7% in 2018.

- The rejection rate declined to 12.3% compared to 2018 (20.5%) but increased slightly compared to 2019 (11.4%).

2.2 Non-performing loans (NPLs)

The percentage of SME non-performing loans related to all SME loans was 28.5% in 2020 and has declined for the fifth year in a row since 2016, when it had reached 43.2%.

- The decline is primarily due to public programs such as the Hercules Program that assists commercial banks in securitizing and removing NPLs from their balance sheets.
- Despite this, in 2020, almost 20% of all business loans were non-performing in Greece.

2.3 Alternative sources of financing

In 2020, alternative sources of finance were hard hit in Greece.

- Factoring decreased to EUR 1.89 million compared to EUR 1.96 million in 2019, which was shaped as follows:
  - The total outstanding amount of loans from factoring companies to all companies increased to EUR 1.8 billion in 2009, before decreasing by 20.2% between 2009 and 2013.
  - Factoring activities recovered since 2014, and reached EUR 1.9 billion in 2018, an 11% increase compared to 2017.
  - In 2020 factoring in Greece decreased to EUR 1.89 million compared to 2019 (EUR 1.96 million).
- Leasing and hire purchase activities also decreased in 2020, reaching EUR 3.3 billion compared to EUR 4.2 billion in 2017, which was shaped as follows:
  - The total outstanding amount of financing from leasing companies reached its peak in 2008 and, at EUR 7.8 billion, was an important source of financing for Greek enterprises.
  - Between 2008 and 2013 though, financing from leasing companies halved to EUR 3.4 billion.
  - In 2014 and 2015, leasing and hire purchase activities picked up, but decreased to EUR 4.2 billion in 2017 and to EUR 3.3 billion in 2020, remaining well below pre-crisis levels.
- Venture capital was also strongly hit compared to 2019, declining by 46.7% in 2020 and reaching EUR 78.8 million from EUR 148.3 million in 2019, which was shaped as follows:
  - Venture capital and growth capital investments totaled EUR 32.7 million in 2008, but decreased tremendously until 2012, when no venture and growth investments took place.
  - Investments slightly recovered in 2013, reaching EUR 4.8 million.
  - In 2015, the index reached EUR 12.6 million, and since then rose rapidly to EUR 44.5 million in 2017, a 20.6% increase from 2008.
  - The increase trend continued in 2019 when venture and growth capital reached the amount of EUR 148.3 million but decreased by 46.7% in 2020 when it reached EUR 78.8 million.

Table 2 Enterprise Financing in Greece

Enterprise Financing in Greece															
Indicator	**Unit**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Debt															
Outstanding business loans, SMEs	EUR billion	..	..	..	44.9	41.6	39.1	48.1	48.1	46.9	48.4	44.7	41.1	35.2	32
Outstanding business loans, total	EUR billion	102	124	124	117	113	101	97	95	89	88	82	76.4	67.3	66.6
Share of SME outstanding loans	% of total outstanding business loans	..	..	..	38.5	36.8	38.8	49.7	50.6	52.6	55.3	54.4	53.8	52.3	48.1
New business lending, total	EUR billion	..	36.5	36.3	20.7	29.4	21.8	24.3	14.9	6.9	5.8	7.3	11.4	7.9	16.2
New business lending, SMEs	EUR billion	..	12.5	13	4.4	5.2	4.1	3.7	2.3	1.2	1.1	1.1	1.2	1.3	3.5
Share of new SME lending	% of total new lending	..	34.2	35.6	21.4	17.8	18.9	15	15.6	17	18.4	15.5	10.18	16.05	31.8
Outstanding short-term loans, SMEs	EUR billion	..	..	..	..	..	..	..	18.1	17.6	18.8	17	15.1	13.4	9.5
Outstanding long-term loans, SMEs	EUR billion	..	..	..	..	..	..	..	30.1	29.3	29.6	27.7	25.9	21.7	22.5
Share of short-term SME lending	% of total SME lending	..	..	..	..	..	..	..	37.6	37.6	38.9	38	58.4	61.6	42.3
Government loan guarantees, SMEs	EUR billion	..	..	..	..	..	..	0.37	0.31	0.24	0.56	1.08	1.2	1.3	3.9
Non-performing loans, total	% of all business loans	4.6	4.3	6.7	8.7	14.2	23.4	31.8	29.4	31	30.3	30.5	28.6	25.5	19.1
Non-performing loans, SMEs	% of all SME loans	..	..	..	..	..	..	..	41.2	44.1	43.2	42.5	38.1	36.1	28.5
Interest rate, SMEs	%	6.57	6.82	4.62	5.53	6.77	6.87	6.51	5.8	5.38	5.32	4.91	4.66	4.31	3.9
Interest rate, large firms	%	5.32	5.71	3.52	4.27	5.74	5.92	5.77	5.55	4.82	4.61	4.2	3.81	3.64	2.8
Interest rate spread	% points	1.25	1.11	1.1	1.26	1.03	0.95	0.74	0.25	0.56	0.71	0.71	0.85	0.67	1.1
Collateral, SMEs	% of SMEs needing collateral to obtain bank lending	..	..	51.4	40.5	49.4	46.7	45.9	46.2	49.2	39.8	25.7	20.7	18.5	18.4
Percentage of SME loan applications	SME loan applications/ total number of SMEs	..	..	37.9	39.6	30.8	29.9	21.4	25.5	18.8	21.5	17.5	23	23.9	31.3
Rejection rate	1-(SME loans authorised/ requested)	..	..	25.8	24.5	33.8	28.3	26	21.5	19.9	18.2	16.2	20.5	11.4	12.3
Utilisation rate	SME loans used/ authorised	..	..	..	..	..	..	..	..	..	..	..	..	..	
Non-bank finance															
Venture and growth capital	EUR million	19	32.7	16.7	25	10.1	..	4.8	12.6	36.8	38	44.5	84.1	147.1	78.8
Venture and growth capital (growth rate)	%, Year-on-year growth rate	..	72	-49	50	-60	..	..	160	193	3	17	88.8	74.87	-46.86
Leasing and hire purchases	EUR billion	7.28	7.87	7.5	7.28	6.85	6.22	3.36	4.08	4.72	4.4	4.25	3.96	3.39	3.32
Factoring and invoice discounting	EUR billion	1.28	1.73	1.77	1.73	1.49	1.53	1.41	1.69	1.69	1.72	1.74	1.93	1.96	1.89
Other indicators															
Payment delays, B2B	Number of days	..	25	34	30	35	40	43	41	36	47	47	33	17	..
Bankruptcies, SMEs	Number	513	359	355	355	445	415	392	330	189	108	123	114	63	..

Bankruptcies, SMEs (growth rate)	%, Year-on-year growth rate	..	-30	-1	0	25	-7	-6	-16	-43	-43	14	-7	-23.17	..

Source: OECD, 2022

3 Government Initiatives

3.1 Direct lending

Several financial instruments with funding from EU structural funds are available to support lending to SMEs in Greece:

- The Hellenic Fund for Entrepreneurship and Development S.A. (ETEAN A.E.) was created in 2011 as a wholly owned state corporation in February 2011, with start-up capital of EUR 1.7 billion.
    - It managed and implemented projects financed via the state budget, public investment programs, and the EU's Agricultural and Fisheries Funds.
    - The government, through the Hellenic Fund for Entrepreneurship and Development S.A., co-financed direct loans to SMEs for investment and working capital purposes.
    - Some of these direct loans targeted young entrepreneurs, export-oriented SMEs or specific sectors (tourism, desalination and waste management, innovation, etc.). The government typically co-financed the loan up to 50% of its value, but some sectoral loans were 33% co-financed.
- The Hellenic Development Bank (HDB) was established in 2019 by the Greek Government, which took place through the transformation and administrative capacity building of two existing entities, the Hellenic Fund for Entrepreneurship and Development S.A. (ETEAN S.A.) and its subsidiary, the New Economy Development Fund S.A. (TANEO SA).
    - HDB's scope is to improve SMEs' access to finance, to foster innovation, to facilitate investments in infrastructure, to encourage equity investments and other alternative financing sources and to provide business support to SMEs, mainly through shared-risk loans and guarantee facilities, as well as financial expertise to the public sector.
    - Since its establishment in 2019, HDB S.A. has been deployed new financial instruments programs by using both public and private funds for the support of SMEs.
    - The HDB S.A. designs and implements financial instrument programs estimated to have significant impact on sustainable growth, regional development, job creation and investments, while at the same time being financially autonomous and sustainable.
- During the 2007-13 EU programming period, The Entrepreneurship Fund provided low-cost loans to SMEs through co-funding schemes with commercial banks that were established after an open tender procedure.

- The Fund ran programs to cover various SMEs in different sectors, providing funds for the implementation of business plans and the provision of working capital for development purposes.

- Furthermore, during the 2007-13 EU programming period, ETEAN established the Agricultural Entrepreneurship Fund I, a program co-financed by the EU's Agricultural Fund for Rural Development (EAFRD) and the Greek Government, for a total of EUR 253 million.
  - The fund aims to support business plans in the agricultural sector.
  - By May 2016, 144 SMEs benefited from loans totaling EUR 8.6 million, with durations of 5-10 years and interest rates ranging between 3.8% and 4.2%.

Table 3 Entrepreneurship Fund I in Greece for the period 2011-2018

Entrepreneurship Fund I in Greece, 2011-2018							
Component/ beneficiary	**Period**	**Max. loan amount**	**Interest rate**	**Loan duration**		**Beneficiaries**	**Uptake**
		EUR	%	Years	Deadline	Number	EUR million
Island Entrepreneurship	2013-17*	30 000	0.0-2.8**	4	30-Jan-17	1 537	33.6
Extroversion	2011-16	500 000	3.2	10-May	31-Jul-15	223	87.3
Thematic Tourism, Desalination, Waste Management, Green Infrastructure, Green Applications, Renewable Energy Sources	2011-13	500 000	3.7	10-May	30-Sep-13	371	75.7
Business Restarting: investment	2013-17*	800 000	0% I.R. offered by ETEAN SA and I.R. offered by participating Bank	12-May	30-Jan-17	4 550	501.2
Business Restarting: working capital	2013-17*	300 000		4	30-Jan-17		
Intermediate Entrepreneurship Fund (working capital)	2017-18	800	0% I.R. offered by ETEAN SA and I.R. offered by participating Bank	4	-	2 005****	221.2****
Exceptional Measure to support SMEs in Kefalonia and Ithaki islands from the January 2014 earthquake ***	2014	19 950	0	10-Apr	30-Jun-14	537	9.2

*Note: *Data leading up to 25-5-2017. ** 0% if island's population is less than 3.100 people. *** Loans Financed by the Island Entrepreneurship Fund. Number and uptake of beneficiaries are parts of number and uptake of beneficiaries of the Island Entrepreneurship Fund. *** Data up to 15-5-2019.*

Source: OECD (2022)

3.2 Support to venture capital

Two of the initiatives that were undertaken to support SMEs through venture capital are presented in this section.

3.2.1 The New Economy Fund (TANEO) SA

The New Economy Fund (TANEO) SA was founded in 2003, aiming at the participation on a minority basis in venture capital funds, venture capital companies, and similar schemes governed by the legislation of EU member states. These investment schemes are managed by agencies from the private sector, following a market-based approach, and must invest exclusively in innovative Greek SMEs.

Since its establishment, TANEO has participated in 11 venture capital funds that manage a total EUR 268 million, providing equity to almost 35 SMEs operating in various sectors, such as information and communication technologies, biotechnology, health, industrial materials, energy, food or beverages and services.

In December 2016, TANEO SA merged with ETEAN SA and in January 2017 became a subsidiary of ETEAN S.A. The merger created a large development group to expand access to finance for SMEs.

Furthermore, during 2018 TANEO SA was funded:

- with the amount of EUR 50 million for its participation in newly established venture capital schemes to invest in Greek R&D enterprises in the 4th Industrial Revolution;
- with the amount of EUR 50 million for its participation in investment schemes aiming at the development of production and promotion of branded products "Made in Greece";
- with the amount of EUR 150 million for its participation in investment schemes aiming at the establishment of companies that need restructuring or reorganization and are active in the production and processing;
- with the amount of EUR 450 million for its participation in newly established venture capital schemes which would invest through convertible bonds and bonds to SMEs.

Subsequently, EUR 700 million in total will be invested in risk finance instruments through TANEO SA to Greek SMEs.

In 2019 TANEO became part of the Hellenic Development Bank S.A. and renamed as the Hellenic Development Bank of Investments S.A.

Table 4 TANEO's venture capital investments in Greece for the period 2007-2014

TANEO's venture capital investments in Greece, 2007-2014

Year	2007	2008	2009	2010	2011	2012	2013	2014
Funds' investments	1.6	8.4	17.8	14	12	10.5	9	4

Source: OECD (2022)

3.2.2 EquiFund

EquiFund was established by the Deputy Minister of Economy and Development in 2016. As a participating fund, it provides equity to enable high value-added investments, through an initial budget of EUR 320 million, funded in part by the Operational Program for Competitiveness, Entrepreneurship and Innovation of the ERDF (EUR 200 million).

- The European Investment Fund (EIF) and European Investment Bank (EIB) provide an additional EUR 60 million each to Equifund under the framework developed by the European Strategic Investment Plan (ESIF).
- EIF manages the fund.
- Equity is provided by intermediary holding funds chosen through an open competitive procedure.

Specifically, EquiFund will invest in the following three key areas:

- Research and innovation (technology transfer – innovation window).
- General entrepreneurship for start-up enterprises (early stage).
- General entrepreneurship for enterprises in development (scale-up/growth).

A special emphasis will be accorded to the strategic sectors of the Greek economy such as tourism, energy, agri-food, the environment, supply chain, information and communication technologies, health and pharmaceutical industry, creative and cultural industries and materials and construction.

In early 2018, the evaluation process was finalized and eventually nine funds were chosen to provide equity to Greek SMEs.

- Targeted sectors include all sectors with a special focus on the food and beverage, agri-business, tourism and hospitality, environment and energy efficiency sectors.
- At the end of 2019, nine selected funds by EIF invested a total amount of 216 million euro to 74 SMEs, mainly start-ups in the ICT sector activating in applications for hospitality, health technologies, transportation, internet of things, travel-tech, e-commerce, software as a service, big data, business services, real estate etc.

Table 5 Investments of Equifund by sector

Investments of Equifund by sector			
Industry	**Number**	**Investment in million Euros**	**Investment % (over total)**
Hospitality	3	71.18	32.98%
Internet of Things	3	28.98	13.43%
ICT	4	26.95	12.49%
e-commerce	3	13.38	6.20%
TravelTech	5	10.63	4.92%
FinTech	2	10.17	4.71%
Agrotechnology	3	8.55	3.96%
Health Technology	6	7.47	3.46%
Software	4	4.92	2.28%
Transportation	5	4.33	2.01%
Software as a Service	4	4.06	1.88%
Big Data	3	3.64	1.69%
Business Services	2	3.5	1.62%
EdTech	4	3.27	1.52%
Real Estate	1	2.96	1.37%
Medical devices and equipment	1	2.64	1.22%
SmartCities	1	1.64	0.76%
Total	**74**	**215.84**	

Source: OECD (2022)

References

OECD. (2022). Financing SMEs and Entrepreneurs 2022 - An OECD Scorecard. Financing SMEs and Entrepreneurs 2022: An OECD Scoreboard | en | OECD

2.2 Types & Categories

2.2.1 Banks, Funds, Business Angels, Crowd funding, other

Forms of Financing

An enterprise is asked to choose its financing method(s) in order to ensure the funds necessary for its operation. These funds can be loan/ debt (or foreign) funds or equity (own) funds. The usual forms of the former are (bank) loans, bonds and private debt. The usual

forms of the latter are shares and private equity/venture capital. Their main characteristics are presented below.

I Debt

1 Bank Loans

The loan is perhaps the simplest and most well-known form of financing. What interests a company is the repayment (amortization) of the loan. There are a number of different types of loans, but the loans that are most common are those that provide for partial repayment in equal installments.

The amount of each installment is the sum of the (accumulated) interest and the arrears (part of capital). The first covers the interest that accumulates as a result of the partial repayment of the loan. The second is directed towards the gradual repayment and therefore the reduction of the capital.

The installment is calculated if the present value of the installments is set equal to the disbursed amount of the loan. That is:

$$PV = \sum_{\nu=1}^{N} X/(1+r)^{\nu} \Rightarrow X = PV/\sum_{\nu=1}^{N}(1+r)^{-\nu} \Rightarrow X = PV/\{[1-(1+r)^{-\nu}]/r\}$$

Where:

PV: The disbursed amount of the loan

N: The number of years (or periods) of repayment of the loan

r: The interest rate of the loan

The presentation is easier to understand with an example:

Example 1

You received a loan of 10,000 Euros and you are required to repay it in three annual installments. The interest rate is 10%.

(a) What should be the loan installments?

(b) Create the loan amortization table.

