



Global

Cross-Discipline

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Executive Summary

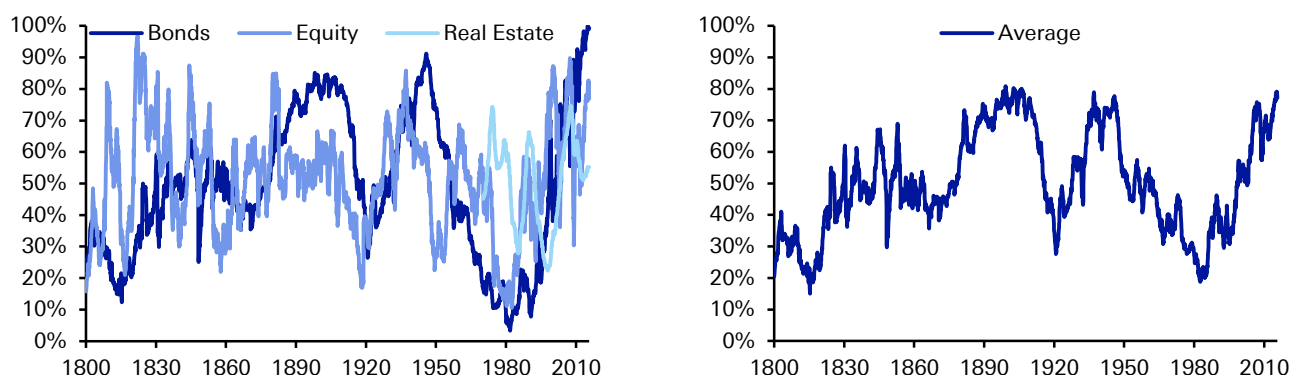
Our annual long-term study allows us to take a step back through time and try to add some historical context to current market conditions. In this year's report we have tried to identify some of the biggest themes in financial markets today and then have used historical data to try to better understand them.

Probably the most topical theme at the moment is what might happen when the Fed eventually raises interest rates. We look at the impact of a Fed hiking cycle on various economic and market variables through time. In other topical analysis, we look back at the impact of major devaluations and currency appreciations through history on similar variables. With currencies increasingly being used as a policy tool, we assess the historical consequences of big FX moves. Elsewhere we try to calculate an index through time aggregating cross asset class valuations at a global level. The aim being to see how expensive overall global assets are now relative to the past.

This study is a culmination of several months work and as we go to print markets have been through a few weeks of turmoil. We try to look through this volatility but clearly the magnitude of the moves do influence the outcomes. Equity markets that were looking historically stretched in valuation terms as we researched the report have corrected over the past month. However as we'll see below and in the report, this is still one of the more expensive points in history to be an owner of the asset class at the index level at least.

In summarising the findings, we start with global cross asset class valuations. Looking at three of the most important assets (bonds, equities and housing) across 15 DM countries, with data often stretching back two centuries, we are currently close to peak valuation levels relative to history. Indeed when aggregated, current levels are higher on average across the three asset classes than they were back in 2007/08 and certainly higher than in 2000. At the equity market peak back in the summer months of 2015 we were pretty much at the peak. So this recent correction should be seen in this context.

Figure 1: Average Percentile Valuations for 15 DM Countries' Bond (Nominal Yields), Equity & Housing vs. History (left) and Aggregated Average (right)



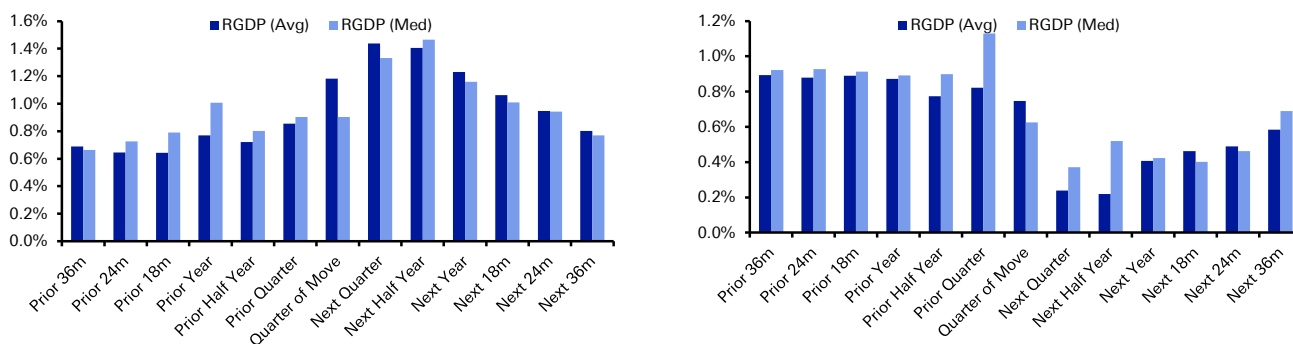
Source: Deutsche Bank, GFD

Extremely high global central bank liquidity and asset purchases have pushed asset prices to these levels. So given that the most important central bank in the world, the Fed, might be close to initiating a tightening cycle, should we be worried that this could lead to a further correction in global asset prices?



History tells us that a rate hike cycle takes time to impact the economy and prices. Real GDP still typically tends to climb for around 6 months after the rate cycle turns before drifting progressively lower over subsequent quarters. Indeed of the twelve US hiking cycles since 1950, the shortest time it took to reach a recession after the first hike was 11 months with the average 41 months (median 33 months). We can perhaps show this delayed impact by also looking at the data around the last hike in a cycle. This shows that growth usually slows in the lead-up as tighter policy has been in place for several quarters. Then only after the last hike, growth falls quite significantly and stays lower for many quarters after.

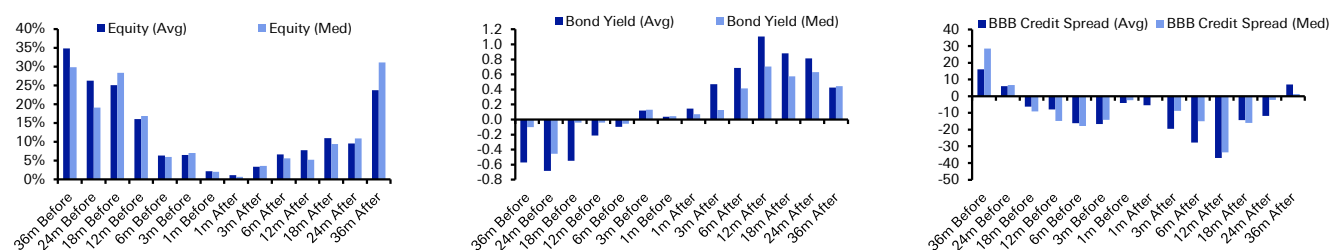
Figure 2: Impact of First (left) and Last (right) US Rate Hike in the Cycle on US Real GDP ('Quarterised', QoQ)



Source: Deutsche Bank, GFC

For asset markets, equities continue to climb initially but seem to stall 12-24 months after the first hike. Bond yields typically climb immediately and for around the next 12 months and credit spreads actually tighten for about the same length of time. Like equities, credit tends to start being impacted a full 12 months after the first hike. So although bond yields rise at the start of a hiking cycle, equities and credit continue to perform for around a year after before succumbing to tighter policy.

