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# **Valuation and Return Measurement in Private Equity**

## **An Overview**

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This note was written by Michael Prahl, Senior Researcher GPEI, under the supervision of Claudia Zeisberger, Affiliate Professor of Decision Sciences and Academic Co-Director Global Private Equity Initiative (GPEI), both at INSEAD. It is intended to provide an overview of the most common approaches to the issues discussed in this note rather than to present an exhaustive debate of all possible variations applied in practice or academia.

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## Overview (Appendix 1)

The topic of valuation and measurement of return (i.e. investment success) permeates the whole life cycle of private equity (PE). While the valuation part is in many ways similar to other direct investment strategies, the measuring of returns in private equity is a notoriously difficult business. This is mainly due to the absence of an efficient and transparent market for the asset class as investments in private equity are long term, illiquid, opaque (i.e. non-transparent), and the underlying company investments are not priced by a market.

So while theoretically not difficult, the wide range of practical approaches – often designed to produce a specific outcome – tend to be confusing to an outsider or new student of the field. This paper does not attempt to systematically explore all the variations that exist in the market but rather to give an overview of the most common approaches, highlighting their strengths and weaknesses and pointing to major alternative methods. To do so we look at the issues over the life cycle of private equity, as depicted in Appendix 1.

The valuation process starts when an investment is evaluated by a GP<sup>1</sup> and eventually executed by a PE fund; it continues when the investment is held on the books of the fund and regularly reported to the fund's investors (LPs) until it is fully realized at exit. The aggregate of individual investments makes up the gross investment performance of the fund; after taking into account various costs (most prominently management fees) and performance fees (carried interest) one arrives at the net return, which is ultimately the focus of the investor in the fund.

## Step 1: Valuation of Acquisition Targets in PE (Appendix 2)

Throughout the valuation process, PE firms employ the whole range of valuation techniques known in corporate finance. However, some of the more exotic techniques (e.g., real option pricing) are reserved for very specific situations, and are often only complementary in nature.

As owners for only a limited time, PE firms focus very much on what the company will be worth at the time of the expected exit, as opposed to the long-term value that might be realizable for a strategic or long-term buyer. Therefore PE firms have a strong preference for their valuation to be based on multiples of comparable listed companies or transactions ("comparables"). Ideally, their valuation takes long-term historic prices and cycles into account. DCF valuations are rarely used (typically only as a complementary method to see how other parties might value the company) due to the sizeable impact of choosing the appropriate discount rate and the high proportion of residual value relative to the overall company value.

Let's take a closer look at the standard techniques used by both venture capital (VC) and buy-out firms.

VCs face high uncertainty about the future exit value of their potential investments as they typically focus on immature companies that carry substantial operational risk e.g. from R&D or market development. Nonetheless, VCs assume an equity exit value  $n$  years from the investment (based on comparables), yet they discount it back using very high "target return rates" that implicitly take account of the substantial failure rate among early-stage companies.

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1 For a glossary of PE terms please refer to <http://www.altassets.com/private-equity-glossary.html>

VCs will thus arrive at an equity value for the company today, at which point the desired investment amount will determine their stake in the company (Note the difference between pre- and post-money valuation).

Buy-out or later stage PE firms have more data – plus the intrinsic value of a going concern – to work with. At the core of PE valuation stands a detailed business plan incorporating all the value drivers and risks to the best of the firm's knowledge. PE firms also assume an equity exit value  $n$  years from the investment (based on comparables for enterprise value adjusted for net debt), take intermediate cash flows (e.g. from recapitalizations) into account, and plug in a purchase price that is competitive today based on multiples and/ or the competitive bidding situation. Through this process, they arrive at a target return, expressed as a multiple of the money invested and IRR. The GP then forms a view on whether this return is appropriate for the combined company/industry risk (operational risk) as well as the assumed risk from the leverage employed (financial risk). Scenario analysis (all the way to Monte Carlo simulation) is utilized to get a proper understanding of the risk profile for the investment (both downside and upside risk) and to adjust the financing structure (and thereby the financial risk) to the company's operating risk. Finally, the partners decide whether this risk/return profile is in line with the fund strategy and overall target returns.

