Investment Banking

2. Private Equity

Private Equity

Introduction
Why Leverage?
Valuation
Exit and returns

Introduction

PE

How big is the sector?

US PE deal activity by Year

Year	Deal value ($B)	Deal count
2007	$764,6	3446
2008	$287,3	2719
2009	$1x	1876
2010	$277,1	2729
2011	$338,8	3089
2012	$370,0	3529
2013	$431,2	3351
2014	$523,9	4187
2015	$484,9	4394
2016	$590,6	4486
2017	$642,6	4913
2018	$725,4	5710
2019	$754,9	5759
2020	$689,6	5 709
2021*	$1 237,5	8 624

■ Deal value ($B) ■ Estimated deal value ($B) — Deal count — Estimated Deal count
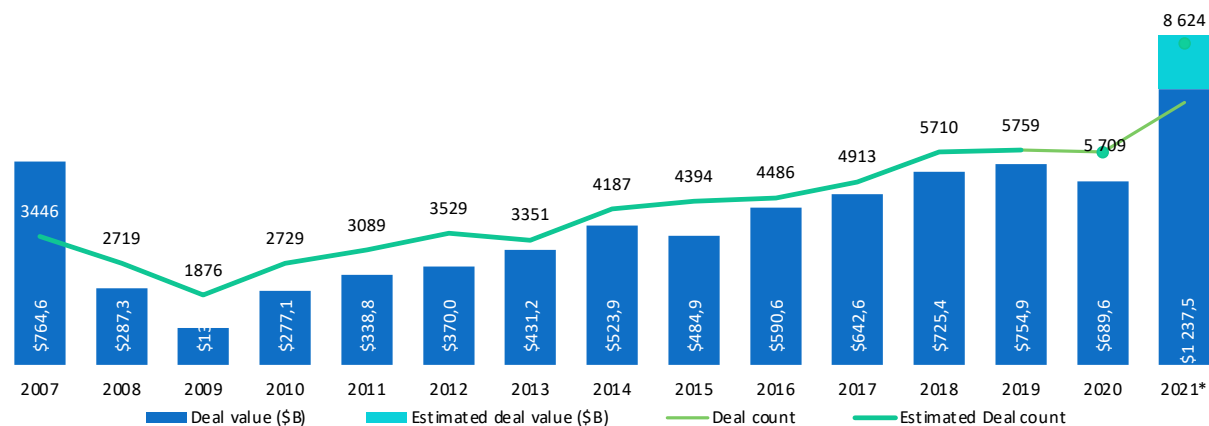
European PE deal activity by Year

Year	Deal value (€B)	Deal count
2010	€ 174,5	2437
2011	€ 195,6	2840
2012	€ 185,1	2724
2013	€ 224,9	2839
2014	€ 286,0	3227
2015	€ 391,6	3754
2016	€ 453,49	3925
2017	€ 430,4	4199
2018	€ 498,2	4517
2019	€ 473,4	4566
2020	€ 431,9	4206
2021*	€ 754,48	7197

■ Deal value (€B) ■ Estimated deal value (€B) — Deal count Estimated deal count
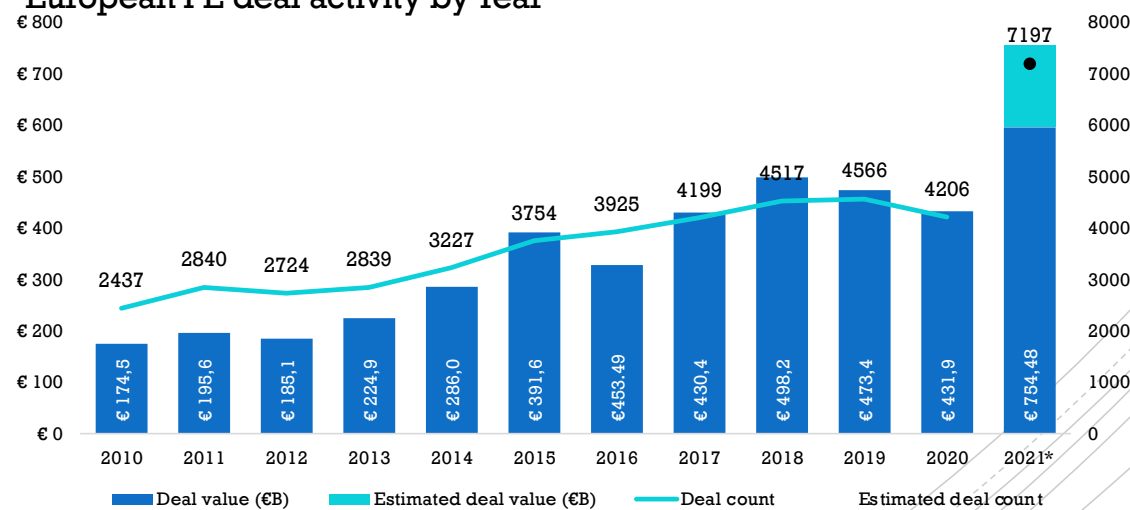
Source: Pitchbook