Figure 3: Impact of First US Rate Hike in the Cycle on Market Assets (Absolute, Cumulative)

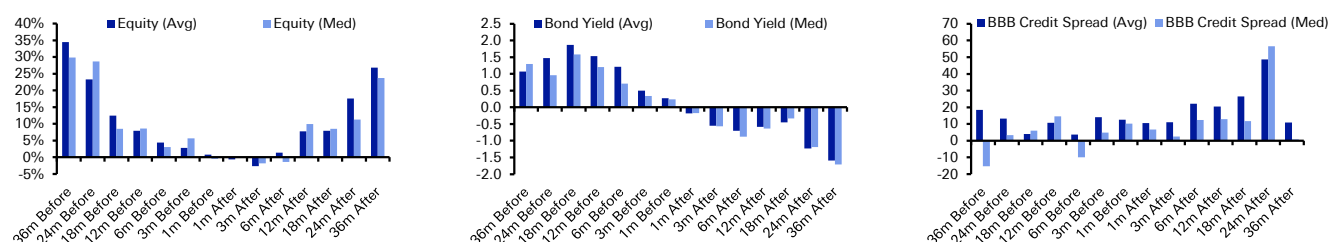


Source: Deutsche Bank, GFD, Moody's

After the last hike, risk aversion tends to be the dominant theme though with lower equity returns, lower yields and wider spreads the immediate outcome.



Figure 4: Impact of Last US Rate Hike in the Cycle on Market Assets (Absolute, Cumulative)



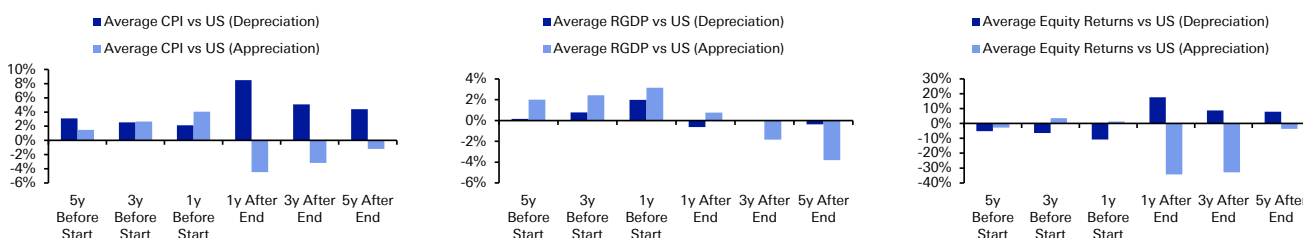
Source: Deutsche Bank, GFC, Moody's Global

The median hiking cycle has lasted 14 months (average 22 months) so if history repeats, the negative impacts on risk assets of the first hike in this cycle may not be felt until late 2016 at the earliest or even well into 2017. This dovetails with our latest annual default study "2017-2018 - The Next Default Cycle?" published in April 2015 where we showed the yield curve was a good lead indicator 30 months in advance and that any flattening today might not hit the default rate at a macro level for another 2-3 years.

However is this time different? In our study since 1950, all hiking cycles to date have been in a super cycle of increasing leverage with GDP eclipsing pre-recession peaks very quickly post the recovery commencing. By contrast this has been a uniquely slow recovery from what was the worst recession in the sample period. This has also been the longest period by far without a rate hike after the previous recession ended. In the twelve cycles since 1950, the median length of time until the first hike once the last recovery starts is 30 months. This current cycle is 74 months and counting, all without a rate hike and now eclipsing the previous high of 35 months without a move higher. So food for thought.

Another way that this cycle is different is with regards to how low global growth has been since the GFC. Many countries have unleashed huge fiscal and monetary stimulus over the subsequent period but now many are resorting to using currency as a policy tool. In this document we look at the impact large devaluations and appreciations (maybe for those not participating in currency wars) have on a country's macro variables and financial assets.

Figure 5: Impact of Major FX Moves on DM Economic and Market Variables (Annualised)



Source: Deutsche Bank, GFD

Notably higher inflation tends to be an immediate and sustained consequence of a devaluation with exactly the opposite occurring with an appreciation. The big conclusion though is that there is no evidence historically that real GDP growth improves relative to its previous trend after a devaluation, although there is some evidence an appreciation is a big headwind to real GDP growth which is something the US may need to consider if all around are debasing their currency. In terms of asset markets, domestic equity returns are strong



post a devaluation and weak post an appreciation. So overall history suggests a currency war is unlikely to dramatically change a country's real GDP but might increase their inflation rate and boost their domestic equity market.

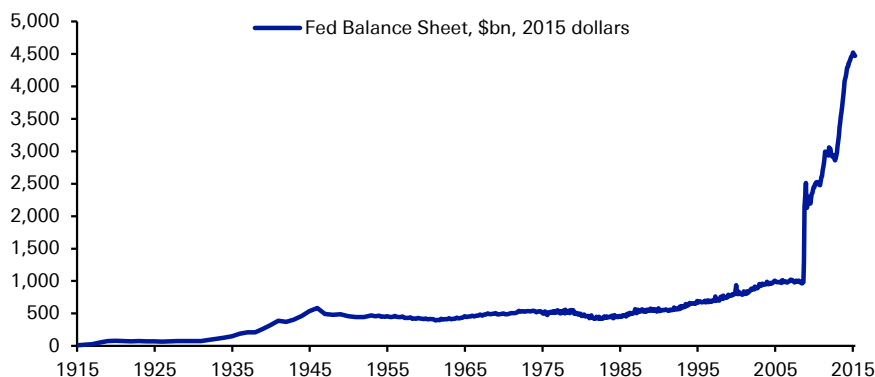
Even if there is limited compelling evidence of a boost to growth from a devaluation, currency wars are likely to continue to be a theme in global financial markets over the next few years. China devaluing last month will perhaps reinforce this further even if their motivation for the move remains unclear. This and slow growth will likely force central banks around the world to continue to keep policy extremely loose relative to history and with it keep asset prices at the historically high levels that we highlight in this report. This is more a theme in DM than EM perhaps, especially given poor performance in the latter block in recent quarters, but there are still elements where it is global. So when will this period of artificially high asset prices end?

