MEETING MATERIALS

HOWARD COUNTY RETIREMENT PLANS

June 25, 2020

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MAY FLASH REPORT

NEPC, LLC

CALENDAR YEAR INDEX PERFORMANCE

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	May	YTD
S&P 500	15.1%	2.1%	16.0%	32.4%	13.7%	1.4%	12.0%	21.8%	-4.4%	31.5%	4.8%	-5.0%
Russell 1000	16.1%	1.5%	16.4%	33.1%	13.2%	0.9%	12.1%	21.7%	-4.8%	31.4%	5.3%	-4.9%
Russell 2000	26.9%	-4.2%	16.3%	38.8%	4.9%	-4.4%	21.3%	14.6%	-11.0%	25.5%	6.5%	-15.9%
Russell 2500	26.7%	-2.5%	17.9%	36.8%	7.1%	-2.9%	17.6%	16.8%	-10.0%	27.8%	7.4%	-13.5%
MSCI EAFE	7.8%	-12.1%	17.3%	22.8%	-4.9%	-0.8%	1.0%	25.0%	-13.8%	22.0%	4.4%	-14.3%
MSCI EM	18.9%	-18.4%	18.2%	-2.6%	-2.2%	-14.9%	11.2%	37.3%	-14.6%	18.4%	0.8%	-16.0%
MSCI ACWI	12.7%	-7.3%	16.1%	22.8%	4.2%	-2.4%	7.9%	24.0%	-9.4%	26.6%	4.3%	-9.2%
Private Equity	19.8%	9.5%	12.6%	22.3%	14.6%	10.4%	10.3%	21.0%	13.1%	11.0%	-	10.4%
BC TIPS	6.3%	13.6%	7.0%	-8.6%	3.6%	-1.4%	4.7%	3.0%	-1.3%	8.4%	0.3%	4.8%
BC Municipal	2.4%	10.7%	6.8%	-2.6%	9.1%	3.3%	0.2%	5.4%	1.3%	7.5%	3.2%	1.2%
BC Muni High Yield	7.8%	9.2%	18.1%	-5.5%	13.8%	1.8%	3.0%	9.7%	4.8%	10.7%	4.1%	-6.4%
BC US Corporate HY	15.1%	5.0%	15.8%	7.4%	2.5%	-4.5%	17.1%	7.5%	-2.1%	14.3%	4.4%	-4.7%
BC US Agg Bond	6.5%	7.8%	4.2%	-2.0%	6.0%	0.5%	2.6%	3.5%	0.0%	8.7%	0.5%	5.5%
BC Global Agg	5.5%	5.6%	4.3%	-2.6%	0.6%	-3.2%	2.1%	7.4%	-1.2%	6.8%	0.4%	2.1%
BC Long Treasuries	9.4%	29.9%	3.6%	-12.7%	25.1%	-1.2%	1.3%	8.5%	-1.8%	14.8%	-1.9%	21.0%
BC US Long Credit	10.7%	17.1%	12.7%	-6.6%	16.4%	-4.6%	10.2%	12.2%	-6.8%	23.4%	1.5%	3.3%
BC US STRIPS 20+ Yr	10.9%	58.5%	3.0%	-21.0%	46.4%	-3.7%	1.4%	13.7%	-4.1%	20.9%	-3.2%	28.5%
JPM GBI-EM Global Div	15.7%	-1.8%	16.8%	-9.0%	-5.7%	-14.9%	9.9%	15.2%	-6.2%	13.5%	5.2%	-7.3%
JPM EMBI Glob Div	12.2%	7.3%	17.4%	-5.3%	7.4%	1.2%	10.2%	10.3%	-4.3%	15.0%	6.1%	-6.1%
CS Hedge Fund	10.9%	-2.5%	7.7%	9.7%	4.1%	-0.7%	1.2%	7.1%	-3.2%	9.3%	-	-6.8%
BBG Commodity	16.8%	-13.3%	-1.1%	-9.5%	-17.0%	-24.7%	11.8%	1.7%	-11.2%	7.7%	4.3%	-21.2%
Alerian MLP	35.9%	13.9%	4.8%	27.6%	4.8%	-32.6%	18.3%	-6.5%	-12.4%	6.6%	9.0%	-30.2%
FTSE NAREIT Equity REITs	28.0%	8.3%	18.1%	2.5%	30.1%	3.2%	8.5%	5.2%	-4.6%	26.0%	0.2%	-21.1%

Source: FactSet, Barclays, Thomson One
*Private Equity return represents calendar year pooled IRR and is subject to a one quarter lag

TRAILING ANNUAL INDEX PERFORMANCE

Equity						
	May-20	YTD	1 YR	3 YR	5 YR	10 YR
MSCI ACWI	4.3%	-9.2%	5.4%	5.2%	5.3%	8.5%
S&P 500	4.8%	-5.0%	12.8%	10.2%	9.9%	13.2%
Russell 1000	5.3%	-4.9%	12.5%	10.1%	9.6%	13.1%
Russell 2000	6.5%	-15.9%	-3.4%	2.0%	3.7%	9.2%
Russell 2500	7.4%	-13.5%	-0.8%	3.9%	4.7%	10.3%
MSCI EAFE	4.4%	-14.3%	-2.8%	-0.4%	0.8%	5.3%
MSCI EM	0.8%	-16.0%	-4.4%	-0.2%	0.9%	2.5%

Credit						
	May-20	YTD	1 YR	3 YR	5 YR	10 YR
BC Global Agg	0.4%	2.1%	5.6%	3.5%	3.3%	2.9%
BC US Agg	0.5%	5.5%	9.4%	5.1%	3.9%	3.9%
BC Credit	1.6%	2.9%	9.5%	5.6%	4.8%	5.3%
BC US HY	4.4%	-4.7%	1.3%	3.0%	4.3%	6.7%
BC Muni	3.2%	1.2%	4.0%	3.8%	3.7%	4.1%
BC Muni HY	4.1%	-6.4%	-2.3%	3.8%	4.2%	5.8%
BC TIPS	0.3%	4.8%	8.0%	4.3%	3.3%	3.6%
BC 20+ STRIPS	-3.2%	28.5%	37.2%	16.6%	11.3%	11.9%
BC Long Treasuries	-1.9%	21.0%	26.9%	12.1%	8.4%	8.2%
BC Long Credit	1.5%	3.3%	14.7%	8.2%	7.2%	7.9%
BC Govt/Credit 1-3 Yr	0.3%	2.7%	4.6%	2.8%	2.1%	1.7%
JPM EMBI Glob Div	6.1%	-6.1%	0.4%	2.4%	4.2%	5.9%
JPM GBI-EM Glob Div	5.2%	-7.3%	2.1%	1.1%	2.0%	1.7%

Real Assets						
	May-20	YTD	1 YR	3 YR	5 YR	10 YR
BBG Commodity	4.3%	-21.2%	-17.1%	-6.9%	-7.8%	-6.0%
Alerian Midstream Index	5.7%	-29.3%	-29.1%	-18.5%	-13.6%	-
FTSE NAREIT Equity REITs	0.2%	-21.1%	-14.6%	-0.3%	2.5%	8.2%

Source: S&P, MSCI, Russell, Barclays, JPM, Alerian, FTSE, FactSet

TOTAL FUND PERFORMANCE SUMMARY (GROSS)

	Market Value ($)	% of Portfolio	Policy %	1 Mo (%)	YTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
								Ending May 31, 2020				
Total Fund Composite	**1,117,210,298**	**100.0**	**100.0**	**3.0**	**-3.0**	**2.6**	**6.6**	**6.6**	**6.4**	**8.1**	**7.2**	**Apr-97**
Policy Index				*2.5*	*-3.0*	*2.3*	*6.1*	*5.7*	*5.5*	*7.5*	*7.1*	*Apr-97*
Allocation Index				*2.2*	*-3.6*	*1.5*	*5.5*	*--*	*--*	*--*	*--*	*Apr-97*
Total US Equity Composite	**250,144,280**	**22.4**	**23.0**	**6.4**	**-6.0**	**3.0**	**10.7**	**9.7**	**9.4**	**13.2**	**8.3**	**Jul-97**
Russell 3000				*5.3*	*-5.6*	*4.1*	*11.5*	*9.5*	*9.2*	*12.8*	*7.7*	*Jul-97*
US Equity Allocation Index				*5.7*	*-5.7*	*3.6*	*10.9*	*9.2*	*8.8*	*12.6*	*--*	*Jul-97*
Total International Equity	**183,040,599**	**16.4**	**17.0**	**5.1**	**-13.2**	**-7.1**	**-1.8**	**1.2**	**2.1**	**5.1**	**4.2**	**Jul-97**
MSCI ACWI ex USA				*3.3*	*-14.8*	*-8.9*	*-3.4*	*-0.2*	*0.8*	*4.4*	*4.0*	*Jul-97*
Total Fixed Income Composite	**345,959,232**	**31.0**	**30.0**	**2.1**	**2.3**	**5.2**	**7.2**	**4.4**	**4.5**	**4.7**	**5.5**	**Jul-97**
Fixed Income Policy Index				*0.5*	*5.5*	*8.1*	*9.4*	*5.1*	*3.9*	*3.9*	*5.4*	*Jul-97*
Total Real Assets Composite	**45,962,969**	**4.1**	**7.0**	**0.0**	**2.1**	**3.6**	**6.1**	**8.6**	**9.0**	**7.3**	**7.1**	**Jul-03**
NCREIF Property Index 1 Qtr. Lag				*0.0*	*1.6*	*4.5*	*6.4*	*6.7*	*8.2*	*10.2*	*8.7*	*Jul-03*
Cash Composite	**16,736,498**	**1.5**		**0.0**	**0.2**	**0.8**	**1.0**	**1.4**	**0.8**	**0.4**	**1.3**	**Dec-03**
91 Day T-Bills				*0.0*	*0.4*	*1.3*	*1.5*	*1.7*	*1.1*	*0.6*	*1.3*	*Dec-03*
Hedge Fund Composite	**120,418,960**	**10.8**	**8.0**	**0.8**	**-2.6**	**-0.8**	**0.3**	**3.2**	**3.0**	**--**	**4.2**	**Jan-11**
HFRI FOF: Conservative Index				*2.0*	*-3.6*	*-2.1*	*-1.4*	*1.3*	*1.0*	*2.3*	*2.0*	*Jan-11*
Private Equity Composite	**154,947,761**	**13.9**	**10.0**	**0.0**	**4.1**	**12.4**	**15.7**	**17.0**	**15.7**	**13.6**	**13.0**	**Jul-08**
C|A US All PE (1 Qtr Lag)				*0.0*	*3.8*	*8.7*	*14.1*	*14.0*	*12.1*	*13.8*	*10.5*	*Jul-08*
Private Debt	**--**	**--**	**5.0**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	
S&P/LSTA Leveraged Loan TR				*3.8*	*-5.7*	*-3.1*	*-2.9*	*1.7*	*2.6*	*4.0*	*--*	

Fiscal year end 6/30.

All history prior to 3/1/2019 was provided by AndCo.

TOTAL FUND PERFORMANCE DETAIL (GROSS)

Ending May 31, 2020

	Market Value ($)	% of Portfolio	Policy %	1 Mo (%)	YTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Total Fund Composite	**1,117,210,298**	**100.0**	**100.0**	**3.0**	**-3.0**	**2.6**	**6.6**	**6.6**	**6.4**	**8.1**	**7.2**	**Apr-97**
Policy Index				*2.5*	*-3.0*	*2.3*	*6.1*	*5.7*	*5.5*	*7.5*	*7.1*	*Apr-97*
Allocation Index				*2.2*	*-3.6*	*1.5*	*5.5*	*--*	*--*	*--*	*--*	*Apr-97*
Total US Equity Composite	**250,144,280**	**22.4**	**23.0**	**6.4**	**-6.0**	**3.0**	**10.7**	**9.7**	**9.4**	**13.2**	**8.3**	**Jul-97**
Russell 3000				*5.3*	*-5.6*	*4.1*	*11.5*	*9.5*	*9.2*	*12.8*	*7.7*	*Jul-97*
US Equity Allocation Index				*5.7*	*-5.7*	*3.6*	*10.9*	*9.2*	*8.8*	*12.6*	*--*	*Jul-97*
Large Cap Composite	**206,928,286**	**18.5**	**19.0**	**5.8**	**-6.1**	**4.0**	**11.9**	**9.7**	**9.0**	**13.1**	**8.3**	**Apr-01**
Russell 1000				*5.3*	*-4.9*	*5.2*	*12.5*	*10.1*	*9.6*	*13.1*	*7.5*	*Apr-01*
LSV Asset Management SMA	54,250,219	4.9		3.8	-21.4	-12.8	-5.8	0.8	3.2	10.3	8.5	May-00
Russell 1000 Value				*3.4*	*-15.7*	*-8.2*	*-1.6*	*2.6*	*4.4*	*9.8*	*6.1*	*May-00*
Westfield Capital Management SMA	86,006,748	7.7		7.8	5.1	17.5	26.3	17.1	13.9	--	16.3	Jul-10
Russell 1000 Growth				*6.7*	*5.2*	*18.1*	*26.3*	*17.2*	*14.5*	*16.1*	*16.9*	*Jul-10*
BlackRock Equity Index Non-Lendable Fund	66,671,319	6.0		4.9	-4.3	--	--	--	--	--	-1.4	Dec-19
S&P 500				*4.8*	*-5.0*	*5.4*	*12.8*	*10.2*	*9.9*	*13.2*	*-2.1*	*Dec-19*
Small/Mid Cap Composite	**43,215,994**	**3.9**	**4.0**	**9.5**	**-5.1**	**0.0**	**7.0**	**9.9**	**10.9**	**13.6**	**11.9**	**Apr-93**
Russell 2500				*7.4*	*-13.5*	*-7.4*	*-0.8*	*3.9*	*4.7*	*10.3*	*9.7*	*Apr-93*
William Blair SMA	15,641,698	1.4		10.9	0.8	6.5	13.8	14.4	12.7	15.7	12.0	Jun-06
Russell 2500 Growth				*10.4*	*-1.6*	*5.3*	*13.5*	*11.6*	*8.7*	*13.3*	*9.4*	*Jun-06*
ICM Small Company - ICSCX	11,668,634	1.0		3.5	-23.9	-17.8	-11.8	-1.2	3.9	8.9	10.6	Apr-93
Russell 2000 Value				*2.9*	*-25.6*	*-19.8*	*-14.7*	*-4.2*	*0.7*	*6.5*	*8.5*	*Apr-93*
Brown Capital Small Company Strategy SMA	15,905,662	1.4		12.9	9.7	11.6	19.3	18.0	17.2	--	18.5	Aug-11
Russell 2000 Growth				*9.4*	*-6.6*	*-0.4*	*7.3*	*7.7*	*6.3*	*11.7*	*10.2*	*Aug-11*

TOTAL FUND PERFORMANCE DETAIL (GROSS)