Answer:

(a) Using the installment calculation formula, we obtain that

$$X = PV/\{[1-(1+r)^{-\nu}]/r\} = 10.000/\{[1-(1+0{,}10)^{-3}]/0{,}10\} \Rightarrow X = 4.021{,}15$$

(b) The amortization/payback table is calculated as:

Time (A)	Principal (B)	Installment (Γ)	Interest (Δ)=(B)*r	Principal Repayment (E)=(Γ)-(Δ)	Loan balance (Z)=(B)-(E)
0					10.000

1	10.000	4.021,15	1.000	3.021,15	6.978,85
2	6.978,85	4.021,15	697,89	3.323,26	3.655,59
3	3.655,59	4.021,15	365,56	3.655,59	0

2 Bonds

2.1 Characteristics of Bonds

2.1.1 Motivation – Intuition

The development of the bond market is of particular importance for any economy since it achieves the reduction of borrowing costs for both businesses and the public sector.

A few years ago, the bond market had only plain vanilla bond issues to display, the valuation of which presented no difficulties. The rise in interest rates and their volatility in the late 1970s and early 1980s resulted in the emergence of new types of bonds such as zero-coupon bonds, floating rate notes (FRN's), or bonds with built-in call or put options.

2.1.2 What is a Bond?

A bond or bond is a loan that has one borrower and several lenders. The loan is divided into smaller parts, often referred to as securities. The borrower, called in this case the issuer, has borrowed through the securities the amount he or she wants from more than one lenders, called bondholders or investors.

The bond usually pays until maturity periodically (annually or semi-annually) only the interest, referred to as interest coupons or coupons, while at maturity it pays the amount of the loan called face value.

The bond is therefore defined by the issuer, the face value, the maturity date and the coupon.

- The issuer is the entity that received the loan by issuing the bond.
    - It can be a government – central or local, such as a state or municipality, a company, a supranational organization, etc.
- The face value is the amount of the loan that the issuer receives.
    - Usually, the minimum subdivision is expressed per security and is 100 or 1000 monetary units.
- The coupon may be fixed for the life of the bond or may be floating.
    - If it is zero, then the bond pays only the nominal value at maturity and is called zero-coupon.
- The bond usually has a specific maturity date.
    - If the bond does not expire, then it is called perpetuity.

Bonds in the past had a paper/ physical/ tangible form and the securities were anonymous. Now the majority of them have an intangible/ digital form and the titles are nominal. The coupon gets its name from the fact that when bonds were in physical/ paper form, they had

punched/ detachable coupons at the end that holders had to present to the issuer to collect the (six-monthly or annual) interest. Now the bonds are in intangible form and the investor does not need to keep them, but simply shows their possession in an investment account/investment share. Coupons are paid into a bank account.

2.1.3 Bond Indentures

Bond indenture is the legal document that contains all the details of the bond issue.

2.1.4 Classes of Bonds

Bonds (Treasury Bonds & Treasury Notes) are those securities that have a duration longer than one year. Securities with a duration equal to or less than one year are classified as Treasury Bills (TB's).

Depending on the issuer, the bonds are divided into

(a) Government bonds

(b) Corporate bonds and

(c) Bonds of Supranational Organizations (supranational(s) such as World Bank, E.I.B, E.B.R.D.).

Usually, the issuer of the bond with a very good name does not give the buyers of the bond any additional security (premium).

The first unsecured issues are called debentures while the ones that follow are called subordinated debentures.

In some cases, the payment of the coupon or the principal is linked to the course of an investment or is covered by a pledge. Some examples are:

1. Revenue Bonds: Interest and principal are paid from revenue that comes from an investment that has been financed by the issuance of the bond.

2. Mortgages: The money from the issue is used for the purchase of land and buildings which also serve as collateral.

3. Income Bonds: The coupon is paid only if there have been profits from the investment of the capital of the issue.

Depending on the way the coupon is defined and paid, the bonds are divided into:

1. Annuities (Fixed Rate Bonds): They have a fixed coupon that is paid at regular intervals, usually every year or six months.

2. Zero Coupon (Zero Coupon Bonds): Interest is paid on the maturity date of the bond.

3. Floating Rate Notes – FRN's (Floating Rate Notes): The coupon changes every period according to the terms of issue.

2.2. Fixed Income Markets

2.2.1 Motivation – Intuition

But where can an investor find a bond and what is the process of making it available to the investment public?

In this subsection we present the bond markets, which are distinguished according to the time until the maturity of the bonds as well as the process of making them available to the general investment public.

2.2.2 Fixed Income Markets

Markets are divided into 2 categories based on the assets traded in them:

Money Market

Fixed income assets with a maturity of less than one year are traded here. It could also be considered a subcategory of the fixed income market.

The issues traded into this market are:

- short-term
- accessible to private investors
- highly liquid
- with great marketability

This includes:

- Treasury Bills
- Certificates of Deposit
- Commercial Paper
- Banker's Acceptances
- Eurodollars
- Repos and Reverses

Fixed Income Capital Market

It is also known as the Bond Market. Fixed income assets with a maturity of more than one year are traded here.

The issues traded into this market are:

- of longer duration
- not always accessible to private investors
- sometimes with limited liquidity
- sometimes with limited marketability

This includes:

- Treasury Notes and Bonds (Treasury Notes and Bonds)
- Federal Agency Debt
- Municipal Bonds
- Corporate Bonds
- Mortgages and Mortgage-Backed Securities

2.2.3 Primary and Secondary Market

Primary Market is the market in which new issues of securities (bonds, shares, etc.) are made available by investment banks to the investment public. It concerns the initial distribution of the securities, which in the case of the State could also be done directly, i.e., without the intermediation of an investment bank.

There are two types of primary issues (mainly found in stocks):

(a) Initial Public Offerings (IPO's), where securities are made available to the investment public for the first time

(b) Seasoned New Issues, where securities that have already been issued are reissued.

Another distinction of primary issues concerns the recipients of the issues and also has two types:

(a) Public Offering, during which the securities are made available to the general investment public and concerns a large-sized issue. It is addressed to a large number of investors. It is then traded on the secondary market. Possible approval by the Securities and Exchange Commission (SEC/USA) is required.

(b) Private Placement, during which the securities are made available to a few, as a rule, institutional investors. It usually concerns a small-sized issue and is not addressed to the general investment public. It is usually not held until maturity. It is not very liquid and marketable, but it has a higher yield and possibly a higher risk.

The steps for a public offering are:

1. The new securities are available through underwriting investment banks.

2. Investment banks usually form underwriting syndicates for the distribution of the new bonds.

3. Some of the banks are put in charge (leads/ lead banks).

4. It is a common tactic for relatively large releases as it ensures access to a larger number of potential investors.

5. Banks advise issuers on what terms they should try to sell their securities.

A preliminary prospectus is drawn up and describes the terms of the issue and the issuer's prospects. It is submitted for approval to the Capital Market Commission. Finally, after the relevant approvals and adjustments, the prospectus is drawn up. The offering price of the securities to the investment public is announced.

There are two methods of underwriting securities:

(a) The firm commitment agreement, in which the underwriting investment banks buy the securities from the issuer and undertake to sell them to the public. The sale of the securities by the issuer to the underwriters is done at a lower price than they are available to the public (spread). Underwriters assume the risk that the entire issue will not be sold.

(b) The best effort agreement, in which the underwriting investment banks agree to help the issuer sell its securities to the public. Underwriters don't buy their securities. But they act as intermediaries. They do not have the risk of their securities being left unsold.

The publishers choose the underwriters:

(a) Either by negotiations

(b) Either by competitive bidding.

In the first case, a negotiation takes place regarding the spread and possibly as a fee the contractor will receive some of the issuer's securities. In the second, prospective underwriters are invited to submit underwriting offers.

The secondary market is the market in which the purchases and sales of securities that have already been issued take place. Its operation is very important since it allows investors to trade securities quickly, without affecting the price of the securities as much, due to the liquidity it offers.

The following fall under the secondary markets:

(a) The organized stock exchanges

(b) Over-The-Counter markets

(c) The direct negotiation between two counterparties

The first category usually concerns stocks and corporate bonds. The second category is very common in the US for both stocks and bonds. In the OTC market traders (and specialist traders) quote prices to buy or sell securities and hope to make the spread. OTC trading of listed securities is known as the Third Market. The last category concerns the direct trading of securities by counterparties without the intermediation of a broker. It is used by large institutions that want to avoid transaction costs. A flourishing of this market (Fourth Market) was observed after the introduction of electronic trading systems (Posit, Instinet).

2.2.4 Issuers

Common issuers (and their respective issues) are:

- The State
- Index-Linked Bonds
- Municipalities (Bonds)
- Companies (Bonds & Shares)
- Government Organizations (Bonds)
- Mortgages

2.2.5 Intermediaries

Intermediaries between issuers and investors are include:

- Investment Bankers - Primary Market
- Dealers & Brokers - Secondary Market
- Mutual funds
- Insurance companies
- Pension Funds
- Commercial Banks

2.3 Valuation and Bond Yields

2.3.1 Motivation – Intuition

What remains after the topics presented in the previous sections is to understand how bonds are valued. What should be made clear is that the approach followed leads to the determination of a fair value for the bond after it has been issued using a theoretical method. This value may differ from the market price of the bond, although unless there is a reason value and price should be the same.

The concept of value is not necessarily the same as the concept of price. Value is a quantity assigned to an asset by a theoretical method. Price is the amount for which an asset can be sold (or bought) in the market.

2.3.2 Valuation of Bonds

Bonds may be bought and sold or traded in organized or over-the-counter markets (as seen above). This means that an investor can buy or sell them from the time of issue to the time of maturity as long as there is a counterparty willing to sell or buy them respectively. This creates the need to calculate the price at which the purchase and the sale takes place. This price is nothing more than the present value of the cash flows paid by the bond, i.e., the coupons and the face value:

$$\mathrm{P}_0 = PV = \frac{c}{1+r} + \frac{c}{(1+r)^2} + \cdots + \frac{c+FV}{(1+r)^N}$$

Where

r the interest rate corresponding to an investment of the same level of risk as the bond

c the coupon (e.g., annual)

N the maturity of the bond (e.g., in years)

FV the face value of the bond

PV the present value of the payments the bond makes

P_0 The price of the bond

Example 2

Consider a bond with an 8% coupon, 30 years to maturity with a nominal value of 1,000 Euro. The bond pays a coupon semi-annually, so it will make 60 coupon payments, of €40 each. If the interest rate was 8% per annum or 4% semiannually then the bond value/ price would equal

$$B = \sum_{t=1}^{60} \frac{40}{(1+0.04)^t} + \frac{1000}{(1+0.04)^{60}} = 1{,}000$$

In this case the coupon was equal to the yield to maturity.

If the interest rate is not equal to the coupon, then if e.g., the interest rate was 10% or 5% for each semester, the price of the bond would become

$$B = \sum_{t=1}^{60} \frac{40}{(1+0.05)^t} + \frac{1000}{(1+0.05)^{60}} = 810.71$$

If the interest rate became 6% per year or 3% for each semester, then the price would be

$$B = \sum_{t=1}^{60} \frac{40}{(1+0.03)^t} + \frac{1000}{(1+0.03)^{60}} = 1{,}276.76$$

We observe that a rise in interest rates means a fall in the price of bonds and vice versa. Bond prices are inversely related to interest rates.

As the price of the bond depends on the interest rate, this means that the price of the bond is a decreasing function of the interest rate.

This relationship is very important for calculating the yield to maturity (YTM) or the bond price depending on what is known. It also helps investment managers in the various calculations they perform for the positions they should take.

However, it is very important to note that for our bond an increase in interest rates results in a drop in price that is smaller than the increase in price that results if the interest rate is reduced by the same amount. There is therefore a convex curve that maps the relationship

between price and interest rates. So, a gradual increase in the interest rate means a gradually smaller decrease in the price of the bond. Consequently, the curve is getting flatter. These concepts will be better understood after the introduction of the concepts of duration and convexity below.

We also notice that the longer the time to maturity of the bond, the more sensitive its price is to changes in interest rates. This is explained by the fact that the longer the duration of a bond, the longer the time the investor has locked up his or her money at a specific interest rate (the coupon). As a result, the loss is greater in the event of an increase in interest rates.

2.3.3 Relation of price to the face value

As may have become apparent from the above example, the relationship between the price and the face value of the bond, depending on the level of the interest rate, is as follows:

• If c = r, then B = FV.

• If c > r, then B > FV.

• If c < r, then B < FV.

In the above:

• r is the discount rate and corresponds to an investment of the same level of risk. It is given by the relationship

$$r = rf + spread.$$

• c is the coupon of the bond.

• B is the price of the bond.

• FV is the face value of the bond.

The above relationships are interpreted as follows:

- That the bond price equals the face value when the interest rate equals the coupon was seen above and is perhaps easy to understand. If the bond offers the same coupon as the alternative investment of the same level of risk, then its price will be equal to its face value, that is, the amount that the investor lends to the issuer.
- If the interest rate is less than the coupon, then since the price is a decreasing function of the interest rate it should be higher than the face value. This may intuitively be understood by the fact that since the coupon is higher than the return on the alternative investment of the same level of risk, then investors will want to invest in the bond so its price will be higher than the face value.
- If the interest rate is greater than the coupon, then since the price is a decreasing function of the interest rate it should be lower than the face value. This may intuitively be understood by the fact that since the coupon is lower than the yield of

the alternative investment of the same level of risk, then investors will want to invest in the alternative investment; hence, its price will be lower than the face value, so that it is attractive.

2.3.4 Purchase price and selling price

So far, we have not taken into account any transaction costs. In fact, when we buy and sell bonds in the secondary market, we do so at slightly different prices. The purchase/ bid price is the price at which the dealer is willing to buy the bond from us. The selling price (ask price or offer price) is the price at which the intermediary (dealer) sells the bond to us.

The ask price is always higher than the bid price and the difference between the two is called the bid – ask spread or bid – offer spread. This is essentially the intermediary's fee. This is a type of transaction cost.

The bid-ask spread or bid-offer spread is generally smaller in bonds with high liquidity compared to bonds that have low liquidity.

When looking at the price of a bond in an electronic trading system, we observe two prices, the price we buy (the highest) and the price we sell (the lowest).

Example 3

In the previous example we saw that the price of the bond was 810.71 Euros. If we were to take into account the discussion above, then we would see a bid price of 810.56 Euros and an ask price of 810.86 Euros. This means that the broker is willing to buy from us at 810.56 Euros and sell us at 810.86 Euros the same bond. The difference is 0.30 Euro and is the bid-ask spread.

2.3.5 Quotes – Reference Prices

The price of the bond that one may see in the press or in any trading system, often referred to as quoted price, is not the cash price one would pay to buy it or receive to sell it. This price is also known as clean price.

The cash price includes the part of the coupon that has accrued since the issued, also referred to as accrued interest. This price is also known as dirty price.

This means that:

cash price=quoted price+accrued interest since last coupon date.

Example 4

Let's say it's 5/3/2019 today and the bond we're interested in has an 11% coupon with semiannual payments. The market price of the bond is 95.50.

Assume that the accrued interest is calculated on an actual/actual basis, and the previous coupon payment date is 5/1/2019. In other words, 54 days have passed.

We therefore get that:

$$cash\ price=95.50+(54/181)*5.50=97.14$$

If the minimum amount were 1,000 Euros, then the corresponding cash price would be 971.4 Euros.

2.4 Bond Yields

2.4.1 Motivation - Intuition

But what the investor really cares about is the yield he or she achieves from the investment in the bond. There are several ways to measure bond yields. We need measures that give both the current yield and the increase or decrease in the price of the bond over its life. The main measures are presented below.

2.4.2 Yield to Maturity (YTM)

It measures the total return (interest plus capital gains or losses) of the investment. In other words, it is the actual return for the investor (from the time of purchase) under the assumptions that:

(a) the bond shall be held to maturity and

(b) all coupons will be reinvested at the same rate of return, i.e., YTM.

It is practically the internal rate of return or IRR of the bond investment. To calculate the YTM we solve the equation that gives us the price of the bond in terms of YTM.

Example 5

Let us consider a bond with a six-month coupon of 8%, with a duration of 30 years and a selling price of 1,276.76 Euros. The equation we need to solve is:

$$1{,}276.76 = \sum_{t=1}^{60} \frac{40}{(1+y/2)^t} + \frac{1{,}000}{(1+y/2)^{60}}$$

The solution gives y/2 = 3% per semester. But the annual yield to maturity is y = YTM = 2 x 3% = 6%.

The YTM is essentially the discount rate, unless there is some reason for which the price of the bond differs from the value we calculated.

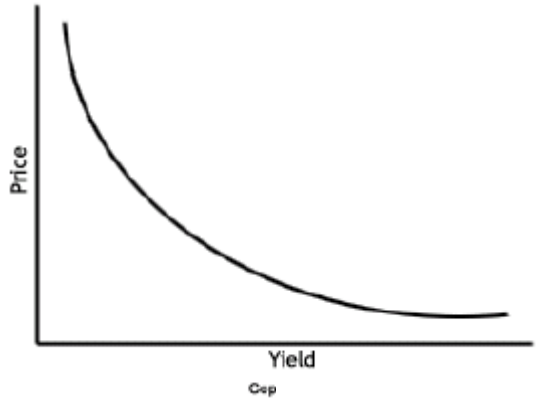
Consequently, if P denotes the price of the bond in the market, and B the price (value) of the bond we calculated, then we find the following:

- If P = B, then y = r.
- If P > B, then y < r.
- If P < B, then y > r.

In the previous y denotes the yield to maturity and r the interest rate.

We notice that the price of the bond is inversely related to the YTM.