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Introduction

PE
Business Model

Investors (Limited Partners)
Pension funds, Banks, Insurance Companies, Mutual Funds, …

**Management Company
(General Partners)**

Capital (~99%)

Small percentage of capital (~1%)
Capacity of management

**Private Equity Fund
(Limited Partnership)**

Equity (30-50%)

Banks

Loans (50-70%)

Company X   Company Y   Company W

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Introduction

PE
Business Model

**Management Company
(General Partners)**

Investors (Limited Partners)
Pension funds, Banks, Insurance Companies, Mutual Funds, …

Capital + ~80% Profit

Management fee (~2%/year)
Profit sharing (~20%)

**Private Equity Fund
(Limited Partnership)**

Equity
(preferable with a huge profit)

Banks

Payment of outstanding
loans

Company X   Company Y   Company W

Introduction

PE

PE fund timeline

| Investment phase (3 to 5 years) | Add value phase (2 to 4 years) | exit |

0 — vintage year

10

(Follow-on fund) — vintage year
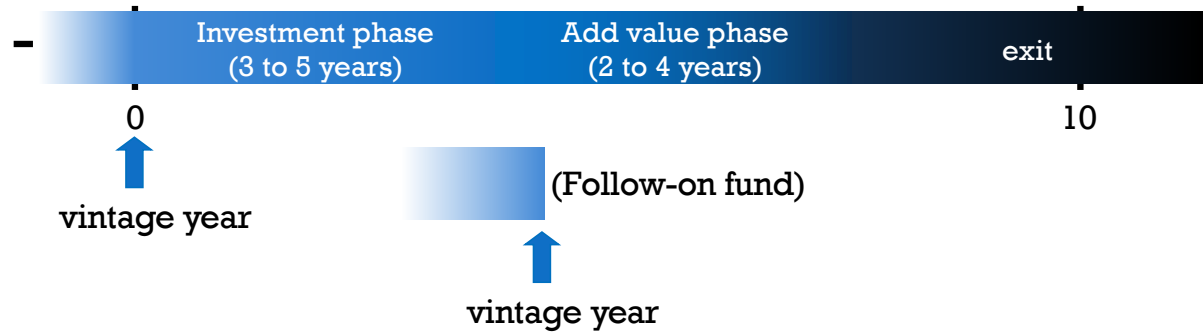
- Fund set-up (marketing phase)
- Drawdown / investment phase
- Add value phase
- Exit (2 years extension is possible with the investor agreement)
- A follow-on fund is normally set up after 3 to 5 years
- VC funds normally can be a little bit longer

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Why Leverage?

PE

- Leveraging is only feasible in buyouts with strong cash flow

- PE funds do not borrow themselves – the portfolio companies take on debt

- Allows PE firms to do much larger deals with less equity

- In theory, in the absence of taxes and agency issues, the enterprise valuation should depend on fundamentals, not on financing structure
  - … but there seems to be a correlation between lending and valuation multiples

- The fundamental arguments for leveraging deals are
  - Taxes
  - Agency costs/incentives
  - The possibility of debt's mis-pricing

Why Leverage?