Ending May 31, 2020

	Market Value ($)	% of Portfolio	Policy %	1 Mo (%)	YTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Total International Equity	**183,040,599**	**16.4**	**17.0**	**5.1**	**-13.2**	**-7.1**	**-1.8**	**1.2**	**2.1**	**5.1**	**4.2**	**Jul-97**
MSCI ACWI ex USA				*3.3*	*-14.8*	*-8.9*	*-3.4*	*-0.2*	*0.8*	*4.4*	*4.0*	*Jul-97*
International Developed Markets Composite	**121,730,775**	**10.9**	**12.0**	**7.0**	**-12.5**	**-4.1**	**1.5**	**1.3**	**1.8**	**6.3**	**2.5**	**Mar-08**
MSCI EAFE				*4.4*	*-14.3*	*-8.3*	*-2.8*	*-0.4*	*0.8*	*5.3*	*1.4*	*Mar-08*
Mondrian International Equity Fund, L.P.	50,536,633	4.5		1.2	-22.3	-15.7	-10.4	-4.1	-1.2	4.6	0.3	Dec-07
MSCI EAFE				*4.4*	*-14.3*	*-8.3*	*-2.8*	*-0.4*	*0.8*	*5.3*	*0.5*	*Dec-07*
Baillie Gifford EAFE Pure K - BGPKX	71,194,142	6.4		11.6	-3.9	6.3	12.0	--	--	--	4.2	May-18
MSCI EAFE				*4.4*	*-14.3*	*-8.3*	*-2.8*	*-0.4*	*0.8*	*5.3*	*-5.2*	*May-18*
International Emerging Markets Composite	**61,309,824**	**5.5**	**5.0**	**1.6**	**-14.6**	**-12.5**	**-7.7**	**1.0**	**2.6**	**2.8**	**4.9**	**Feb-06**
MSCI Emerging Markets				*0.8*	*-16.0*	*-10.0*	*-4.4*	*-0.2*	*0.9*	*2.5*	*3.6*	*Feb-06*
DFA Emerging Markets Value Portfolio Institutional - DFEVX	21,829,859	2.0		0.8	-23.1	-21.3	-17.3	-5.2	-1.3	0.8	3.6	Feb-06
MSCI Emerging Markets				*0.8*	*-16.0*	*-10.0*	*-4.4*	*-0.2*	*0.9*	*2.5*	*3.6*	*Feb-06*
GQG Partners Emerging Markets Equity Fund	39,479,965	3.5		2.0	-9.1	-6.8	-1.4	--	--	--	7.7	Dec-18
MSCI Emerging Markets				*0.8*	*-16.0*	*-10.0*	*-4.4*	*-0.2*	*0.9*	*2.5*	*-2.1*	*Dec-18*
Total Fixed Income Composite	**345,959,232**	**31.0**	**30.0**	**2.1**	**2.3**	**5.2**	**7.2**	**4.4**	**4.5**	**4.7**	**5.5**	**Jul-97**
BBgBarc US Aggregate TR				*0.5*	*5.5*	*8.1*	*9.4*	*5.1*	*3.9*	*3.9*	*5.2*	*Jul-97*
Core Fixed Income Composite	**264,046,795**	**23.6**	**22.0**	**1.2**	**4.7**	**7.4**	**8.7**	**--**	**--**	**--**	**9.8**	**Mar-19**
BBgBarc US Aggregate TR				*0.5*	*5.5*	*8.1*	*9.4*	*5.1*	*3.9*	*3.9*	*10.7*	*Mar-19*
Dodge & Cox SMA	119,345,148	10.7		1.6	4.1	7.2	8.8	5.2	4.6	5.0	4.9	May-10
BBgBarc US Aggregate TR				*0.5*	*5.5*	*8.1*	*9.4*	*5.1*	*3.9*	*3.9*	*4.0*	*May-10*
PIMCO Total Return	120,578,197	10.8		0.9	5.3	7.6	8.8	5.2	4.2	4.4	4.4	May-10
BBgBarc US Aggregate TR				*0.5*	*5.5*	*8.1*	*9.4*	*5.1*	*3.9*	*3.9*	*4.0*	*May-10*
State Street Global Advisors TIPS	24,123,450	2.2		0.3	4.8	7.0	8.0	4.3	3.3	3.5	3.7	Nov-09
BBgBarc US TIPS TR				*0.3*	*4.8*	*7.1*	*8.0*	*4.3*	*3.3*	*3.6*	*3.7*	*Nov-09*
Emerging Markets Debt Composite	**43,831,781**	**3.9**	**4.0**	**7.3**	**-7.5**	**-3.3**	**2.3**	**--**	**--**	**--**	**0.7**	**Mar-19**
JP Morgan GBI EM Global Diversified TR USD				*5.2*	*-7.3*	*-3.3*	*2.1*	*1.1*	*2.0*	*1.7*	*0.7*	*Mar-19*
Colchester Local Markets Debt Fund	43,831,781	3.9		7.3	-7.5	-3.3	2.3	2.0	--	--	6.7	Oct-15
JP Morgan GBI EM Global Diversified TR USD				*5.2*	*-7.3*	*-3.3*	*2.1*	*1.1*	*2.0*	*1.7*	*4.9*	*Oct-15*
Absolute Return Fixed Income	**38,080,655**	**3.4**	**4.0**	**3.2**	**--**	**--**	**--**	**--**	**--**	**--**	**-4.6**	**Mar-20**
3-Month Libor Total Return USD				*0.0*	*0.5*	*1.5*	*1.7*	*2.0*	*1.5*	*0.9*	*0.2*	*Mar-20*
Payden Absolute Return Bond Fund PYAIX	38,080,655	3.4		3.2	--	--	--	--	--	--	-4.6	Mar-20
3-Month Libor Total Return USD				*0.0*	*0.5*	*1.5*	*1.7*	*2.0*	*1.5*	*0.9*	*0.2*	*Mar-20*

TOTAL FUND PERFORMANCE DETAIL (GROSS)

Ending May 31, 2020

	Market Value ($)	% of Portfolio	Policy %	1 Mo (%)	YTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Total Real Assets Composite	**45,962,969**	**4.1**	**7.0**	**0.0**	**2.1**	**3.6**	**6.1**	**8.6**	**9.0**	**7.3**	**7.1**	**Jul-03**
NCREIF Property Index 1 Qtr. Lag				*0.0*	*1.6*	*4.5*	*6.4*	*6.7*	*8.2*	*10.2*	*8.7*	*Jul-03*
Cash Composite	**16,736,498**	**1.5**		**0.0**	**0.2**	**0.8**	**1.0**	**1.4**	**0.8**	**0.4**	**1.3**	**Dec-03**
91 Day T-Bills				*0.0*	*0.4*	*1.3*	*1.5*	*1.7*	*1.1*	*0.6*	*1.3*	*Dec-03*
Hedge Fund Composite	**120,418,960**	**10.8**	**8.0**	**0.8**	**-2.6**	**-0.8**	**0.3**	**3.2**	**3.0**	**--**	**4.2**	**Jan-11**
HFRI FOF: Conservative Index				*2.0*	*-3.6*	*-2.1*	*-1.4*	*1.3*	*1.0*	*2.3*	*2.0*	*Jan-11*
Magnitude International Class A Eligible	60,076,950	5.4		0.0	-1.4	-0.4	0.2	3.3	2.7	--	4.2	Jan-11
HFRI FOF: Conservative Index				*2.0*	*-3.6*	*-2.1*	*-1.4*	*1.3*	*1.0*	*2.3*	*2.0*	*Jan-11*
Blackstone Partners Offshore Fund LTD	60,342,010	5.4		1.7	-3.8	-1.2	0.4	2.9	3.3	--	4.2	Mar-11
HFRI FOF: Conservative Index				*2.0*	*-3.6*	*-2.1*	*-1.4*	*1.3*	*1.0*	*2.3*	*1.9*	*Mar-11*
Private Equity Composite	**154,947,761**	**13.9**	**10.0**	**0.0**	**4.1**	**12.4**	**15.7**	**17.0**	**15.7**	**13.6**	**13.0**	**Jul-08**
C|A US All PE (1 Qtr Lag)				*0.0*	*3.8*	*8.7*	*14.1*	*14.0*	*12.1*	*13.8*	*10.5*	*Jul-08*
Private Debt	**--**	**--**	**5.0**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	
S&P/LSTA Leveraged Loan				*3.8*	*-5.7*	*-3.1*	*-2.9*	*1.7*	*2.6*	*4.0*	*--*	

Magnitude International Class A Eligible is preliminary as of 05/31/2020.

TOTAL FUND PERFORMANCE DETAIL FOOTNOTES

Fiscal year ends 6/30.

Policy index consists of: 19% Russell 1000 / 4% Russell 2500 / 12% MSCI EAFE / 5% MSCI Emerging Markets / 20% BBgBarc US Aggregate TR / 2% BBgBarc US TIPS TR / 4% 3-Month Libor Total Return USD / 4% JP Morgan GBI EM Global Diversified TR USD / 5% S&P/LSTA Leveraged Loan TR / 7.0% NCREIF Property Index 1 Qtr. Lag / 8% HFRI FOF: Conservative Index / 10% Private Equity Composite.

Allocation index consists of: Weighted index of underlying managers to their respective benchmark.

Fixed Income Policy index consists of: 100% BBgBarc US Aggregate TR.

Real Estate, Real Assets and Private Equity investments are valued as of 12/31/2019 and adjusted for capital calls and distributions through 05/31/2020.

All history prior to 3/1/2019 was provided by AndCo.

PRIVATE EQUITY PACING PLAN

INTRODUCTION

- **Each year, NEPC will provide a review of the Howard County's private equity allocation to determine the dollars that should be committed**
  – We consider: existing manager commitments and anticipated calls/distributions, adjustments to the target allocation and the Howard County's forecasted net growth rate
  – An annual review provides an opportunity to make adjustments to any of the above factors and assess the program carefully so as to not over-allocate to illiquid investments

- **The strategy is to maintain an active commitment pace in each vintage year going forward, being mindful of the Howard County's liquidity needs**
  – Fund and manager recommendations are made in the context of the existing portfolio along with NEPC's market views
  – Our goal is to develop a program that will invest in various strategies and achieve returns in excess of public market returns

NEPC RECOMMENDATIONS

- **Based on our review, Howard County should commit approximately $27 million to private equity ("PE") for the upcoming year to achieve the 10% target allocation.**
- **Over the next 2-3 years, we expect Howard County to commit approximately $27 - $35 million per year to hit and maintain the target allocation.**
- **Howard County is forecasted to achieve the 10% target in 2022 based on current inputs**

Note: Pacing recommendations are based on annual forecasts, independent of when the model is run during the calendar year. For example, commitment recommendations based on June 30 data will encompass NEPC recommendations for the time period July 1 of the current year through June 30 of next year.

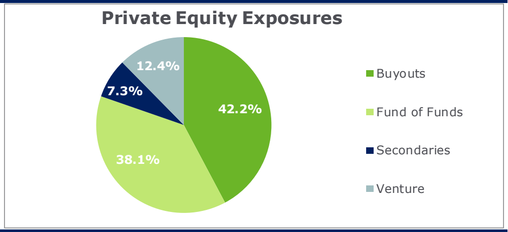
PRIVATE EQUITY

CURRENT STRATEGY AND VINTAGE YEAR EXPOSURES

($ in millions)

Private Equity NAVs and Exposures

Investment Strategy	Current Valuation (NAV)	Capital to be Funded	Total Current Exposure	% of Total Exposure
Buyouts	$67.5	$13.0	$80.5	42.2%
Fund of Funds	$52.9	$19.7	$72.6	38.1%
Secondaries	$10.0	$4.0	$14.0	7.3%
Venture	$20.5	$3.1	$23.6	12.4%
Total	**$151.0**	**$39.7**	**$190.7**	**100.0%**



Private Equity Investments by Vintage Year

Vintage Year	Commitment	Paid In Capital	Capital to be Funded	Cumulative Distributed	Current Valuation (NAV)	Total Value	Net Benefit	Call Ratio	DPI Ratio	TVPI Ratio
2008	$4.0	$3.8	$0.2	$5.2	$4.7	$9.9	$6.0	96%	1.36x	2.57x
2010	$3.0	$2.0	$1.0	$2.6	$0.6	$3.1	$1.2	66%	1.29x	1.58x
2011	$21.0	$19.1	$1.9	$12.7	$24.7	$37.4	$18.3	91%	0.67x	1.96x
2012	$17.6	$14.0	$3.6	$10.2	$10.6	$20.8	$6.8	79%	0.73x	1.49x
2013	$30.0	$29.2	$0.8	$24.5	$28.1	$52.7	$23.3	97%	0.84x	1.80x
2014	$30.0	$26.3	$3.7	$7.8	$39.0	$46.8	$20.4	88%	0.30x	1.78x
2015	$28.0	$18.2	$9.8	$0.6	$23.5	$24.1	$5.9	65%	0.03x	1.33x
2017	$19.4	$13.2	$6.2	$2.1	$15.0	$17.1	$3.9	68%	0.16x	1.29x
2018	$5.0	$1.4	$3.6	$0.0	$1.5	$1.5	$0.1	28%	0.00x	1.04x
2019	$12.3	$3.3	$9.0	$0.0	$3.4	$3.4	$0.1	27%	0.00x	1.04x
Total Private Equity	$170.3	$130.6	$39.7	$65.8	$151.0	$216.8	$86.1	77%	0.50x	1.66x

CURRENT STRATEGY AND VINTAGE YEAR EXPOSURES

Existing Private Equity Investments

Buyouts

Fund Name	Vintage Year	Committed	Paid In Capital	Capital To Be Funded	Cumulative Distributions	Current Valuation (NAV)	Total Value	Net Benefit	DPI Ratio	TVPI Ratio
Schroder Adveq Europe V, L.P.	2012	$7.6	$6.8	$0.8	$4.3	$6.3	$10.6	$3.8	0.63x	1.55x
Aberdeen U.S. Private Equity V, L.P.	2013	$15.0	$14.7	$0.3	$9.3	$14.9	$24.2	$9.5	0.63x	1.64x
HarbourVest 2013 Direct Fund, L.P.	2013	$15.0	$14.5	$0.5	$15.3	$13.2	$28.5	$13.9	1.05x	1.96x
Aberdeen U.S. Private Equity VI, L.P.	2014	$15.0	$13.5	$1.5	$3.9	$15.4	$19.3	$5.8	0.29x	1.43x
Schroder Adveq Europe VI, L.P.	2015	$6.0	$3.9	$2.1	$0.6	$4.7	$5.3	$1.4	0.16x	1.36x
Aberdeen U.S. Private Equity VII, L.P.	2017	$5.0	$2.4	$2.6	$0.5	$2.8	$3.3	$0.9	0.19x	1.35x
HarbourVest Partners Co-Investment Fund IV, L.P.	2017	$9.4	$7.8	$1.6	$1.7	$8.8	$10.5	$2.7	0.21x	1.34x
HarbourVest Partners Co-Investment Fund IV AIV, L.P.	2018	$0.6	$0.3	$0.3	$0.0	$0.2	$0.2	($0.1)	0.00x	0.65x
Schroder Adveq Europe Direct II S.C.S.	2018	$0.9	$0.4	$0.5	$0.0	$0.4	$0.4	$0.0	0.00x	1.03x
Schroder Adveq Europe VII S.C.S.	2018	$3.5	$0.8	$2.7	$0.0	$0.9	$0.9	$0.1	0.00x	1.18x
Total Buyouts		$78.0	$65.0	$13.0	$35.5	$67.5	$103.0	$37.8	0.55x	1.58x

Fund of Funds

Fund Name	Vintage Year	Committed	Paid In Capital	Capital To Be Funded	Cumulative Distributions	Current Valuation (NAV)	Total Value	Net Benefit	DPI Ratio	TVPI Ratio
Crown Asia-Pacific Private Equity II PLC	2011	$14.0	$12.8	$1.2	$6.3	$15.2	$21.5	$8.7	0.49x	1.68x
Greenspring Global Partners V-B, L.P.	2011	$7.0	$6.4	$0.6	$6.4	$9.5	$16.0	$9.6	1.01x	2.51x
Crown Asia-Pacific Private Equity III PLC	2014	$5.0	$3.8	$1.2	$0.6	$6.0	$6.5	$2.7	0.15x	1.70x
57 Stars Global Opportunity Fund 4 (US), L.P.	2015	$7.0	$5.5	$1.5	$0.0	$6.5	$6.5	$1.1	0.00x	1.20x
NB Crossroads Fund XXI, L.P.	2015	$15.0	$8.9	$6.2	$0.0	$12.3	$12.3	$3.4	0.00x	1.39x
Greenspring Global Partners IX-B, L.P.	2019	$7.3	$1.7	$5.5	$0.0	$1.8	$1.8	$0.0	0.00x	1.02x
NB Crossroads Fund XXII, L.P.	2019	$5.0	$1.6	$3.5	$0.0	$1.6	$1.6	$0.1	0.00x	1.06x
Total Fund of Funds		$60.3	$40.6	$19.7	$13.3	$52.9	$66.2	$25.7	0.33x	1.63x

Secondaries

Fund Name	Vintage Year	Committed	Capital	Funded	Distributions	Valuation	Total Value	Net Benefit	DPI Ratio	TVPI Ratio
Pantheon Global Secondary Fund IV, L.P.	2010	$3.0	$2.0	$1.0	$2.6	$0.6	$3.1	$1.2	1.29x	1.58x
Crown Global Secondaries III PLC, L.P.	2012	$10.0	$7.2	$2.9	$6.0	$4.3	$10.2	$3.1	0.83x	1.43x
Greenspring Secondaries Fund I, L.P.	2014	$2.5	$2.4	$0.1	$1.3	$5.2	$6.5	$4.1	0.53x	2.69x
Total Secondaries		$15.5	$11.5	$4.0	$9.8	$10.0	$19.9	$8.3	0.85x	1.72x