Figure 1. Relationship between bond price and yield to maturity



Source: Investopedia (2003)

As a result, when we observe the price of a bond in an electronic trading system, we can see two prices, the price we buy (the highest) and the price we sell (the lowest). Next to them we also see two YTMs, one corresponding to the bid price and one corresponding to the ask price. The former is obviously higher than the latter.

2.4.2 Effective Yield (EY)

The effective (annual) yield of a bond essentially takes into account the effect of compounding.

Example 6

In the previous example the effective annual yield gives the compounded interest rate. It is calculated as

$$(1+r)^2 - 1 = (1.03)^2 - 1 = 1.0609 - 1 = 6.09\%$$

2.4.3 Current Yield (CY)

It measures only the portion of the yield that is associated with the coupon payments. Any capital gains or losses are not accounted for.

Current Yield = Annual Coupon/ Bond Clean Price.

It should be noted that for bonds traded at a discount the YTM is always greater than the Current Yield. Similarly for bonds that trade at a premium the YTM is always less than the Current Yield.

Example 7

If the coupon of a 30-year bond is 8% and its price is 1,276.76 Euros, then

CY=80/1276.76=0.627=6.27%

2.4.4 Realized compound yield (RCY)

It measures the real yield for bonds that pay a coupon more than once a year. For a bond with a six-monthly coupon this yield is measured as follows:

$$RCY = [1 + (R/n)]^n - 1.$$

Where:

- R = yield to maturity
- n = the number of times a coupon is paid over time.

2.4.5 Simple Yield to Maturity (SY)

It is also known as Japanese Yield. It takes into account both the Current Yield and any capital gains or losses. It is calculated as follows:

$$SY = \frac{CPN + \frac{Par - Clean\ Price}{N}}{Clean\ Price}$$

N measures the remaining life of the bond in years. It is calculated by dividing the total number of days until the bond maturity by 365.

2.4.6 Yield to Call

The YTM is calculated on the condition that the bond will be held to maturity. But if the bond is callable, then it can be withdrawn before its maturity date by the issuer. These are essentially bonds that have an integrated call option in which the issuer has a long position (buy position).

In these bonds the issuer has the option to repurchase the bond, at a specific price, on a specific date before the maturity date. Exercised by the issuer if interest rates fall and the coupon is substantially higher. There is usually a protection period during which the call option (deferred callable bonds) is not exercised.

In this case, in addition to the yield to maturity, the yield to call is also of interest. It is calculated like YTM but time to call replaces time to expiration and the price at which the call is made replaces par value.

Example 8

Let as consider a bond with a six-month coupon of 8%, with a duration of 30 years and a selling price of 1,150 Euros. It is callable in 10 years with a price of 1,100 Euros. The yield to call is calculated at 6.64% while the yield to maturity at 6.82%.

	Yield to Call	**Yield to Maturity**
Coupon	40	40
Number of Payments	20 periods	60 periods
Final Payment	1,100	1,000
Price	1,150	1,150

Most callable bonds are issued with an initial protection period. They cannot be called during this time.

Deep discount bonds are indirectly protected. Even if interest rates fall enough, their price will be below the call price.

Bonds at a premium, sold near call prices are likely to be called if interest rates fall further.

2.4.7 Treasury Bills (T-Bills)

On the date of issue, the price of Treasury Bills is determined based on the assumption that the month has 30 days and the year has 360 days. Thus, we have:

$$P_0 = \frac{Parvalue}{(1 + y\frac{D}{Basis})}$$

Where:

- P_0 the current price.
- Par Value the face value.
- y the yield to maturity or the issue rate.
- D the number of contractual days, i.e., 90, 180, 360 days for 3-, 6-, 12- month T-Bills.
- Basis the contractual number of days for a period of 12 months (360).

Solving this relationship in terms of y we find the yield-to-maturity of the T-Bill.

2.4.8 Zero-Coupon Bonds

The price of a zero-coupon bond is calculated as follows:

$$P_0 = Par/(1+y)^N$$

Solving this relationship in terms of y we find the zero-coupon bond yield.

Example 9

Suppose we want to know the interest rate at which by investing 450 Euros today we will get 1000 Euros in 7.5 years. Solving the above equation, we have:

$$450 = 1000/(1+y)^{7.5}$$

So

$$y= 11.23\%.$$

2.4.9 Floating Rate Bonds

A floating rate bond does not have a fixed coupon. Its coupon resets on the annual anniversary. In this case the future coupons are not known and it is not possible to determine the price based on the above formulas.

Assuming that the dividends are paid once a year we have:

$$P_0 = (C_1+FV)/(1+y)^1.$$

The numerator is the 1st year cash flow, i.e., the coupon and the bond face value. This is because at the moment the coupon is paid, the bond is instantly worth as much as its face value after the coupon resets to be determined anew.

However, while the equation is similar to fixed rate bond pricing, it is not. This is because a fixed rate bond provides a constant stream of coupons based on a discount rate, which is not the case with floating rate bonds.

2.5 Bond Price Changes

2.5.1 Motivation – Intuition

The price of bonds changes over time. This is because the interest rate may change, but also because the time to maturity is reduced.

We will study the change in the price of the bond in relation to the change in interest rates in the next section.

How does the price of bonds change over time?

We consider two cases:

(a) Coupon to be below market rates.

(b) Coupon to be above market rates.

2.5.2 Change in the price of the bond over time

Understanding the change in bond price over time is best achieved with an example.

Example 10

Let us consider a bond that was issued some years ago and with an interest rate of 7% at the time. The coupon then was set at 7% and was annual. Its price was 1,000 Euros.

Let's say there are 3 years left until the bond matures and the interest rate has risen to 8%. The price of the bond is calculated as:

$$B = \sum_{t=1}^{3} \frac{70}{(1+0.08)^t} + \frac{1000}{(1+0.08)^3} = 974.23 < 1000$$

After one year, with the same interest rate, its value becomes:

$$B = \sum_{t=1}^{2} \frac{70}{(1+0.08)^t} + \frac{1000}{(1+0.08)^2} = 982.17 < 1000$$

This gives a capital gain of 7.94 per year and a total revenue including coupon of 77.94. Therefore, the overall performance is

77.94/974.23=8%.

The price of the bond, however, should approach 1,000 as it approaches maturity.

2.5.3 Zero-Coupon Bonds

Bonds without a coupon but issued below par are called zero-coupon bonds. They don't give a coupon but give all the interest as appreciation.

Example 11

Let us consider a zero-coupon bond with 30 years to maturity. Let the market interest rate be 10%. The price of the bond today is:

$$1000 / (1.10)^{30} = 57.31$$

After one year it is:

$$1000 / (1.10)^{29} = 63.04$$

We notice that the increase is of the order of 10%.

2.6 Holding Period Return

2.6.1 Motivation - Intuition

Investors do not necessarily hold bonds to maturity. They may keep them for a shorter period of time. This results in their yield possibly being different from the yield to maturity YTM.

But what we saw above is that if the interest rate remains constant, then the yield on the bond for one year is the same as the yield to maturity, that is the discount rate. We will find that this is true for all years.

2.6.2 Holding Period Return (HPR)

Let us consider a bond that matures in N years, pays an annual coupon c and has a yield to maturity y = r. We observe that its value at time 0 is:

$$P_0 = \frac{c}{1+r} + \frac{c}{(1+r)^2} + \frac{c}{(1+r)^3} + \cdots \frac{c+FV}{(1+r)^N} .$$

Its value at time 1 is:

$$P_1 = \frac{c}{1+r} + \frac{c}{(1+r)^2} + \cdots \frac{c+FV}{(1+r)^{N-1}} .$$

Its value at time 2 is:

$$P_2 = \frac{c}{1+r} + \cdots \frac{c+FV}{(1+r)^{N-2}} .$$

Its value at time k (where k = 0, 1, 2, … N) is:

$$P_k = \frac{c}{1+r} + \cdots \frac{c+FV}{(1+r)^{N-k}} .$$

Its return if the investor holds it for 1 year is:

$$HPR_1 = \frac{P_1 + c - P_0}{P_0} ,$$

since the investor has also collected the one-year coupon. HPR stands for holding period return. The index indicates the years of holding to the bond.

But we notice that

$$P_1 + c = c + \frac{c}{1+r} + \frac{c}{(1+r)^2} + \cdots \frac{c+FV}{(1+r)^{N-1}} = P_0 \cdot (1+r) .$$

So, we get that:

$$HPR_1 = \frac{P_1 + c - P_0}{P_0} = \frac{P_0 \cdot (1+r) - P_0}{P_0} = r = (1+r) - 1 \ .$$

That is, the bond's return for a holding period of 1 year is exactly the bond's YTM.

If the investor holds the bond for two years, then

$$HPR_2 = \frac{P_2 + c + c \cdot (1+r) - P_0}{P_0} \ ,$$

since the investor has also collected the two-year coupon. The coupon of the first year is reinvested for 1 year. We consider the reinvestment rate to be the constant discount rate. This is a strong assumption, which we may remove.

We find that:

$$P_2 + c + c \cdot (1+r) = c \cdot (1+r) + c + \frac{c}{1+r} + \frac{c}{(1+r)^2} + \cdots \frac{c + FV}{(1+r)^{N-1}} = P_0 \cdot (1+r)^2$$

So, we get that:

$$HPR_2 = \frac{P_2 + c + c \cdot (1+r) - P_0}{P_0} = \frac{P_0 \cdot (1+r)^2 - P_0}{P_0} = (1+r)^2 - 1 .$$

That is, the bond's annualized return for a holding period of 2 years is exactly the bond's YTM, since

$$(1+r)^2 - 1$$

is the return on the investment of 1 Euro for 2 years with annual compounding.

If the investor holds the bond for k years, then,

$$HPR_{\mathrm{k}} = \frac{P_k + c + c \cdot (1+r) + \cdots c \cdot (1+r)^{k-1} - P_0}{P_0}$$

since the investor has also collected the k-year coupon. The coupon of the first year is reinvested for k-1 years, the coupon of the second year is reinvested for k-2 years, of the k-1 year for 1 year, while the last one is not invested. We assume that the reinvestment rate is the constant discount rate, which as we said is a strong assumption, which we may remove.

We find that:

$$P_k + c + c\cdot(1+r) + \cdots c\cdot(1+r)^{k-1} = c\cdot(1+r)^{k-1} + \cdots c + \frac{c}{1+r} + \cdots \frac{c+FV}{(1+r)^{N-1}} = P_0\cdot(1+r)^k$$

So, we get that:

$$HPR_k = \frac{P_k + c + c\cdot(1+r) + \cdots c\cdot(1+r)^{k-1} - P_0}{P_0} = \frac{P_0\cdot(1+r)^k - P_0}{P_0} = (1+r)^k - 1\ .$$

That is, the bond's annualized return for a holding period of k years is exactly the bond's YTM, since

$$(1+r)^k - 1$$

is the return on investment of 1 Euro for k years with annual compounding.

II Stocks

1 What is a stock?

Stocks are securities that represent the equal shares into which the equity/ stock capital of a company is divided. Stocks can be common or preferred.

2 Stock Valuation

By the same logic that the price of a bond equals the present value of its cash flows, the theoretically fair (or intrinsic) price or economic value or simply price of a stock will equal the present value of its dividends, since it gives its owner every time dividend from the profits of the business. In the case of the stock, however, the dividends are not known in advance. The investor who buys the stock has an expectation for these dividends.

It is clear that an investor would like to have a method for calculating the value of a stock as in the case of bonds. As we look for a value, we recall that this is not necessarily equal to the trading price of the stock, but rather reflects a "fair price". It is therefore a "theoretical" quantity that we seek to calculate with some method.

If we proceed in a way similar to how we calculated the value of a bond, we notice that we should find what future income an investor can expect from a stock. These are best expressed through dividends. Since typically stocks do not have an expiration date, we understand that the value of the stock should be given by an equation of the form:

$$V_0 = \sum_{i=1}^{\infty} \frac{D_i}{(1+r)^i},$$

Where:

D_i is the expected dividend of year i.

r is the interest rate corresponding to an investment of the same level of risk as the share

V_0 is the value of the stock.

This stock valuation model is called the dividend discount model (DDM).

The above equation is clear, but unfortunately it does not give us a way to predict future dividends. A fairly popular variant is the one that assumes that:

$$D_{i+1} = (1+g)D_i$$

for g constant. That is, it assumes a constant growth rate of the dividend and is called constant-growth DDM. Our equation then becomes:

$$V_0 = \sum_{i=1}^{\infty} \frac{D_1(1+g)^{i-1}}{(1+r)^i} = D_1 \sum_{i=1}^{\infty} \frac{(1+g)^{i-1}}{(1+r)^i}.$$

If g<r, then:

$$V_0 = \frac{D_1}{r-g} = \frac{(1+g)D_0}{r-g},$$

which is known as Gordon's formula.

If the dividend growth rate is zero, then we refer to this as the constant dividend or zero growth model and the above equation becomes:

$$V_0 = \frac{D}{r},$$

where D is the fixed dividend.

In the case where the dividend growth rate g is not constant, but there is an (estimated) growth rate g_1 until year t_1 and another dividend growth rate g_2 from t_1 onwards in perpetuity, we can apply Gordon's formula sequentially, but where we should find the present value today (at t) of the stock price for the dividends from t_1 onwards. The equation for $t_1=\mu$ becomes:

$$V_0 = \sum_{\nu=1}^{\mu} \frac{D_0 \times (1+g_1)^{\nu}}{(1+r)^{\nu}} + \frac{1}{(1+r)^{\mu}} \times \frac{D_{\mu}(1+g_2)}{(r-g_2)}$$

Example 1

Let us consider a company that pays a fixed dividend on its preferred shares equal to €3, while the required return for this share is 8%. We wish o calculate the theoretically correct share price.

Answer

D=€3 and since the growth rate of the dividend is zero (constant dividend) then, according to the zero-growth model:

$$V_0 = \frac{D}{r} = \frac{3}{0{,}08} = 37{,}5.$$

Example 2

This year company Ω pays a dividend of €0.8 per share. If the dividend is expected to grow at a rate of 4% per year and investors' required return is 10%, what should the theoretically correct stock price be today?

Answer

According to Gordon's model for a constant dividend growth rate we will have:

$$V_0 = \frac{D_0 \cdot (1+g)}{r - g} = \frac{0{,}8 \cdot (1+0{,}04)}{1 - 0{,}04} = 13{,}86 .$$

Example 3

Suppose that the current dividend per share of company Z is €1.2 and is expected to grow at a rate of 10% for the next 3 years, after which its long-term growth rate is expected to fall to 4%. Calculate the value of the stock today if the required return on the stock is 15%.

Answer

The value of the stock today is equal to the present value of the dividends of the next 3 years and the present value of the stock price after 3 years. Therefore, we will apply the equation:

$$V_0 = \sum_{\nu=1}^{\mu} \frac{D_0 \times (1+g_1)^{\nu}}{(1+r)^{\nu}} + \frac{1}{(1+r)^{\mu}} \times \frac{D_{\mu}(1+g_2)}{(r-g_2)}$$

where g_1 = 10%, μ = 3, g_2 = 4% and $D_3 = DX(1+g_1)^3 = 1.2X(1+0.1)_3 = 1.597$

So:

$$V_0 = \frac{1{,}2 \times (1+0{,}1)}{(1+0{,}15)} + \frac{1{,}2 \times (1+0{,}1)^2}{(1+0{,}15)^2} + \frac{1{,}2 \times (1+0{,}1)^3}{(1+0{,}15)^3} \frac{1}{(1+0{,}15)^3} \times \frac{1{,}597 \times (1+0{,}04)}{(0{,}15-0{,}04)}$$

There are other stock valuation methods as well as stock selection criteria based on both fundamental and technical characteristics. We will not deal with these methods here.

III Private Debt

1 Overview of private debt

1.1 Definition

Private debt or private debt or private placement of debt or private lending has recently been considered only as an asset class and the term covers a number of different forms and investment strategies. The term private debt is usually applied to debt investments that are not financed by banks and are not issued or traded on an open market, while the word private refers to the investment instrument itself and not necessarily to the borrower - i.e., listed - public companies can borrow through private debt, just as private – unlisted companies can. Private debt falls into a broader category called alternative debt or alternative credit and is used without distinction with terms such as direct lending, private lending and private credit.

In the private debt market, investors lend to investee entities - be they corporate groups, subsidiaries or special purpose entities created to finance specific projects or assets - in the same way that banks lend to those entities. Private debt investments are typically used to finance business growth, provide working capital or finance infrastructure or real estate development.

Note here that some investors and authors consider private debt as part of private equity. However, as it has its own special characteristics, we cover it in a separate section.

From this, however, the reader can see that its history is essentially parallel to that of private equity, as described in the corresponding subsection of private equity. Likewise, it has the advantages and disadvantages of private equity over public debt.

1.2 The position of private debt in the asset market

What is worth seeing is how private debt can be positioned in the asset market both from the point of view of investors and as a form of financing for businesses. This is shown comparatively in Figure 1.