As discussed above, a US rate hike may not have an immediate impact but could do by the time we get to 2017-2018. However if the Fed keep policy looser than the market expects we may not witness a typical hiking cycle and the traditional impacts detailed in this note may be less relevant.

If this is the case what could start the declines away from the peak prices we currently see? The most likely driver would be something that changes the current policy orthodoxy where central banks are continually keeping rates at close to zero and accumulating assets at a pace never previously seen through history. Anything that changes this will likely be a negative for assets. As discussed, if the Fed do start a sustained hiking cycle then the evidence is that the economy and assets will eventually adjust. Perhaps this time this will be more extreme given the weaker economy and higher asset prices leading into the tightening.

Alternatively it could be a regime change towards higher global inflation. This would leave central banks with less flexibility to manipulate policy and with it asset prices. So far subdued inflation has worked in central banks' favour, allowing them to offer the financial markets an extraordinary level of stimulus. If inflation was higher they would have a real dilemma.

Figure 6: Size of Federal Reserve Balance Sheet (1915-) – Extraordinary Times



Source: Deutsche Bank, Haver, St. Louis Fed, Bloomberg Finance LP

One more curveball outcome would be a move away from monetary stimulus to fiscal stimulus. If global powers decided that central banks were becoming impotent and even exacerbating the lack of global growth they could in theory embark on a co-ordinated global fiscal stimulus program, possibly financed by money printing. This would probably help growth but possibly at the expense of monetary stimulus into asset markets. This seems unlikely in the near-term



but could start to gain traction at the next major global downturn as global leaders search for a growth solution. This was a theme we explored in depth in our 2013 Long-Term Study “A Nominal Problem”. Unfortunately the problem of ultra low nominal global GDP growth still exists.

Overall even with the recent sell-off in markets, asset prices are still generally high with many close to peak levels in the DM world. However they could easily stay close to these highs until we see a policy regime change.

The long-term investor should be cautious at this point in history (in DM government bonds and equities at the very least) in this artificial financial system, even if the short-term trend points us towards more stimulus across the world.

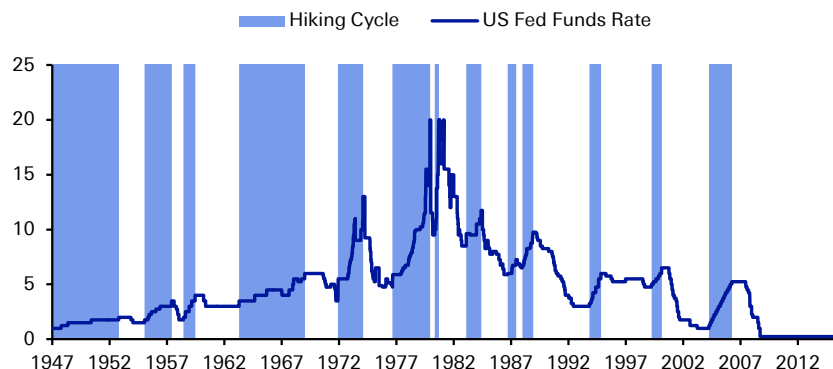
In the remainder of the report we conduct our annual mean reversion exercise for US assets but also include EUR and GBP credit. US assets look pretty expensive across the board but long-run credit excess returns going forward should exceed their long-term average. In addition to this we publish our usual tables and graphs depicting long-term returns for global equities and government bonds.



The Impact of a Fed Rate Hike Cycle through History

With the Fed seemingly hovering with their finger on the rate hike trigger regardless of whether we see a move in September 2015, in this chapter we take a look through history at Fed rate hikes and rate hike cycles to see the impact on various US economic variables and markets to the tightening of policy. We start by identifying twelve US hiking cycles since 1950 which are shown in Figure 7.

Figure 7: US Rates since 1950 with Rate Hiking Cycles Block Shaded



Source: Deutsche Bank, GFD

For each cycle we look at the first hike, but also the data based on all hikes seen over the period and also from the last hike in the cycle. This should give us a feel as to how the economy and markets respond at different stages of the tightening regime. To complete the analysis we also look at easing cycles by analysing what happens after the first cut in a cycle and also what happens around any cut in Fed Funds. This helps us contrast the response at opposite ends of the cycle.

We then look at the period 3 years before and after each of these events and examine the evolving performance of real and nominal GDP, inflation, equities, bonds and credit spreads.

For all of the market analysis the returns/changes are cumulative and absolute (i.e. the 18 months equity return refers to the absolute return over that entire period) whilst for the macro analysis the growth/inflation rate is cumulative but 'quarterised' (i.e. the 18 months growth rate will be the geometric average QoQ growth rate over that 18m period). For equity returns we look at the change in the S&P 500 index level, for bond yield changes we focus on the 10 year government bond and for credit spreads we use US BBB spreads.

We conclude by repeating this analysis for the UK, the other G7 nation which is currently sounding out the potential for rate hikes in the near future.



Figure 8: US Hiking Cycle Summary Stats

Timing			Moves				Next Recession	
Start Date of Hike Cycle	End Date of Hike Cycle	Duration of Cycle (Months)	Start Level of Rates (Pre-Cycle)	First Hike Size	End Level of Rates	Total Amount of Hiking	Date of Next Recession	Time to Next Recession (Months)
15/04/1955	23/08/1957	28	1.50	0.25	3.50	2.00	Aug 57	28
12/09/1958	11/09/1959	12	1.75	0.25	4.00	2.25	Apr 60	19
17/07/1963	04/04/1969	69	3.00	0.50	6.00	3.00	Dec 69	77
01/03/1972	01/05/1974	26	3.50	2.00	13.00	9.50	Nov 73	20
01/12/1976	03/03/1980	39	4.75	1.13	20.00	15.25	Jan 80	37
07/08/1980	05/12/1980	4	9.50	0.50	20.00	10.50	Jul 81	11
02/05/1983	21/08/1984	15	8.50	1.13	11.75	3.25	Jul 90	86
16/12/1986	04/09/1987	9	5.88	0.12	7.25	1.37	Jul 90	43
29/03/1988	24/02/1989	11	6.50	0.25	9.75	3.25	Jul 90	28
04/02/1994	01/02/1995	12	3.00	0.25	6.00	3.00	Mar 01	85
30/06/1999	16/05/2000	11	4.75	0.25	6.50	1.75	Mar 01	21
30/06/2004	29/06/2006	24	1.00	0.25	5.25	4.25	Dec 07	42
Average		22	4.47	0.57	9.42	4.95		41
Median		14	4.13	0.25	6.88	3.13		33

Source: Deutsche Bank, GFD

In the 12 US hiking cycles we have identified since 1950, Figure 8 shows that the average length has been 22 months, with the median length 14 months. The median and average starting levels were 4.13% and 4.47% respectively, with the total hikes amounting to 3.13% (median) and 4.95% (average). From the first hike the average and median lengths until the next recession were 41 and 33 months respectively. So normally a recession doesn't start for around 3 years after a hiking cycle starts and 19 months after the hiking cycle ends. As we'll see throughout this chapter, this helps illustrate that monetary policy takes time to impact activity. Of the 12 hiking cycles, the shortest time between the first hike and a US recession was 11 months after the first hike in August 1980 and the second shortest was 19 months after the first hike in September 1958.