Venture

Fund Name	Vintage Year	Committed	Capital	Funded	Distributions	Valuation	Total Value	Net Benefit	DPI Ratio	TVPI Ratio
Greenspring Global Partners IV, L.P.	2008	$4.00	$3.84	$0.16	$5.21	$4.66	$9.87	$5.99	1.36x	2.57x
Greenspring Global Partners VI, L.P.	2014	$7.50	$6.60	$0.90	$2.03	$12.47	$14.49	$7.89	0.31x	2.20x
Greenspring Global Partners VIII-B, L.P.	2017	$5.00	$3.00	$2.00	$0.00	$3.39	$3.39	$0.39	0.00x	1.13x
Total Venture		$16.50	$13.44	$3.06	$7.24	$20.52	$27.75	$14.28	0.54x	2.07x

MODEL INPUTS AND ASSUMPTIONS

($ in millions)

General Portfolio Assumptions

Total Portfolio Assets	$1,152.0
Total Private Equity Assets	$151.0
Private Equity Capital to be Funded	$39.7
Total Private Equity Exposure	$190.7
Total Private Equity Assets / Total Portfolio Assets	13.1%
Total Private Equity Exposure / Total Portfolio Assets	16.5%
Target Private Equity Allocation % (Current Target)	10.0%

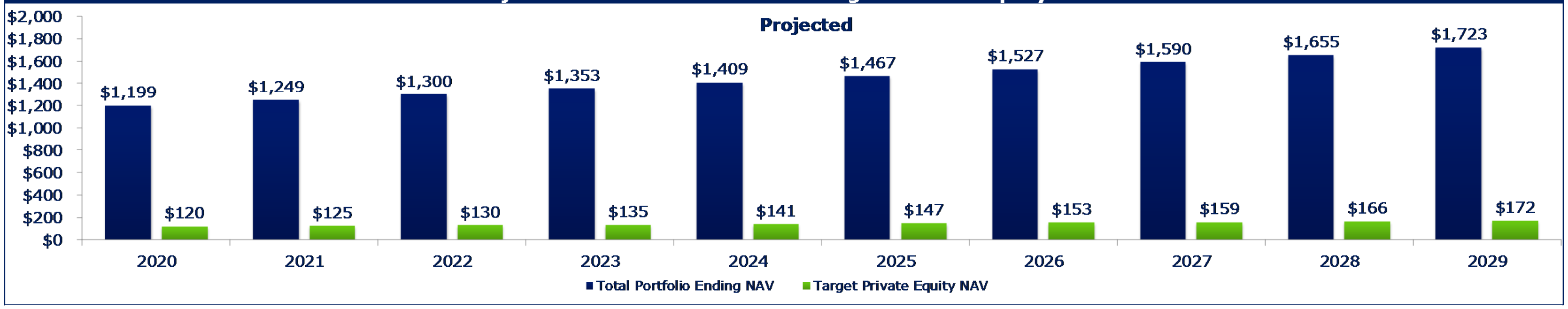
Portfolio Return Assumptions	2020	2021	2022
Net Growth Rate %	4.11%	4.11%	4.11%

Portfolio Data as of:	12/31/2019
Private Equity Data as of:	9/30/2019

Total Projected Portfolio Assets

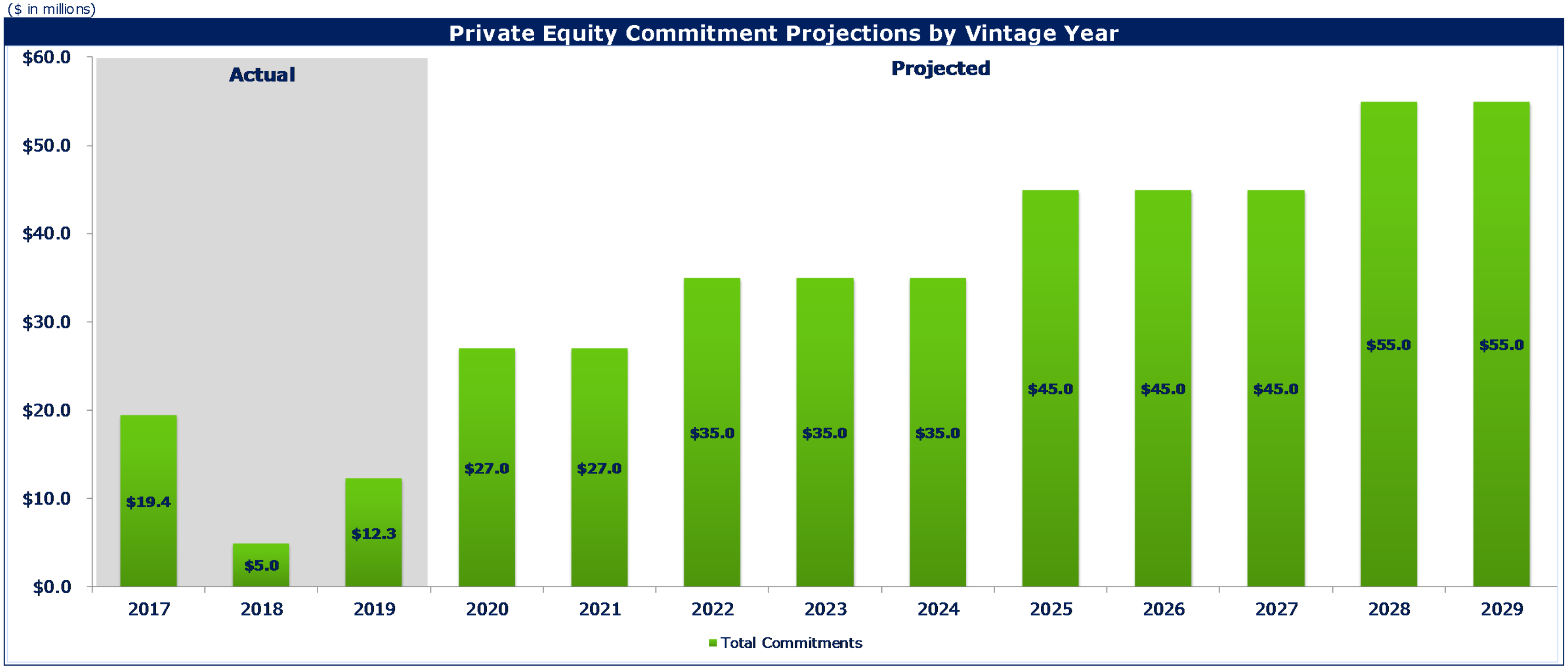
	Projected									
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Total Portfolio Net Growth Rate	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%
Total Portfolio Beginning NAV	$1,152.0	$1,199.3	$1,248.6	$1,300.0	$1,353.4	$1,409.0	$1,466.9	$1,527.2	$1,590.0	$1,655.3
Yearly Net Growth	$47.3	$49.3	$51.3	$53.4	$55.6	$57.9	$60.3	$62.8	$65.3	$68.0
Total Portfolio Ending NAV	$1,199.3	$1,248.6	$1,300.0	$1,353.4	$1,409.0	$1,466.9	$1,527.2	$1,590.0	$1,655.3	$1,723.4
Target Private Equity Allocation	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Target Private Equity NAV	$119.9	$124.9	$130.0	$135.3	$140.9	$146.7	$152.7	$159.0	$165.5	$172.3

Total Projected Portfolio Assets and Target Private Equity Allocation



PROJECTED COMMITMENT PACE

($ in millions)



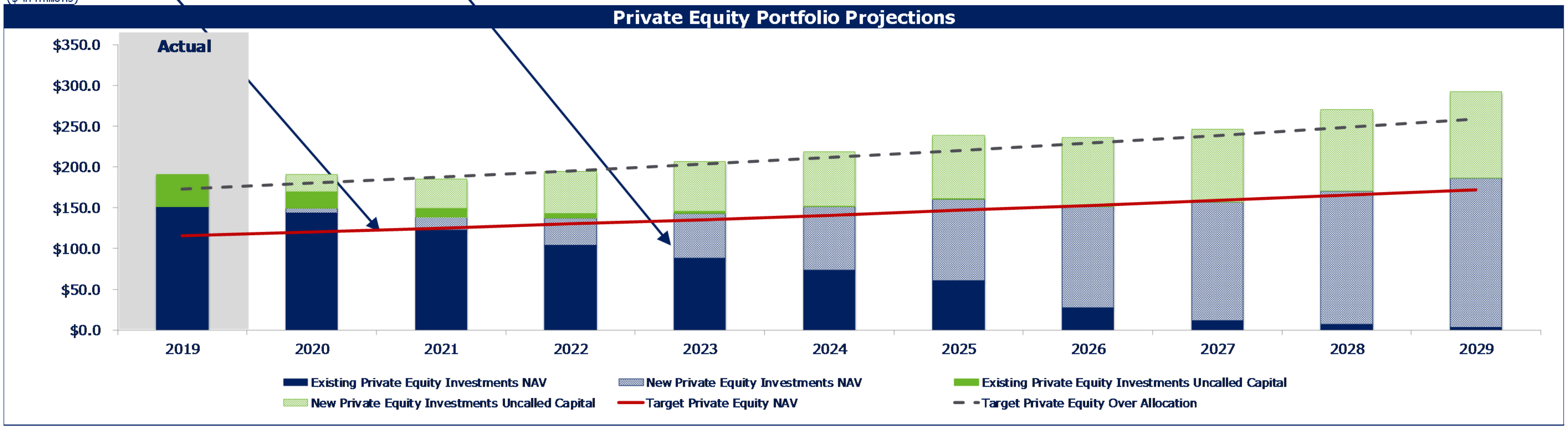
Private Equity Commitments by Vintage Year

	Actual			More Certain			Less Certain						
Year	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
Total Commitments	$19.4	$5.0	$12.3	$27.0	$27.0	$35.0	$35.0	$35.0	$45.0	$45.0	$45.0	$55.0	$55.0

ASSET LEVEL PROJECTIONS

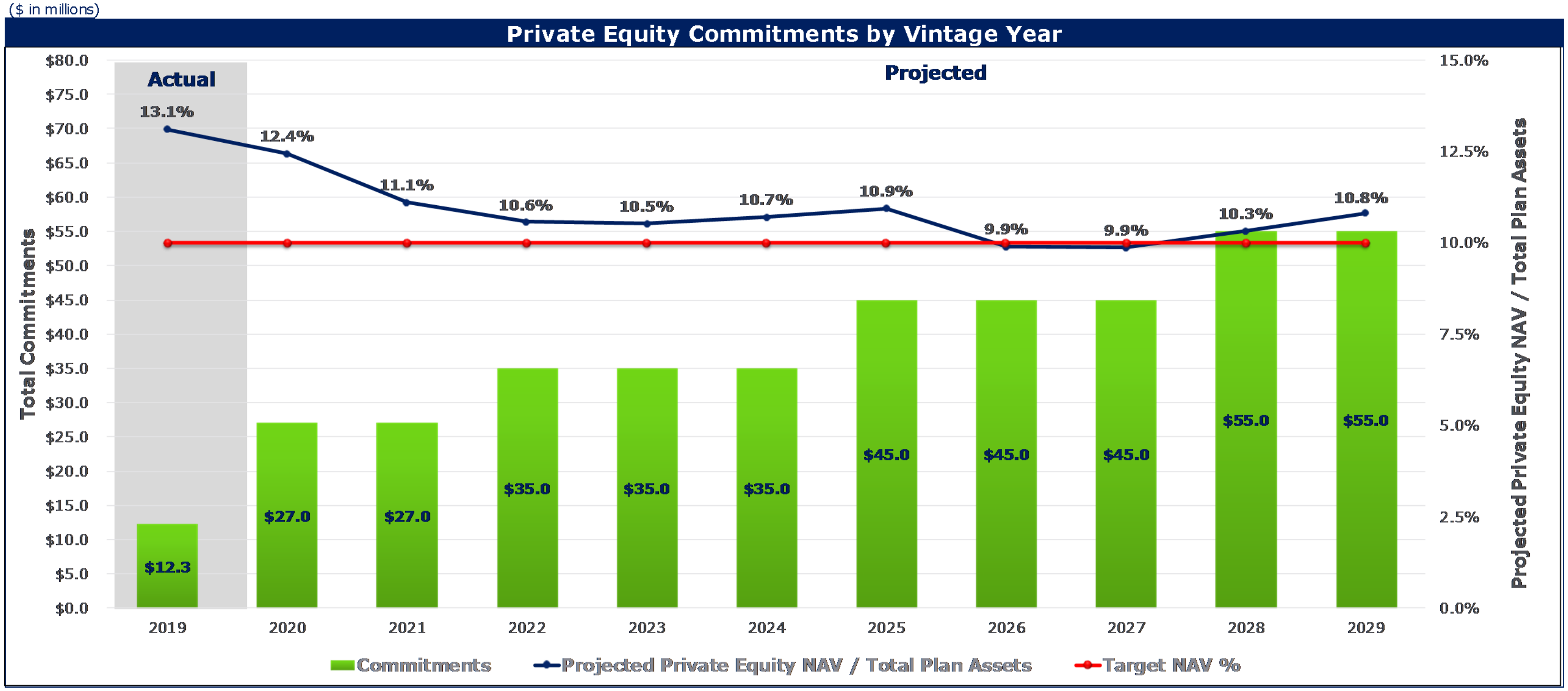
- **Red line** is the **10%** target private equity allocation based on projected plan total NAV; **Black dashed line** is the 1.5x over-commitment pace.
- Goal is to keep the private equity NAV (**blue bar**) plus uncalled capital commitments (**green bar**), between red line and black dashed line while aligning the blue bar with the red target line.

($ in millions)



		Projected									
Year	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
Private Equity NAV	$151.0	$149.2	$138.6	$137.5	$142.5	$150.7	$160.5	$151.1	$156.8	$170.9	$186.3
Uncalled Capital Commitments	$39.7	$41.5	$47.0	$57.3	$63.8	$67.5	$78.1	$85.0	$89.2	$99.3	$106.1
Private Equity NAV + Uncalled Capital Commitments	$190.7	$190.7	$185.6	$194.8	$206.3	$218.2	$238.6	$236.1	$246.0	$270.2	$292.3
Target Private Equity NAV	$115.2	$119.9	$124.9	$130.0	$135.3	$140.9	$146.7	$152.7	$159.0	$165.5	$172.3
Over-Commitment Pace	1.5x	1.5x	1.5x	1.5x	1.5x	1.5x	1.5x	1.5x	1.5x	1.5x	1.5x
Target Private Equity Over Allocation	$172.8	$179.9	$187.3	$195.0	$203.0	$211.4	$220.0	$229.1	$238.5	$248.3	$258.5
Private Equity Percent of Total Portfolio Assets											
Private Equity NAV	13.1%	12.4%	11.1%	10.6%	10.5%	10.7%	10.9%	9.9%	9.9%	10.3%	10.8%
Private Equity Uncalled Capital Commitments	3.4%	3.5%	3.8%	4.4%	4.7%	4.8%	5.3%	5.6%	5.6%	6.0%	6.2%
NAV + Uncalled Capital Commitments	16.5%	15.9%	14.9%	15.0%	15.2%	15.5%	16.3%	15.5%	15.5%	16.3%	17.0%
Target Private Equity Allocation	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%

