



# Aviation Finance & Leasing Series

**How have Public Aircraft Leasing  
Companies Performed?**





# How have Public Aircraft Leasing Companies Performed?

**A look at the public aircraft lessors index performance against benchmarks and more in-depth performance analysis of the 4 acquired public listed lessors.**



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This is the first article in the KPMG Aviation Finance & Leasing Thought Leadership Series exploring more in depth analytical aspects of the aviation finance and leasing markets.

## Key Summary Points

Aircraft Lessor indexes (equal weighted) including and excluding the acquired and delisted public lessors – AVOL, AYR, and GLS are analyzed and compared against benchmarks in terms of returns, volatility and correlations.

- Inclusive and Exclusive Lessor Indexes underperform the S&P 500 under both price and total return cases.
- Dividends account for a significant difference in the price and total return profiles for both Inclusive and Exclusive Lessors Indexes.
- Inclusive and Exclusive Lessor Indexes outperform the 3M Libor benchmarks and significantly underperform the hypothetical 15% return PE fund.
- Inclusive and Exclusive Lessor industry indexes are more correlated to the S&P 500 under both price and total return cases than would be suggested by industry participants and commentators
- Inclusive and Exclusive Lessor Indexes are very weakly positive correlated to 3M Libor while mildly positive correlation with the 15% return PE fund.

## Introduction and Background:

The aviation finance and leasing industry has seen large growth along with the overall aviation industry since the 1950s. Before 2006 there were

only a few examples of public aircraft leasing companies. The success of Tony Ryan and Guinness Peat Aviation (“GPA”) and Steve Udvar-Hazy and International Lease Finance Corporation (“ILFC”), which were both established in the 1970s, formed the bedrock of the industry.

A significant number of companies involved in aircraft leasing are privately funded and consequently public financial information is limited, this article focused on the results of publicly listed entities for which such information is available.

ILFC began trading over the counter in 1983 and was later acquired by American International Group (“AIG”) in 1990 for \$1.26bn<sup>1</sup>. After Udvar-Hazy’s retirement from ILFC in February 2010, he subsequently co-founded Air Lease Corporation (“ALC”) which subsequently went public on the NYSE in 2011. GPA attempted to go public in 1992 with a public offering of EUR850 million but the bearish environment due to the first Gulf War and the lack of demand at the given prices offered caused it to be unsuccessful. This failed IPO created a liquidity crisis for the company as it had a very large aircraft order book of 700 aircraft to service, which ultimately led to its downfall.

There are numerous instances (successful and not) of privately funded companies involved in aircraft leasing and also examples of aircraft leasing businesses within larger companies which are public companies. Some examples of the

<sup>1</sup> <https://www.nytimes.com/1990/06/26/business/big-lessor-of-aircraft-to-be-sold.html>

latter include ILFC having been acquired by AIG in 1990, CIT Aerospace part of CIT Group, GECAS part of General Electric., RBS Aviation Capital part of Royal Bank of Scotland Group, among others<sup>2</sup>.

After the short period that ILFC was public in the late 1980s, Willis Finance Lease Corp (“Willis”), focused mainly on engine leasing, which listed in 1996 and AeroCentury Corp. (“AeroCentury”), mainly focused on regional aircraft leasing, which listed in 1998 are the pre-runners to the modern wave of new public leasing companies. It was not until 2006 when this next wave of new public aircraft leasing companies going public in any meaningful way. On August 7, 2006, Aircastle Limited (“AYR”) began trading on NYSE and soon after AerCap Holdings N.V. (“AER”), Genesis Lease Corporation (“GLS”) and FLY Leasing Limited (“FLY”) all completed their listings of shares. Since then the comparative set has enlarged both in terms of number of different lessors but also geographies where companies are based and also being listed. The other listing locations include London, Hong Kong, Warsaw, and Kuwait with majority of the publicly listed lessors still in the US.

Just recently on November 6, 2019, Aircastle announced it is being acquired by Marubeni and Mizuho Leasing for an implied enterprise value of \$7.4 billion and equity value of \$2.4 billion. This is just the latest example in a string of acquisitions in the aviation finance and leasing space including Aviation Capital Group, PK Airfinance, DVB Bank’s aviation finance business, Apollo Aviation, Sky Leasing, etc. This is only the fourth example of a wholesale acquisition of a public leasing company since the acquisition of Avolon Holdings (“AVOL”) in 2016.

#### Questions:

- How have the public aircraft leasing companies as an index performed?
- How have the 4 acquired public leasing companies AVOL, Ayr, GLS and ILFC compared to certain industry comparable benchmarks and other metrics?

#### Methodology:

These analyses will consider the public equity investor’s point of view with a focus on returns, volatilities and correlations.

The publically listed aircraft leasing index are comprised of two separate indexes, all and excluding the acquired companies, respectively named the Inclusive and Exclusive Lessor Indexes. These are analyzed alongside benchmarks and alternatives metrics (as defined below). The timeframe under consideration is August 6, 2006 with the IPO of Aircastle and ending date of November 15, 2019.