## **Step 2: Valuation of Portfolio Companies (Appendix 3)**

Ultimately, the performance of a deal or fund is not determined until its final exit or full realization has been achieved. Therefore, every fund will report some unrealized investments while active. The valuation of unrealized investments is one of the most contentious issues in private equity. GPs cannot wait for full realization before reporting since the intermediate value of investments and by extension the fund, will determine the success of the next round of fundraising for the GP in year 3 or 4, and will also be the main input for portfolio allocation and management decisions for the LP.

While historically a “holding at cost” approach was often used until realization or until a third-party transaction allowed a new price discovery, the recent financial crisis has brought the concept of “fair value” to the fore. “Fair value is the price that would be received for an asset or paid for a liability in a transaction between market participants at the reporting date.”<sup>2</sup>

However, a typical private equity investment in unlisted companies has “no market price” in the absence of a liquid market. It therefore requires the GP to estimate a hypothetical price taking into account current market conditions (but ruling out forced/distressed sales due to temporary market imbalances such as the Lehman collapse). Typical valuation methodologies include recent investment (either by the fund itself or a third party), comparable public companies or transaction multiples (with a strong preference for inputs that are less influenced by accounting; so EBITDA rather than net income), DCF, and industry valuation benchmarks. While the GP should exercise judgment to select the most appropriate valuation for a particular investment, preference should be given to those methodologies that draw heavily on market-based measures of risk and return. After arriving at an enterprise value, adjustments need to be made for excess assets or liabilities before deducting any instruments ranking

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2 For an overview of current best practice, refer to the International Private Equity and Venture Capital valuation guidelines (for example: [http://www.afic.asso.fr/Images/Upload/DOCUMENTS/International\\_PE\\_VC\\_Valuation\\_Guidelines\\_2006.pdf](http://www.afic.asso.fr/Images/Upload/DOCUMENTS/International_PE_VC_Valuation_Guidelines_2006.pdf))

senior to the PE fund's equity in the case of an exit or liquidation of the portfolio firm, to arrive at the "fair" equity value.<sup>3</sup>

The approach is different for holdings in public companies, resulting either from direct investment in public companies, PIPEs, or from an exit, e.g. an IPO or an acquisition by a listed entity. In such cases, the market does quote a price for the portfolio company's equity, yet adjustments might still be required for the fund's position. Often these corrections result from holding a large position relative to the free float, which on one hand might make a sale on the open market difficult without impacting the share price (liquidity discount required) but on the other hand might allow for a "control premium", especially when secured by additional rights (preferred dividends, board control etc.). In addition, GPs and LPs may take different views on the market risk, with some preferring to hold investments longer (e.g., hoping to maximize money multiples or because of difficulty accessing this specific company/growth exposure) while others prefer to exit earlier (to maximize IRR and avoid paying 2+20 on public securities returns). The GP may therefore decide at times to distribute shares (distribution in kind), thereby allowing each investor to act according to their preferences. Yet logistical and accounting issues as well as the financial cost connected with this approach make it a less popular option.

After the value of the portfolio company has been established, the GP typically reports two return measurement numbers: multiple of money invested (MoM or MoI) and IRR. The former is fairly straightforward as it expresses the absolute investment return, while the latter is often used in a misleading way, as discussed in the following next section.

### **Step 3: Valuation of Overall Fund Performance (Appendix 3b &4)**

IRR is a widely used return measure in the PE industry. While it has explanatory value, its limitations make it prone to misinterpretation. PE firms can mix and match different IRR methodologies to present their returns in the best possible light (similar to league tables in investment banking).

Firstly, the IRR represents the discount rate that renders the NPV of all future cash flows from a particular investment zero. This typically results in IRRs across several investments or funds or even value-weighted average IRRs to show very different results from the IRR of aggregate cash flows (as shown in the example on Slide 3).