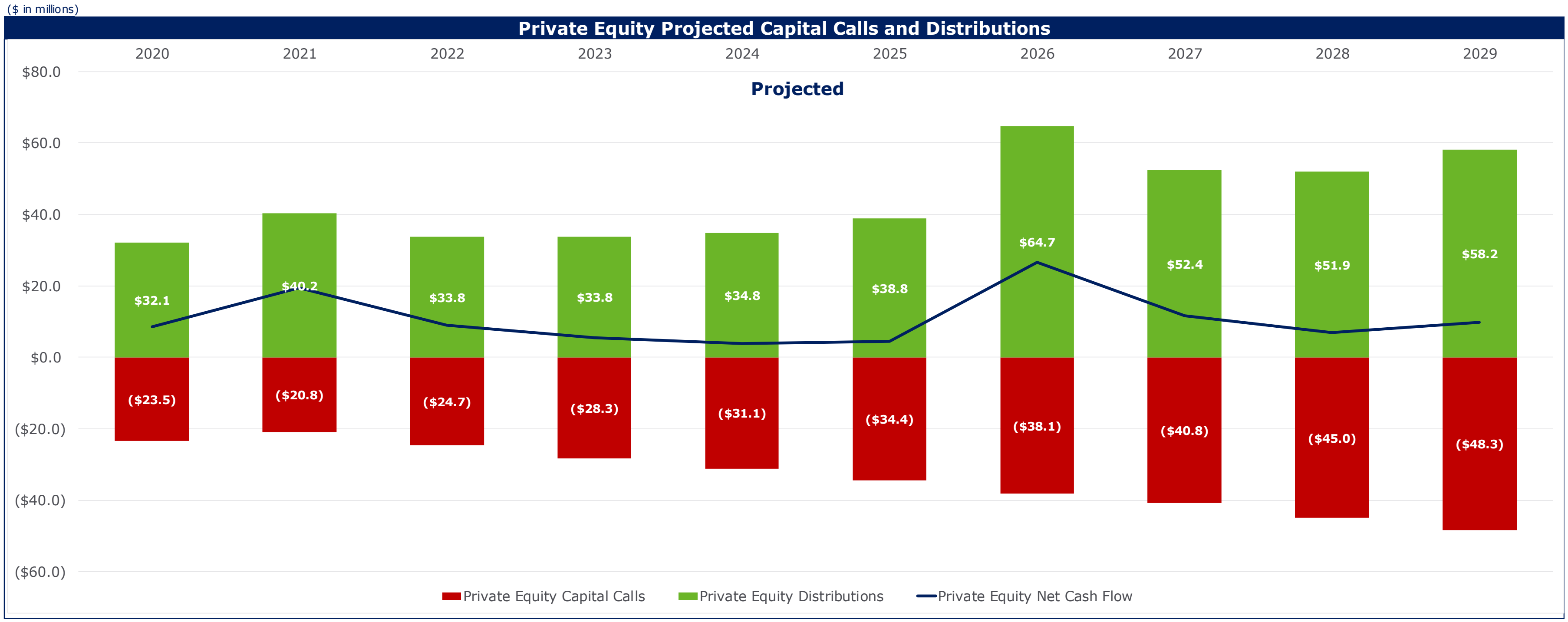
COMMITMENTS & PROJECTIONS



Private Equity Commitments by Vintage Year

	Actual	More Certain			Less Certain						
Year	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
Total Commitments	$12.3	$27.0	$27.0	$35.0	$35.0	$35.0	$45.0	$45.0	$45.0	$55.0	$55.0
Target Private Equity Allocation (%)	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Projected Private Equity NAV / Total Plan Assets	13.1%	12.4%	11.1%	10.6%	10.5%	10.7%	10.9%	9.9%	9.9%	10.3%	10.8%

PROJECTED CASH FLOWS



	Projected									
Year	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
Private Equity Capital Calls	($23.5)	($20.8)	($24.7)	($28.3)	($31.1)	($34.4)	($38.1)	($40.8)	($45.0)	($48.3)
Private Equity Distributions	$32.1	$40.2	$33.8	$33.8	$34.8	$38.8	$64.7	$52.4	$51.9	$58.2
Private Equity Net Cash Flow	$8.7	$19.4	$9.1	$5.5	$3.8	$4.4	$26.5	$11.6	$6.9	$9.9

PACING PLAN DISCLAIMERS

- **NEPC's private markets pacing analysis projects a potential level of future assets and cash flows for a single scenario based on a series of assumptions. This analysis is intended to help estimate future exposure levels. It is not a guarantee of future cash flows, appreciation or returns.**
- **The timing and amounts of projected future cash flows and market values of investments could vary significantly from the amounts projected in this pacing analysis due to manager-specific and industry-wide macroeconomic factors.**
- **Estimates of projected cash flows and market values for existing private markets commitments were made at the Fund level and do not incorporate any underlying portfolio company projections or analysis.**
- **The opinions presented herein represent the good faith views of NEPC as of the date of this report and are subject to change at any time.**
- **Data used to prepare this report was obtained directly from the investment managers and other third parties. While NEPC has exercised reasonable professional care in preparing this report, we cannot guarantee the accuracy of all source information contained within.**
- **This report may contain confidential or proprietary information and is intended only for the designated recipient(s). If you are not a designated recipient, you may not copy or distribute this document.**

ALTERNATIVE INVESTMENT DISCLOSURES

It is important that investors understand the following characteristics of non-traditional investment strategies including hedge funds and private equity:

1. **Performance can be volatile and investors could lose all or a substantial portion of their investment**
2. **Leverage and other speculative practices may increase the risk of loss**
3. **Past performance may be revised due to the revaluation of investments**
4. **These investments can be illiquid, and investors may be subject to lock-ups or lengthy redemption terms**
5. **A secondary market may not be available for all funds, and any sales that occur may take place at a discount to value**
6. **These funds are not subject to the same regulatory requirements as registered investment vehicles**
7. **Managers may not be required to provide periodic pricing or valuation information to investors**
8. **These funds may have complex tax structures and delays in distributing important tax information**
9. **These funds often charge high fees**
10. **Investment agreements often give the manager authority to trade in securities, markets or currencies that are not within the manager's realm of expertise or contemplated investment strategy**

PRIVATE MARKETS APPENDIX

NEPC, LLC

PRIVATE EQUITY THOUGHTS & ACTIONS

Private Markets Thoughts

- **Fundraising has continued to be robust and efficient—and early**
- **Valuations remain at cyclical highs across all geographies and strategies**
- **Risk taking behavior is indicative of a market peak; debt levels and equity contributions are at historical highs on adjusted EBITDA**
- **Late cycle vintages exhibit lower illiquidity premia and less alpha**

Private Markets Actions

- **Continue to deploy capital thoughtfully in private equity, with an eye toward preserving liquidity, as returns compress in late cycle vintages**
- **Seek managers with industry expertise and operational improvement capabilities, which are more reliable return drivers than multiple expansion and de-leveraging**
- **In developed markets, seek long term growth by investing in transformative innovations and technologies**
- **Seek near term growth by building exposure to Asia**

VIEW POINT SUMMARY

Private Equity

US Early Stage Venture	Europe Early Stage Venture	Asia Pacific Early Stage Venture	US Large/Mega Buyout	Europe Large/Mega Buyout	Asia Pacific Buyout
US Late Stage Venture	Europe Late Stage Venture	Asia Pacific Mid/Late Stage Venture	US Small/Mid Buyout	Europe Small/Mid Buyout	Secondaries
US Growth Equity	Europe Growth Equity	Asia Pacific Growth Equity	US Special Situations	Europe Special Situations	Co-Investment Funds

Green: Favorable
Gray: Neutral
Red: Negative

STRATEGY IMPLEMENTATION: PRIVATE EQUITY

Strategy		Outlook	Commentary
North American Venture and Growth Equity	Early Stage	Positive	Target managers with broad and relevant networks and expertise. Due to the lack of scalability at this stage, focus on appropriately sized funds (<$500 million).
	Late Stage	Negative	With valuations still high, target managers that have a sector-focused strategy whose value-add goes beyond that of a capital provider.
	Growth Equity	Neutral	Seek managers that can consistently execute a strategy of scaling and professionalizing previously bootstrapped companies. Alternatively, target managers that are well equipped to fuel continued growth in VC-backed companies.
European Venture and Growth Equity	Early Stage	Positive	Target managers with broad and relevant networks and expertise. Due to the lack of scalability at this stage, focus on appropriately sized funds (<€400 million).
	Late Stage	Neutral	Target managers with strong networks, ample deal flow and demonstrated value-add, given that these managers may be competing with US name brands for deals.
	Growth Equity	Neutral	Seek managers that can consistently execute a strategy of scaling and professionalizing previously bootstrapped companies. Alternatively, target managers that are well equipped to fuel continued growth in VC-backed companies.
Asia Pacific Venture	Early Stage	Positive	In Asia, target managers with broad and relevant networks and expertise. Due to the lack of scalability at this stage, focus on appropriately sized funds (<$500 million).
	Mid/Late Stage	Neutral	With Asian valuations high, target managers that have a focused strategy whose value-add goes beyond that of a capital provider. Local managers focused outside the competitive Tier I and II cities will likely have local advantage. In the latest stages global players will have an ability to provided geographic diversification along with a global scale perspective.

STRATEGY IMPLEMENTATION: PRIVATE EQUITY

Strategy		Outlook	Commentary
North American Buyout and Special Situations	Mega & Large	Negative	This end of the market is the most efficient and correlated with public markets; look for sector specialists and groups with a proven edge to improve operations and increase profitability.
	Mid & Small	Neutral	While multiples are still elevated at this end of the market, there is enough of a gap that multiple expansion is still possible. With higher manager dispersion in this part of the market, look for experienced teams with a demonstrable edge in sourcing.
	Special Situations	Positive	While this area has the greatest opportunity for inefficiencies, choosing managers with good asset selection and the ability to turn around underperforming businesses is paramount.
European Buyout and Special Situations	Mega & Large	Negative	In these relatively efficient markets, look for managers with some competitive advantage/angle in their deals; sector specialists and managers with the ability to deal with large complex deals.
	Mid & Small	Neutral	Seek managers that can source smaller founder-owned companies, or local GPs that can take local/regional champions and turn them into Pan-European leaders.
	Special Situations	Positive	Evaluate opportunistic special situations managers with flexible and nimble approaches able to capitalize on market, industry and/or specific company volatility; outperformers skew to smaller fund sizes.
Asia Pacific Buyout and Growth	Buyout	Positive	China should be central to growth investing Asia-Pacific given the size of the country and the consumption spending of its rising middle class. Invest with groups that have strong local reputations and networks with local entrepreneurs.
	Growth	Positive	Buyout capital is a good source of transition capital for family-owned businesses and industries undergoing rapid structural changes. Opportunities differ by country. Invest with managers with strong sourcing channels and ability to drive value creation within their portfolios.

VENTURE AND GROWTH EQUITY

NEPC, LLC

NORTH AMERICAN VENTURE & GROWTH EQUITY

General Market Thoughts

- **Early Stage Venture Capital**
  - Valuations remain elevated. However, average company age at funding is growing too, making price more commensurate with maturation
- **Mid/Late Stage Venture Capital**
  - Valuations continue to climb as ample capital pursues deals. At later stages capital becomes global, resulting in hype and competition for the best companies from venture capitalists as well as other investors (e.g. mutual funds, hedge funds, strategic corporates, etc.)
- **Growth Equity**
  - Differentiated managers are hard to find among generalists (multi-sector focused), and established firms continue to raise larger funds. However, sector focused firms are increasingly attractive due to expertise and tempered fund sizes

Implementation Views

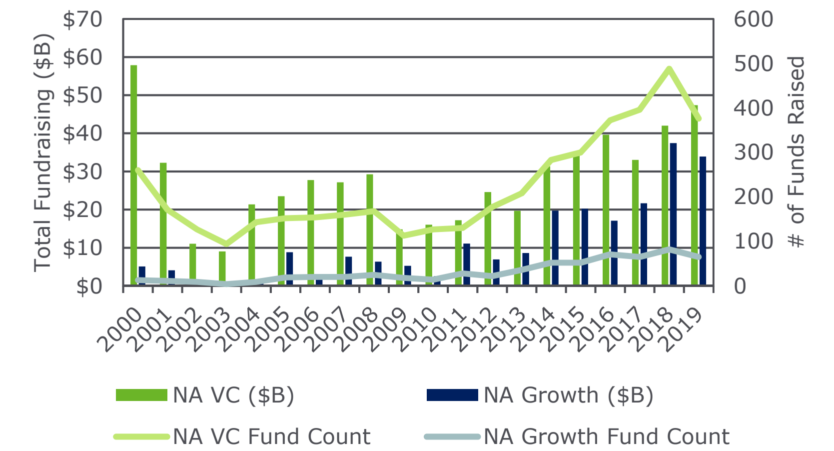
Strategy	Outlook	Commentary
Early Stage Venture Capital	Positive	Target managers with broad and relevant networks and expertise. Due to the lack of scalability at this stage, focus on appropriately sized funds (<$500 million)
Late Stage Venture Capital	Negative	With valuations still high, target managers that have a sector-focused strategy whose value-add goes beyond that of a capital provider
Growth Equity	Neutral	Seek managers that can consistently execute a strategy of scaling and professionalizing previously bootstrapped companies. Alternatively, target managers that are well equipped to fuel continued growth in VC-backed companies

NORTH AMERICAN VENTURE AND GROWTH: FUNDRAISING & RETURNS

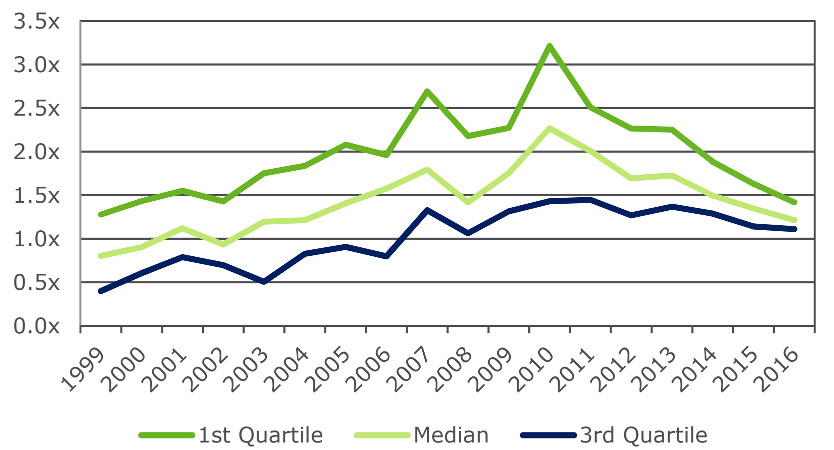
Comments

- **VC and growth equity fundraising highest in recent years**
  - VC still below peak (2000)
- **Venture IRRs have rebounded to healthy levels after a depressed period in the mid-2000's**
  - Recent top quartile vintages have continuously generated IRRs over 20%
- **Recent TVPI's are strong**
  - DPIs are beginning to strengthen as long awaited exits are increasing in frequency
- **Spreads between 1st and median highlights importance of 1st quartile manager selection**

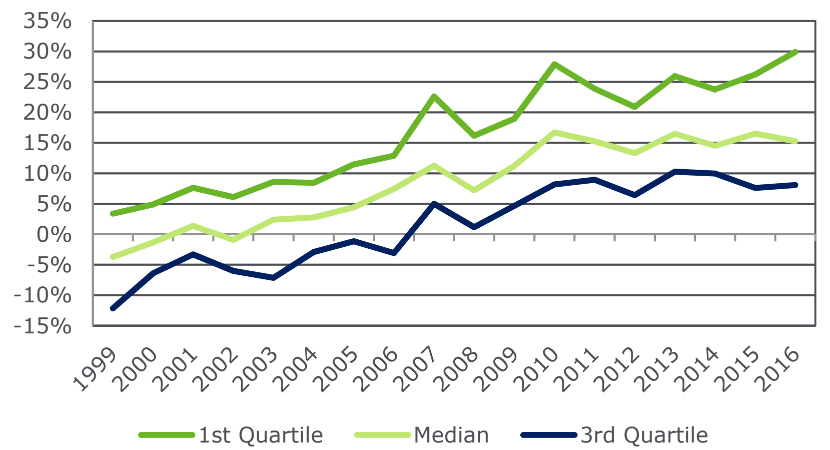
Fundraising



Net TVPI



Net IRR



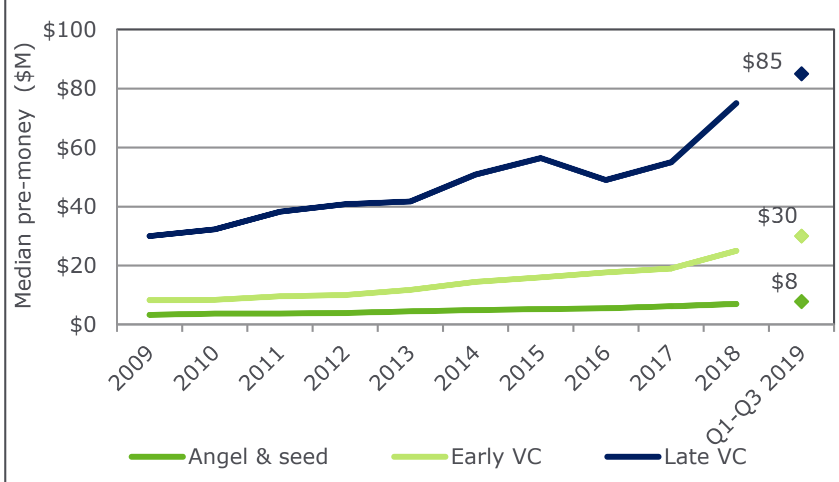
Source: Thomson One/C|A as of 06/30/2019. Performance for 2017-2019 vintage funds not yet meaningful
Fundraising data from Preqin as of 11/30/2019