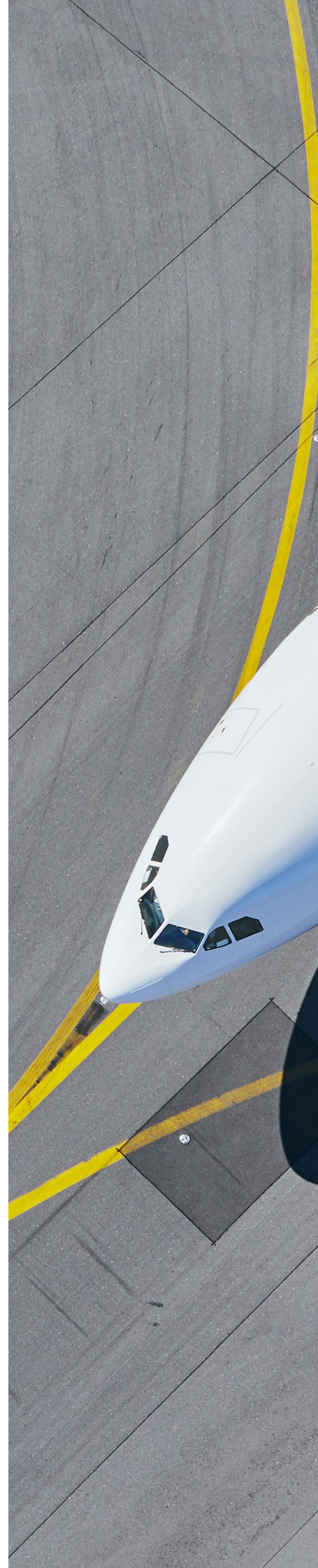
#### Inclusive Aircraft Leasing Comparative Index includes:

AER, ALC, Avation PLC, Bank of China Aviation, China Aircraft Leasing Group Holdings Limited, FLY, AviaAM Leasing, China Development Bank Financial Leasing Co., Ltd., ALAFCO Aviation Lease and Finance Company K.S.C.P.; AeroCentury, Willis, AYR, GLS, and AVOL.

**Note:** The index does not include the ILFCs public period as its time period in existence is significantly prior to this timeframe under consideration.

<sup>2</sup> Some of these companies have been acquired or subsequently changed names.

<sup>3</sup> <https://www.prnewswire.com/news-releases/aircastle-limited-enters-into-merger-agreement-with-affiliates-of-marubeni-and-mizuho-leasing-300952729.html>





**Exclusive Aircraft Leasing Comparative Index** includes all of the above Inclusive Index members except AYR, GLS and AVOL.

*There is a further differentiation for both Indexes between total return as denoted by "Total" which includes dividend and capital returns while price return is denoted by "Price" considers only the capital appreciation derived from the price. All indexes are equal weighted which means that each stock has equal weighting in the formation of the index. An example of weighting index is Barron's 400 index while Dow Jones Indexes are price weighted indexes and S&P 500 is a market capitalization weighted index.*

**Benchmarks** include S&P 500 (given these are primarily US listed companies), 3M Libor price index and a theoretical 15% return fund.

#### **Acquired public lessors**

Of the historical public lessors, three of the modern generation have been acquired, specifically Airastle, Genesis, Avolon Holdings Limited and ILFC pre-acquisition by AIG in the initial incarnation of a publically listed lessor. Each of these companies, prior to their acquisition, were compared to comparative benchmarks in terms of returns and volatilities for two different holdings periods, specifically Scenario 1) entire shareholder holding period from the time of IPO to sale and Scenario 2) max appreciation period or the period between the min to max price points.

## Results & Analysis

### Lessor Indexes Analysis

#### Aircraft Lessor Index Statistics

8/7/2006 - 11/15/2019 Holding Period

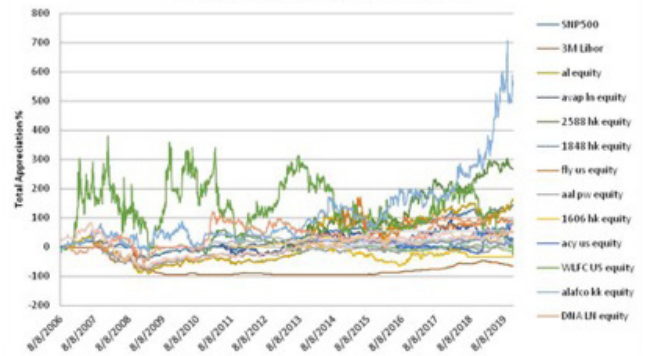
	MinApp%	MaxApp%	MinDate	MaxDate	Appr%	StdDev	CorrS&P500	Corr3MLibor	Corr15%PE
<b>Exclusive Price</b>	-54.21	90.94	3/10/2009	7/23/2007	58.58	20.82	0.613	0.156	0.466
<b>Inclusive Price</b>	-63.48	72.81	3/10/2009	7/23/2007	51.53	21.94	0.743	0.263	0.565
<b>Exclusive Total</b>	-52.73	97.09	3/10/2009	9/13/2019	81.19	24.40	0.755	0.120	0.645
<b>Inclusive Total</b>	-58.46	85.20	3/10/2009	9/13/2019	73.98	25.03	0.841	0.202	0.704
<b>S&amp;P500</b>	-46.97	144.59	3/9/2009	11/15/2019	144.59	47.11	1.000	0.053	0.947
<b>3M Libor</b>	-95.90	5.24	5/5/2014	9/7/2007	29.42	1.61	0.053	1.000	-0.155
<b>15% PE</b>	0.00	540.03	8/7/2006	11/15/2019	540.03	151.98	0.947	-0.155	1.000