PE
Taxes

- The main impact of leverage is to create tax shields at the corporate level which can reduce the cost of capital

- The reduction in corporate taxation can be extremely large – and often results in the company paying no taxes post-LBO

- But who benefits? Is it the PE firm and their investors or the exiting shareholders?

- What is the effect on national tax revenues?
  - Depends where the profits of the debt providers are taxed – if offshore corporations then there may be no flow-back to national exchequers
  - Which is why countries are imposing limits on the tax-deductibility of debt

Why Leverage?

PE
Agency costs/incentives

- High leverage reduces the free-cash flow available to management
  - as noted by Jensen and Meckling (1976) this can be a very effective way of overcoming agency issues
  - Makes management focus on cash-flow and value maximization
- The equity owned by the management is highly leveraged – so they face high-risks and high potential returns

Why Leverage?

PE
Mispricing of debt and risk?

- If the debt market is not pricing risk at an appropriate level there this is an obvious arbitrage opportunity
  - … but history tells us that markets are reasonably efficient most of the time

- The most obvious example of market inefficiency was the recent credit boom (until Summer 2007)
  - lending multiples hit all-time highs
  - interest rates fell despite the increase in lending multiples
  - covenants on loans became weaker (cov-lite loans)
  - bank competition for lending mandates led to them taking on hugely risky positions

Why Leverage?

PE

Example of a financing structure of an LBO

	Amount (£m)	Terms	Pricing (spread over LIBOR)	Multiple of EBITDA
Enterprise Value	**773.5**			**8.1x**
Equity	**191.0**			**2.0x**
Debt	**582.5**			**6.1x**
Senior secured debt				
Term Loan A	140	7 year	2.25%	
Term Loan B	135	8 year bullet	2.50%	
Term Loan C	135	9 year bullet	3.00%	
Total	410			4.3x
Junior debt				
2nd Lien	75	9.5 year bullet	5.00%	
Mezzanine	97.5	10 year bullet	4.50%+5%PIK	
Total	172.5			1.8x

In addition, the package may include a revolving credit facility for working capital. This may rank along with senior debt

Valuation

PE
Methods

- More emphasis on enterprise value than equity value. The latter is usually calculated by subtracting the net debt to the former

- Although more traditional valuation methods such as, DCF and Adjusted Present Value (APV) are used, the use of comparable (earnings multiples) is very common

Valuation

PE
Adjusted Present Value

- Valuing the firm assuming the company is financed only with equity (no debt)

- Add the value added by debt = PV of tax savings
  - If the debt is assumed to be constant, PV (TS) = Tax rate x Debt

- Subtract the value taken away by the expected bankruptcy costs
  - Very hard to estimate, most of the times it is assumed that this effect is incorporated in the cash-flow projections and so it is assumed to be zero

$$EV = \sum_{1}^{n} \frac{FCFF_i}{(1 + Ur_e)^i} + \frac{TV_n}{(1 + Ur_e)^n} + TxD - \pi xPV(BC)$$

  - U_{re} = Unlevered cost of equity
  - T = Tax rate
  - D = Total Debt
  - p = Probability of bankruptcy
  - BC = Bankruptcy costs

Valuation

PE

DCF Valuation Example

- Operational
  - Sales 2016 = 600 (5% growth until 2020)
  - EBITDA margin = 15%
  - D&A = 25
  - Tax rate = 30%

- Capital structure
  - Debt = 300 (interest rate = 5%)
  - It represents 1/3 of the capital
  - Cost of equity (2/3 of capital) = 8.5%

- Main assumptions
  - Net Capex [Capex-DA] is equal to zero and there is no change in working capital
  - Debt is constant
  - Growth after 2020 is equal to 1%
  - Unlevered cost of equity =7.33%

Valuation

PE

DCF Valuation Example

	2016	2017	2018	2019	2020 (TV)
Sales	600.0	630.0	661.5	694.6	729.3
EBITDA margin	15%	15%	15%	15%	15%
EBITDA	**90.0**	**94.5**	**99.2**	**104.2**	**109.4**
D&A	25.0	25.0	25.0	25.0	25.0
EBIT	**65.0**	**69.5**	**74.2**	**79.2**	**84.4**
Interest	15.0	15.0	15.0	15.0	15.0
EBT	**50.0**	**54.5**	**59.2**	**64.2**	**69.4**
Taxes	15.0	16.4	17.8	19.3	20.8
Net Earnings	**35.0**	**38.2**	**41.5**	**44.9**	**48.6**