NORTH AMERICAN VENTURE AND GROWTH TRANSACTION ENVIRONMENT

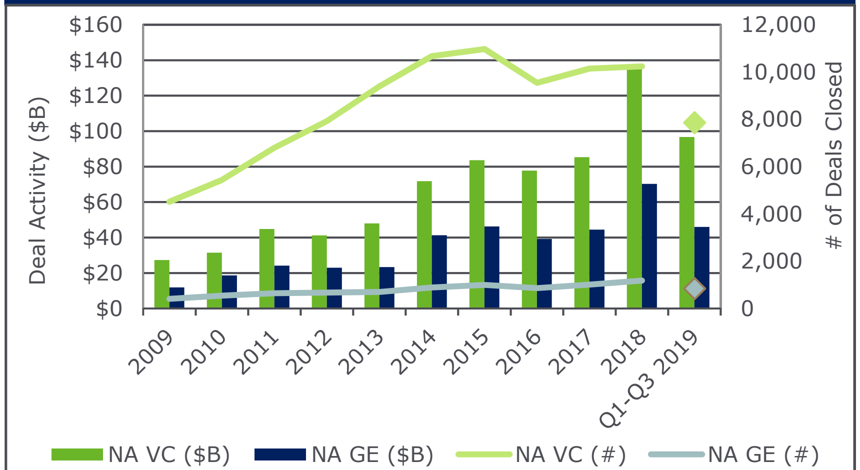
Comments

- **Valuations continue trending upwards**
- **Managers are being selective**
  - 2019 deal levels will surpass recent averages on a dollar basis
  - The number of deals looks to remain near average thus more capital is pursuing the same number of deals
- **2019 was a blockbuster year for exits thanks to many high profile liquidity events including a number of large IPOs**

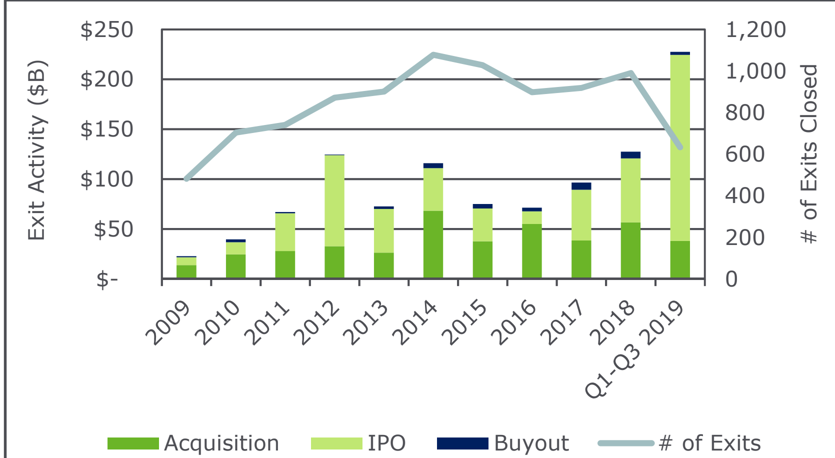
Valuations



Deal Activity



Exit Activity



Source: Pitchbook as of 9/30/2019

EUROPEAN VENTURE & GROWTH EQUITY

General Market Thoughts

- **Early Stage Venture Capital**
  - Tech hubs are continuing to develop as is the VC ecosystem. Competition remains low, especially relative to the US
- **Late Stage Venture Capital**
  - Valuations remain lower at these stages, but have been climbing as a result of increased US VC participation and attention. At later stages capital becomes global resulting in hype and competition for the best companies from venture capitalists as well as other investors (e.g. mutual funds, hedge funds, strategic corporates, etc.)
- **Growth Equity**
  - Differentiated managers are hard to find among generalist (multi-sector focused), and established firms continue to raise larger funds. However, sector focused firms are increasingly attractive due to expertise and tempered fund sizes

Implementation Views

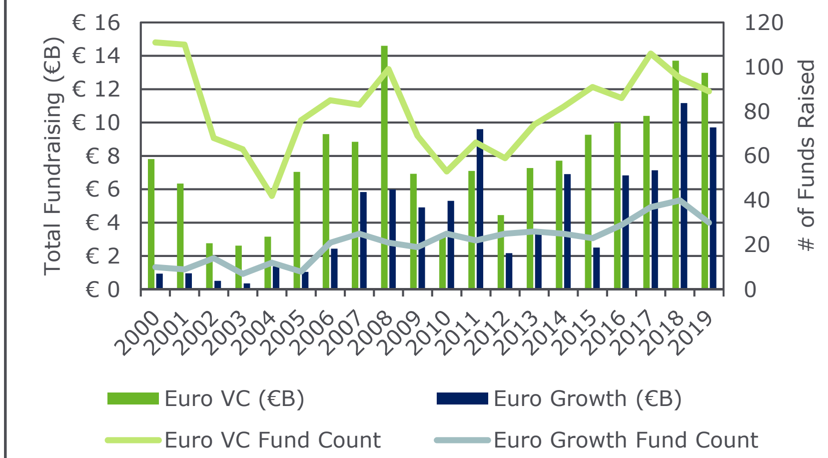
Strategy	Outlook	Commentary
Early Stage Venture Capital	Positive	Target managers with broad and relevant networks and expertise. Due to the lack of scalability at this stage, focus on appropriately sized funds (<€400 million)
Late Stage Venture Capital	Neutral	Target managers with strong networks, ample deal flow and demonstrated value-add, given that these managers may be competing with US name brands for deals
Growth Equity	Neutral	Seek managers that can consistently execute a strategy of scaling and professionalizing previously bootstrapped companies. Alternatively, target managers that are well equipped to fuel continued growth in VC-backed companies

EUROPEAN VENTURE AND GROWTH EQUITY: FUNDRAISING & RETURNS

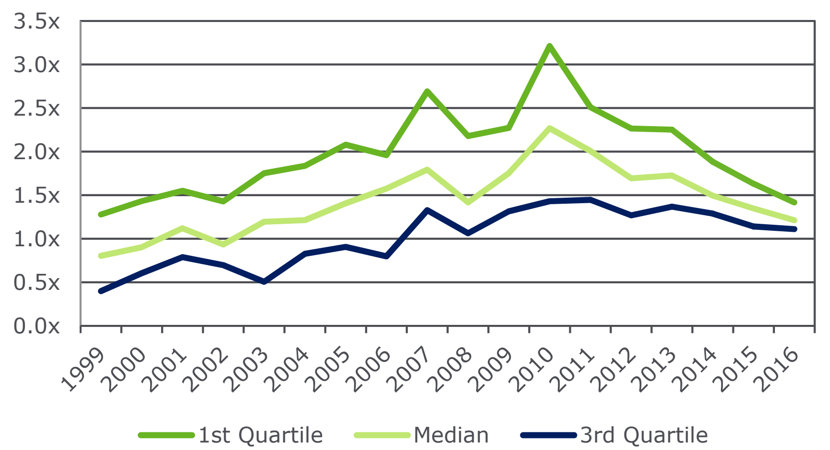
Comments

- **VC and growth equity fundraising highest in recent years**
- **Venture IRRs have rebounded to healthy levels after a depressed period in the mid-2000's**
  - Recent top quartile vintages have continuously generated IRRs over 20%
- **Recent TVPI's are strong**
  - DPIs are beginning to strengthen as long awaited exits are increasing in frequency
- **Spreads between 1st and median highlights importance of 1st quartile manager selection**

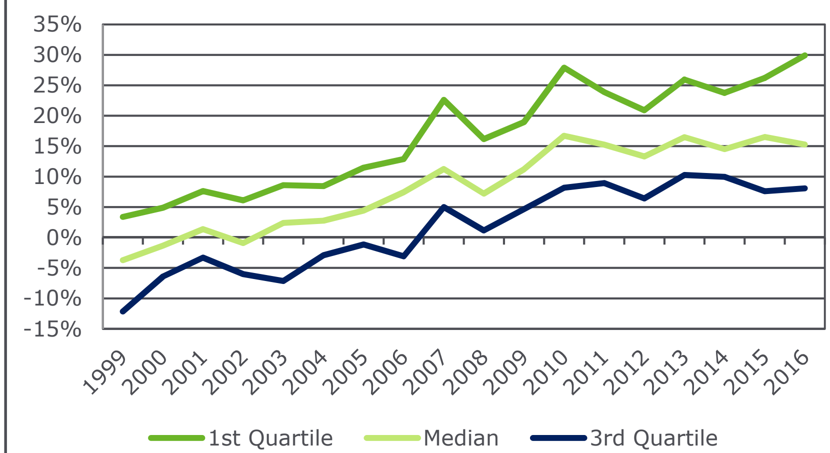
Fundraising



Net TVPI : North American Venture*



Net IRR : North American Venture*



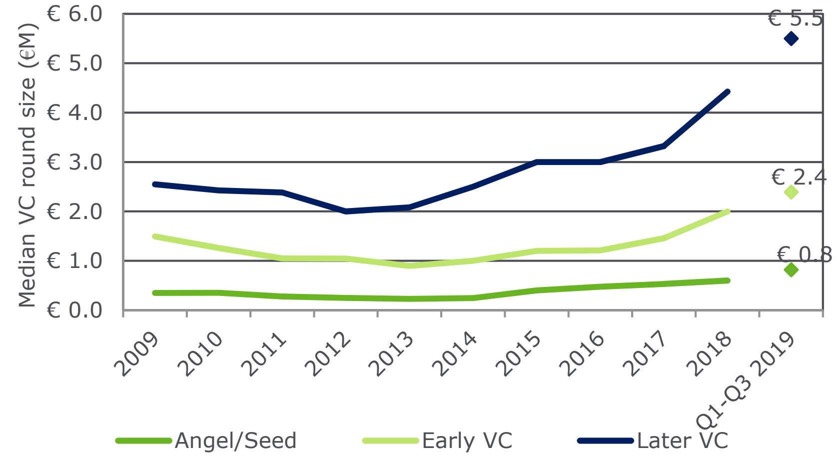
Source: Thomson One/C|A as of 06/30/2019. Performance for 2017-2019 vintage funds not yet meaningful
Fundraising data from Preqin as of 11/30/2019
*European venture does not yet have a meaningful enough data set to benchmark

EUROPEAN VENTURE AND GROWTH EQUITY TRANSACTION ENVIRONMENT

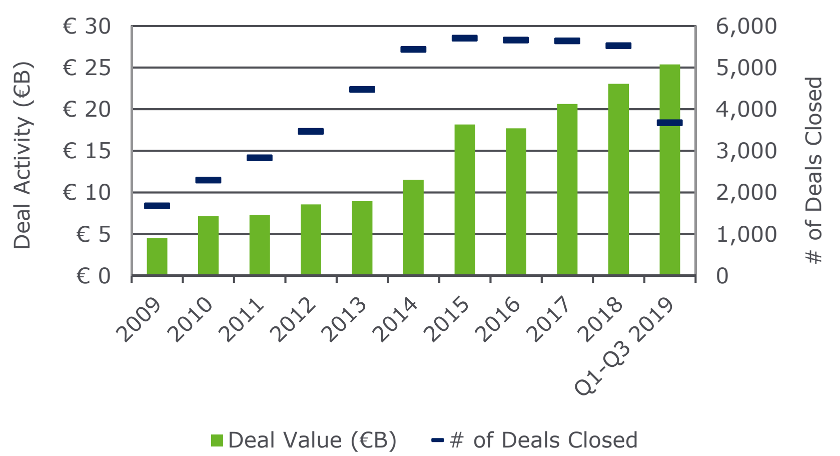
Comments

- **Using deal size as a proxy for valuation, valuations continue trending upwards but remain low relative to the US**
- **2019 deal level will set a new a high, but deal count may end below recent averages**
  - More capital into fewer deals represents both increasing manager selectivity and also a maturing market with companies that require larger funding rounds
- **Exits have slowed in 2019 after hitting all-time highs in 2018 thanks to large exits such as Spotify and Adyen**

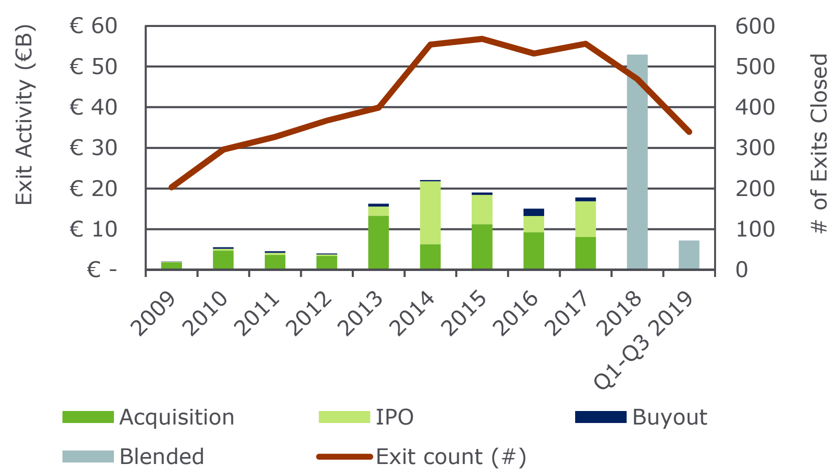
Valuations



Deal Activity



Exit Activity



Source: Deal activity from Pitchbook as of 9/30/2019

ASIA-PACIFIC VENTURE

General Market Thoughts

- **Global investors have increased their amounts into China's startup ecosystem with approximately 30% of global venture being directed into Chinese startups in 2018**
- **China's early stage technology ecosystem is thriving as new funding for entrepreneurial initiatives are being developed including a large national incubator, seed and early stage funding, and multiple funds-of-funds being raised**
- **Capital becomes global at later stages thus resulting in hype and competition for the best companies. China's large tech companies also become competitors at the latest stages and can be less price sensitive than financial buyers**
- **Geopolitical tensions have caused a slow down on the number of local Funds being raised. Limited Partners adopting a "wait and see approach" to non-core managers, opening the door for new Limited Partners**

Implementation Views

Strategy	Outlook	Commentary
Early Stage Venture Capital	Positive	In Asia, target managers with broad and relevant networks and expertise. Due to the lack of scalability at this stage, focus on appropriately sized funds (<$500 million)
Mid/Late Stage Venture Capital	Neutral	With Asian valuations high, target managers that have a focused strategy whose value-add goes beyond that of a capital provider. Local managers focused outside the competitive Tier I and II cities will likely have local advantage. In the latest stages global players will have an ability to provided geographic diversification along with a global scale perspective

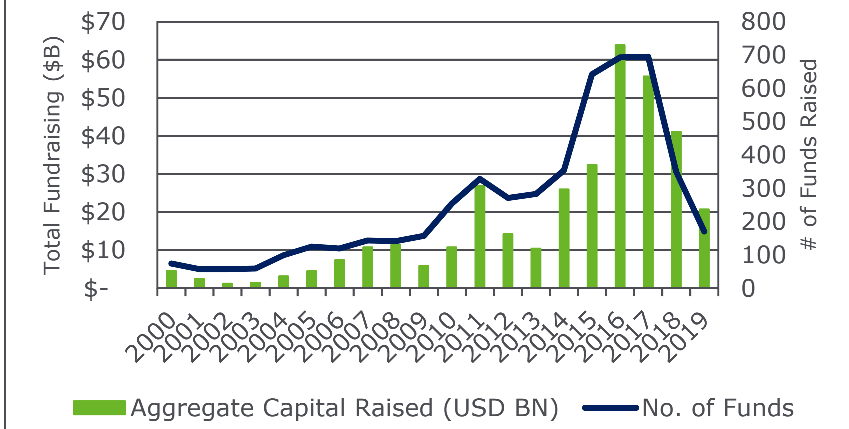
Source: PitchBook

ASIA-PACIFIC VENTURE: FUNDRAISING & RETURNS

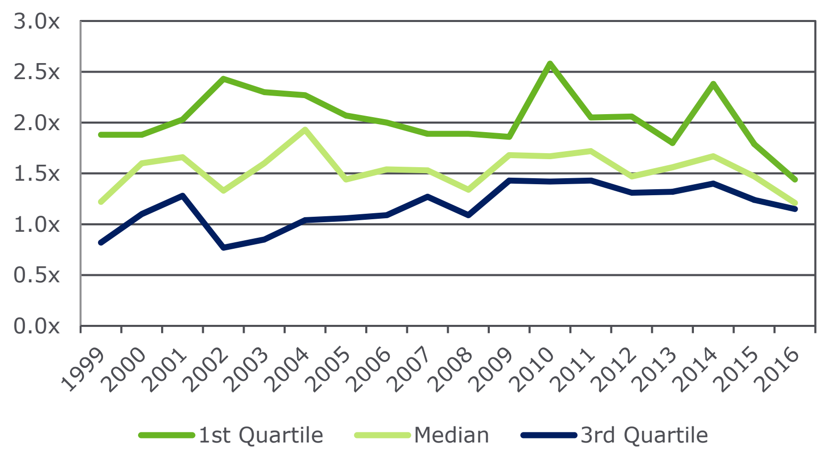
Comments

- **Fewer funds are being raised, indicating a flight to quality likely due to a looming global slow down and geopolitical tensions**
- **Recently the region has produced strong returns, with net IRRs reaching 30% in 2014**
  - Venture Capital has been a large contributor
- **Current vintages have generated attractive returns, highlighting the nascency of the market opportunity**