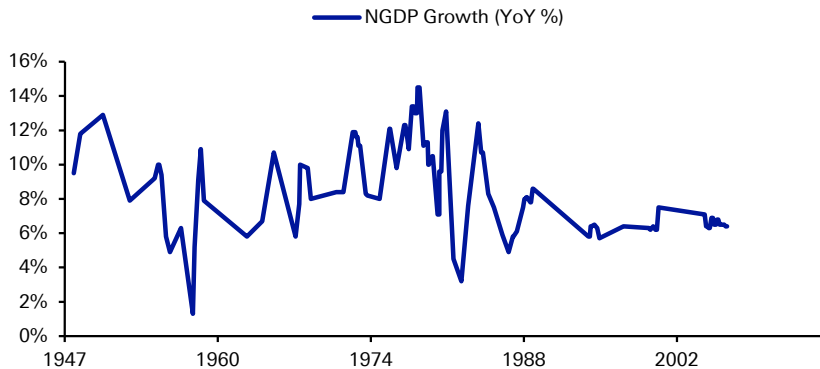
Before we look at the results it is worth hypothesizing as to whether this time is different. In our study since 1950, all hiking cycles to date have been in a super cycle of increasing leverage with GDP eclipsing pre-recession peaks very quickly post the recovery commencing. By contrast this has been a uniquely slow recovery from what was the worst recession in the sample period. This has also been the longest period by far without a rate hike after the previous recession ended. In the twelve cycles since 1950, the median length of time until the first hike once the last recovery starts is 30 months. This current cycle is 74 months and counting, eclipsing the previous high of 35 months.

The market performance in the lead up to an imminent hike and economic performance are also different from the past. As Figure 17 shows, only one of the twelve hiking cycles since 1950 have seen US equities decline in the 3 months prior to the hike and that was a relatively mild -1.51% in 1976. If we look at markets from June 17th - 3 months before the next FOMC - the S&P 500 is down around -7%. Also BBB spreads have only widened more than 2bps once in the 3 months before the start of one of these hiking cycles. This was also in 1976 and saw a 45bps widening. Since June 17th, this index has widened 43bps.

In terms of the economy, earlier this year we published the graph in Figure 9 which shows that of the 118 rate hikes since 1950, YoY Nominal GDP had only been below 4.5% on two occasions at the point of a hike. As can be seen these were both temporary spikes lower before a strong rebound.



Figure 9: NGDP YoY Growth Rate at Time of each Fed Hike



Source: Deutsche Bank, Bloomberg Finance LP, GFD

Having said all this, there are always reasons why each cycle is unique and there are also those who would be more sanguine than us on this cycle. As such looking at past Fed hiking cycles is instructive and can give us clues as to how we should interpret any move the Fed makes towards tightening policy over the next few months.

Figure 17 and Figure 18 at the end of this section are tables showing the response over different periods leading up to, and post the start of each tightening cycle. Overall our analysis shows that big moves are rare in the immediate days and weeks around the first hike so when we table/graph the average/median results below we exclude any time horizon shorter than a month.

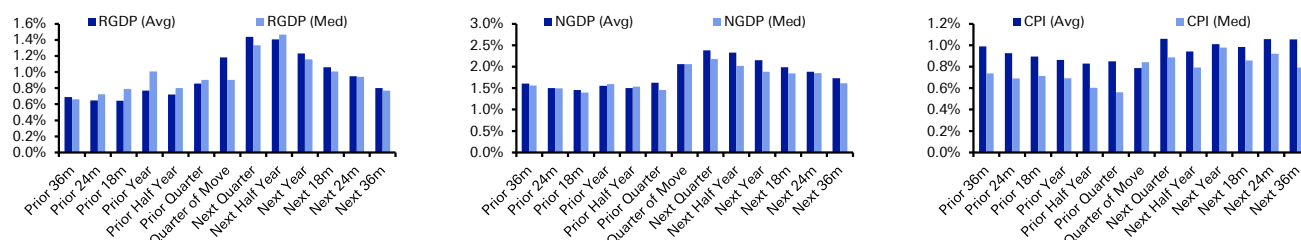
US results

If we look at the first hike in the cycle, invariably real GDP growth is in the process of steadily climbing into the move and then actually accelerating in the half year afterwards. From 6 month to three years after, the pace of growth incrementally slows as the long lag of monetary policy and subsequent rate hikes bite. It generally is still higher 18 months after the first hike than it was in the entire 18 months before the move and the same 3 years after than 3 years before. A similar pattern emerges for nominal GDP (NGDP) with growth peaking out 3-6 months after the first hike but still above pre-hike levels 18 months and 3 years later. This higher NGDP is supported by higher CPI which is firmer 18 months and 3 years after the hike than the same period before. There's not a strong bias to when it peaks it simply remains at elevated levels post the first hike.

These readings probably reflect a traditional textbook rate hiking cycle where the Fed feel comfortable raising rates due to activity levels rising and inflation pressures building and one where activity levels take several quarters to be impacted.



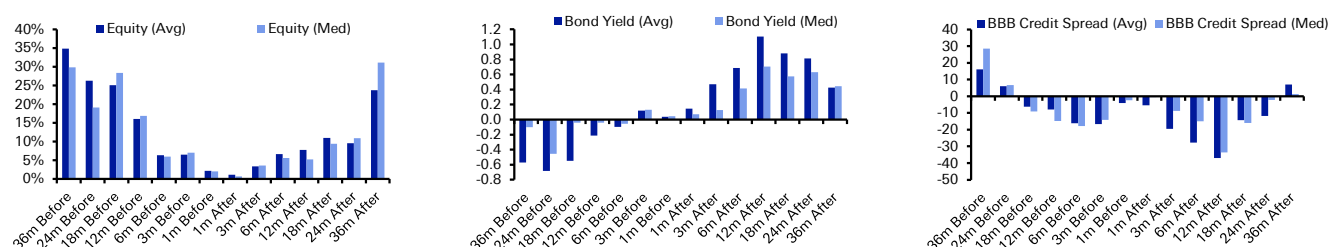
Figure 10: Impact of First US Rate Hike in the Cycle on US Economic Variables ('Quarterised', QoQ)



Source: Deutsche Bank, GFD

We now look at the response in equity, government bond and credit markets.