	2016	2017	2018	2019	2020 (TV)
FCFF	45.5	48.7	52.0	55.4	59.1
FCFE	35.0	38.2	41.5	44.9	48.6
FCFF (TV)				1,012,7*	
FCFE (TV)				647.7**	

*WACC = 8.5*2/3 + 5%*1/3*(1-30%) = 6.83%   **r_e = 8.5%

Valuation

PE

DCF Valuation Example (FCFF and FCFE)

- **Free Cash Flow to Firm**

$$EV = \sum_{1}^{4} \frac{FCFF_i}{(1 + WACC)^i} + \frac{FCFF(TV)_{2019}}{(1 + WACC)^4}$$

$$= \sum_{1}^{4} \frac{FCFF_i}{(1 + 6.83\%)^i} + \frac{1,012.7}{(1 + 6.83\%)^4}$$

$$= 947.8$$

- **Free Cash Flow to Equity**

$$EV = \sum_{1}^{4} \frac{FCFE_i}{(1 + r_e)^i} + \frac{FCFE(TV)_{2019}}{(1 + r_e)^4} + D$$

$$= \sum_{1}^{4} \frac{FCFE_i}{(1 + 8.5\%)^i} + \frac{647.7}{(1 + 8.5\%)^4} + 300$$

$$= 869.9$$

Valuation

PE

DCF Valuation Example
(APV)

- Adjusted Present Value
  - Unlevered cost of equity = 7.33%
  - FCFF (TV) = 59.1 / (7.33% - 1%) = 932.8
  - Annual Tax savings = Interest * Tax rate = 15*30% = 4.5
  - PV (Tax Savings) = 4.5 / 5% = 90

$$EV = \sum_{1}^{4} \frac{FCFF_i}{(1+Ur_e)^i} + \frac{FCFF(TV)_{2019}}{(1+Ur_e)^4} + PV(TaxSavings)$$

$$= \sum_{1}^{4} \frac{FCFF_i}{(1+7.33\%)^i} + \frac{932.8}{(1+7.33\%)^4} + 90 = 961.2$$

Exit and Returns

PE
Exit routes

Trade Sale	IPO	Secondary Buyout
• Sale of the company to a strategic investor • Historical de main exit route • Usually a full exit	• Preferred exit route due reputational effects, but… • It is just a partial exit due to lock up periods agreements • Dimension is essential … • … as well as the development of capital markets	• Sale of the company to another financial investor • Usually a full exit • In the last 10 years became the most used exit • "Exit of last resort?" • Huge advantage: buyer "speaks the same language"

Other alternatives: Recap(italization), Buyback and … Liquidation

Exit and Returns

PE

How to measure returns?

- Cash Multiple
  - Cash returned /Money invested
  - Money multiples do not take account of the time the money is invested

- IRR
  - Do take explicit account of the time money is invested, but can sometimes conflict with money multiples (especially when there are quick distributions through interim dividends or quick flips)

- PME (Public Market Equivalent)
  - Compares the value a LP earns with a PE investment with what he had earned if the capital calls had instead been invested in the market portfolio.
  - Intermediate distributions are also assumed to be reinvested in the market portfolio.

Exit and Returns

PE

How to measure returns?

- Cash Multiple

$$CashMultiple_n = \frac{\sum_1^n CashOutFlow_i}{\sum_1^n CashInFlow_i}$$

- IRR

$$IRR_n: \sum_1^n \frac{CashOutFlow_i}{(1 + IRR_n)^i} - \sum_1^n \frac{CashInFlow_i}{(1 + IRR_n)^i} = 0$$

- PME (Public Market Equivalent)

$$PME_n = \frac{\sum_1^n \frac{CashOutFlow_i}{I_i}}{\sum_1^n \frac{CashInFlow_i}{I_i}}$$, I_i – Reference index return between 0 and i