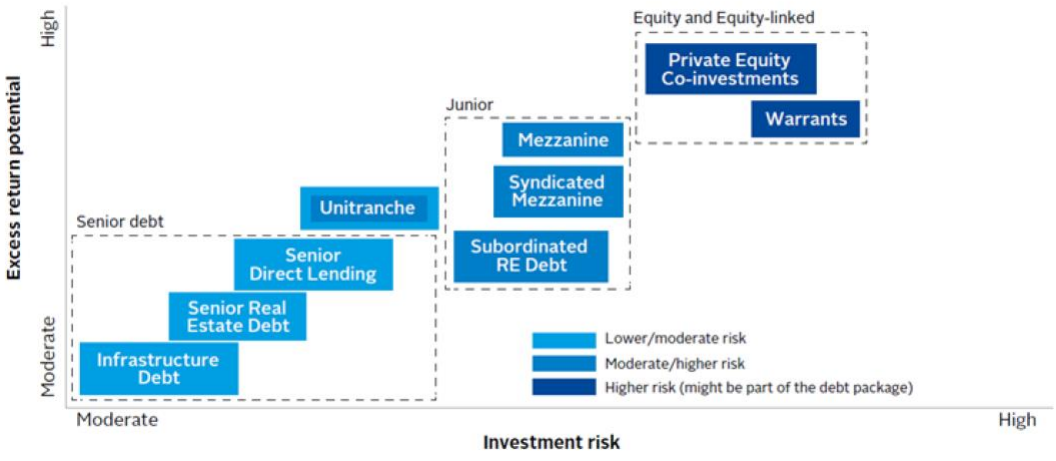
Figure 1 Comparison of private debt with other asset classes

	EQUITY		DEBT	
	PUBLIC	PRIVATE	PUBLIC	PRIVATE
Investee entity	Public company	▪ Private company ▪ Special Purpose Vehicle (SPV)	▪ Government-related entity ▪ Public company ▪ Private company ▪ SPV	▪ Public company ▪ Private company ▪ SPV
Investor/investee relationship	Legal owner (partial)	Legal owner (full or partial)	Lender (contractual relationship only)	Lender (contractual relationship only)
Returns profile	Investor potentially participates in both upside and downside	Investor potentially participates in both upside and downside	Investor participates in downside only	Investor participates in downside only
Investment holding period	Potentially unlimited	Potentially unlimited (typically seven-15 years for Private Equity funds)	Limited by bond tenor	Limited by terms of loan (illiquidity typically requires hold-to-maturity approach)
Liquidity	Most liquid	Somewhat liquid	Most liquid	Least liquid
Investment objective	Growth (occasionally income)	Growth	Income	Income
Investor control over investee	High (via voting and engagement)	High (via engagement and board seats)	Medium to low (limited opportunities to engage)	High to low (dependent on access to management)
Investee reporting requirements	Stock exchange requirements and national legal minimum	National legal minimum	Stock exchange requirements (public companies only) and national legal minimum	National legal minimum (for private companies)

Source: PRI (2019)

Also, its comparative evaluation in terms of performance - risk is interesting. This is shown in Figure 2.

Figure 2. Risk-return profiles for various investment strategies



Source: PRI (2019) from IHS Markit (2017) The Rise of Private Debt

2 The operation of private debt

2.1 Types of private debt

Private debt includes mezzanine financing and other forms of debt financing that come mainly from institutional investors such as funds and insurance companies - but not from banks. Unlike listed corporate bonds, private securities are generally illiquid and not regularly traded on organized markets. They originate from the UK and US, where they are an established form of finance and have long been used to finance growth and acquisitions. Fund managers generally specialize in specific market segments:

2.1.1 Senior debt

Senior debt refers to secured loans used to finance acquisition transactions and growth financing. Returns come almost entirely from current interest payments.

2.1.2 Mezzanine debt

Mezzanine debt is an intermediate form between debt and equity. It is mainly used for acquisitions and growth financing and is often dependent on bank debt. Returns are made up of various components - mainly current and final interest payments, as well as options to buy shares of the acquired company, known as equity kickers.

2.1.3 Credit opportunities

Credit opportunities funds invest in a wide variety of financing structures and situations. Alongside complex refinancings of companies withdrawing from the capital markets for various reasons, the funds also specialize in secondary transactions.

2.1.4 Distressed debt

Distressed debt funds mostly buy senior secured loans in the secondary market at a discount to their face value. They focus on acquiring healthy assets in situations where businesses are experiencing financial difficulties.

2.1.5 Infrastructure debt

Debt used for infrastructure development and investment in existing assets, generally with longer-term horizons (30+ years) due to the extended useful life of the assets.

2.1.6 Real estate debt

The most common real estate debt strategy is direct lending to purchase real estate. This may include buying and selling securitized real estate loans in the secondary market. Risk profiles differ depending on the underlying assets.

2.1.7 Special situations

Debt or structured equity investments made for the purpose of acquiring control of a company - generally, one that is in financial distress. Special situations may include trading in the secondary market, or the debt of distressed companies, where the manager believes there is a price distortion.

2.1.8 Venture debt

Debt financing was extended to venture capital-backed companies. For entrepreneurs, business debt serves to extend the financing corridor without losing ownership.

2.2 Reasons for investing in private debt

The main reasons for investing in private debt are summarized as follows:

1. Attractive, stable spreads

Private debt and mezzanine debt offer attractive spreads on government bonds, corporate bonds and high yield securities.

2. Low correlation with other asset classes

Low correlation with traditional asset classes provides positive diversification.

3. Reduction of risk

Stable performance in all market cycles thanks to the combination of different credit strategies.

4. Established asset class

The asset class has highly experienced fund managers with verifiable track records and diversified investment approaches.

3. The private debt market

Private debt represents a significant portion of private markets -10% to 15% of total assets under management with most private mid-caps having at least some debt. Investor demand for debt capital is increasing. Depending on factors such as interest rates, regulations and the business cycle, investors see private debt as a less risky way to invest or diversify their assets.

The global market has grown significantly as a result of both supply and demand factors.

Supply factors

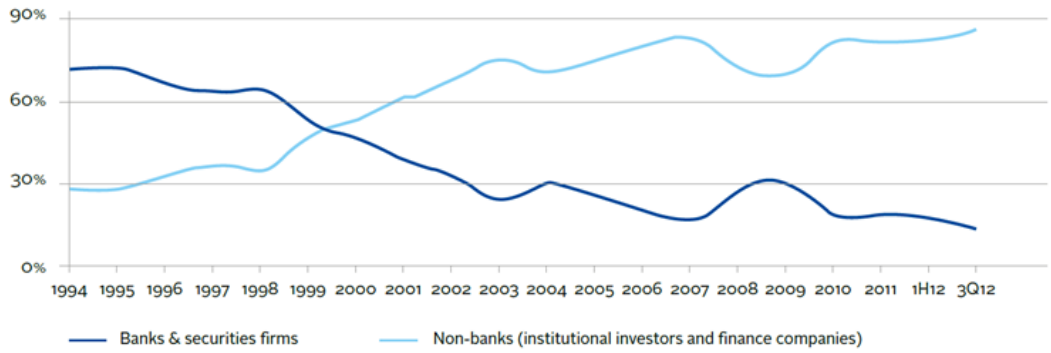
- Banks have reduced lending (especially to smaller private companies) in order to meet EU regulatory capital requirements through deleveraging, thus limiting sources of capital.

- In turn, this has made direct lending more attractive to investors, as yields can be higher than government debt and flexible terms can allow indices to be linked to indices.

Demand factors

- Investors seek to increase yield in an extremely low interest rate world.
- Investors seek diversification from traditional asset classes.
- Companies seek floating rates to protect themselves from rising interest rates.
- A recovery in the global economy has led to significant corporate demand for (re)financing loans for growth.

Figure 3 Relationship between bank and non-bank loans for leveraged loans from 1994 to 2012



Source: PRI (2019) from S&P Capital IQ LCD

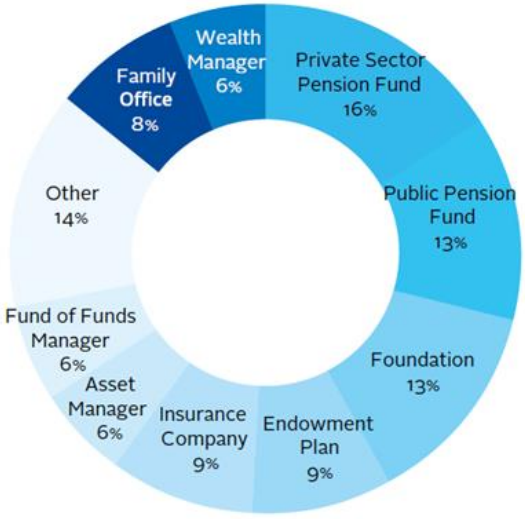
The total volume of assets under management by institutional investors allocated to private debt is estimated at approximately $638 billion worldwide. There are two dominant private debt markets worldwide, the US and Europe. The US market is larger and more mature than the EU market (which consists mainly of British and French publishers).

About $107 billion of new capital was raised in private debt in 2017 globally, of which $67 billion was raised from US funds, $33 billion from European funds and $6 billion from Asian funds. Elsewhere - especially in Germany and the Nordic countries - banks still dominate the lending market for historical and/or regulatory reasons.

Figure 4 Growth in private equity assets under management by asset class from 2007 to 2017

Source: PRI (2019) from Preqin (2018) 2018 Preqin Global Private Debt Report

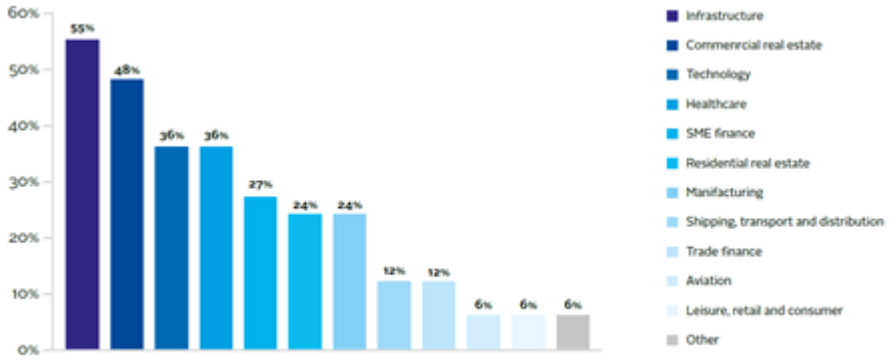
Figure 5 Analysis of investors participating in the private debt market



Source: PRI (2019) from Preqin Private Debt Spotlight March 2018

The most active investors in the private debt market are pension funds, foundations, endowments and insurance companies (Figure 5). Sectors likely to attract the largest placements from investors over the next 12-24 months (based on Q4 2017) are real assets such as infrastructure and commercial real estate, followed by companies financed by private equity (Figure 6).

Figure 6 Expectations of private debt funds for sectors that will attract their highest levels of investment



Source: PRI (2019) from Intertrust (2018) Changing Tides: Global Private Debt Market in 2018

4 Comparison of private debt with private equity

Private debt covers loan financing, which is when money is lent to a company to finance current operations or infrastructure improvement. Often the loan will be secured against an existing asset, such as real estate, but private debt funds do not seek to own companies. Private equity funds, in contrast, will usually own part or all of the company.

Private debt funds can sometimes be open-ended, while private equity funds will often be closed-ended and have a limited life. Private debt generates returns from interest on loans, while private equity funds seek to return profits by increasing the value of portfolio companies.

5 Concerns about private debt

Despite the attractiveness of private debt, there are some concerns that stem mainly from the risks that investing in it entails.

- There can be no assurance that specific performance or income targets will be met. Past performance and predictions are no guarantee of future success.
- Minority shareholders who do not participate in the management of a private debt fund have no or only limited means of influencing the fund manager.
- At the level of private debt funds, it is often permissible and common to use not insignificant levels of debt, known as leverage. Although the use of leverage can improve returns, it also increases the potential for losses.
- Market values of private debt funds may experience significant volatility due to macroeconomic factors and/or other market conditions, in particular market interest rates.

- Private debt funds are generally not regulated as investment vehicles and provide only limited protection to investors.
- Investors bear the tax and regulatory risks associated with private debt funds and the investments they make.
- If the risks arise, investors in private debt funds may suffer losses up to the total loss of their invested capital.

IV Venture Capital/ Private Equity

1. Overview of private equity

1.1 Definition

Private equity or private capital or private placement in shares or private participation is an alternative category of investment and consists of funds – investments in companies or assets that are not listed on the stock exchange.

Private equity consists of funds and investors that invest directly in private companies or that carry out acquisitions of public companies, resulting in the deletion of public holdings from the stock exchange (delisting). Institutional and retail investors provide the capital for private equity, and the capital can be used to finance new technology, make acquisitions, expand working capital, and strengthen and consolidate a balance sheet.

A private equity fund has Limited Partners (LP), who typically own 99 percent of the shares in a fund and have limited liability, and General Partners (GP), who own 1 percent of the shares and have full liability. The latter are also responsible for the execution and operation of the investment.

Note here that some investors and authors consider private debt part of private equity. However, as it has its own special characteristics, we cover it in a separate section.

1.2 Understanding private equity

Private equity investments come primarily from institutional investors and accredited investors, who can commit significant amounts over extended periods of time. In most cases, long participation periods are often required for private equity investments in order to ensure the recovery of troubled companies or to facilitate liquidity events such as an initial public offering (IPO) or a sale to a public company.

1.2.1 Advantages of private equity

Private equity offers several advantages to companies and start-ups. It is preferred by companies because it allows them to access liquidity as an alternative to conventional financial mechanisms, such as high-interest bank loans or listings on public markets.

Some forms of private equity, such as venture capital, also finance early stage ideas and companies. In the case of delisted companies, private equity can help these companies try to develop unorthodox – unconventional growth strategies away from the view and microscope of public markets. Otherwise, the pressure of quarterly earnings dramatically reduces the amount of time available to senior executives to help a company recover or experiment with new ways to cut losses or make money.

1.2.2 Disadvantages of private equity

Private equity has its own unique rules, which may make it difficult to put money into it. First, private equity holdings can be difficult to liquidate because, unlike public markets, there is no ready order book available to match buyers with sellers. A business must itself search for a buyer in order to sell its investment or company. Second, the pricing of a company's shares in private equity is determined through negotiations between buyers and sellers rather than market forces, as is usually the case with publicly traded companies. Third, the rights of private equity shareholders are generally decided on a case-by-case, negotiated basis, rather than a broad governance framework that typically dictates rights for their public market counterparts.

1.3 History of private equity

While private equity has only come into the limelight in the past three decades, the tactics used in the industry date back to the beginning of the last century. Banker tycoon JP Morgan is said to have made the first leveraged buyout of the Carnegie Steel Corporation, then among the nation's largest steel producers, for $480 million in 1901. It merged with other major steel companies of the time, such as the Federal Steel Company and the National Tube, to create United States Steel - the largest company in the world. It had a market capitalization of $1.4 billion. However, the Glass Steagall Act of 1933 put an end to such large consolidations created by banks.

Private equity firms have largely remained on the fringes of the financial ecosystem after World War II until the 1970s, when venture capital began to invest in America's technological revolution. Today's tech moguls, including Apple and Intel, received the capital they needed to grow their businesses from Silicon Valley's emerging private equity ecosystem when they were founded. During the 1970s and 1980s, private equity firms became a popular source of financing for companies struggling to raise capital from the public markets. Their offers caused publicity as well as scandals. With greater knowledge of the specifics of the industry, the amount of capital available for investment has multiplied and the size of the average private equity transaction has increased significantly.

When it took place in 1988, Kohlberg, Kravis & Roberts' (KKR) purchase of RJR Nabisco Group for $25.1 billion was the largest transaction in private equity history. It was surpassed 19 years later by the $45 billion acquisition of coal plant TXU Energy. Goldman Sachs and TPG Capital worked with KKR to raise the debt needed to buy the company during the private equity boom between 2005 and 2007. Even Warren Buffett bought $2 billion of bonds from the company. new company. The purchase turned into bankrupty seven years later, and Buffett called his investment "a big mistake."

The boom years for private equity, however, were those immediately preceding the financial crisis and coincided with the increase in their debt. According to a Harvard study, global private equity groups raised more than $2 trillion in loans, and each dollar was leveraged

with more than two dollars of debt. However, the study found that private equity-backed companies performed better than their counterparts in the public markets. This was particularly evident in companies with limited capital at their disposal and in companies whose investors had access to networks and capital that helped to increase their market share.

In the years following the financial crisis, private equity funds represented an increasing share of activity at private equity firms. These funds raise money from institutional investors, such as pension funds, to provide credit for companies that cannot tap into corporate bond markets. These funds have shorter time periods and terms compared to typical private equity funds and are among the least regulated parts of the financial services industry. Funds, which charge high interest rates, are also less affected by geopolitical concerns than the bond market. However, we cover private debt in another section.

2 The operation of private equity

Private equity firms raise money from institutional investors and accredited investors for funds that invest in different types of assets.

2.1 Strategy

When a management team invests in private equity, there are three parts to their strategy:

Buy

• An acquisition strategy has been mapped out

• Capital is accumulated for the purchase/acquisition

• A takeover deal is completed

Change

• Once the company is purchased, it is restructured or reorganized to improve profitability

• It becomes, in effect, a new company

Sale

• After the company is converted and transformed, it is marketed

• Sold at a profit

• Private equity holders share in the profits

Figure 1 Private equity strategy

Source: Blackrock (2019)

Each stage represents a part of the private equity management team's acquisition strategy. This recovery process is what differentiates private equity from other forms of investment: it undertakes corporate transformation, with the goal of profitability.