Figure 11: Impact of First US Rate Hike in the Cycle on US Assets (Absolute, Cumulative)



Source: Deutsche Bank, GFD, Moody's

For equities the performance a year ahead of the first hike in the cycle is around double that seen in the year after. However it's fair to say that the performance in the 6 months before the first hike and 6 months after are fairly similar. Overall it's hard to see evidence that the early months of a Fed hiking cycle impact US equities too severely. Maybe in the 6-12 months prior, confidence and growth was high with little immediate risk of tighter policy but perhaps the market starts to reign itself in as prospects of a rate rise approach. It does seem there is a trend for equity returns to stall 12-24 months after the first hike which again perhaps reflects the lag in monetary policy. If the median recession takes 33 months to arise after the first Fed hike, given that equities typically move ahead of an official recession, then this seems sensible. At 3 years after the first hike, returns are nearly back to normal, perhaps reflecting the move to price in the recovery from the growth slowdown.

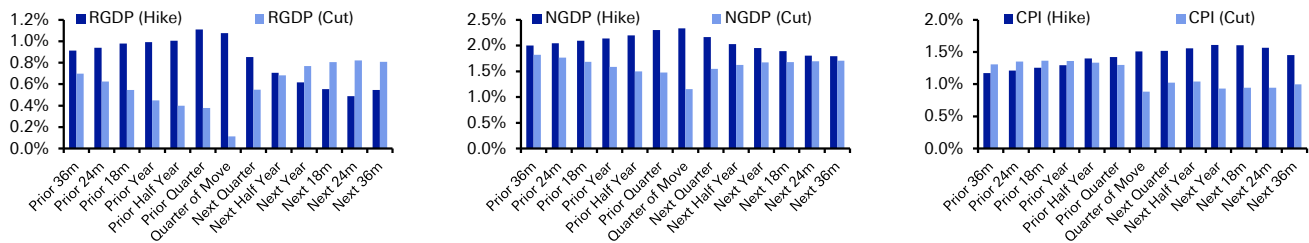
For bond yields there is a clear trend for higher yields after the first hike in the cycle which seems to peak after around 12 months, then stabilises over the next year before falling again in the third year after the hike which again perhaps reflects the lag of policy and the associated slowdown in activity.

For credit spreads, we see tightening for around 12 months after the first hike. However after this for the next two years this tightening is fully and progressively reversed hinting again at the lag of the impact of policy.

If we extend the analysis to all hikes regardless of when they occur and then the same exercise for the last hike in the cycle, the results for the same economic and financial variables are shown in Figure 12 - Figure 15. On the all hikes graphs we also show the impact over the same time period of all interest rate cuts to show a comparison. To complete the analysis we then show in Figure 16 the impact on all the variables of the first cut in a subsequent easing cycle. For the hiking cycles, looking at the analysis at different points will help highlight whether there is a lag between monetary tightening and its impact on the economy and financial assets.

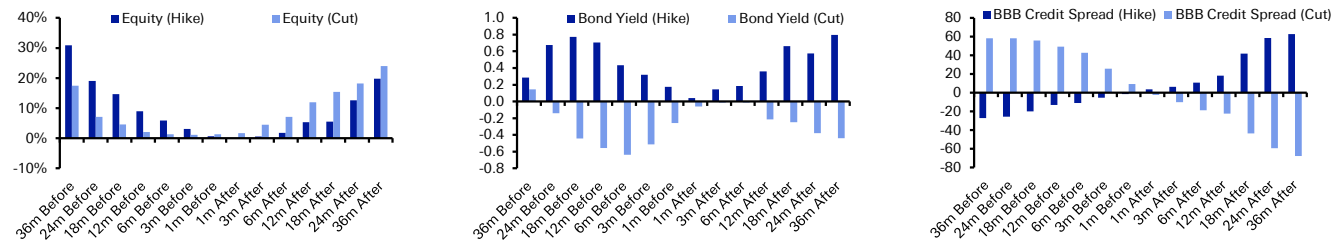


Figure 12: Impact of All US Rate Hikes in the Cycle on US Economic Variables ('Quarterised', QoQ)



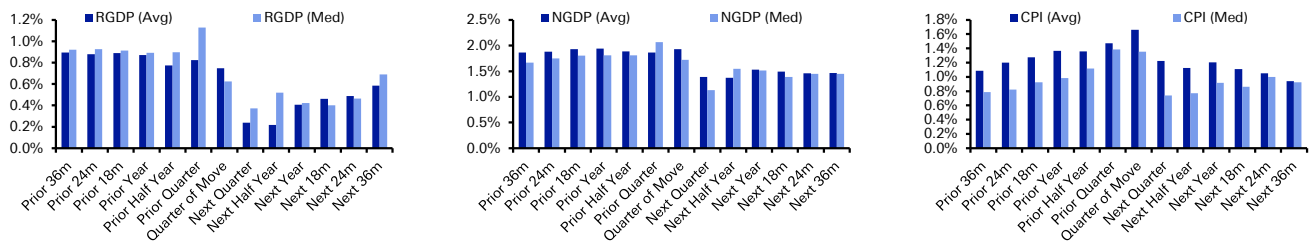
Source: Deutsche Bank, GFD

Figure 13: Impact of All US Rate Hikes in the Cycle on US Assets (Absolute, Cumulative)



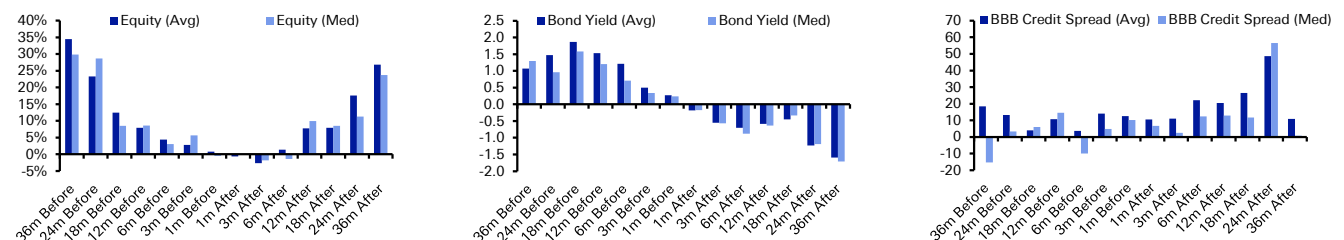
Source: Deutsche Bank, , GFD, Moody's

Figure 14: Impact of Last US Rate Hike in the Cycle on US Economic Variables ('Quarterised', QoQ)