Secondly, IRR relies on the re-investment assumption, meaning that any interim cash flow can and will be re-invested in an investment that produces the same IRR. This has the following effect on a fund's performance: a high positive IRR early in a fund's life makes large cash flows later on irrelevant (known as "locking in the IRR"). However, in the case of these early cash-backs, it is unrealistic to assume that the investor can access an equally attractive re-investment at short notice (if at all). An obvious adjustment – at least in theory, though rarely used in practice – would be to assume an explicit investment and re-investment rate for interim cash flows (modified IRR or M-IRR). While variations exist depending on whether this re-investment rate is used over the whole theoretical life cycle of the fund (typically used for comparison among funds) or only until the fund is closed (isolated M-IRR), the main problem is picking the right rate, which may be linked for instance to cost of

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<sup>3</sup> While analysing the capital structure, the risk of default on debt covenants should be investigated as well.

capital or a broad public market returns benchmark.<sup>4</sup> In any event, an M-IRR brings the sometimes astronomic 100%+ IRRs for some “star” funds down into more reasonable territory, yet conversely props up underperformers, leading to a levelling of the field.

Thirdly, unlike mutual or hedge fund managers who collect all funds from the start, GPs call capital from their investors only if and when needed for an investment. This requires the investor to keep investable funds at hand to service these capital calls. LPs can either do so for the full commitment (or a sufficiently large proportion taking early distributions conservatively into account) or decide to hold other investments that can be liquidated in time to meet the demand (they may also include future capital returns from other more mature PE funds in the calculation). In case the investor decides to provision fully for the capital calls, a very low return rate for these near-cash investments (around the risk-free rate) should be taken into account. Conversely if the investor decides to manage cash flows over a wider portfolio the risk of default needs to be considered.<sup>5</sup>

After a decision on the methodology has been made, LPs have to adjust the reported gross returns to net returns (both for IRR and MoM). Major adjustments come from the management fee, other fees (broken deal expenses, deal fees etc.), fund set-up cost, and of course carried interest, all of which we explore below.

A word of caution: there is no industry standard for the many commercial terms in a PE fund that can impact the return to investors. Such terms are very much the result of a negotiated process between GPs and LPs. After the great financial crisis in 2008, the Institutional Limited Partners Association (ILPA) published its Private Equity Principles,<sup>6</sup> which have the potential to become the industry standard or at least a baseline for the industry going forward.

The following fees impact an LP's net return:

- A management fee is typically charged on committed capital during the investment period (normally 3-5 years from the closing of the fund) and on invested capital thereafter. It ranges from 1.5%-2%+ (less for larger funds/managers with multiple overlapping funds, more for smaller funds or funds with resource-intensive strategies). This fee has undergone much investor scrutiny, yet with little apparent change.
- There have been changes to other fees, principally deal fees, monitoring fees and exit fees (do they accrue 100% to the fund or only partially, and if so to what proportion to the GP?), and restrictions or stronger offset on broken deal expenses (when a deal has reached a high probability with corresponding costs and is abandoned, broken deal costs can be substantial). Fund set-up costs (usually 0.5-1% per fund; again more for smaller funds) are

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4 For more on the application of M-IRR and performance measurement refer to one of many studies by Oliver Gottschalg and Ludovic Phalippou. Other methods not detailed here include Public Market Equivalent (PME), Zero Base Time IRR or Neutrally-Weighted Portfolio IRR.

5 A default on capital calls is severe as it can result in the LP losing all or some interest in the fund (including already drawn down capital) or being forced to sell his interest to another investor at a steep discount. Beyond financial, the reputational damage both with this specific manager and the industry as a whole will be substantial. Nevertheless, during the recent financial crisis which reduced distributions by GPs to a trickle, numerous LPs defaulted while many had to sell other long-term assets at steep discounts to honour their commitments. Alternatively, GPs restructured funds, reduced fund sizes or LPs sold positions (typically with GP consent) to secondary players.

6 First in September 2009, with a revised version 2.0 in January 2011. Please check: <http://ilpa.org>

still normally borne by LPs, yet fees for placement agents are no longer routinely included.