**Note:** Exclusive and Inclusive indexes components are described in the methodology section.

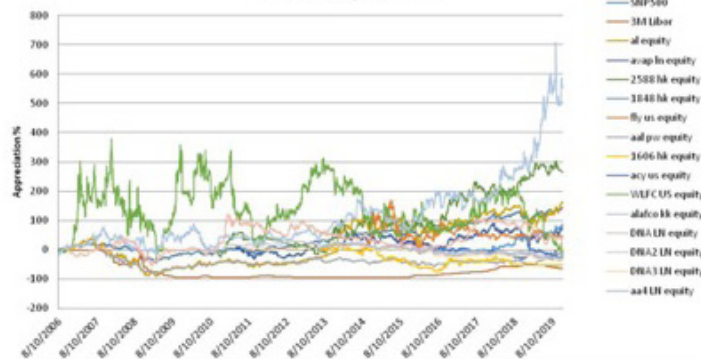
Price / Total Appreciation % of Exclusive & Inclusive Aircraft Lessor Indexes & S&P500 / 3M Libor



Total Appreciation % of Exclusive Aircraft Lessor Index Components & S&P500 / 3M Libor



Price Appreciation % of Exclusive Aircraft Lessor Index Components & S&P500 / 3M Libor





### **Aircraft Lessor Indexes vs. Benchmark Returns**

Exclusive and Inclusive Indexes differ from its component companies which include the four companies who have been acquired, merged or taken private, namely Aircastle, Avolon, Genesis, and ILFC. There is a significant difference observed between price and total returns for both Exclusive and Inclusive Indexes. This difference of ~22% for both Exclusive and Inclusive Indexes implies that dividend return is a significant factor in total returns to investors.

Exclusive and Inclusive Indexes both price and total returns underperformed the S&P 500. The S&P 500 appreciated by ~145% during the holding period from August 7, 2006 to November 15, 2019 and outperformed Exclusive total return index by ~63% while it outperformed Inclusive total return index by ~71% for the same holding period. Both Exclusive and Inclusive total return indexes outperformed 3M Libor benchmark by ~50% and ~44% respectively while significantly lagging the theoretical 15% return fund which appreciate by ~540%.

### **Aircraft Lessor Indexes vs. Benchmark Volatilities and Correlations**

While the S&P 500 outperforms both Exclusive and Inclusive price and total return indexes, its volatility as measured by standard deviation is higher than the same four index cases. Given the industry mantra of low volatilities and correlations of the aircraft asset class versus other benchmarks the expectations of correlation should be close to 0. The correlation to the S&P 500 of both Exclusive and Inclusive indexes for the total returns resulted in 0.755 and 0.841, respectively, which are higher than expected. Under the price only case for Exclusive and Inclusive indexes, the correlations are slightly lower than the observed of the total return case at 0.613 and 0.743, respectively.

Exclusive and Inclusive price and total return indexes have very weak positive correlation with the 3M Libor with a range of 0.120 for Exclusive total return index to 0.263 for Inclusive price return index. For correlations with the theoretical 15% return fund is mildly positive with the correlation range between 0.466 to 0.704.

## Results & Analysis

### Acquired Lessors Analysis

#### Acquired Public Lessors

##### IPO-Sale Holding Period

	MinPx	MaxPx	MinDate	MaxDate	Px Appr%	Tot Ret%	PxStdDev	RetS&P500	Ret3MLibor	Ret15%PE	CorrS&P500	Corr3MLibor	Corr15%PE
<b>AYR</b>	23	32.22	8/7/2006	11/15/2019	40.09	93.83	7.36	144.59	-65.03	540.03	0.507	0.624	0.253
<b>GLS</b>	23	10.8	12/13/2006	3/24/2010	-53.04	-41.80	8.43	-17.37	-94.68	58.15	0.932	0.863	-0.835
<b>AVOL</b>	20	30.93	12/11/2014	1/7/2016	54.65	54.65	4.58	-4.53	156.38	16.20	-0.328	0.692	0.958
<b>ILFC</b>	12.5	32.375	2/1/1988	8/31/1990	159.00	160.72	5.13	26.47	17.27	43.43	0.827	0.286	0.771