Source: Deutsche Bank, GFD

Figure 15: Impact of Last US Rate Hike in the Cycle on US Assets (Absolute, Cumulative)



Source: Deutsche Bank, GFD, Moody's

These results are interesting as they show further evidence that progressive rate hikes do slow real GDP. Our earlier analysis showed growth slowing progressively from 6 months after the first hike but that growth was still higher 18 and 36 months after the first hike than all periods before. On the all hikes analysis, growth is definitely slower after the 'average' hike than for all periods before. Then after the last hike in the cycle growth slows considerably before slowly recovering over the next 3 years but not to former levels. It perhaps



shows that it takes time and a series of hikes to slow the economy down. Interestingly CPI continues to rise until the last hike in the cycle at which point it finally starts to fall.

It does seem equities have a bias to climb in the year after all hikes but the pace is less than the year before. This trend is especially true 6 months before and after. In the 6 months after all hikes, prices rise less than 2% which is low relative to history. Indeed in the period 12-18 months after all hikes, equities appear to plateau and are only around 5% higher at the end of that period – a notable under-performance relative to history and to that seen in an easing cycle. So it does seem progressive hikes do start to slow equity returns more than the first hike. After the last hike, equities are flat 6 months later and only around 5% higher at the 18 month point before recovering strongly at the 2 and 3 year point post last rate hike.

For bonds the all hike analysis shows the pace of bond yield rises slows after 18 months. Again we see the sharp difference between performance both before and after in a hiking and easing cycle. The fact that the trend is already established before the 'average' hike/cut in the cycle perhaps shows that the impact of the earlier hikes/cuts have already impacted performance. For bonds, it does seem yields change direction immediately as the first hike/cut in the cycle arrives. At the end of the hiking cycle bond yields fall immediately backing up what we saw with growth and CPI at the same point.

For credit, the results are again slightly different for all hikes than they were for the first hike in the cycle. Using all hikes, credit starts to widen over all horizon periods post the 'average' hike. Again this shows that it's the subsequent rate hikes in the cycle that tend to weigh on risk asset performance rather than the initial move. A similar result is seen after the last hike in the cycle with spreads continuing wider culminating with spreads on average 50bps wider after 2 years.

Looking at all cuts in the cycle and also analysing the first cut in the cycle in Figure 16, it's clear the difference between being in an easing cycle to that of a tightening one is stark. Growth is lower leading into a cut but it does seem to pick up progressively after a cut. This is especially true for real GDP as the trend is slightly less stark for nominal GDP as inflation seems to have a bias to continue to be lower in the 3 years after a cut perhaps showing the lag effect or possibly that external forces are often more powerful for inflation.

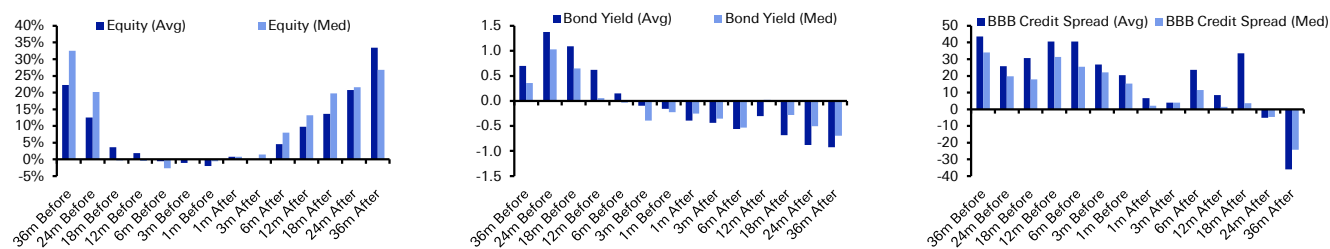
In terms of market variables, rate cuts are a potent force for equities with equities actually declining a year before the first cut and pretty flat a year before all cuts (likely due to a weaker economy/earnings requiring the cut). However in the 12 months after, equities tend to see low double digit gains showing the impact of looser monetary policy on the asset class relative to the period prior to the cuts and relative to a tightening cycle.

As discussed before, bonds seem to be very sensitive to the first move in the cycle. By the time we see the all hikes/cuts data we've already seen the first move which seems to be the trigger for a change in direction in yields.

For credit, again the results are interesting. For all cuts, credit does perform badly in the year prior to the move (again a weaker economy requiring the cut) but relatively well in the year after as the cumulative impact of cuts kick-in. There is again evidence that it takes a while for the positive impact to be felt as spreads continue to widen for 12-18 months after the first cut albeit not by as much as they do in the prior 12 months.



Figure 16: Impact of First US Rate Cut in the Cycle on US Assets (Absolute, Cumulative)