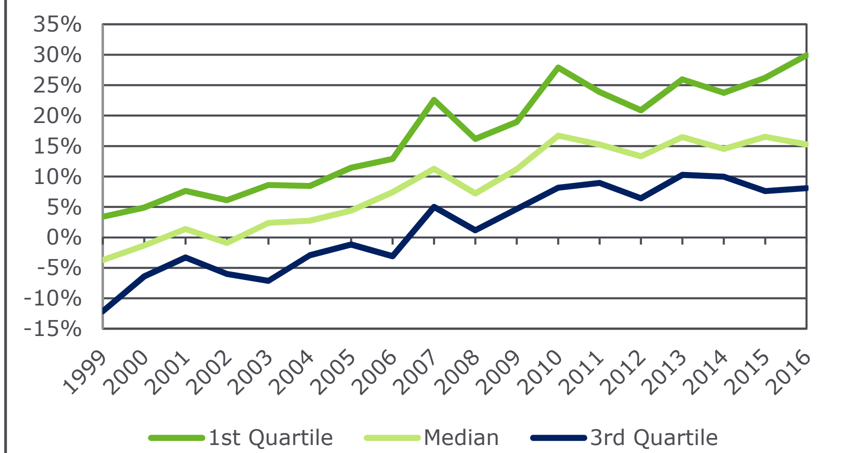
Fundraising



Net TVPI



Net IRR



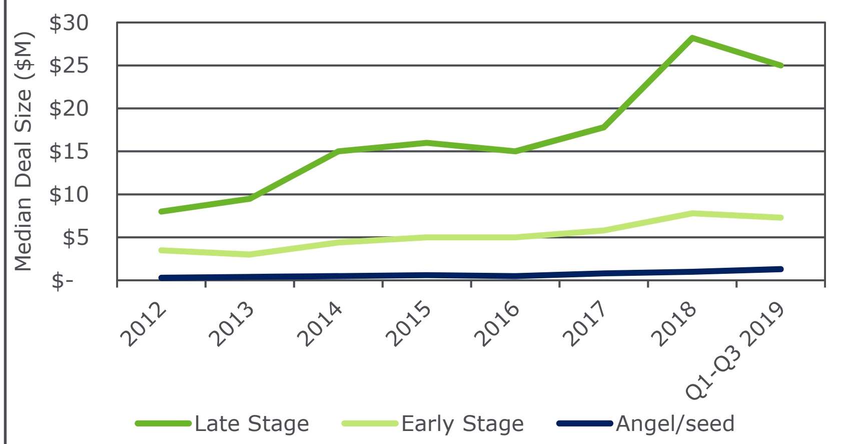
Source: Thomson One/C|A as of 06/30/2019. Performance for 2017-2019 vintage funds not yet meaningful. Asia-Pacific Private Equity Fundraising data from Preqin as of 11/30/2019

ASIA-PACIFIC VENTURE: TRANSACTION ENVIRONMENT

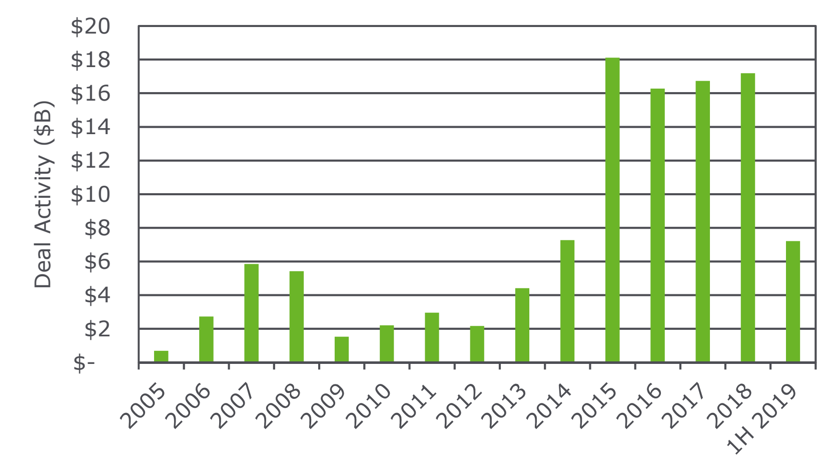
Comments

- **2018 was a historic period for the median deal size, with several mega-deals being completed**
- **Using deal size as a proxy for valuation, late stage valuations have been on a steep climb since 2016 and peaked in 2018**
  - More moderation in the earlier stages
- **Exit paths for Chinese startups have been limited, however evolving regulations and new high tech boards create an optimistic outlook**
  - IPO has been the preferred exit path for venture-backed companies; most listing on international and Hong Kong exchanges

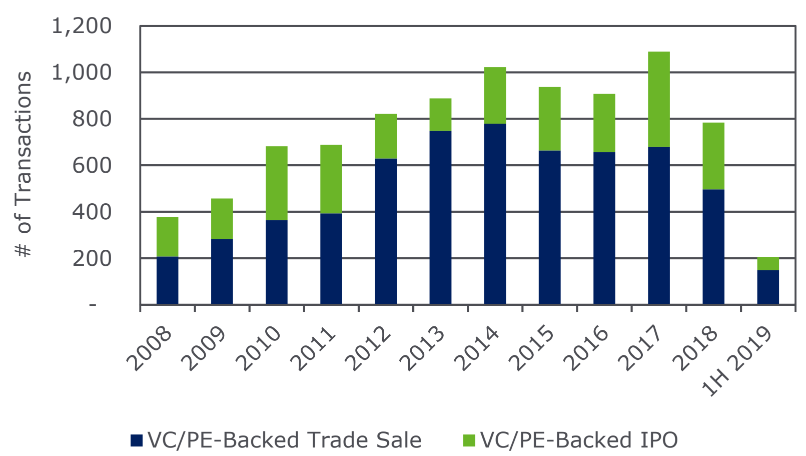
Valuations



Deal Activity



Exit Activity



Valuation Source: Venture Pulse, Q3'19, Global Analysis of Venture Funding, KPMG Enterprise. Data provided by PitchBook, October 9, 2019
Deal Activity and Exit Activity Source: Bain & Co., S&P Capital IQ & Global Market Intelligence, AVCJ

BUYOUTS AND SPECIAL SITUATIONS

NEPC, LLC

US BUYOUT & SPECIAL SITUATIONS

General Market Thoughts

- **Same as it ever was**
  - Strong fundraising environment, driven by mega funds and stockpiling of capital
  - New deal environment remains competitive and expensive, driven by plentiful equity and credit
- **Plentiful signs of excess**
  - Pro forma EBITDA: "**E**ventually **B**usted, **I**nteresting **T**heory, **D**eeply **A**spirational"
  - Many managers showing peak market behavior: record new mega fund closes, one and done fundraisings, pre-emptive purchases, covenant-wide/loose, cross-fund deals, launching new platforms, selling minority stakes
- **Potential silver linings**
  - Muted new deal activity could be a sign of discipline on some managers' parts
  - While there is great concern about impact of high valuations on entry multiples, those same valuations are great news for the exit environment
- **Recent vintages will not be some of buyout's finest**

Implementation Views

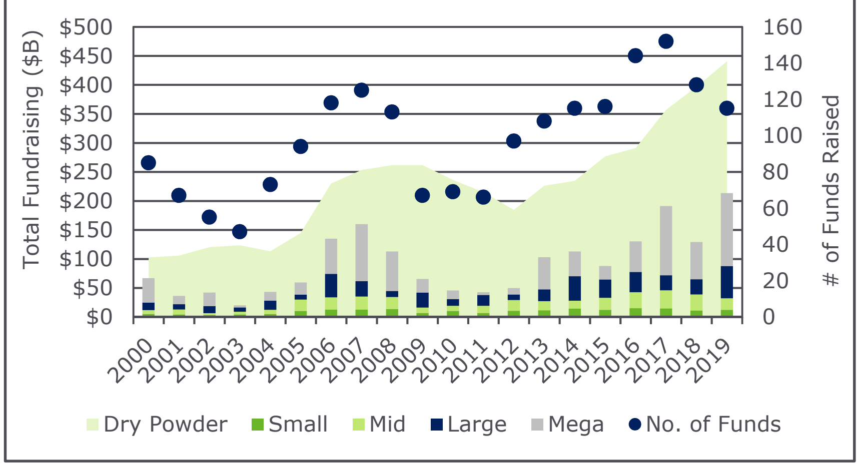
Strategy	Outlook	Commentary
US Mega & Large	Negative	This end of the market is the most efficient and correlated with public markets; look for sector specialists and groups with a proven edge to win deals and add value
US Mid & Small	Neutral	While multiples are still elevated at this end of the market, there is enough of a gap that multiple expansion is still possible. With higher manager dispersion in this part of the market, look for experienced teams with a demonstrable edge in sourcing
Special Situations	Positive	While this area has the greatest opportunity for inefficiencies, choosing managers with good asset selection and the ability to turn around underperforming businesses is paramount

NORTH AMERICAN BUYOUT & SPECIAL SITUATIONS FUNDRAISING & RETURNS

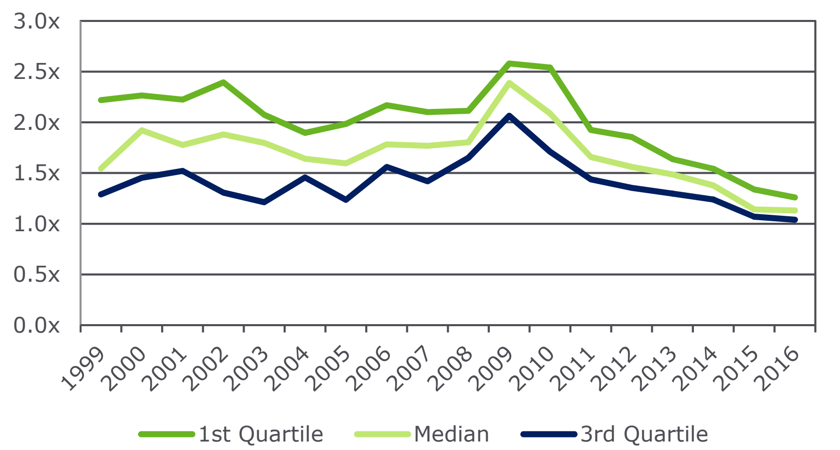
Comments

- **Record 2019 fundraising totals eclipsed prior year and 2017 peak, driven by mega funds and funds returning to market more quickly**
- **Fundraising totals also include new platforms raised by established firms, totaling >$12 billion**
- **Funds raising less than $500 million have maintained their fundraising totals over the last cycle**
- **2009 and 2010 funds showed strong performance over the last year, benefiting from strong exit markets 10 years into their lives**

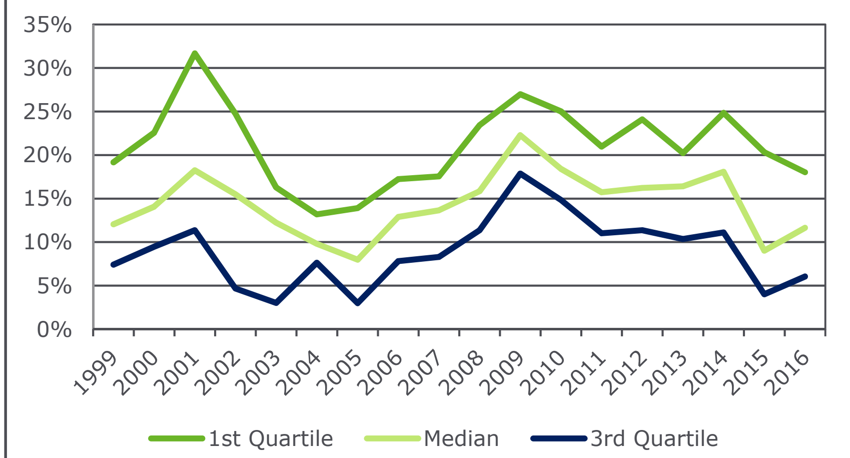
Annual Fundraising



Net TVPI



Net IRR



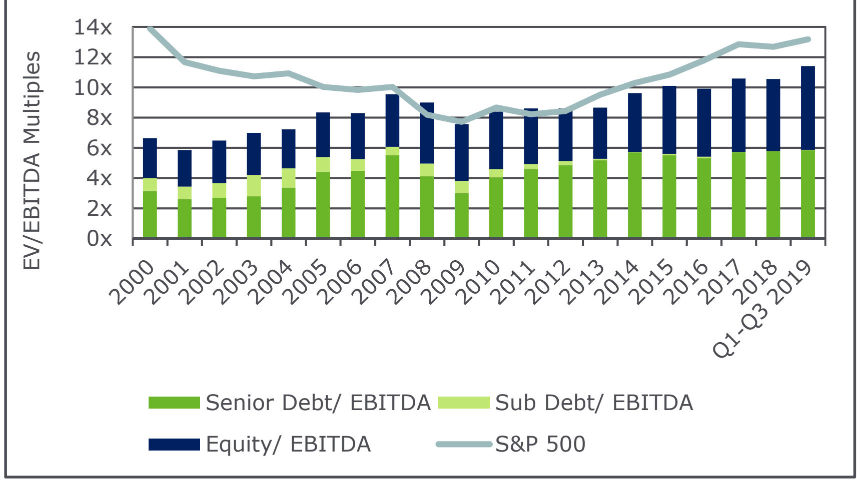
Source: Thomson One/C|A as of 06/30/2019. Performance for 2017-2019 vintage funds not yet meaningful
Fundraising data from Preqin as of 11/30/2019

NORTH AMERICAN BUYOUT & SPECIAL SITUATIONS TRANSACTION ENVIRONMENT

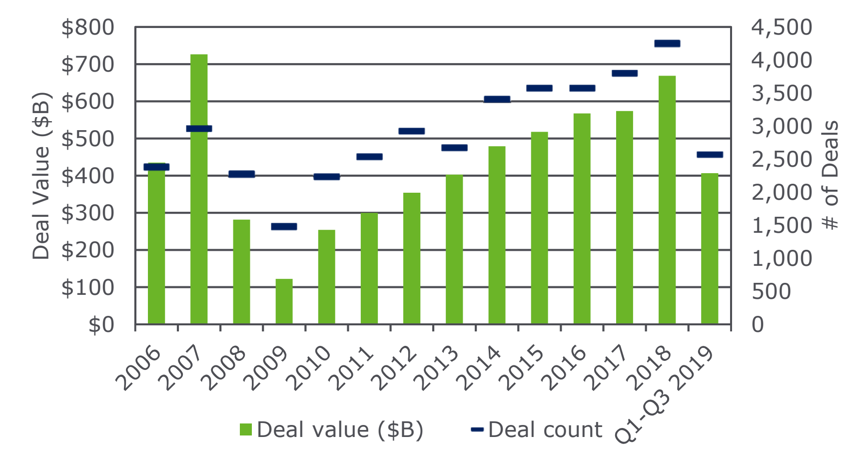
Comments

- **Valuations continue to climb, with average EBITDA multiples over 11x for all LBOs in 2019, some of this driven by mix shift toward tech and healthcare**
- **Leverage multiples continue to hold steady at ~6x on average though there is large variability on a deal by deal basis**
- **New deal activity is down over last year and near prior year totals on an annualized basis; add-ons continue to be a focus for many managers, much more so than in pre-GFC vintages**
- **Exits are also down across all types, particularly corporate acquisitions**