#### Max Appreciation

##### Min-Peak Holding Period\*

	MinPx	MaxPx	MinDate	MaxDate	Px Appr%	Tot Ret%	PxStdDev	RetS&P500	Ret3MLibor	Ret15%PE	CorrS&P500	Corr3MLibor	Corr15%PE
<b>AYR</b>	23	32.22	8/7/2006	11/15/2019	40.09	93.83	7.36	144.59	-65.03	540.03	0.507	0.624	0.253
<b>GLS</b>	23	10.8	12/13/2006	3/24/2010	-53.04	-41.80	8.43	-17.37	-94.68	58.15	0.932	0.863	-0.835
<b>AVOL</b>	20	30.93	12/11/2014	1/7/2016	54.65	54.65	4.58	-4.53	156.38	16.20	-0.328	0.692	0.958
<b>ILFC</b>	12.5	32.375	2/1/1988	8/31/1990	159.00	160.72	5.13	26.47	17.27	43.43	0.827	0.286	0.771

\*Assumes 0% holding cost for short sale gains in cases where min price is after max price occurrence

**Note:** ILFC represents the firm during the period from 2/1/1988 - 8/31/1990

**Source:** Publicly available information, Bloomberg, Prof. Yu's research

**Total Appreciation % of Acquired Companies & S&P500 / 3M Libor**



**Price Appreciation % of Acquired Companies & S&P500 / 3M Libor**





### **Aircraft Lessor Indexes vs. Benchmark Returns**

For the shareholders of AYR, AVOL and ILFC, if they invested at the IPO and held the stock until delisting, they would have had net positive total returns of 94%, 55%, and 161% respectively. Under the entire public company holding period scenario, GLS shareholders experienced negative total return of 42% if they had invested at the IPO and held until it was acquired. Compared to S&P 500 performance during their respective full holding period, AYR total return performed ~50% points below and GLS's total return underperformed by ~23% points while AVOL and ILFC both outperformed the S&P 500 significantly. The total return of AVOL outperformed the S&P 500 by ~60% and ILFC outperformed by ~135%.

Similarly with the theoretical 15% return fund, AVOL and ILFC both outperformed significantly, respectively by 38% and 117% while AYR and GLS both underperformed by 446% and 100%, respectively. The results are absolute returns and don't factor in time value of money in these calculations. The different time scales in the IPO to sale holding period would account for some of the differences compared to the overall market as the general financial environments are not the same. AVOL and ILFC had a short life of approximately two years as public companies while GLS had a slightly longer history of 4 years as a public company compared with AYR's longer 13 year history. For example, the late 1980s financial environment for ILFC is different versus GLS's 2006 to 2010 existence which included the height of the market right before the Great Financial Crisis ("GFC") and the slow down afterwards. Also this compares differently with the 13 year period of Aircastle incorporating both the bullish periods before the GFC and then the subsequent lows and bull markets afterward.

The other scenario considered in comparison is the max difference between the minimum and maximize peak in the stock price aka a perfectly timed investment either buying and selling at the min and max or vice versa for a short sale. In each of the cases, a shareholder would have performed significantly better relative to the other benchmarks during the same time periods for all companies. In all returns cases (price & total), all of the acquired lessors stocks significantly (greater than 30% in the minimal case with AVOL while others are significantly higher) outperforms the benchmarks including the S&P 500, 3M Libor and theoretical 15% return cases.

### **Aircraft Lessor Indexes vs. Benchmark Volatilities and Correlations**

For the entire public company life holding period scenario, the volatilities for the four stocks were mixed. GLS and ILFC had high correlations to S&P 500, of 0.932 and 0.827, respectively. AYR correlations were not as strong at 0.507 and AVOL was weakly negatively correlated at -0.328. For 3M Libor, GLS also had high correlation (0.863) while the others were weaker positively correlated ranging 0.286 for ILFC to 0.692 for AVOL. For correlation with the theoretical 15% return fund, GLS had high negative correlation (-0.835) while the rest had weak to strong positive correlation. AVOL had high correlations (0.958), ILFC had a slightly lower correlation (0.771) and AYR had the weakest positive correlation (0.253).

For the max appreciation time period scenario, the highest volatilities of the four stocks was AYR while the others were similar to the other scenarios. For correlations, the results were similar to the entire period but the correlations were higher for both the positive and negative figures in almost all cases.

Correlations to the S&P 500 for all are quite high in the 0.8+ other than AVOL with a negative correlation. Interestingly, the correlation to methodical increase in the theoretical 15% return case is correlated highly for AVOL and ILFC with 0.958 and 0.771 respectively while AYR and GLS both had strong negative correlation closer to -1. AYR's correlations increased for all three benchmarks while AVOL remained relatively unchanged. GLS time period between the two scenarios were only slightly different so there were not many differences in the correlation figures. For ILFC, the time period was the same for both, therefore no changes were expected. The higher correlations suggest that the stock prices were influenced by the overall benchmark markets performance during these periods.