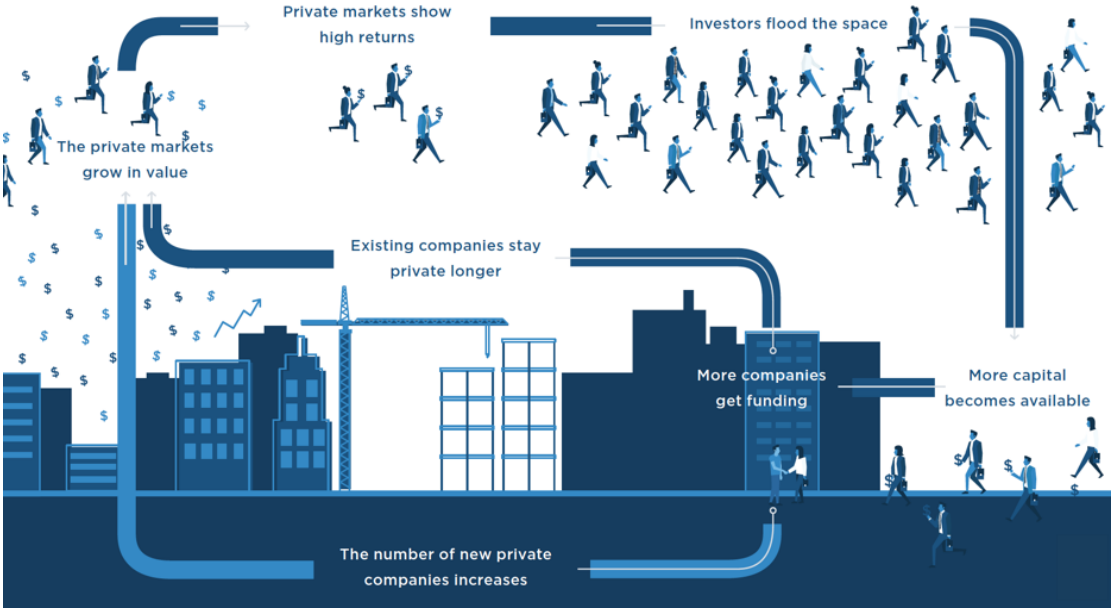
2.2 The use of private equity

Private equity generally refers to capital investments designed to bring about positive change in a company, such as:

- Developing a new business: Investing the growth capital for expansion or growth
- Business change: Restructuring or introducing innovations in the operation of a business to make it more profitable
- Financing an acquisition: Raising capital to make the purchase of another entity
- Private takeover of a public company: Converting a previously public company into a private entity (delisting it from the stock exchange) to enable it to provide the benefits that come with private status, so that if it is no longer focused on short-term (quarterly) profits, to be able to pursue long-term growth strategies that are not available to listed companies.

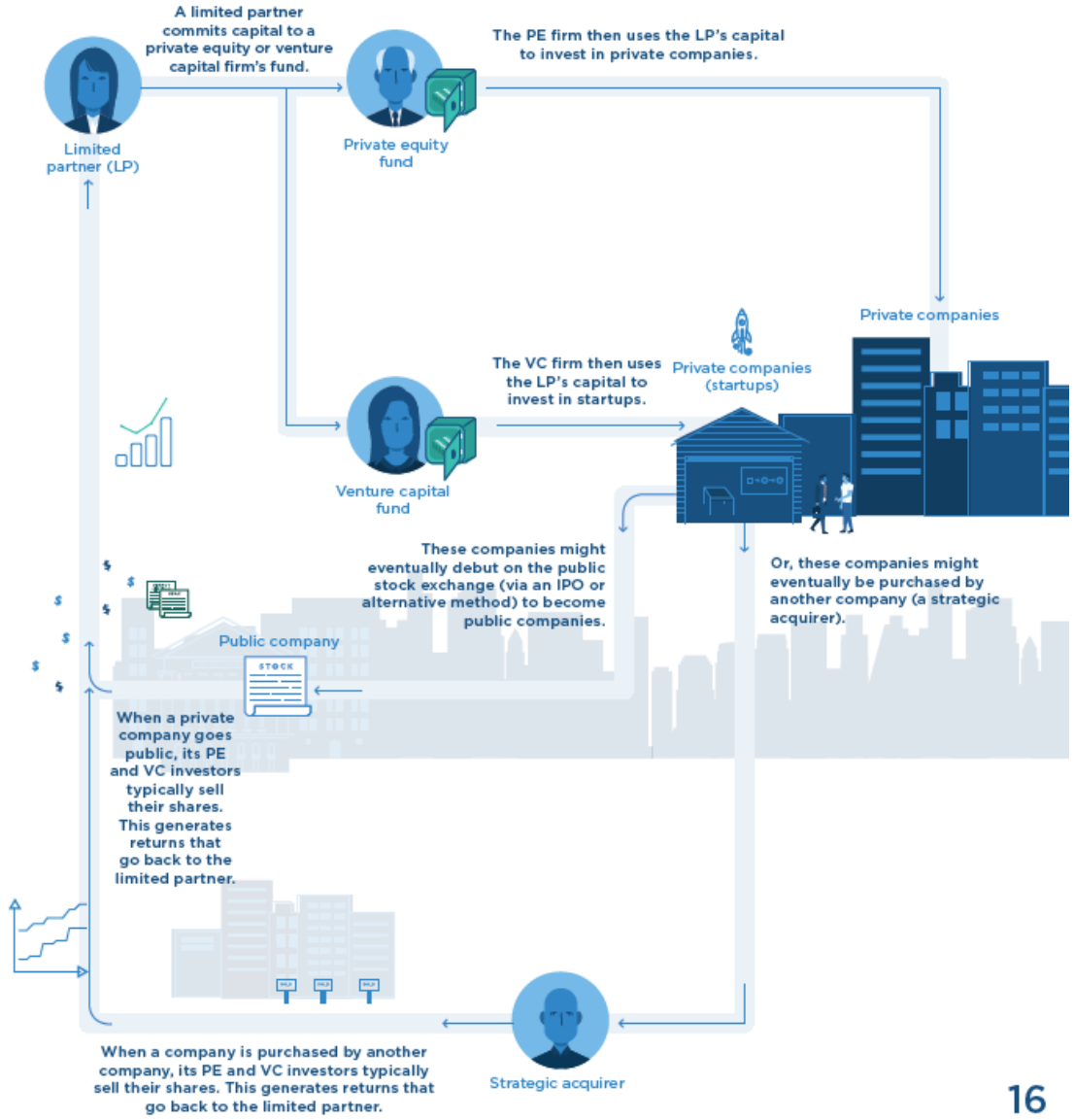
Because private equity returns are achieved through operational improvements and financial restructuring, the experience and leadership of the private equity manager is paramount.

Figure 2 Operation of private equity



Source: PitchBook (2019)

Figure 3 Private equity formation



Source: PitchBook (2019)

2.3 Types of private equity

The most popular types of private equity financing are listed below.

2.3.1 Distressed funding

Also known as vulture financing, money in this type of financing is invested in troubled companies with underperforming business units or assets.

The intention is to transform them by making the necessary changes in their management or operations or to carry out a sale of their assets at a profit. Assets in the latter case can range from physical machinery and real estate to intellectual property such as patents. Companies that have filed for bankruptcy are often candidates for this type of financing. There has been an increase in private equity funding of distressed businesses since the 2008 financial crisis.

2.3.2 Leveraged buyouts

This is the most popular form of private equity financing and requires the full acquisition of a company with the intent of improving its business and financial health and reselling it or making a profit for an interested party or an IPO. Until 2004, the sale of non-core business units of publicly traded companies constituted the largest category of leveraged buyouts for private equity.

The leveraged buyout process works as follows. A private equity firm identifies a potential target and creates a Special Purpose Vehicle (SPV) to finance the acquisition. Typically, businesses use a combination of debt and equity to finance the transaction. Debt financing can be up to 90% of total capital and is transferred to the balance sheet of the company being acquired for tax benefits. Private equity firms use a variety of strategies, from downsizing to replacing entire management teams, to transform a company.

2.3.3 Real estate private equity

There has been an increase in this type of financing after the financial crisis of 2008 and the resulting collapse in real estate prices. Typical areas where capital is used are commercial real estate and real estate investment trusts (REITs).

Real estate funds require a higher minimum capital for investment than other types of private equity financing. Investor funds are also locked up for several years in such type of financing. According to research firm Preqin, real estate private equity funds are expected to grow 50% by 2023 to reach a market size of $1.2 trillion.

2.3.4 Funds of funds

As the name suggests, this type of financing focuses mainly on investing in other funds, mainly mutual funds and hedge funds. They offer access to an investor who cannot afford the minimum capital requirements in these funds. However, critics of such funds point to the higher management fees (because they are imported from multiple funds) and the fact that unlimited diversification may not always lead to an optimal return-multiplying strategy.

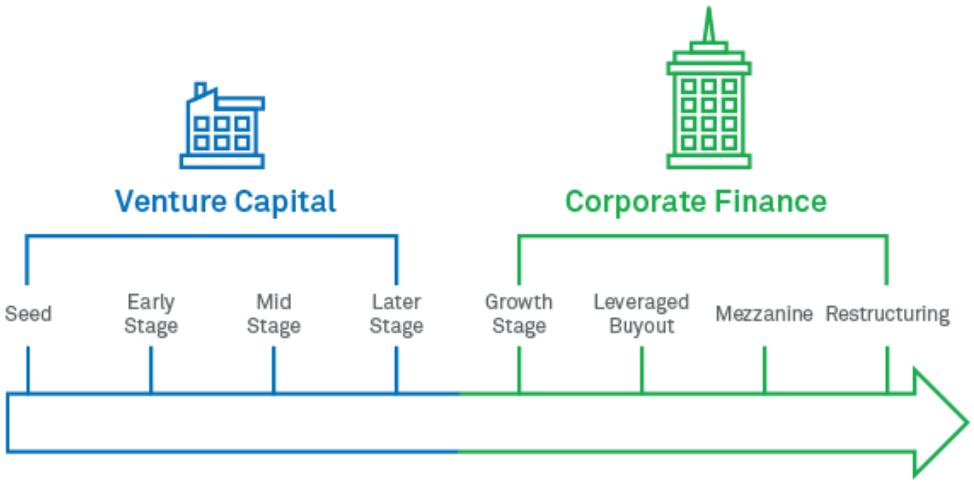
2.3.5 Venture capital

Venture capital funding is a form of private equity in which investors (also known as angels) provide capital to entrepreneurs. Depending on the stage at which it is provided, venture capital can take various forms.

Seed financing refers to capital provided by an investor to develop an idea from a prototype to a product or service. On the other hand, early-stage financing can help an entrepreneur further develop a business, while a Series A financing allows them to actively compete in a market or create a market.

Private equity investments can play an important role in the growth of a business. Their ability to progress from early-stage venture capital to mature venture funding demonstrates their flexibility, authority and appeal as an alternative investment.

Figure 4 Business financing at the various stages of its development



Source: Blackrock (2019)

3 Sources of income of private equity firms

The main source of income for private equity firms is management fees. The fee structure for private equity firms varies, but typically includes a management fee (outgoing) and a performance fee (outgoing). Some firms charge an annual management fee of 2% on assets under management and require 20% of the profits made on the sale of a company.

Positions at a private equity firm are highly sought after, and for good reason. For example, consider a business with $1 billion in assets under management (AUM). This firm, like the majority of private equity firms, is likely to have no more than twenty-twenty-five professional investors. 20% of gross profits generate millions in management fees. As a result, some of the top players in the investment industry are attracted to positions in such firms. Depending on the level, salaries for workers can range from a few hundred thousand dollars to as much as a million dollars, depending on the job and the level of the hierarchy.

4 Comparison of private and public placement

By its very nature, private equity has different characteristics that differentiate it from public equity. Private equity can take advantage of opportunities outside the organized stock markets. For example, it can extract private information. The active ownership status of private equity contrasts with the passive investors of the public markets, and private equity investments can lead to greater entrepreneurship and risk-taking in pursuit of profits.

In summary, we observe the following:

Private equity

• Uses private information to make decisions

• Investors act as operators

• Private concentration of ownership

• Multi-year strategic planning

• Ability to retain entrepreneurs and attract qualified executives through equity participation

Public equity

• Public information

• Passive investors

• Broad public ownership

• Focus on quarterly earnings

• Traditional incentive structures (options, restricted stock grant)

5 Ways to invest in private equity

There are several ways to invest in private equity. Some of the most important are:

Funds of funds

A mutual fund owns the shares of a wide selection of private partnerships that invest in private equity. It offers investors a cost-effective vehicle that lowers their initial minimum investment requirement. It can also offer diversification as it can invest in hundreds of companies covering a wide range of venture capital types and industry sectors. Since their asset allocation is so diversified with such a multitude of individual investments, a fund of funds can also represent a hedging approach.

Private equity exchange-traded funds

Exchange-traded funds (ETFs) track an index of publicly traded companies and invest in private equity - and they're easy to get hold of. Because their shares are available to buy on a stock exchange, there is no minimum investment requirement. However, ETFs may include a management fee that will not be part of a direct private equity investment as well as brokerage fees.

Public shares of private equity managers

By buying the listed shares of private equity managers - companies that manage private equity - an investor is still investing in private equity and diversifying his portfolio, because these managers invest in a whole spectrum of funds that spreads the risk. The expected return is not as high as investing directly in a mutual fund that produces significant profits.

6 Concerns around private equity

Beginning in 2015, there have been calls for more transparency in the private equity industry, primarily due to the amount of revenue, profits, and high salaries earned by employees at nearly all private equity firms. Since 2016, a limited number of states have advanced bills and regulations that allow greater access to the inner workings of private equity firms. However, there is also the reverse pressure that calls for restrictions on its access to access to information.

V Crowdfunding

1 Definition

Crowdfunding is considered as a means of alternative financing, as well as a kind of crowdsourcing by which people, can contribute money to a person, cause, event, or business venture primarily via the Internet or the social media.

This method can be used to fund

- startup businesses,
- help communities suffering from a natural disaster, and
- aid families and individuals in financial need due to a medical emergency or a death.

Crowdfunding is now a common method for connecting entrepreneurs and investors—offering an alternative to bank loans or venture capitalists—and it is now a popular way of supporting cultural institutions, such as art organizations and charities.

Billions of dollars are raised annually via this fundraising method (Britannica, 2023).

In our case the interest is in the use of crowdfunding for the financing of small business ventures via the collection/ accumulation of small amounts of capital from a large number of individuals/ investors. Its contribution is in bringing together investors and entrepreneurs in an attempt to foster mainly start-up entrepreneurship. It increases the candidate investors beyond the traditional ones: owners, relatives and venture capitalists (Investopedia, 2022).

2 The Operation of Crowdfunding

There are three components to crowdfunding (Britannica, 2023):

1. The person seeking money to help fund or pay for an idea, product, or expense.

2. Those who support the concept or business and are willing to invest or help pay for it.

3. A platform or service that brokers the financial transactions.

Crowdfunding operates via

- Social media sites such as Facebook and Twitter and direct email solicitations,
- Numerous platforms that facilitate crowdfunding, including Kickstarter, Indiegogo, GoFundMe, and Crowdfunder.

2.1 Revenues

These services generate revenue by taking a percentage of the total amount of funds collected as well as by charging a fee per pledge and credit card transaction. These fees and charges vary, but often the total cost of a crowdfunding campaign can range between 5–12 percent of the donated funds (Britannica, 2023).

2.2 Fund collection

Typically, a person or business posts a request on a digital site, and potential contributors can browse offerings and decide whether or not to participate. Those interested in a project can typically contribute as little as $5 -$10. Individuals or businesses posting a crowdsourcing request often send emails to friends, acquaintances, and customers. Many of the listings include photos, videos, and detailed descriptions about the product, service, or cause. A brief biography about the person soliciting pledges is also typically included.

Many contributors do so altruistically (for nothing in return except the satisfaction of supporting a person or a cause), though some funders may receive products or gifts in exchange for their contributions. On some crowdfunding platforms, organizations are charged a fee only if the project meets its funding goal by the stated deadline. On other crowdfunding sites, a minimum level of donations must be met before the host can receive any of the contributed funds (Britannica, 2023).

3 Types of crowdfunding

The two most traditional types of crowdfunding are

- For the funding of start-up companies looking to bring a product or service into the market.
- For the funding of individuals who experienced some type of emergency.

The latter covers two main categories of individuals:

- Individuals affected by a natural disaster, hefty medical expense, or another tragic event such as a house fire have received an amount of financial relief, they wouldn't otherwise have had access to thanks to crowdfunding platforms.
- Creative people, such as artists, writers, musicians or podcasters, so as to support their work by establishing a steadier source of income (Investopedia, 2022).