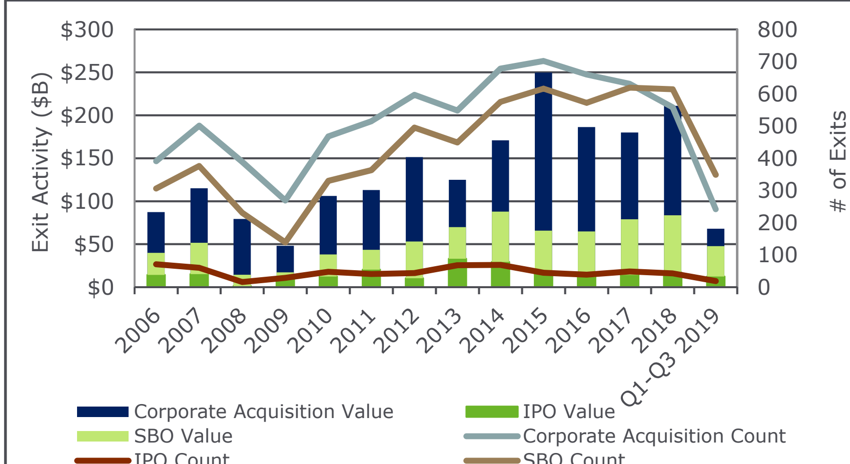
Valuations



Deal Activity



US PE Exit Activity



Source: S&P Global Market Intelligence and Pitchbook as of 9/30/2019

EUROPEAN BUYOUTS & SPECIAL SITUATIONS

General Market Thoughts

- **The market continues to grow at a tepid pace but overall deal volume was down in 2019**
  - Deal volume in 2020 is set to be challenging with the amount of dry powder
  - The overall buyout market remains just as competitive as the US but European deals are slightly better equitized
  - Healthcare and the DACH region are sectors and regions that continue to increase
- **The European middle market remains attractive relative to the larger end**
  - Middle market LBOs (<$/€50 million EBITDA) have exhibited lower overall purchase price multiples (approximately 1x lower) relative to the US
  - Sector and regionally-focused funds have been able to drive returns and exits
- **Corporate carveouts have increased**
  - Competitive markets, shareholder activism, industry consolidation and quarterly market pressure has increased deal flow as companies look to streamline core assets
- **Geopolitical uncertainty has led to some price softening but not on a consistent basis**

Implementation Views

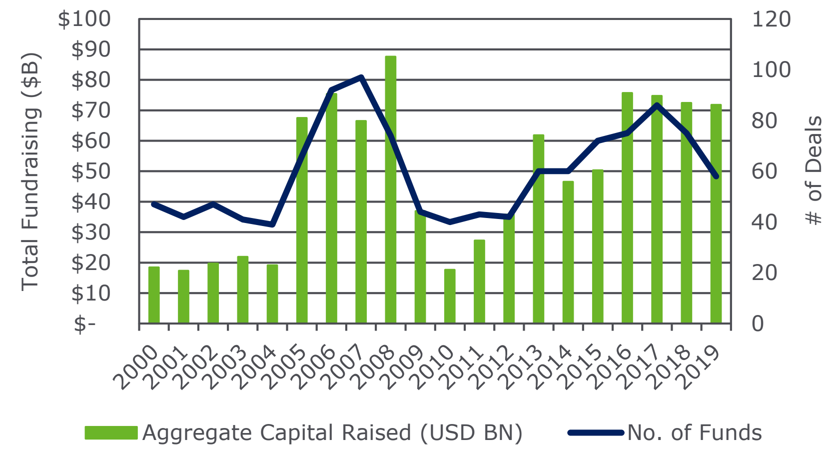
Strategy		Outlook	Commentary
Buyouts & Special Situations	Europe Mega & Large	Negative	In these relatively efficient markets, look for managers with some competitive advantage/angle in their deals; sector specialists and managers with the ability to deal with large complex deals
	Europe Mid & Small	Neutral	Seek managers that can source smaller either founder-owned or local GPs and take local/regional champions and turn them into Pan-European leaders
	Europe Special Situations	Positive	Evaluate opportunistic special situations managers with flexible and nimble approaches able to capitalize on market, industry and/or specific company volatility; outperformers skew to smaller fund sizes

EUROPEAN BUYOUTS: FUNDRAISING & RETURNS

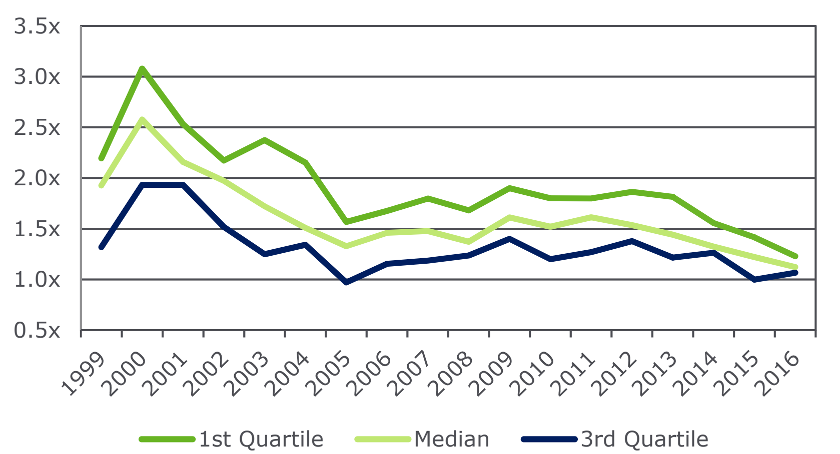
Comments

- **Fundraising has remained steady over recent years in terms of capital raised, however, larger funds are making up a greater proportion of the market in 2019 relative to previous years**
- **As the market has become more efficient, dispersion in overall net TVPI performance has converged**
- **Even with tighter performance, it is important to seek out first quartile managers to compensate for the risk relative to the US**

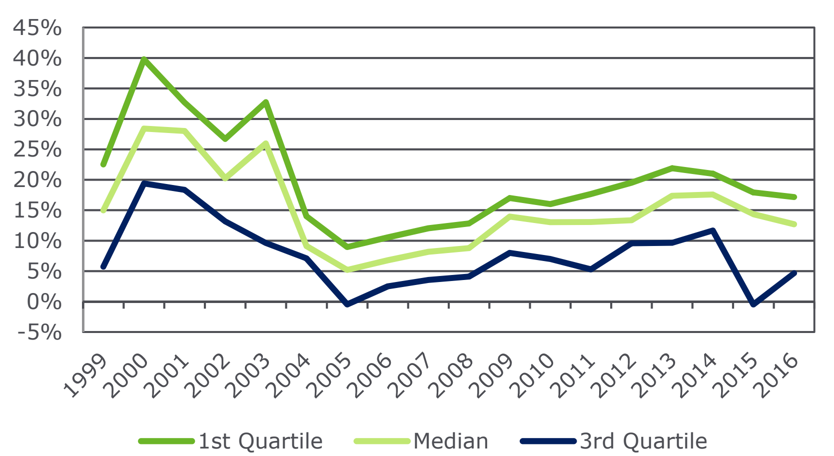
Fundraising



Net TVPI



Net IRR



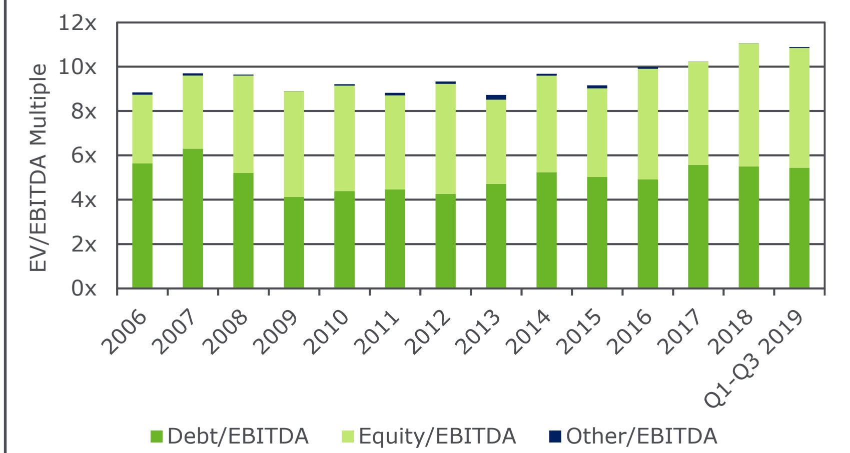
Source: Thomson One/C|A as of 06/30/2019. Performance for 2017-2019 vintage funds not yet meaningful
Fundraising data from Preqin as of 11/30/2019

EUROPEAN BUYOUTS: TRANSACTION ENVIRONMENT

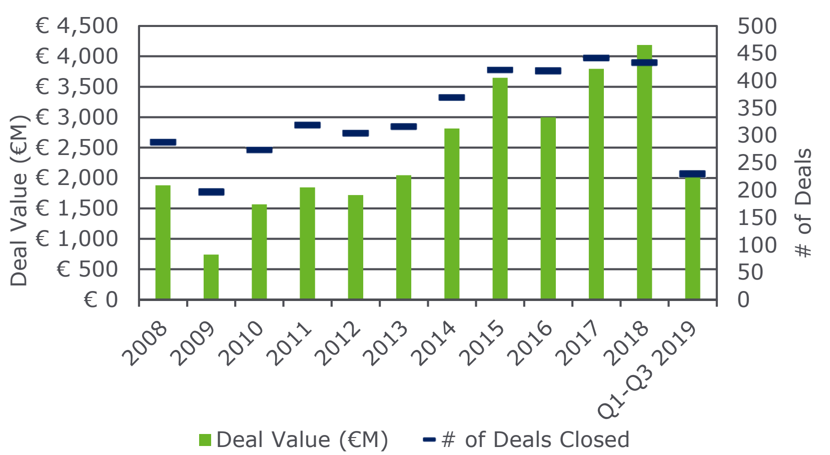
Comments

- **European buyout purchase price multiples continue to increase – overall purchase price multiples are in line with the US**
- **Deal activity reached an all-time high in 2018; saw a big uptick in Q3 (skewed by three deals), however, total deal volume is down**
- **Overall exit activity has been challenging - B2B and IT deals dominate the exit activity but exit activity is expected to be the lowest since 2013**

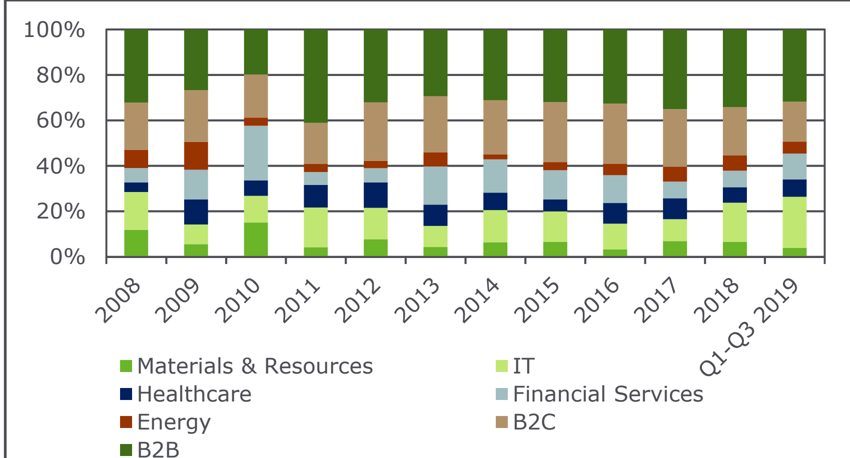
Valuations



Deal Activity



Exit Activity



Source: S&P Global Market Intelligence and Pitchbook as of 9/30/2019

ASIA-PACIFIC BUYOUTS & GROWTH EQUITY

General Market Thoughts

- **Growth equity investing, particularly in China, India and Southeast Asia, continues to be the most prominent form of private equity capital in the Asia-Pacific region**
- **Buyout fundraising has doubled over the past five years, accounting for 27% of all private equity capital raised in Asia-Pacific in 2019. As growth in China slows and PE industry matures, China buyout activity is expected to continue expanding**
- **Domestic consumption and technology-enabled business themes dominate the growth equity landscape in Asia-Pacific region, particularly in China and other developing countries.**
- **Buyouts are a growing source of capital for businesses to expand footprints in growing consumption markets; multi-national carve-outs and cross-border deals can benefit from capital provided by buyout investors with experience and access to industry expertise**

Implementation Views

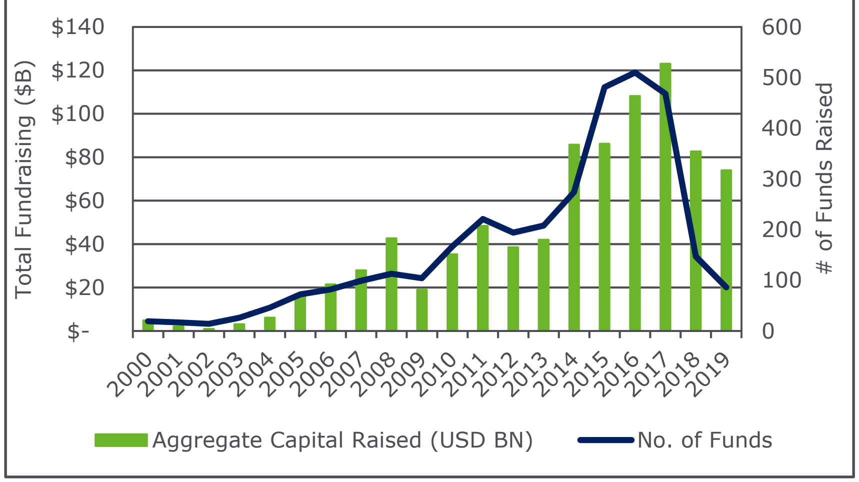
Strategy	Outlook	Commentary
Growth Equity	Positive	China should be central to growth investing Asia-Pacific given the size of the country and the consumption spending of its rising middle class. Invest with groups that have strong local reputations and networks with local entrepreneurs
Buyouts	Positive	Buyout capital is a good source of transition capital for family-owned businesses and industries undergoing rapid structural changes. Opportunities differ by country • In Japan and South Korea, industry restructuring and corporate divestitures are providing strong source of deals. • In China, India & SE Asia, as growth slows, private equity expertise can provide established companies with insights into reigniting growth and improving profitability. Invest with managers with strong sourcing channels and ability to drive value creation within their portfolios

ASIA-PACIFIC BUYOUTS & GROWTH EQUITY: FUNDRAISING & RETURNS

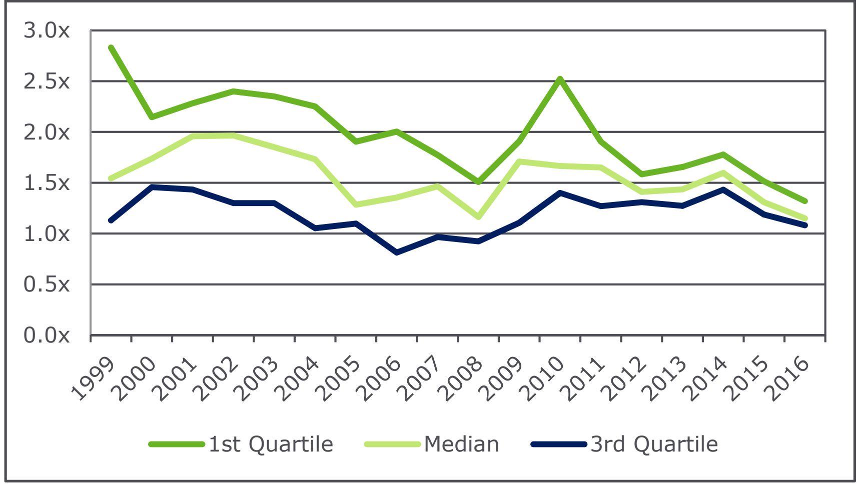
Comments

- **Buyout and Growth Equity funds represent approximately two-thirds of private equity capital being raised in Asia-Pacific region**
- **Fewer funds are being raised as successful firms as private equity industry shakes out less experienced growth fund managers & and buyout funds increase fund sizes**
- **Current vintages have generated more consistent returns as growth as slowed and the private equity industry continues to mature.**