The differences between the entire holding period and the most optimal case shows that with only the two differing holding periods that have been considered, the correlations and returns can be dramatically different for investors based on different holding periods and its correlations to various benchmarks from a portfolio point of view.

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*All data gather from publically available information, Bloomberg, and Prof. Yu's other research.*

*All opinions expressed are the authors' own. The author is an investor turned full time finance professor at New York University in Shanghai, where he teaches and focuses on cross-border investing and financing along with a specialty in real assets and aviation. He is also Chairman of China Aviation Valuation Advisors and is the only senior ISTAT Certified Appraiser based in N. Asia and China. His research website is [www.davidyuda.com](http://www.davidyuda.com) and can be reached at [david.yu@nyu.edu](mailto:david.yu@nyu.edu).*



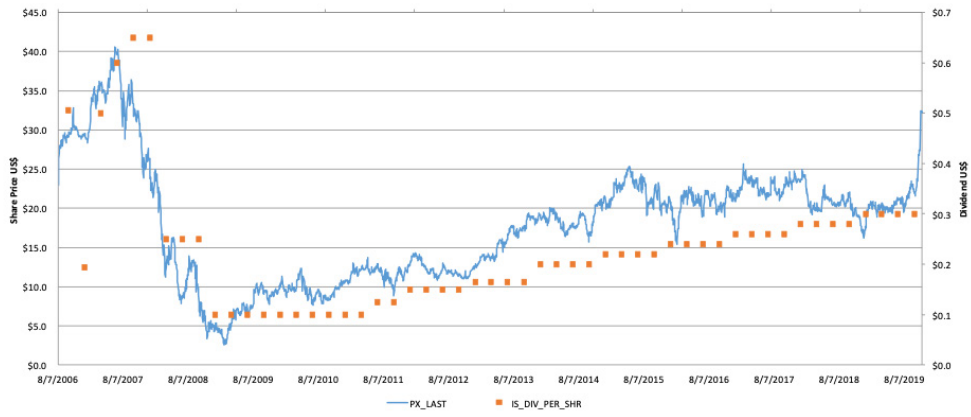
# Appendices



**AVOL US EQUITY PRICE AND DIVIDEND: USD**



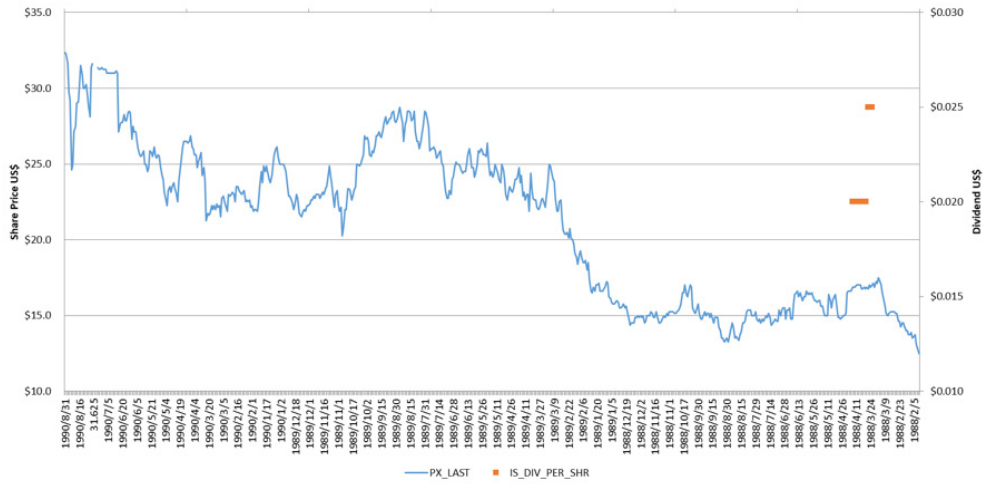
**AYR US EQUITY PRICE AND DIVIDEND: USD**