Source: Deutsche Bank, GFD, Moody's

Figure 17: US First Hike - Market Analysis

Hike Cycle Timing			Moves				Next Recession		Equity Index (% Change)													
Start Date	End Date	Duration (Months)	Pre-Cycle Rates Level	First Hike Size	End Level of Rates	Total Hiking	Next Recession	Time to it (Months)	36m Before	24m Before	18m Before	12m Before	6m Before	3m Before	1m Before	1m After	3m After	6m After	12m After	18m After	24m After	36m After
15/04/1955	23/08/1957	28	1.50	0.25	3.50	2.00	Aug 57	28	60.47%	52.08%	58.50%	35.86%	19.71%	7.60%	6.30%	-2.48%	11.70%	9.04%	26.34%	23.45%	18.41%	11.78%
12/09/1958	11/09/1959	12	1.75	0.25	4.00	2.25	Apr 60	19	9.82%	3.15%	10.93%	8.28%	14.43%	8.45%	1.68%	6.37%	9.66%	16.63%	17.43%	11.93%	14.92%	40.04%
17/07/1963	04/04/1969	69	3.00	0.50	6.00	3.00	Dec 69	77	22.98%	6.39%	0.89%	21.40%	5.83%	0.01%	-1.44%	3.64%	6.28%	11.07%	21.88%	25.48%	24.23%	26.20%
01/03/1972	01/05/1974	26	3.50	2.00	13.00	9.50	Nov 73	20	8.60%	19.07%	31.65%	9.87%	7.57%	11.66%	2.46%	0.85%	2.97%	4.64%	4.20%	-1.93%	-10.36%	-22.09%
01/12/1976	03/03/1980	39	4.75	1.13	20.00	15.25	Jan 80	37	6.80%	46.48%	12.44%	13.04%	2.64%	-1.51%	-0.59%	4.40%	-1.79%	-5.42%	-7.61%	-5.02%	-6.06%	3.26%
07/08/1980	05/12/1980	4	9.50	0.50	20.00	10.50	Jul 81	11	24.85%	19.07%	26.90%	16.71%	6.04%	15.04%	4.24%	0.01%	4.77%	4.84%	6.85%	-7.03%	-16.40%	29.10%
02/05/1983	21/08/1984	15	8.50	1.13	11.75	3.25	Jul 90	86	53.54%	22.14%	30.52%	39.22%	17.91%	13.18%	5.98%	1.15%	-0.06%	1.68%	-0.13%	3.28%	10.43%	44.83%
16/12/1986	04/09/1987	9	5.88	0.12	7.25	1.37	Jul 90	43	53.97%	53.69%	33.64%	17.93%	1.59%	7.91%	2.27%	6.49%	15.27%	21.88%	-0.78%	7.89%	10.50%	37.45%
29/03/1988	24/02/1989	11	6.50	0.25	9.75	3.25	Jul 90	28	43.96%	8.83%	13.12%	-12.18%	-19.16%	6.33%	-2.89%	0.48%	4.20%	4.81%	12.41%	34.25%	31.04%	42.77%
04/02/1994	01/02/1995	12	3.00	0.25	6.00	3.00	Mar 01	85	34.87%	13.52%	10.71%	4.50%	4.74%	2.69%	0.63%	-1.08%	-3.85%	-2.43%	2.41%	18.97%	36.53%	68.00%
30/06/1999	16/05/2000	11	4.75	0.25	6.50	1.75	Mar 01	21	104.69%	55.08%	41.39%	21.07%	11.43%	5.53%	5.44%	-3.20%	-6.56%	6.68%	5.97%	11.43%	-9.91%	-29.44%
30/06/2004	29/06/2006	24	1.00	0.25	5.25	4.25	Dec 07	42	-6.83%	15.26%	29.73%	17.07%	2.81%	1.23%	1.80%	-3.43%	-2.30%	6.37%	4.43%	9.42%	11.34%	33.19%
Hike Cycle Timing			Moves				Next Recession		10Y Government Bond (Yield Change)													
Start Date	End Date	Duration (Months)	Pre-Cycle Rates Level	First Hike Size	End Level of Rates	Total Hiking	Next Recession	Time to it (Months)	36m Before	24m Before	18m Before	12m Before	6m Before	3m Before	1m Before	1m After	3m After	6m After	12m After	18m After	24m After	36m After
15/04/1955	23/08/1957	28	1.50	0.25	3.50	2.00	Aug 57	28	0.36	-0.08	0.09	0.46	0.32	0.14	0.08	0.01	0.15	0.13	0.43	0.59	0.73	0.13
12/09/1958	11/09/1959	12	1.75	0.25	4.00	2.25	Apr 60	19	0.79	0.38	0.35	-0.16	0.78	0.79	0.22	0.04	0.10	0.23	0.92	0.49	0.04	0.22
17/07/1963	04/04/1969	69	3.00	0.50	6.00	3.00	Dec 69	77	0.13	0.11	-0.09	0.00	0.21	0.03	0.03	-0.04	0.09	0.14	0.17	0.16	0.17	1.01
01/03/1972	01/05/1974	26	3.50	2.00	13.00	9.50	Nov 73	20	-0.22	-0.86	-1.43	-0.08	-0.18	0.12	-0.05	0.10	0.03	0.39	0.61	1.17	1.04	1.46
01/12/1976	03/03/1980	39	4.75	1.13	20.00	15.25	Jan 80	37	0.28	-0.67	-1.07	-1.15	-0.97	-0.67	-0.41	-0.13	0.52	0.41	0.61	1.44	1.83	3.47
07/08/1980	05/12/1980	4	9.50	0.50	20.00	10.50	Jul 81	11	3.29	2.35	1.62	1.80	-1.00	0.75	0.51	0.58	1.95	2.50	4.12	4.17	2.99	1.49
02/05/1983	21/08/1984	15	8.50	1.13	11.75	3.25	Jul 90	86	0.02	-3.79	-4.31	-3.61	-0.30	-0.62	-0.36	0.52	1.56	1.44	2.60	1.40	1.03	-2.75
16/12/1986	04/09/1987	9	5.88	0.12	7.25	1.37	Jul 90	43	-4.76	-4.44	-2.86	-2.04	-0.51	-0.41	-0.17	-0.09	0.10	1.16	1.88	1.77	2.05	0.65
29/03/1988	24/02/1989	11	6.50	0.25	9.75	3.25	Jul 90	28	-3.09	1.07	1.02	1.23	-1.08	-0.29	0.40	0.31	0.32	0.42	0.80	-0.25	0.04	-0.49
04/02/1994	01/02/1995	12	3.00	0.25	6.00	3.00	Mar 01	85	-1.94	-1.35	-0.72	-0.45	0.07	0.27	0.06	0.44	1.20	1.18	1.59	0.56	-0.24	0.51
30/06/1999	16/05/2000	11	4.75	0.25	6.50	1.75	Mar 01	21	-0.92	-0.70	0.01	0.37	1.16	0.60	0.17	0.11	0.09	0.58	0.22	-0.69	-0.44	-0.96
30/06/2004	29/06/2006	24	1.00	0.25	5.25	4.25	Dec 07	42	-0.80	-0.24	0.80	1.08	0.33	0.71	-0.04	-0.12	-0.48	-0.35	-0.68	-0.23	0.53	0.38
Hike Cycle Timing			Moves				Next Recession		BBB Spreads (bp Change)													
Start Date	End Date	Duration (Months)	Pre-Cycle Rates Level	First Hike Size	End Level of Rates	Total Hiking	Next Recession	Time to it (Months)	36m Before	24m Before	18m Before	12m Before	6m Before	3m Before	1m Before	1m After	3m After	6m After	12m After	18m After	24m After	36m After
15/04/1955	23/08/1957	28	1.50	0.25	3.50	2.00	Aug 57	28	-4	-8	-42	-44	-29	-10	-6	0	-12	-3	-24	9	22	105
12/09/1958	11/09/1959	12	1.75	0.25	4.00	2.25	Apr 60	19	49	42	9	10	-59	-47	-2	1	-12	-25	-61	-11	10	3
17/07/1963	04/04/1969	69	3.00	0.50	6.00	3.00	Dec 69	77	-50	-35	-18	-22	-26	-8	-3	1	-10	-16	-18	-21	-14	-16
01/03/1972	01/05/1974	26	3.50	2.00	13.00	9.50	Nov 73	20	96	61	17	-59	-28	-28	2	-13	-8	-63	-85	-63	-76	58
01/12/1976	03/03/1980	39	4.75	1.13	20.00	15.25	Jan 80	37	51	-95	-51	-32	23	45	31	-38	-92	-97	-120	-115	-119	-31
07/08/1980	05/12/1980	4	9.50	0.50	20.00	10.50	Jul 81	11	101	114	107	78	71	-66	-26	21	12	42	2	81	139	-27
02/05/1983	21/08/1984	15	8.50	1.13	11.75	3.25	Jul 90	86	-25	22	-47	-82	-120	-51	-25	-10	-68	-67	-123	-62	-44	21
16/12/1986	04/09/1987	9	5.88	0.12	7.25	1.37	Jul 90	43	73	71	65	56	-16	2	6	-26	-55	-66	-43	-61	-96	-69
29/03/1988	24/02/1989	11	6.50	0.25	9.75	3.25	Jul 90	28	8	-57	-62	-8	25	-20	-25	0	3	-13	-47	-22	-33	-17
04/02/1994	01/02/1995	12	3.00	0.25	6.00	3.00	Mar 01	85	-77	-10	-1	-4	-1	-18	-10	-4	-5	-1	-2	7	12	0
30/06/1999	16/05/2000	11	4.75	0.25	6.50	1.75	Mar 01	21	63	73	63	55	-19	3	6	-1	15	-14	58	57	32	46
30/06/2004	29/06/2006	24	1.00	0.25	5.25	4.25	Dec 07	42	-93	-106	-116	-44	-16	0	4	3	-1	-8	20	30	25	12