- The much talked about “carried interest”<sup>7</sup> is essentially an economic arrangement entitling the GP to a specified percentage (typically 20%) of the cumulative net profits from the fund after the return of capital to the investors. Beyond capital used for investments, this might include other capital contributions to the fund to pay for organizational and operating expenses and to finance management fees. There are two main structures for carried interest – “all capital first” and “deals realized to date” – the latter is also known as “deal by deal carry”.
  - All capital first: The GP is only entitled to receive carried interest distributions after he returns all capital contributed by the investors (plus a hurdle rate or preferred return). This structure was common in the US in the early days of PE, is still the standard in Europe, and appears to see a revival in the US.
  - Deals realized to date: For each portfolio investment sold, the fund typically distributes proceeds as follows: First, investors receive capital invested in that portfolio firm back. Second, they receive any unreturned capital from prior realised investments (e.g., if written down or sold at a loss). Third, they receive fund expenses including management fees (allocated pro rata to prior investments under a+b). Finally, excess returns (potentially after hurdle rate) are split 80:20. This structure has two main consequences, namely that the GP receives carry earlier, and there is a substantial likelihood that the GP will receive (temporarily) more than its 20% share of profits, i.e. an “over-distribution”. This issue has to be resolved by a “clawback” mechanism from partners, which in turn raises a number of technical issues.<sup>8</sup>

Overall, the example in Appendix 4 highlights the drastic impact all these costs will have on the net return of LPs. A model by Towers Watson<sup>9</sup> estimates that for a traditional fee structure (as described above), standard distribution of investments (equally over the investment period) and realizations, and a gross annual return of 20%, a GP will on average subtract 6.3% in net performance annually (i.e. net return will be 13.7% in this example). Once the investor has a clear idea of the fund’s performance, s/he should consider the riskiness of the fund/manager. Both risk and return need to be benchmarked against the competition and in a wider portfolio context against other asset classes.

Within the LP’s private equity portfolio alone, decisions have to be made on the percentage allocation by sub-strategy (venture capital vs. large, medium or small buy-outs vs. distressed etc.); only then will individual fund managers be chosen.

In line with modern portfolio theory, LPs will attempt to diversify their exposure across products, geographies, vintages and managers, the details of which will provide material for a follow-up paper.

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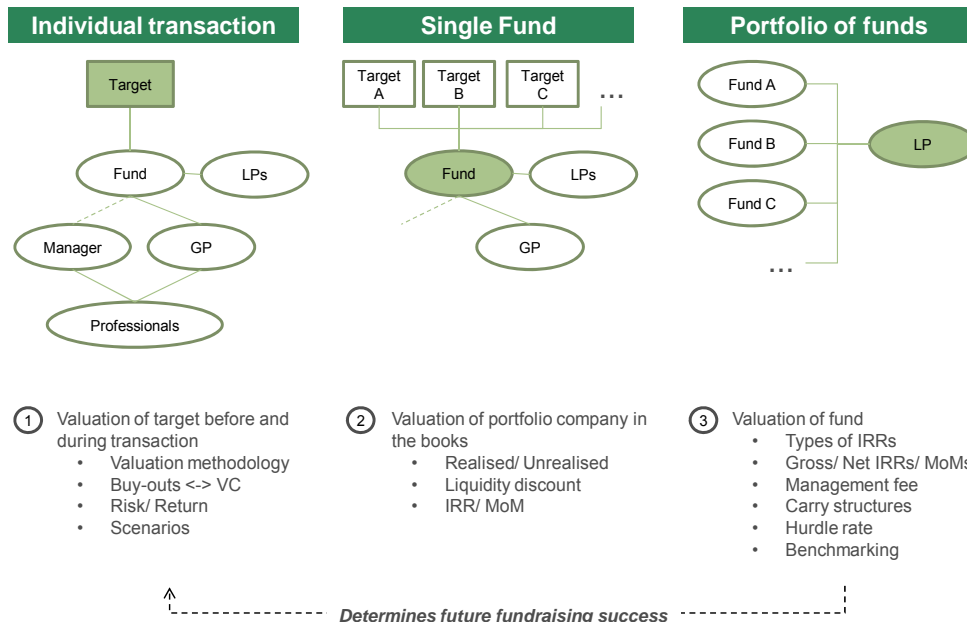
7 For a more detailed overview on carried interest structures and issues around clawback provisions, see Debevoise & Plimpton (2006) *The Private Equity Primer*.

8 Just to mention a few: Who guarantees the clawback, as the GP is typically an asset-less special purpose vehicle (SPV)? If the partners give guarantees, will they be joint or individual? Should the guarantee be secured by cash in escrow; should the clawback be net of taxes; should the clawback happen only at the end of the funds life or in between?