**GLS US EQUITY PRICE AND DIVIDEND: USD**



**ILFC US EQUITY PRICE AND DIVIDEND: USD**



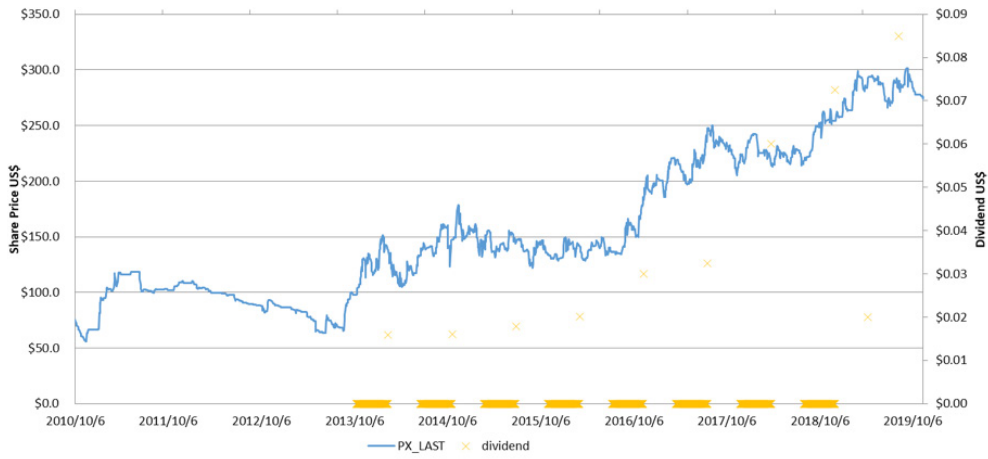
**AER US EQUITY PRICE AND DIVIDEND: USD**



**AL US EQUITY PRICE AND DIVIDEND: USD**



**AVAP UK EQUITY PRICE AND DIVIDEND: USD**



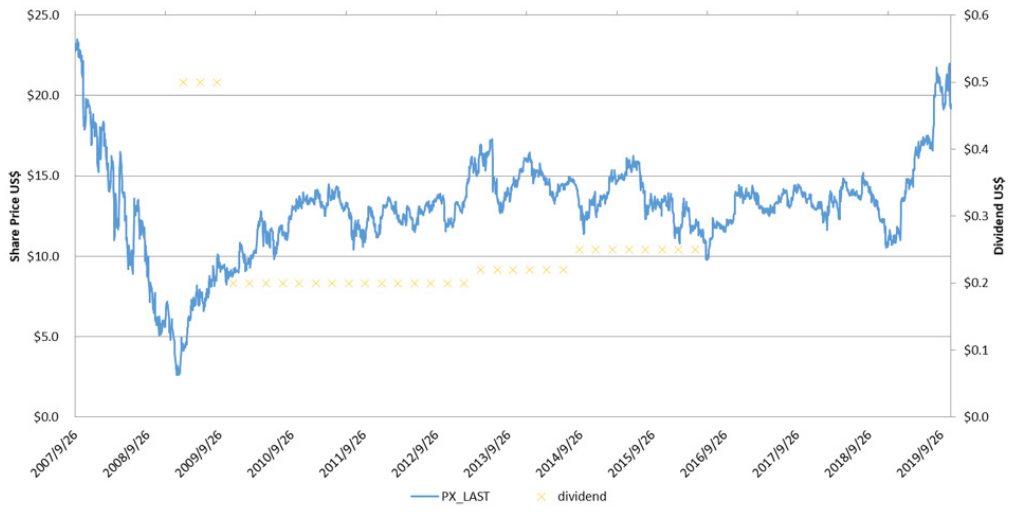
**BOC HK EQUITY PRICE AND DIVIDEND: USD**



**CAL HK EQUITY PRICE AND DIVIDEND: USD**



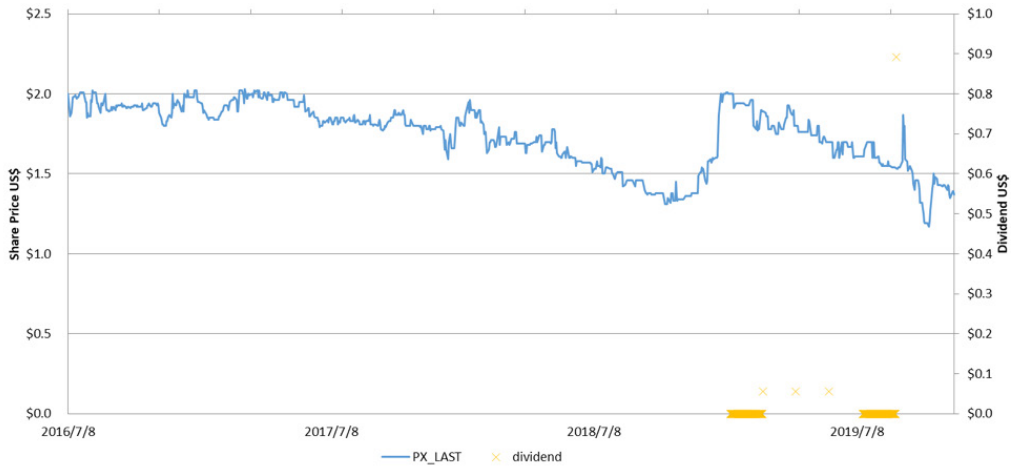
**FLY US EQUITY PRICE AND DIVIDEND: USD**