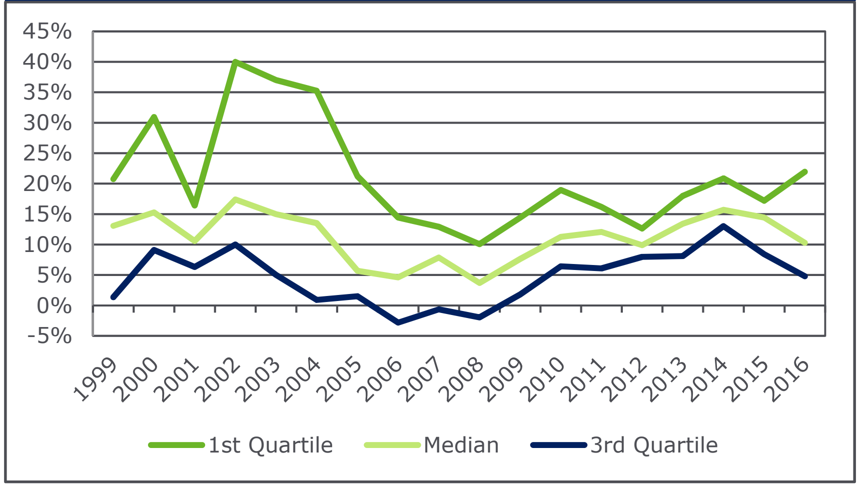
Fundraising



Net TVPI



Net IRR



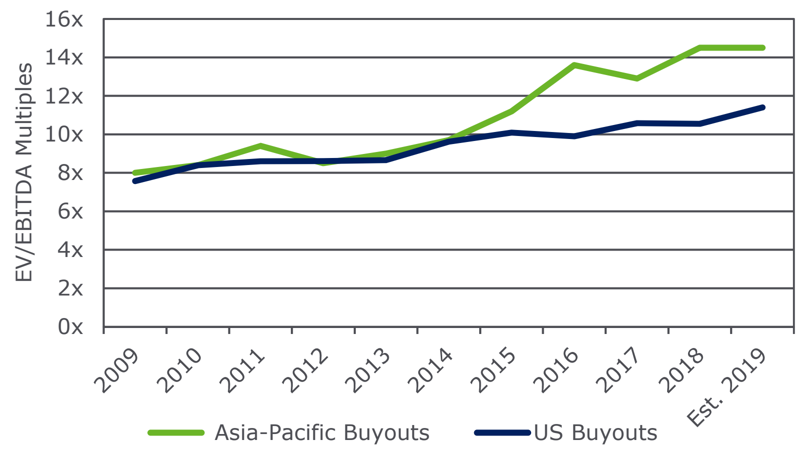
Source: Thomson One/C|A as of 06/30/2019. Performance for 2017-2019 vintage funds not yet meaningful
Fundraising data from Preqin as of 11/30/2019 includes Buyout, Growth and Balanced fund strategies in Asia & Australia/NZ

ASIA-PACIFIC BUYOUTS & GROWTH EQUITY: TRANSACTION ENVIRONMENT

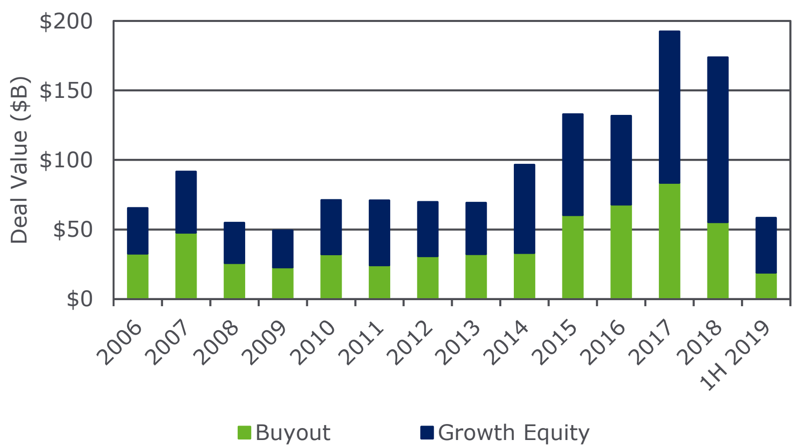
Comments

- **Asia-Pacific buyout valuations have been on the rise over the past five years as buyout activity has grown**
- **Buyout and growth equity deal activity is declining in 2019 due to a combination of slowing growth, macroeconomic & trade uncertainties and rising valuations**
- **Exit volume in 2019 is also muted, with IPOs tracking lower than the 33% average percentage of total exits during the past 5 years**

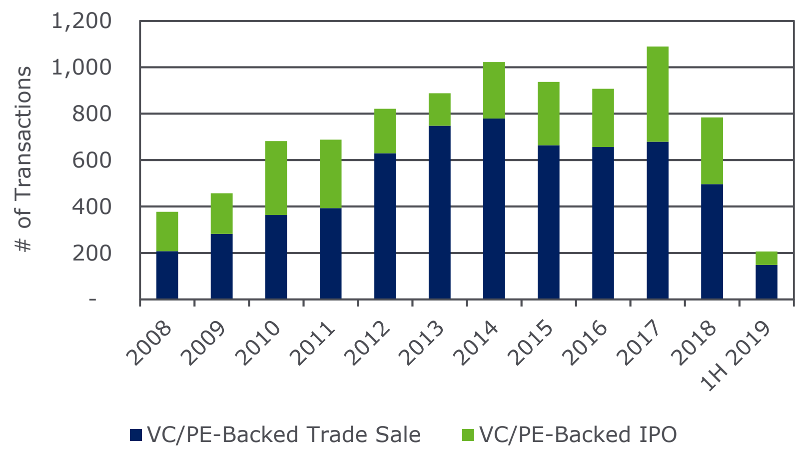
Valuations



Deal Activity



Exit Activity



Source: Bain & Co., S&P Capital IQ & Global Market Intelligence, AVCJ

GLOBAL SECONDARIES

NEPC, LLC

GLOBAL SECONDARIES

General Market Thoughts

- **Transaction volume at record levels due to high level of private equity funds raised in past 10 years and growth of GP-Led secondary deals**
  - $90-$100 billion of secondary transactions expected in 2019, up from $40 billion in 2014
  - $30 billion of GP-led secondary deals in 2019
- **Pricing marginally improved in first half of 2019 but still relatively high**
  - Buyout funds average price ~95% of NAV
  - Venture capital funds average price ~82% of NAV
- **Debt usage becoming more prevalent across secondary funds**
  - All use short-term lines of credit to minimize capital call frequency
  - Many are using longer lines of credit to delay LP capital calls to enhance fund IRRs
  - Some are using leverage in deal models to bid higher prices

Implementation Views

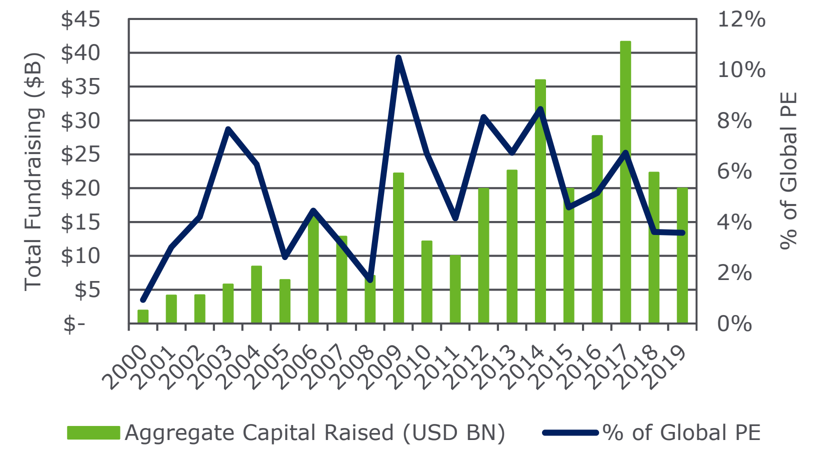
Strategy	Outlook	Commentary
Secondaries	Neutral	• Avoid competition by investing with very large or very small fund managers • Be aware of how fund managers plan to use leverage to assess how it could impact investment risks • Invest in managers who have flexibility and skillset to invest in both traditional LP interest deals and in GP-led deals • Venture-focused secondary funds can provide better entry valuations to mid-late stage venture capital than primary commitments

GLOBAL SECONDARIES: FUNDRAISING & RETURNS

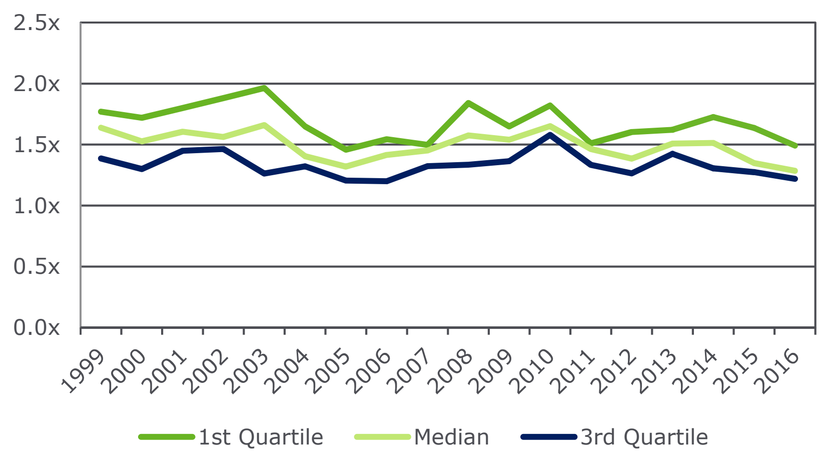
Comments

- **Annual secondary fund raising has been $20 billion or greater for past 8 years**
- **Secondary fund raising as a percent of the total PE industry has had a declining trend since the financial crisis**
- **Long-term returns across top and bottom quartile secondary fund managers are in a narrow band**
- **Best performing vintages for secondaries are the vintage years following a recession**
- **Even in worst performing vintages, secondary funds have generated decent returns**

Fundraising



Net TVPI



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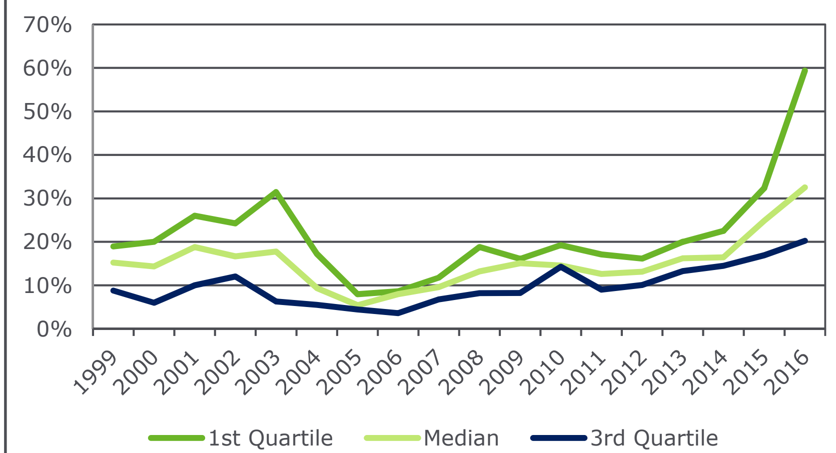


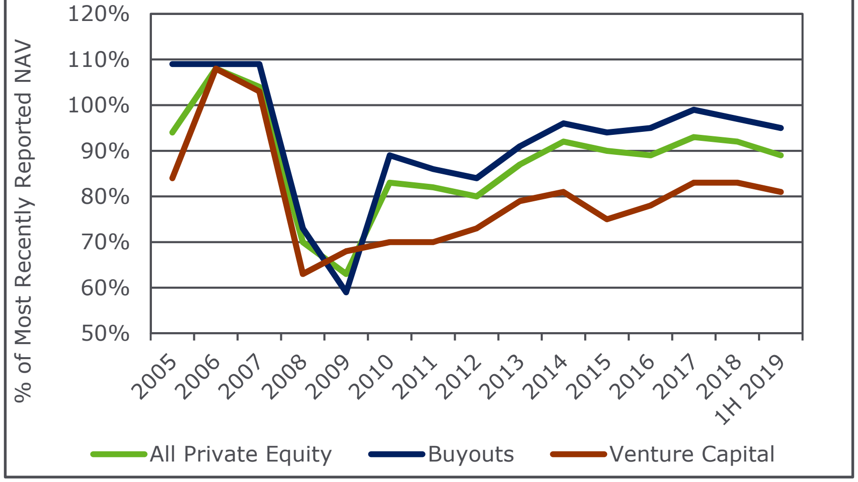
Source: Thomson One/C|A as of 06/30/2019. Performance for 2017-2019 vintage funds not yet meaningful
Fundraising data from Preqin as of 11/30/2019

GLOBAL SECONDARIES

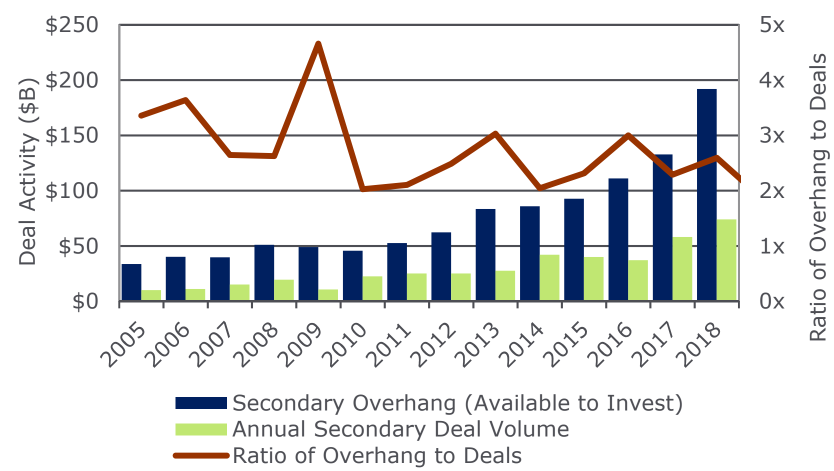
Comments

- **Secondary pricing declined in the first half of 2019 to 89% from an average of 92% in 2019**
- **Traditional & Direct secondary transaction volume grew from $30 billion to $60 billion over the past five years**
- **GP-Led secondary transactions have emerged over the past five years to be an estimated $30 billion market in 2019, one-third of all secondaries**

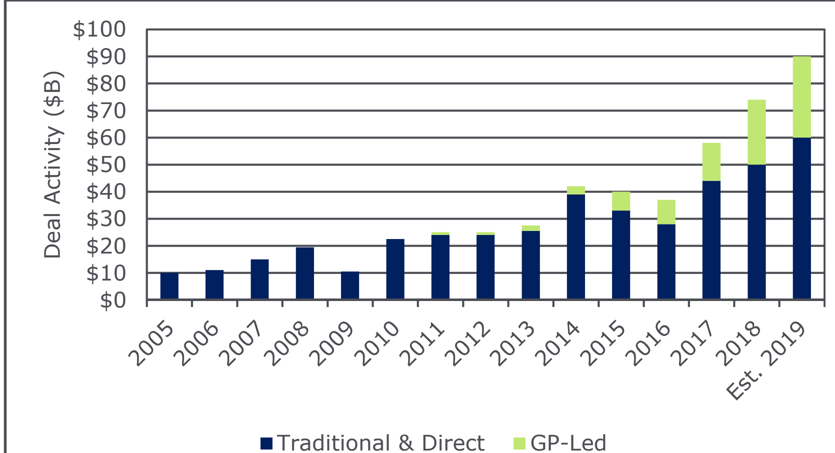
Secondary Deal Pricing



Deal Activity & Capital Available



Deal Activity by Type



Source: Secondary deal pricing, volume and capital overhang from Greenhill as of 6/30/2019

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- The client's custodian bank is NEPC's preferred data source unless otherwise directed. NEPC generally reconciles custodian data to manager data. If the custodian cannot provide accurate data, manager data may be used.
- Trailing time period returns are determined by geometrically linking the holding period returns, from the first full month after inception to the report date. Rates of return are annualized when the time period is longer than a year. Performance is presented gross and/or net of manager fees as indicated on each page.
- For managers funded in the middle of a month, the "since inception" return will start with the first full month, although actual inception dates and cash flows are taken into account in all Composite calculations.
- This report may contain forward-looking statements that are based on NEPC's estimates, opinions and beliefs, but NEPC cannot guarantee that any plan will achieve its targeted return or meet other goals.