9 Towers Watson (June 2010) *PE Emerging from the Crisis*

## APPENDIX 1

### 1. Valuation and Return Measurement - Overview



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## APPENDIX 2

### 2. Simple Valuation

**VC**

- A VC is looking at an investment of \$2 million in an early stage opportunity today.
- Exit in 5 years at an EBIT multiple of 15x and a Yr 5 EBIT of \$8m ==> Exit Value 15x\$8m = \$120m
- No debt required; no additional equity to be raised
- Cash flow profile:

YEAR	0	1	2	3	4	5
CF	(2)	0	0	0	0	120

- Required IRR 70%**

Discounted Terminal Value  
DTV =  $120 / (1.70)^5 = \$8.45m$

- What % of the company should the VC ask for?**

Equity Percentage =  $\$2m / \$8.45m = 23.66\%$

- Watch out for difference between pre-money (\$6.45m) and post-money valuation (\$8.45m)

**Later stage PE**

- A PE firm has developed a Base Case business plan for a LBO arriving at a moderate (but steady) profit growth
- Comparable / Competitive pricing indicates entry valuation of about 7x EBITDA (LTM)

YEAR	2010	2011	2012	2013	2014	CAGR
EBITDA	180	195	210	225	240	7.5%
Multiple	1	7	7	7	7	
EV	1260				1680	
Debt multiple	4					
Debt paydown		55	70	85	100	
Debt	720	665	595	510	410	
Equity	-540	0	0	0	1270	
IRR	24%					
MoM	2.4					

- Model gives expected return as 24% IRR or 2.4x MoM after 4y

Drivers of Return in LBOs are:

- Profit/ Cash Flow growth – operating risk\*
- Multiple expansion (buy low, sell high)
- Leverage amount and debt pay-down – financial risk\*

Decide whether expected return compensates for operating and financial risk (scenarios analysis) depending on risk profile of company, industry etc. and target return for fund strategy

\* Risk is to be understood as deviation from plan both downside and upside

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## APPENDIX 3

### 3. (Somewhat) Fictional Fund Portfolio

## Fund example

## Background

Great Returns Growth Fund III  
Investment Schedule, September 30, 2010  
\$000's

Company	Industry	Date of Initial Investment	Total \$ Invested	Realised Value	Unrealised Value	Total Value	Total MoM	Gross IRR
Company A	Services	Mar-07	18.5	18.5	0.0	18.5	1.0	0%
Company B	Technology	Apr-07	15.0	60.0	24.0	84.0	5.6	64%
Company C	Consumer Staples	Sep-08	22.1	0.5	0.0	0.5	0.0	-100%
Company D	Cleantech	Jan-09	9.1	0.0	40.9	40.9	4.5	136%
Company E	Industrial	Jun-09	61.5	0.7	82.1	82.8	1.3	25%
Company F	Financial Services	Sep-09	32.2	0.0	45.0	45.0	1.4	36%
Company G	Financial Services	Nov-09	65.9	0.0	65.9	65.9	1.0	0%
<b>TOTAL</b>			<b>224.3</b>	<b>79.7</b>	<b>257.9</b>	<b>337.6</b>	<b>1.5</b>	

Value base	Exit Year	Exit type
Realised	2008	Buyback
Realised/ Contract	2010	Trade sale
Realised	2009	Write off
Quoted	2010	IPO
Multiple	not exited	
3rd party transaction	not exited	
Cost	not exited	

Average	23%
Value weighted Average	12%
Aggregated CFs IRR	33%

## 3b. IRR

- IRRs cannot be averaged
  - Average IRR  $\neq$  IRR of aggregated cash flows
- Re-investment assumption
  - The IRR is predicated on reinvesting CFs back into an investment that produces the same IRR.
  - IRR  $\neq$  effective Rate of Return