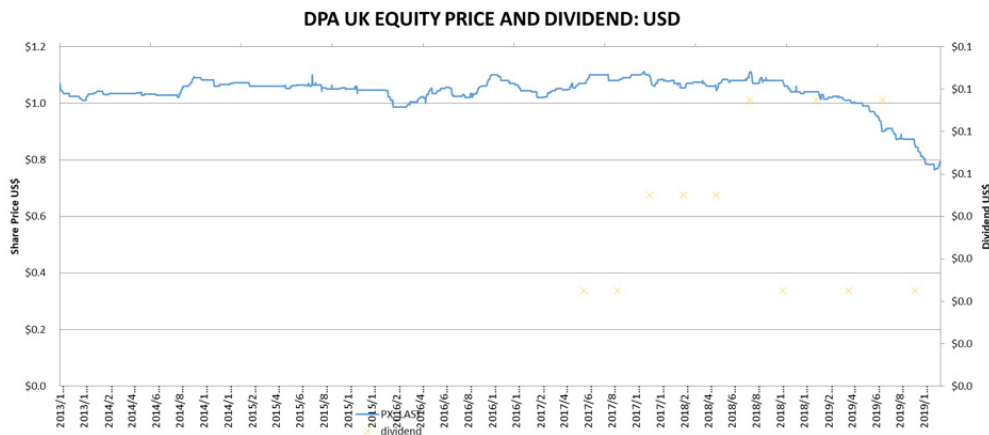
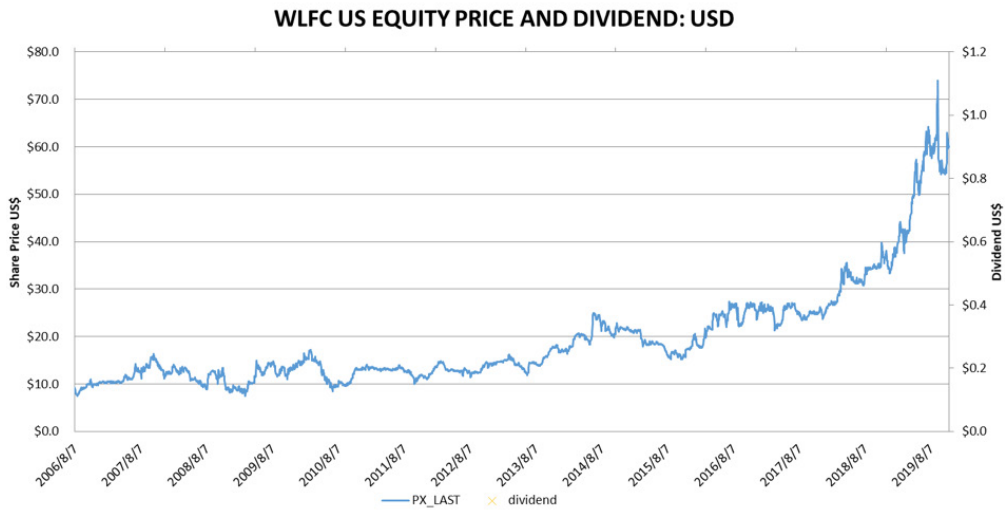
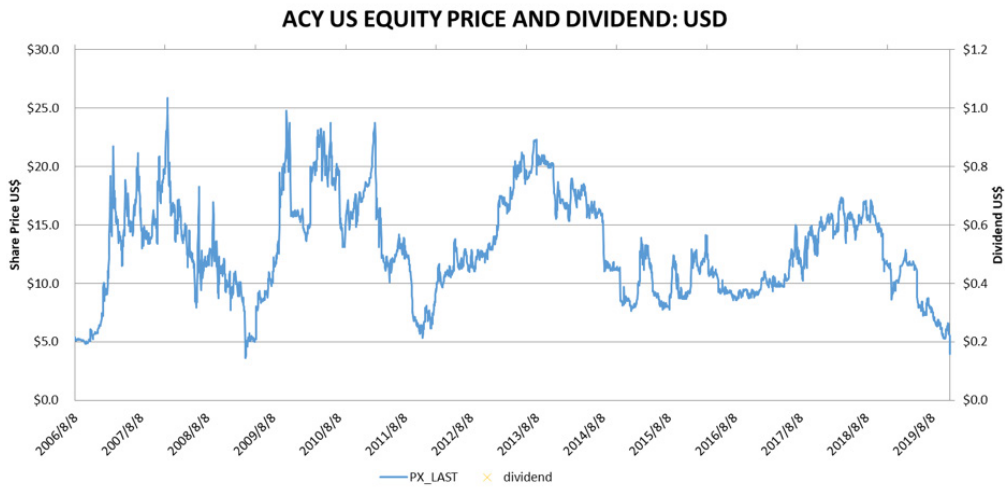