3.1 Examples of crowdfunding platforms

The most popular crowdfunding platforms are Kickstarter, Indiegogo, and GoFundMe. Their particulars are as follows (Crowdfunding, 2023):

Platform	Total Raised	Supporters	Platform Fee	Payment Fee
GoFundMe	$25B	50M	0%	2.9%+$0.30
Indiegogo	$1.5B	10M	5%	3.0%+$0.30
Kickstarter	$3B	15M	5%	3.0%+$0.20

4 Advantages and Disadvantages of Crowdfunding

4.1 Advantages

The main advantages of crowdfunding are:

- Start-up companies or individuals gain access to a larger and more diverse group of investors/supporters.
    - With the ubiquity of social media, crowdfunding platforms are an incredible way for businesses and individuals to both grow their audience and receive the funding they need.
- Entrepreneurs and start-ups can access financing beyond banks and venture capital firms.
    - They may be able to launch a project/ product faster and without the restrictions that traditional financing institutions may impose.
- It can help enhance a brand and marketing efforts by creating an extended community that might also extend to crowdsourcing ideas.
- Many crowdfunding projects are rewards-based; investors may get to participate in the launch of a new product or receive a gift for their investment.
- Equity-based crowdfunding is growing in popularity because it allows startup companies to raise money without giving up control to venture capital investors.
    - In some cases, it also offers investors the opportunity to earn an equity position in the venture.
    - In the United States, the Securities and Exchange Commission (SEC) regulates equity-based crowdfunding (Investopedia, 2022 & Britannica, 2023).

4.2 Disadvantages

The main disadvantages of crowdfunding could be:

- The possible damage to a company's reputation caused by "resorting" to crowdfunding.
- The fees associated with the crowdfunding site.
- Projects usually require a significant investment of time and resources.
- Large, complex projects can also be difficult to describe and to raise funding for.
- (On some platforms) If the funding goal is not reached, then any finance that has been pledged will be returned to the investors and the company will receive nothing (Investopedia, 2022 & Britannica, 2023).

VI Business Angels

1 Introduction

1.1 Definition

The term business angel – BA describes a high-net-worth individual who invests private capital and may offer value-adding services to unlisted start-ups and entrepreneurs with whom they have no family ties.

1.2 Purpose

The purpose of business angels is to achieve a financial return higher than their initial investment. They generally try to create an active relationship between them and their investments, but without getting involved in day-to-day business operations.

1.3 Role - Offer

There is no doubt that business angels play an extremely important role in the informal investment market for new enterprises seeking funding today, in an environment where bank lending was (and may still be) limited, but borrowing costs can also be high.

In addition to capital, angel investors provide the entrepreneur with business management experience, skills and contacts. Experienced angels also know that they may have to wait to achieve the desired return on their investment. They can therefore be a good source of "smart and patient" capital.

Business angels play an important role in the economy. In many countries, they are the second largest source of external funding for start-ups, after family and friends. Thus, they develop into increasingly important providers of venture capital and thus contribute to economic development and technological progress.

Business angels can invest individually or as part of a syndicate where usually one angel takes the lead role.

1.4 Business Angels in the European Union (EU)

The EU has tasked its members with finding means and tools to promote business angel investment. They should create incentives for individuals willing to invest in enterprises. This includes, among others, the use of public funds to co-invest with business angels.

The European Commission encourages EU countries to learn from good practice by supporting business angel investments, especially cross-border, and by working with venture capital funds. The Commission also supports good practices in investment readiness training.

Given the local and regional dimension of business angel activities, the European Commission considers that through co-investment opportunities through the European Structural and Investment Funds (ESI Funds) and through financial instruments enable

business angels to play an important role in the financing of Small and Medium Enterprises (SMEs) at this level, as long as there is their active involvement and participation.

1.5 Business Angels in the Investment Universe

Business angels (according to a study by Sørheim and Landström (2001)), are only one category of investors in the informal investment market. Investor groups can be distinguished based on the determinants of "ability" and "investment activity", creating a categorization of four different informal investor groups:

Figure 1 Categorization of informal investors

Investment Activity	Competence: Low	Competence: High
High	Group 2 Traders	Group 4 Business Angels
Low	Group 1 Lotto Investors	Group 3 Analytical Investors

Source: Created by the authors with data from Schulz & Schmücker (2017)

Business angels are categorized as the group that exhibits both high levels of investment/ management ability and entrepreneurial experience. They can thus actively support their investments but also be active in more investments at the same time and per year. They appear to be the most capable and active of the informal investors, hence their name. After all, these characteristics make them suitable financiers as well as business advisors for start-ups.

It is therefore important that the enterprises that wish to attract them understand what they are interested in when choosing/considering a business to invest in. What is easy to diagnose is that they do not have similar characteristics.

1.6 Characteristics of business angels

Business angels cannot be considered as a homogenous group behaving in similar ways and patterns – they have been shown to be very different from each other and can be distinguished in a variety of characteristics – at least in terms of their investment process, preferences and selection criteria (Mason et al., 2017). Other characteristics, such as demographic characteristics (age, gender and career path), however, seem to be rather consistent for most business angels.

1.6.1 Age and Gender

Regarding the first two characteristics, it appears that business angels are usually men with an average age of 56 years (Kelly, 2007; Månsson and Landström, 2006; Politis and Landström, 2002).

1.6.2 Professional Course

The professional development of business angels also shows similar development paths. After rising through the ranks of the companies they worked for in the first phase of their professional life and then gaining experience as entrepreneurs in the second phase of their careers, they begin their investment activity. The first two stages provide the angels with the necessary work, management and start-up experience to be able to support other ventures and invest in them in the third stage (Politis and Landström, 2002). This very experience/ previous service of theirs is fundamental in terms of the criteria applied by business angels for their first investments in other (start-up) companies.

1.6.3 Method of Investment

A consequence can also be seen in the way business angels invest. Previous research shows that angels rely on their feelings and intuition rather than a detailed analysis of data (Shane (2008), Haines et al. (2003)). This is one of their differences with venture capital firms, which have a much more objective, rigorous and sophisticated investment approach, mainly because they have the resources for detailed evaluations of the opportunities they (re)take (Parhankangas, 2007).

1.6.4 Investment Experience

When looking at the differences between business angels, a particularly important aspect is their investment experience. If they have not yet invested, but are thinking about doing so, they can be considered as beginner angels. At the other end of the spectrum, there are very experienced business angels with several dozen capital inflows into new ventures (Harrison et al., 2015; Mitteness et al., 2012). The factor of experience and its application in practice can influence, for example, the speed of the decision-making process or the criteria that lead to the approval or rejection of an investment opportunity (Harrison et al., 2015). As a result, experienced angels tend to make quicker decisions about whether or not to pursue an investment opportunity and place more emphasis on matching the investor with the entrepreneur. In contrast, inexperienced angels spend more time on each step in the process and are more likely to base their decisions on financial aspects (Harrison et al., 2015).

1.7 Business Angels of Interest

It is clear that a start-up business needs a number of resources and means to be able to start and operate/ succeed in its field of activity. In addition to funding – which is perhaps the obvious need, a number of structures and processes are also required. It is therefore important that it can receive guidance on these structures and processes from people who have the necessary experience to pass on their knowledge. Therefore, experienced business

angels are of greater interest as financiers of a start-up company, since in addition to undertaking the investment, they can also offer support in matters of management, production activity, but also the daily operation of the enterprise.

The reasonable question is what business angels are looking for in a company, but also what steps/stages they follow and what criteria they apply in order to undertake this type of investment - financing. The investment process that business angels (seem to) follow will be examined in the following sections.

2. The Business Angel Investment Process

2.1 Prototype/ primitive models (stages) of the investment process

The recording of the investment process followed by business angels is done in the literature with a qualitative methodology, mainly from the experience they themselves convey through interviews. Emphasis is therefore placed (and this is what we follow in this text) on the supply side, i.e., the investor, and not on the demand side, i.e., the company that receives the investment (recipient). So initially this process could be divided into three big/broad stages:

1. before the investment,

2. the negotiation of the contract/agreement, and

3. after the investment.

When screening/selecting enterprises for/ before the investment, the interest of business angels to contribute to the business in addition to the financial contribution, potentially passing on their expertise in strategy, marketing, operations, etc., is noted.

Another point of interest in the investment process followed by business angels is the evaluation criteria they use and concerns the negotiation-decision stage. Initially some broad criteria could be considered such as:

a. the assessment of the entrepreneur's abilities

b. the evaluation of the entrepreneur's background, and

c. the balancing of risk and reward.

Especially with regard to the risk-return relationship (stage 1) the question that concerns business angels is how likely it is that the actual results of the investment will be different from those predicted and how this risk compares with the potential returns from the business.

During the decision-making stage/phase (stage 2) (Payne et al., 1992) a business angel may be faced with a choice characterized by conflict, uncertainty and complexity.

- A conflict may arise over the details of the agreement.
- Uncertainty can occur, for example, when there are still doubts and/or concern about the ability of the entrepreneur behind the business.
- Complexity can increase when a business angel considers more than one investment opportunity or participates in an investment syndicate whose members have different views on the commercial viability of the entrepreneur's plans.

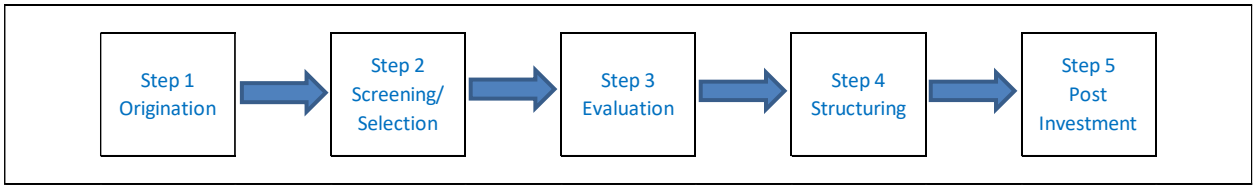
The business angel's assessment of the entrepreneur's personal qualities and characteristics (Harrison and Mason, 2017), the assessment of the marketing strategy and financial projections/forecasts (Mason and Harrison, 1996) and the angel's needs and expectations of what requires an investment need to be combined as a final decision is to be made, leading to a single, combined/mixed/ balanced choice during the decision process.

At the post-investment stage (stage 3), evidence shows that angel investors follow their investments with the majority taking a hands-on role in the business using their commercial skills and experience to add value beyond their financial investment (Harrison and Mason, 1992; Freear et al., 1995; Madill et al., 2005). An angel with sufficient funds does not need to wait until an investment comes to fruition before looking/considering/evaluating and potentially investing in other opportunities. The experience of the process, successful or not, is also likely to influence the types of opportunities an angel subsequently pursues. Evidence on angel exit strategies is limited, but suggests that the majority had no preference if achieved through a management buyout, trade sale, or initial public offering (Paul et al., 2003). Given the high-risk nature of informal investing, there is also the possibility that the venture will fail or be moderately successful, so it may be difficult for the angel to exit, an investment called "living dead" investing (Ruhnka et al. (1992)).

The first attempts to capture the steps taken by business angels come from the field of venture capitalists. These steps could still be used today to help the prospective company understand what a business angel is looking for. A point of caution is that the market for venture capitalists is more structured and organized than that of business angels.

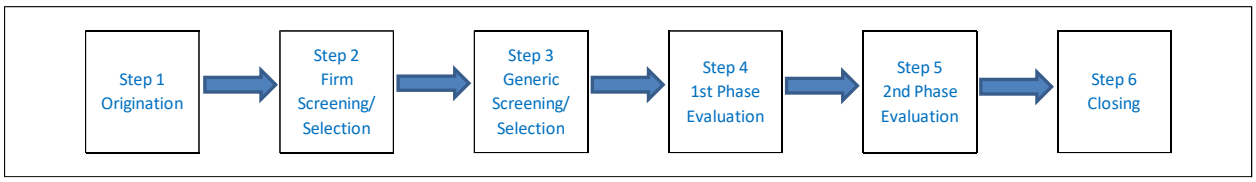
These steps are taken from Tyebjee & Bruno (1984) and are described in Figure 2 and from Fried & Hisrich (1994) and described in Figure 3.

Figure 2 Steps of business angels according to Tyebjee & Bruno (1984).



Source: Created by the authors with data from Paul et al. (2007)

Figure 3 Steps of business angels according to Fried & Hisrich (1994)



Source: Created by the authors with data from Paul et al. (2007)

We notice a similarity in the two approaches. Fried & Hisrich (1994) essentially have two steps for the examination/selection/control of the companies to be invested and two steps for their evaluation in relation to Tyebjee & Bruno (1984). However, they do not have the step of actions/activities after the investment.

Based on the above, it is clear that a company that is interested in receiving funding from business angels should at least follow the following steps in order to be considered a candidate for investment:

1. To get noticed/ in the investment universe/ on the radar of business angels.

2. To project its unique points which will make it stand out and be selectable (whether there is one or more selection/screening phases) by the business angels.

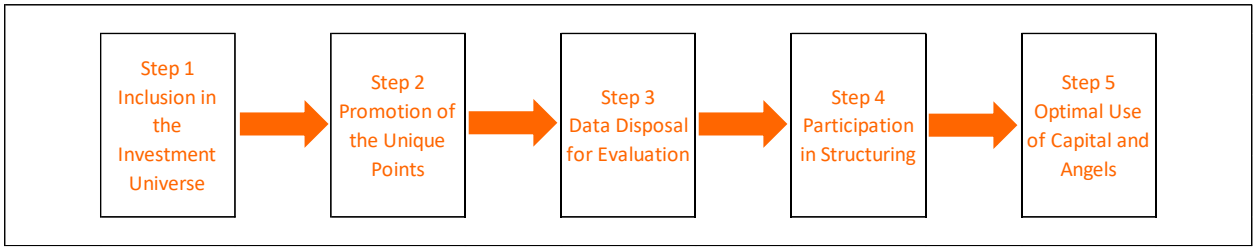
3. To make available to the business angels all those elements/data/documents which will allow/facilitate its evaluation (whether there is one or more phases of evaluation) by them.

4. To actively/dynamically assist in building its financing plan from business angels and to ensure that it receives as much help and guidance from them as possible in matters of strategy, strategic planning, business plan, etc. as well as in marketing, sales and operations.

5. To take care after the (agreement on) investment to mobilize/use in the best possible/optimal way the available funds and to activate the willing/available business angels to help both in matters of strategy, strategic planning, business plan, etc. etc. as well as in matters of marketing, sales and operations (as mentioned above) in order to ensure the success of the venture.

These steps are somewhat shadowy of the steps/stages followed by business angels and are shown in Figure 4.

Figure 4 Shadow steps of enterprises to get funding



Source: Created by the authors

The stages mentioned above, and this attempt to capture the steps of the investment process followed by business angels are somewhat primitive. Therefore, it is amenable to improvement/ refinement/ deepening in order to capture all the steps.

But both this first impression, as well as the more complete one that follows, are based on interviews with active business angels with a focus on the last investment they made. This approach has some advantages:

• Speculation and theoretical or hypothetical or improbable answers are avoided.

• The accuracy of the experience/investment description is ensured.

• Consideration of sequential decision-making becomes possible.

• The tendency for self-report/self-report bias is minimized because the success or failure of the investment is (preferably) unknown at the time of the interview.

• Narrative stories of the past that may not have anything to do with current conditions are avoided.

These advantages are an indication that companies wishing to be candidates for investment can also organize/structure similar interviews with business angels in order to understand on the one hand what they are looking at and the results of their previous investments, on the other hand to determine whether they fit with any interested entrepreneurs - angels. After all, the investment process is a two-way process. It is not enough that the company (or entrepreneur) is eligible, suitable or desired by the business angel. Correspondingly, the business angel should be suitable or desired by the company (or the entrepreneur).

In this way, it can also be understood which are the stages that the business angel (eventually) follows not only in terms of their content, but also in terms of the time they require, the relevance of these stages to the interested/candidate enterprise, and the thoughts and feelings that are created.

Of course, interviews are to some extent based not only on facts but also on perceptions/beliefs – and this is perhaps a point of caution. But entrepreneurship and the matching of the business angel-investor with the prospective investment company-entrepreneur is also based to a certain extent on the coincidence of their perceptions/beliefs

or approaches. After all, capturing real situations (such as the stages that business angels (might) follow) is always a challenge.

2.2 Advanced models (stages) of the investment process

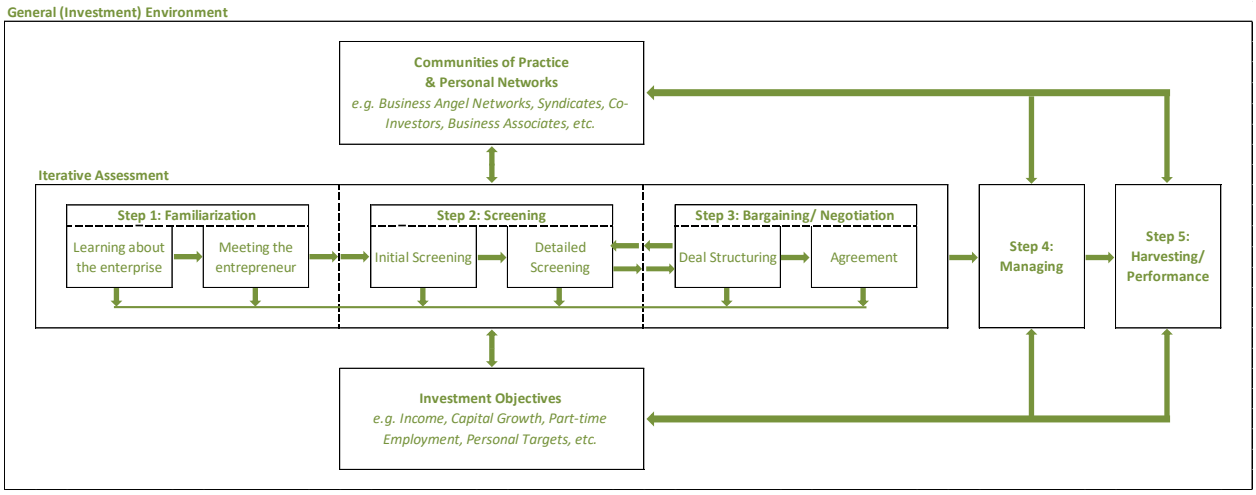
Over the years, more advanced models have been recorded that attempt to capture the stages/steps that business angels follow during the investment process. Their main differences in relation to the above initial/prototype/ primitive stages are found in the individual and deeper analysis they offer, in the consideration of more specific and descriptive titles based on the actions that take place in each step/stage and in the finding that some actions are repetitive and so they constitute an iterative process for the business angel.