### • Other IRR concepts:

- M-IRR, IM-IRR, Zero Base Time IRR or Neutrally-Weighted Portfolio IRR

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## APPENDIX 3b

### 4. Example of Bridge from Gross to Net Returns

Impact of Cost on Net Returns											Comments
Fund Size (m \$): 200 Term (years): 10 Management fee: 2% on commitment during 4y investment periode, 1.5% on committed capital thereafter Carry: 20% of European style "All capital first" structure (hurdle rates and catch up not relevant as fund in example comfortably exceeds hurdle) Deals: 2 per year a \$20m with 4y until exit											• Strongly simplified example!
<b>Year</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	
Invested	-40	-40	-40	-40	-40						①
Realised					80	80	80	80	80		
Management fee	-4	-4	-4	-4	-2.4	-1.8	-1.2	-0.6	0	Sum:	②
Carried interest					0	0	-8	-16	-16	Sum:	③
Gross Return	-40	-40	-40	-40	40	80	80	80	80	Sum (gain):	
										MoM:	2
										IRR:	18.9%
Net CF to investor	-44	-44	-44	-44	37.6	78.2	70.8	63.4	64	Sum (gain):	
										MoM:	④
										IRR:	13.4%

- ① Equal time distribution of investment & distributions
- ② Management fee drops substantially after Y5, building a successful GP franchise requires new fund raised by this time
- ③ First "Carry" flows in Y7! Consider personal discount rate for PE professional vs. annual bonus in banking
- ④ Cost to investor about 5.5% p.a. or 0.39x MoM



## APPENDIX 4

### 5. Example: Blackstone Group\*

#### Impact of Cost on Net Returns

(\$ in millions)										
	Through June 30, 2010				Total Investments					
	Realized / Partially Realized Investments									
	Total Invested Capital <sup>(1)</sup>	MOIC	Gross Annual Rate of Return	Net Annual Rate of Return	Total Invested Capital <sup>(1)</sup>	MOIC	Gross Annual Rate of Return	Net Annual Rate of Return	S&P 500 Annual Return <sup>(2)</sup>	Blackstone Out-Performance
BCP I	\$679	2.6x	28%	19%	\$679	2.6x	28%	19%	13%	6%
BCP II	1,201	2.6x	55%	37%	1,292	2.5x	50%	32%	11%	21%
BCP III	3,402	2.0x	23%	18%	4,026	2.0x	17%	13%	1%	12%
BCOM	1,215	1.8x	27%	24%	2,132	1.3x	14%	7%	1%	6%
BCP IV	4,373	3.1x	79%	62%	7,219	2.4x	53%	39%	2%	37%
Subtotal – Closed	10,870	2.5x	33%	25%	15,349	2.2x	29%	21%	5%	16%
BCP V	1,504	1.5x	23%	15%	17,428	1.0x	0%	-2%	-7%	5%
Total	\$12,374	2.4x	33%	25%	\$32,777	1.5x	26%	16%	0%	16%

- Only meaningful for mature funds

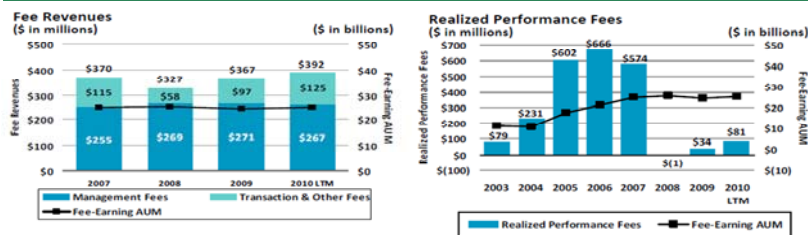
Gap between Gross & Net returns

#### Blackstone PE Profile

##### Blackstone PE Profile

- Fee earning AUM of \$25.2bn (relatively constant last few years)
- Management fees paid on committed capital, not carrying value:
  - Insulated from market cyclicality
  - Transaction fees create "upside"
- 20% performance fee on realized gains
  - \$2.1bn since 2003

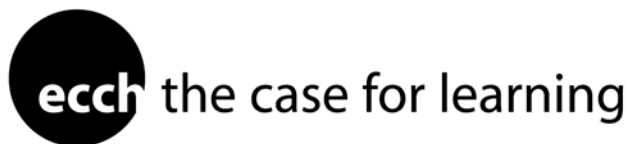
#### Fee Income



\* 2010 Investor Day presentation, Sept. 2010

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