**AAL PW EQUITY PRICE AND DIVIDEND: USD**

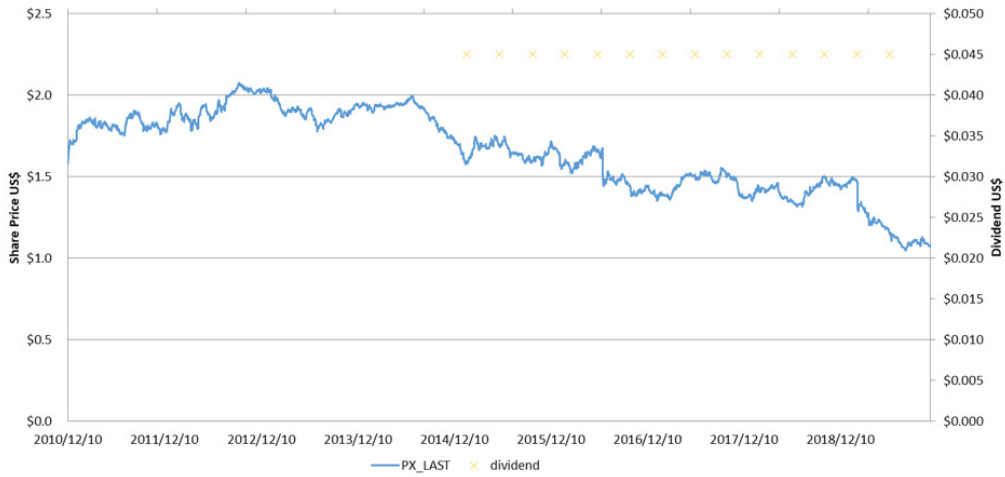


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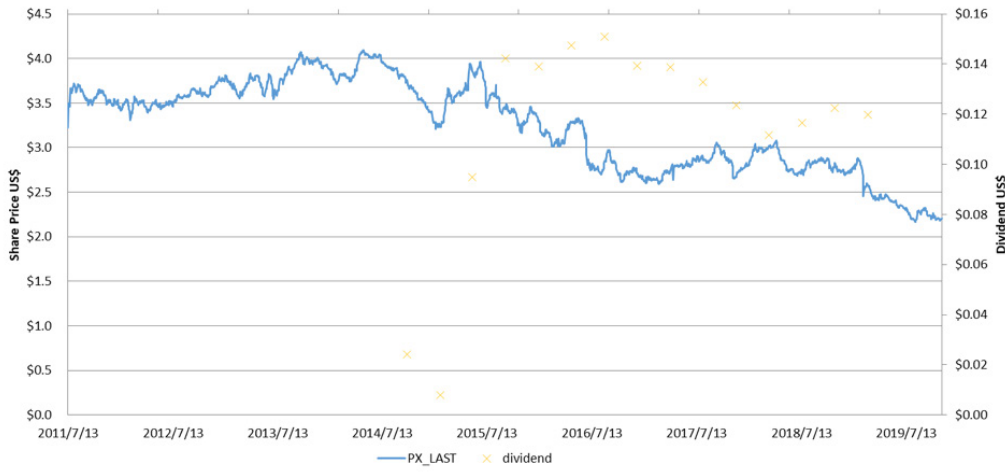




**DNA UK EQUITY PRICE AND DIVIDEND: USD**



**DNA2 UK EQUITY PRICE AND DIVIDEND: USD**



**DNA3 UK EQUITY PRICE AND DIVIDEND: USD**

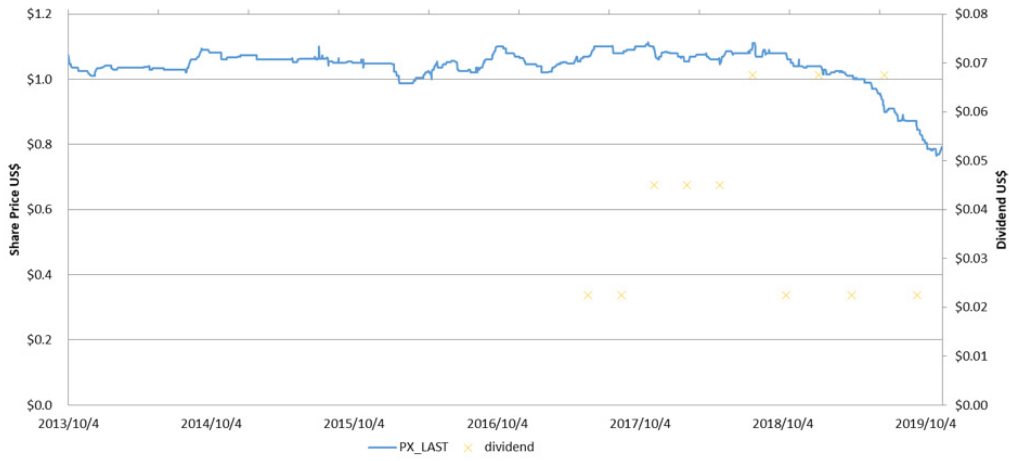




**AA4 UK EQUITY PRICE AND DIVIDEND: USD**



**DPA UK EQUITY PRICE AND DIVIDEND: USD**







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