Business angels appear to follow a sequential approach with steps in a sequence, but these are not necessarily standardized. This is for a number of reasons, as deals do not always progress in the same way and can be delayed or interrupted. Reasons why this can happen include:

- Raising the full amount of capital required for a business activity can involve funding from many angels and while some may be willing to invest, others may not be so reluctant.
- An angel may not be convinced and delay the whole process to carry out further checks.
- Business like human relationships (which are such after all) also have ups and downs as prospective partners know and try to match their preferences, perceptions and idiosyncrasies.
- External factors may affect the investment process, such as an illness or a pandemic nowadays, and therefore timescales vary depending on the case and circumstances from a few months to over a year.
- A business angel can easily withdraw from the process by ending discussions with the entrepreneur at any time before an investment is made.

However, more modern models suggest that a business angel investment evolves through five stages (Paul et al. (2007)): familiarization, screening/selection/examination, negotiation, management and harvesting/gathering/performance (Figure 6):

Figure 6 Steps of angel investors according to Paul et al. (2007)



Source: Created by the authors with data from Paul et al. (2007)

This process is iterative to the first three stages followed by the business angel, i.e., familiarization, screening/selection/examination and negotiation, allowing/leading to an iterative evaluation that includes six main activities/actions to which an angel adds constantly on the information available to him. Consultation and analysis, which may involve third parties in the form of friends and advisors, may take place as a more detailed knowledge and understanding of the business is thus gained. This repeatability allows the existence and confirmation of both primary and secondary data so that the transition from one stage to another is possible. At the same time, it is a safety net for the business angel as he or she thus has the opportunity/possibility to verify the correctness/validity of his decision/choice before making the final investment. After all (Paul et al. (2007))

- A business angel has the opportunity to terminate the process at any time during this iterative phase.
- In practice/reality there is the possibility of going back to previous steps as an agreement is formed.
    - Angels initially have limited information to guide them in valuing their stake in a business.
    - The arrival or acquisition of new information or unexpected events may lead to a reassessment of their position.

The last two stages followed by business angels are those of managing and harvesting (the profits) of the investment.

Business angels are human and therefore are influenced by a number of factors, such as the formal and informal networks in which they operate, their personal investment goals and of course the overall (investment) environment (Paul et al. (2007)).

- Therefore, the importance of formal and informal networks that may influence the investment choices of business angels should not be overlooked.
    - Formal networks include communities of practice that actively support angel activity, such as business angel networks, unions and economic development agencies (where available).
    - Informal networks include informal personal networks to which a business angel can turn for advice and support such as friends, but also co-investors and business partners.
- The importance of an angel's personal investment goals in the process is of course great. These can be (financial) economic, such as achieving income and/or increasing one's capital. But they may also include other goals, such as finding a part-time interest, such as spending time on the angel side of a business after the investment has been made. The investment process can be affected by an angel's investment objectives, particularly if they change.
    - For example, a change in (financial) economic conditions may force a business angel to re-prioritize the balance between achieving income or capital growth and, in turn, may affect the evaluation of a potential investment.
- Many factors enable and constrain investment processes and therefore the model is completed by showing the impact that the general (investment – and not only) environment can have at any stage.
    - This includes economic, socio-cultural, political and technological influences, which individually or collectively may affect the activities of business angels.

2.2.1 Familiarization Stage

Business Angels

This stage of the investment process involves two main activities,

1. learning opportunity and

2. the meeting with the entrepreneur.

Business angels appear to find investment opportunities through three main sources:

a. business partners,

b. business angel networks and

c. investment syndicates.

The more formal methods of finding investments through, for example, accountants, lawyers, banks and other financial institutions appear to be relatively trivial.

At this early stage of the process,

- Most business angels prefer to read a business plan summary of two to three pages, although some want to see a more detailed version.
- Opportunity evaluation begins immediately with the key considerations of location and industry.
    - Angels prefer to invest relatively close to their place of residence.
    - Investing in longer distances requires compensation from other factors.
- Business angels may be willing to consider proposals that do not meet their preferences, particularly if a trusted business partner has referred the proposal to them.
- The entrepreneur is contacted/acquainted, initially usually by phone or video call, in order to have a preliminary discussion and arrange a first meeting. In this acquaintance the following should be taken into account:
    - Business angels are wealthy individuals and are generally under little pressure to make an investment in order to generate income or capital growth. They can afford to wait until not only the right opportunity but also the right person comes along.
    - The assessment at this stage focuses on the entrepreneur or team behind the business, although more information about the business opportunity may be gathered at the same time.
    - Finding the right entrepreneur and the impression he gives them is important for the business angel. They should judge that they can work with him and share comparable views and understandings but also possibly fit better overall.

Entrepreneurs

It is therefore clear that if entrepreneurs want to attract the serious interest of a business angel, they must be able to present not only their ideas but also themselves effectively.

- It is important that they give the impression of reasonable, reliable, consistent and composed people who know what they want to do, without being dogmatic. If the latter is true, the possibility of a long-term relationship/cooperation with the business angel is very small.
- Equally important is the team that surrounds the entrepreneur. She should also be convinced of her ability to carry out the project.
- The entrepreneur together with his team should inspire the business angel to want/decide to work with them.
    - A strong team may cover any gaps that will be diagnosed in a business plan.

2.2.2 Control/Examination/Selection Stage

Business Angels

From this stage onwards in pre-investment activities, angels engage in more structured evaluation in which the term screening/examination/selection is used. The business angel

- Examines both primary and secondary data (hard and soft data) about the opportunity and the entrepreneur(s) behind it.
- Begins with an initial screening stage during which further meetings are held with the entrepreneur as the business angels try to confirm first impressions and delve deeper into the business opportunity.
- Interested parties can use their own business networks to check the background and history of the entrepreneur.

A thorough study of the business plan will also be done at this stage.

- When a proposal involves angels investing in an industry or technology with which they are unfamiliar, they may seek advice from business partners to bring them into the deal as additional angels.
- At this stage, business angels are also likely to assess how they can contribute to the business beyond the scope of their financial investment.
- Envisioning a fulfilling, more holistic post-investment role can be a key factor in ensuring that the investment process unfolds smoothly, as their involvement in the company's operations makes it more likely that angels will be successfully matched with the right entrepreneurs.
- Business angels may form an "emotional" commitment to an investment proposal (Fried and Hisrich (1994)).
    - During the review of an opportunity, business angels may spend more time and suggest changes to the business plan.
    - The most common areas for review are marketing and (finance).

At this point in the process, the number of additional angels, if any, to participate is determined. Having experienced angels or a syndicate inspires confidence in the less experienced as well as the entrepreneur.

Entrepreneurs

At this stage, companies interested in receiving funding from business angels should therefore pay attention – in line with the above – to the following:

- Make available to business angels all the information they have about the business they want to recommend (or have already recommended) with full transparency.
    - This can be sometimes be laborious or procedural but it helps to gain useful time that can be used creatively in strategy planning.
- To have made sure to draw up at least a preliminary business plan. The first "justification" a funding body looks for is the business plan.
    - Therefore, it is important that the company has prepared at least a simple version of it including its main points.

- The parts and content of a business plan are discussed/presented in the respective texts/tools.

- Get in touch with business angel networks to identify – if possible – business angels who invest in related activities or would like to invest in related or non-related activities.
  - This effort may help to find business angels who will at least have an interest in the company's activity or industry.
  - Without meaning that there will be an absolute match, it shows a motivation and an interest on the part of the entrepreneur and this might spark the interest of some (additional) business angels.
  - It also makes it easy to access the history of the entrepreneur or business, which is what business angels are looking for.
- To have thought about the possibility of suggesting to the business angels themselves areas that could contribute to the business. On the one hand, this will mobilize business angels, but possibly also attract the most qualified in these fields.
  - Areas of interest are strategy, marketing, sales, operations and finance.
- Let the entrepreneurs themselves think about the profiles of business angels that would match them. What are the characteristics that a business angel should have in order to work with him, who would make him their partner and who would co-invest with him.
  - An important aspect is whether they would like - among others - business angels who invest in similar businesses and therefore already have experience, or whether they consider this would lead to a conflict of interest and therefore choose business angels who invest in unrelated businesses.
  - Thus, it can be ensured to some extent that their views, perceptions and beliefs will match, which is important for business angels as well.
  - After all, the investment process, as mentioned above, is a two-way street. It is not enough that the investment is considered suitable for the investor. The investor should also be acceptable to the company and should not constitute a solution of necessity.

2.2.3 Negotiation Stage

Business Angels

At this stage the due diligence is completed.

- Several times it is not a standardized activity and is performed, at least in part, by the angels themselves.
- Also, the negotiations on the value of the financial investments in terms of shares are completed.

The return an angel (should) expect to receive for different levels of investment is a key issue.

- These negotiations are often difficult and intense as business angels and entrepreneurs try to find common ground.
- In part, this may be because business angels invest early in the business process, when their value is often minimal and of course there is no track record of returns.
- However, when the entrepreneur has already established a business and made an investment of time and money, this provides the angel with a reference point to more easily assign an approximate value.
- However, angels often approach the subject of stock valuation intuitively, without necessarily following a logic. They therefore often rely on their judgment.

How and when additional investment capital will be made available is also considered, although in most cases this is not set out in a formal agreement.

- Given the risk and reward issues outlined in the negotiation phase, reaching a final agreement is often more difficult than the parties thought.
- Disagreements may also arise in finer points of the deal such as the equity composition as the addition of additional partners or the departure of angels may occur.

Completing the negotiation stage is a formal agreement between the entrepreneurs and the angels that sets out the details of the deal reached.

Entrepreneurs

This stage is perhaps difficult and demanding for entrepreneurs as well, as the outcome of the negotiation will determine the shareholder composition of the company, the expected or promised returns and the role of each interested party (entrepreneur or business angel) in the governance and daily activity of the company.

Entrepreneurs should be prepared for a number of issues:

- Based on the business plan (even in its preliminary form) entrepreneurs should know what their real need is for financing of each form and specifically what amounts they expect from business angels.
    - Do they favor one or more business angels so that there is no concentration on one of them?
- They should also have a first view of the activities (other than financing) in which a business angel's contribution may be needed (eg marketing) and be prepared to ask for it as part of the negotiation.
- To have thought about which points of the business plan, the share composition, the returns, etc. are important to them and therefore (potentially) non-negotiable and which are of lesser importance and to some extent would be subject to change to conform to the preferences, expectations or requirements of the business angels.

2.2.4 Management Stage

Business Angels

Business angels often choose to be actively involved in the enterprises they choose to invest in. In this way, they appreciate that they contribute to the success of the project and help the company in the execution of their tasks. Depending on their experience they can contribute in matters of organization, management and motivation of teams, strategy, marketing, operations, etc.

Typically, business angels limit the number of companies they invest in. While the overall level of funds available for investment is a limiting factor, time is also a critical resource. Angels are careful not to commit to too many companies, especially if they devote some of their time to the business so they can meet the demands.

Entrepreneurs

At this stage, entrepreneurs have an interest/interest in ensuring that what has been agreed on, on the one hand, in terms of the financing/provision of capital, and, on the other hand, in terms of the participation of business angels in the operation of the company, are respected.

It is now the stage when the company - if it did not exist before - has entered the phase of its productive activity or a new phase of development - if it existed before. It is important to have a cooperative spirit to implement the business plan and achieve production, sales, profitability, etc. goals. set by the company. These goals are the focus of entrepreneurs' interest and they must ensure that business angels remain focused, committed and available to achieve them.

Entrepreneurs should ensure that the business angels they have invested in continue to provide the (financial) resources or assistance in the functions that have been agreed, particularly if they have chosen to do this for more than one business. The latter is important as other enterprises may claim part of their resources or time.

2.2.5 Harvesting/ Collecting/ Performance Stage

Business Angels

Angels can get the result of their investment probably by a sale of their share. Less likely is through an initial public offering process or a management buyout. Business angels have an exit strategy that depends on their temperament, their engagement with the business and the prospects it provides. Exit schedules are flexible. A decisive role in maintaining the investment – apart from its prospects – is the maximization of any tax advantages.

Entrepreneurs

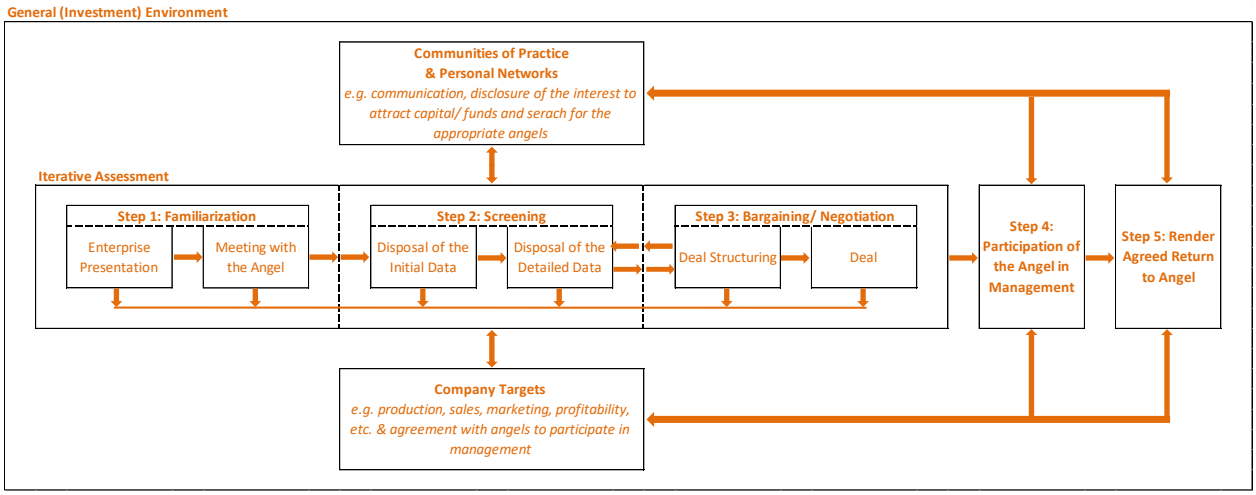
The entrepreneurs at this stage ensure – in collaboration with the business angels – that the returns are paid as agreed, but also that any planned exit strategy is followed. Depending on the case, possibly the entrepreneurs (themselves):

- To have collected the amount required to buy the share of the business angels participating in the business.
- To have taken care to find new partners or business angels to replace those who will leave.
- To have drawn up a plan to introduce the company to an organized stock market through an initial public offering.
- Willing to continue working with existing business angels, thereby convincing them to roll over/continue their investment for additional years.
- To have chosen/decided to dissolve or sell the enterprise as a whole (possibly due to a change in circumstances, unfavorable environment or failure of the venture), so they are moving in this direction in collaboration with business angels.

Of course, in any case the circumstances will determine what will happen in the end. As mentioned, the schedules are flexible for business angels. The same is largely true for entrepreneurs. What is important is that entrepreneurs are prepared and foresee - as far as possible - what the next steps of their cooperation with business angels will be - depending on the course of the business and the formation of the general (investment) environment.

In summary the process from the business side is shown in Figure 7:

Figure 7 Shadow steps of enterprises to receive angel funding



Source: Created by the authors

3. The informal nature of business angel investment

Although a five-stage business angel investment process has been described, one cannot claim that the process is always so structured and orderly in stages. In practice, these stages overlap and the boundaries between them are blurred. Angels do not always perform them

in the same order or necessarily in their entirety. This is largely due to the informal nature of angel investing. Nevertheless, two generative mechanisms can be identified that drive the investment process followed by investment angels (Paul et al. (2007)):

• the personal nature of the process and

• the assessment activity.

3.1 Personal nature of the process

Business Angels

The model described above explains that informal investment is a process characterized by intense interaction through a series of interconnected stages in which there is a transition from one stage to the next as cooperative practices develop. This can be seen throughout the process. This process is significantly based on the temperament and personal preferences, beliefs and choices of the business angel and not on official protocols for recording procedures or undertaking investments. Examples are (Paul et al. (2007))

- knowledge/information about the business/investment, where the source of information is important for business angels
- the choice of investment before or after which is decided the personal involvement of business angels in the ventures in which they invest, an involvement facilitated by a good working relationship with the entrepreneur (Harrison and Mason, 1992; Freear et al., 1995; Paul et al., 2003; Mason and Stark, 2004)
- the entire investment process and throughout its duration, where personal relationships underpin the informal investment process with angel investors emphasizing the choice of business activity entrepreneurs who inspire credibility (Shane and Stuart, 2002).

Entrepreneurs

Entrepreneurs hoping for business angel funding should recognize this intensely personal stamp that each business angel puts on the process and prepare to attract and partner with the business angels they feel are a good fit. After all, start-up entrepreneurs often operate in this way as well. Their personal intuition weighs more than standards, and the coincidence of opinions, beliefs and perceptions is important in choosing partners. Therefore they are called:

- Make sure to communicate their interest to agencies that have contact with business angels.
- Know what activities business angels can participate in other than financing and address the appropriate ones.
- Ensure that both their venture and themselves and their teams exude trust, credibility and consistency.

3.2 Evaluation

Business Angels

The second generative mechanism, which also covers the entire investment process, is evaluation. Once an angel learns about a potential investment opportunity, the evaluation begins by weighing both primary and secondary data, where the business angel tries to find answers to a series of questions that will help him in the evaluation (Paul et al. (2007)):

- First, the angel assesses whether the opportunity meets its investment criteria in terms of location and industry by asking a series of questions:
    - What is the distance from the enterprise?
    - What do I know about this industry?
- The angel's focus then turns to the entrepreneur, his personality, background and experience by asking a few more questions:
    - Can I work with this person?
    - Does the entrepreneur have a good track record in this field?
- As the process evolves, emphasis is placed on marketing and (financial) considerations:
    - Are the sales forecasts justified?
    - Do we have our amounts correct?
    - Who else can invest in the company?
- Post-investment angels are (often) actively involved/participating in the business which enables them to not only monitor but to actively evaluate and manage their investment by considering:
    - How is the company doing?
    - Are sales high enough?
    - What else can I do?
- And, although the harvest/gathering/performance stage is perhaps not clearly prescribed when it will happen, it can be seen as involving the business angel's assessment of if and when it will go away.

The decision to invest ultimately represents a synthesis of the angel's assessment of primary and secondary data (hard and soft data) that has been and continues to be collected throughout the process.

Entrepreneurs

Assessment reflects (when done correctly) the image created by the assessee. It is therefore in the interest of the entrepreneurs to ensure that the impression that the business angels get during the evaluation they carry out at all stages of the process is the right one. More specifically:

- To make available to the business angels all the data necessary to form an opinion on the appropriateness of the investment, possibly addressing those they consider relevant to the subject.

- Be honest and forthright in revealing their strengths and weaknesses, highlighting their comparative advantages, both themselves and their teams, with an emphasis on reliability and consistency.
- To explain the forecasts of sales and other commercial and financial figures having made sure that they are based on realistic data and assumptions.
- To prepare for (and co-implement when the time comes) the involvement of business angels in the running of the business and possibly suggest activities in which they would like to be involved.
- Cooperate for the exit or stay of the business angels in their business, delivering each time what was agreed upon.

3.3 Comparison with formal/standard forms of investment

Business Angels

A comparison of the steps/stages followed by business angels, which as explained constitute an informal market and have an informal nature of investment with other formal/organized markets and forms of investment (such as venture capital for example) shows that there are similarities and differences (Paul et al. (2007)).

Similarities

The approaches (represented linearly above) are based on a series of stages of stakeholder engagement in activities (Paul et al. (2007))

- before the investment and
- after the investment that
- are associated with a successful negotiation phase in which a formal agreement is reached.

Differences

However, compared to data on investors in the formal market, we found that business angels give more weight to more secondary factors/secondary data (soft factors). These differences can be traced to the individual stages of the business angel investment model (Paul et al. (2007))

- An important difference is the importance that business angels give to the early stages of investment. In the familiarization stage, the impression the entrepreneur makes/gives at the first meeting with the angel is important in determining whether the investment will proceed further. It is essentially an acquaintance that resembles an interview. The impression they make on each other (and especially the entrepreneur on the business angel) is important to whether there will be further steps. In the case of business angels this will determine whether they will eventually provide the funding.

- When screening/screening/selecting investments, business angels are more likely than venture capitalists to place more emphasis on personal factors. Trust in the entrepreneur in the informal market is of the utmost importance and he should inspire credibility. The latter is also important for venture capitalists, who seem to be equally or more interested in the business's growth dynamics.
- During the trading stage, informal investors work with less information, have little precedent to draw on, and lack the resources to conduct in-depth market analysis compared to venture investors (Fiet, 1995). Faced with these obstacles, business angels operate more on intuition in terms of estimating how much equity/equity they should receive in return for their investment. This intuition involves the integration of disparate information (Hisrich and Jankowicz, 1990) as an angel performs a balancing act in which the value of the opportunity is weighed in terms of equity. Evidence from the formal venture capital market suggests that investment candidates are typically evaluated by applying one or more valuation techniques to the financial and accounting information contained in the business plan submitted by the entrepreneur (Wright and Robbie, 1996). This evaluation process is likely to involve many iterations to test the robustness of the internal rate of return (IRR), the most common performance measure used by the venture capital industry (Murray, 1999). Business angels may not have the means to calculate the expected IRR and thus may not include it during the valuation or other phase of the investment process. Furthermore, while financial theory suggests that, faced with a lack of information about an opportunity, investors respond by writing contracts designed to transfer risk to the entrepreneur (Denis, 2004), this does not seem to apply in the stages that follow business angels (either at the negotiation stage or at other stages);
- The extent of post-investment involvement in the management of the business is likely to vary between venture capital and angel investors. In the formal market, the main roles undertaken by venture capital investors are as members of strategic boards/committees and financial advisors (Manigart and Sapienza, 2000). In contrast, in the management stage of the process, angels are usually expected to assume a role that allows them to contribute not only strategically but also operationally by interacting with the entrepreneur on an ongoing basis (Madill et al. (2005), Paul et al. (2007)).

Consequently, as the role of venture capitalists and business angels are complementary and their markets of operation are also complementary, these similarities and differences are perhaps to be expected (Paul et al. (2007)).

- In terms of similarities, it is clear that both markets serve the same purpose of providing private financing to high-risk business activities in exchange for equity stakes and returns higher than expected from public investment/listed companies. These returns are hoped to materialize at a future date for significant return.

- In terms of differences, there is a focus of business angels/informal markets on the secondary factors (soft factors) which can be attributed to two main reasons:
    1. In the early stages of a firm's development, assets are often intangible and knowledge-based (Hsu, 2004) and evidence from trading performance is limited if not non-existent unlike venture capitalists who have access to a wealth of evidence / data for business (science). Business angels therefore work with little (art) or no (magic) historical performance data on which to base their investment decisions (Freear et al., 1995). Therefore, business angels have no choice but to give relatively more weight to the characteristics of business founders/entrepreneurs.
    2. Second, venture capitalists employ others/manage other people's money and raise capital signaling their ability to spot opportunities and then maximize investment returns. In contrast, angels use their own funds and are fully exposed to both the risk and reward of any investment. They have no fixed performance goals and timelines, and are accountable practically only to themselves. While venture capitalists focus on due diligence, due diligence and contracting during the investment process as a risk reduction strategy, angels are more likely to focus on an active role after involvement in the business (Van Osnabrugge, 2000). This involvement/relationship approach with the entrepreneur to reduce the risk of venture failure results in angels placing more emphasis on secondary factors throughout the investment process compared to venture capitalists.

Entrepreneurs

As angels pay more attention than venture capitalists to softer factors this means that they should be emphasized by entrepreneurs. Specifically, you should

- Prepare to promote themselves and their business proposals more effectively.
- To be trained in presentation skills for entrepreneurs in the general context of investment readiness (Mason and Harrison, 2001).
- Assess the role they wish an angel to play after the investment. A successful relationship between an angel and an entrepreneur underpins the informal investment process and, in turn, is facilitated by a good match between the skills and experience an investor can offer and the needs of the business.

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4 CHAPTER 3. Evaluation of Financial Tools/Instruments

4.1 Methodological Framework

We compare the different financing tools in terms of six different dimensions, which are key from the perspective of the investor. Namely,

- Liquidity, which measures the ease with which an asset or security can be readily converted into cash without affecting its market price (Investopedia, 2023b). It ranges from low to high.
- Investment objective, which ranges from income to growth (Cooper Pacific, 2020).
    - Growth investing at increasing the value of the investment over time, and is based on compound interest. It can provide the potential for significant returns, but it also involves a high level of risk. Growth investments often favor faster-developing companies at early stages in their development.
    - Income investing, on the other hand, is based on dividends paid out to the investor. Income funds target a steady stream of income. Income investing can provide a steady stream of income, but the potential for returns may be lower.
- Control of the investor over the investee, which means that the investor is exposed, or has rights, to variable returns from its involvement with the investee and has the ability to affect those returns through its power over the investee (Annual Reporting, 2019). It ranges from low to high.
- Holding Period of the investment, which is the time the investment is held by an investor, or the period between the purchase and sale of a security. The holding period is used to determine the taxing of capital gains or losses on the investment. The holding period is calculated, starting on the day after the asset's acquisition and continues till the day of its disposal or sale. The holding period can also include the time for which the person, who gave you the asset, held them. It ranges from limited to unlimited.
- Expected Investment Return, which is is the profit or loss that an investor anticipates on an investment that has known historical rates of return (RoR). It is calculated by multiplying potential outcomes by the chances of them occurring and then totaling these results (Investopedia, 2023a). It ranges from Medium to High.
- Assumed Risk, which is the possibility or probability of losing money or not achieving the expected return on an investment. It is caused by various factors, such as market conditions, political instability, or public perception. Investment risk is often related to investment returns, meaning that safer investments tend to offer lower returns, while riskier investments may offer higher returns. Investment risk can be managed

by diversifying the investments and understanding the different types of risk involved (Morning Star, 2021).

4.2 Evaluation Matrix – basic elements of tools

It is now the stage when the company - if it did not exist before - has entered the phase of its productive activity or a new phase of development - if it existed before. It is important to have a cooperative spirit to implement the business plan and achieve production, sales, profitability, etc. goals. set by the company. These goals are the focus of entrepreneurs' interest and they must ensure that business angels remain focused, committed and available to achieve them.

Based on the above definitions, we assess the financing tools in terms of the aforementioned dimensions, i.e.

- Liquidity
- Investment objective
- Control of the investor over the investee
- Holding Period of the investment
- Expected Investment Return
- Assumed Risk.

We derive the following charts (Poufinas, 2022):

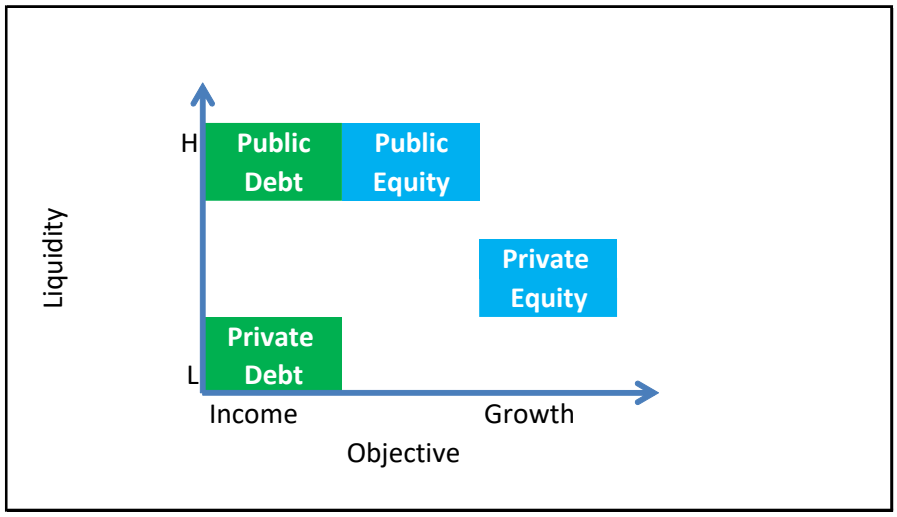

Figure 1 Comparison asset categories in terms of liquidity and objective

Note: Created by the author with information assembled from PRI (2019).

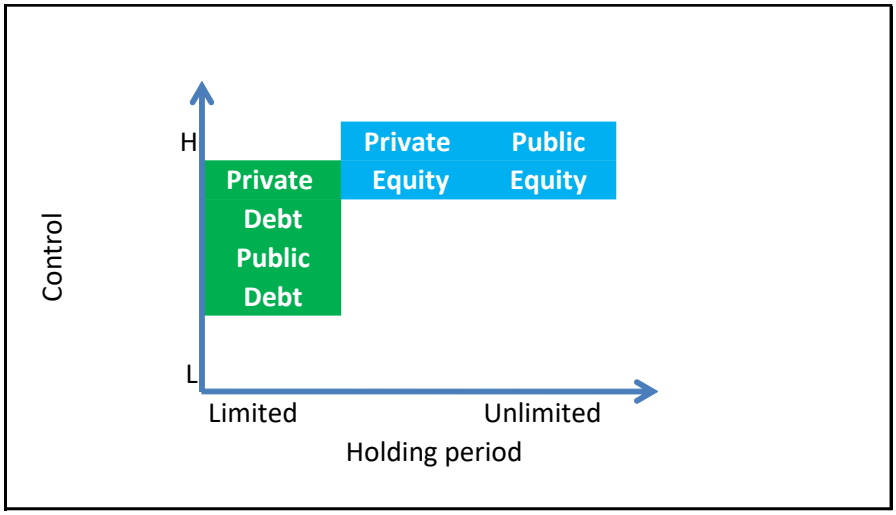

Figure 2 Comparison asset categories in terms of control and holding period

Note: Created by the author with information assembled from PRI (2019).

PRI (2019) has drafted the above in a tabular form:

	EQUITY		DEBT	
	PUBLIC	PRIVATE	PUBLIC	PRIVATE
Investee entity	Public company	▪ Private company ▪ Special Purpose Vehicle (SPV)	▪ Government-related entity ▪ Public company ▪ Private company ▪ SPV	▪ Public company ▪ Private company ▪ SPV
Investor/investee relationship	Legal owner (partial)	Legal owner (full or partial)	Lender (contractual relationship only)	Lender (contractual relationship only)
Returns profile	Investor potentially participates in both upside and downside	Investor potentially participates in both upside and downside	Investor participates in downside only	Investor participates in downside only
Investment holding period	Potentially unlimited	Potentially unlimited (typically seven-15 years for Private Equity funds)	Limited by bond tenor	Limited by terms of loan (illiquidity typically requires hold-to-maturity approach)
Liquidity	Most liquid	Somewhat liquid	Most liquid	Least liquid
Investment objective	Growth (occasionally income)	Growth	Income	Income
Investor control over investee	High (via voting and engagement)	High (via engagement and board seats)	Medium to low (limited opportunities to engage)	High to low (dependent on access to management)
Investee reporting requirements	Stock exchange requirements and national legal minimum	National legal minimum	Stock exchange requirements (public companies only) and national legal minimum	National legal minimum (for private companies)

Figure 3 Overall Comparison of different investment types.

Source: PRI (2019).

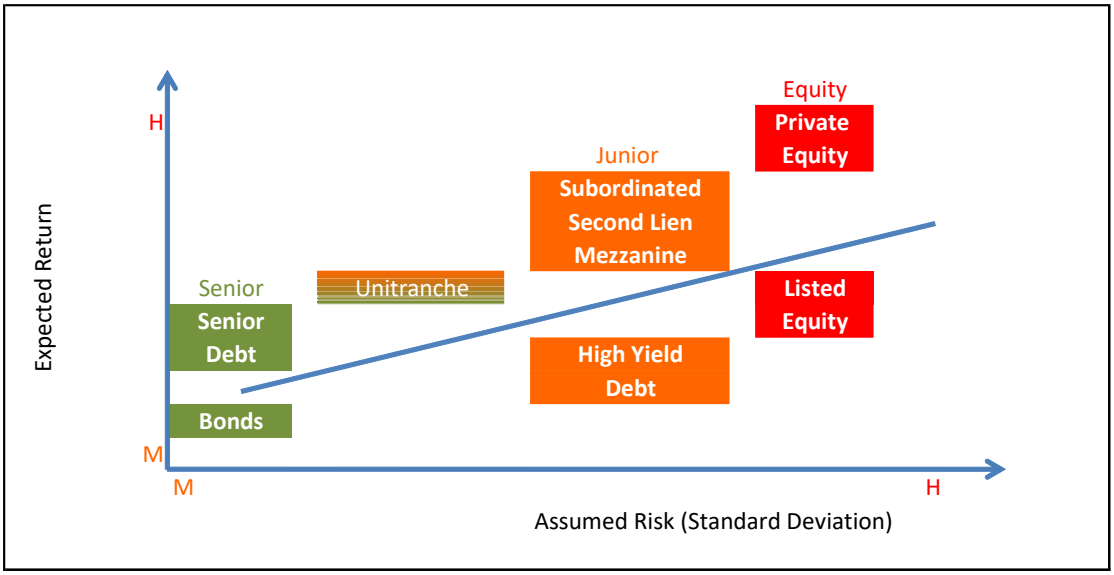

Figure 4 Risk-return profiles for various investment strategies

Note: Created by the author with information assembled from PRI (2019), IHS Markit (2017) and NN Investment Partners (2017).

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