Source: Deutsche Bank, GFD, Moody's



Figure 18: US First Hike - Macro Analysis

Hike Cycle Timing			Moves				Next Recession		Real GDP (QoQ)												
Start Date	End Date	Duration (Months)	Pre-Cycle Rates Level	First Hike Size	End Level of Rates	Total Hiking	Next Recession	Time to it (Months)	Prior 36m	Prior 24m	Prior 18m	Prior Year	Prior Half Year	Prior Quarter	Quarter of move	Next Quarter	Next Half Year	Next Year	Next 18m	Next 24m	Next 36m
15/04/1955	23/08/1957	28	1.50	0.25	3.50	2.00	Aug 57	28	0.85%	0.53%	0.67%	1.51%	2.40%	2.85%	1.63%	1.34%	0.97%	0.59%	0.65%	0.54%	0.19%
12/09/1958	11/09/1959	12	1.75	0.25	4.00	2.25	Apr 60	19	0.19%	-0.01%	-0.27%	-0.51%	-0.98%	0.66%	2.31%	2.34%	2.10%	1.60%	1.50%	1.11%	0.99%
17/07/1963	04/04/1969	69	3.00	0.50	6.00	3.00	Dec 69	77	0.99%	1.29%	1.11%	0.94%	1.21%	1.30%	1.95%	0.71%	1.44%	1.35%	1.37%	1.45%	1.46%
01/03/1972	01/05/1974	26	3.50	2.00	13.00	9.50	Nov 73	20	0.52%	0.52%	0.69%	1.08%	0.54%	0.29%	1.79%	2.32%	1.62%	1.84%	1.32%	1.00%	0.47%
01/12/1976	03/03/1980	39	4.75	1.13	20.00	15.25	Jan 80	37	0.42%	0.71%	1.21%	1.22%	0.63%	0.51%	0.75%	1.16%	1.56%	1.22%	1.52%	1.43%	1.06%
07/08/1980	05/12/1980	4	9.50	0.50	20.00	10.50	Jul 81	11	0.65%	0.23%	-0.07%	-0.19%	-0.86%	-2.03%	-0.15%	1.85%	1.96%	1.08%	0.24%	0.20%	0.60%
02/05/1983	21/08/1984	15	8.50	1.13	11.75	3.25	Jul 90	86	0.07%	-0.11%	-0.21%	0.40%	0.70%	1.31%	2.28%	1.96%	2.01%	1.94%	1.59%	1.43%	1.26%
16/12/1986	04/09/1987	9	5.88	0.12	7.25	1.37	Jul 90	43	1.18%	0.93%	0.94%	0.79%	0.73%	1.01%	0.52%	0.70%	0.91%	1.09%	1.04%	1.02%	0.91%
29/03/1988	24/02/1989	11	6.50	0.25	9.75	3.25	Jul 90	28	0.96%	0.91%	0.98%	1.09%	1.28%	1.65%	0.56%	1.32%	0.95%	1.06%	0.96%	0.88%	0.51%
04/02/1994	01/02/1995	12	3.00	0.25	6.00	3.00	Mar 01	85	0.67%	0.86%	0.76%	0.65%	0.91%	1.33%	0.98%	1.37%	0.98%	0.86%	0.77%	0.75%	0.87%
30/06/1999	16/05/2000	11	4.75	0.25	6.50	1.75	Mar 01	21	1.15%	1.16%	1.08%	1.18%	1.22%	0.80%	0.82%	1.26%	1.50%	1.29%	0.97%	0.76%	0.63%
30/06/2004	29/06/2006	24	1.00	0.25	5.25	4.25	Dec 07	42	0.61%	0.74%	0.82%	1.09%	0.87%	0.58%	0.73%	0.91%	0.89%	0.84%	0.80%	0.78%	0.66%

Hike Cycle Timing			Moves				Next Recession		NGDP (QoQ)												
Start Date	End Date	Duration (Months)	Pre-Cycle Rates Level	First Hike Size	End Level of Rates	Total Hiking	Next Recession	Time to it (Months)	Prior 36m	Prior 24m	Prior 18m	Prior Year	Prior Half Year	Prior Quarter	Quarter of move	Next Quarter	Next Half Year	Next Year	Next 18m	Next 24m	Next 36m
15/04/1955	23/08/1957	28	1.50	0.25	3.50	2.00	Aug 57	28	1.16%	0.79%	0.92%	1.76%	2.80%	3.37%	2.03%	2.06%	1.83%	1.43%	1.49%	1.42%	0.95%
12/09/1958	11/09/1959	12	1.75	0.25	4.00	2.25	Apr 60	19	0.95%	0.71%	0.41%	0.00%	-0.31%	0.94%	2.94%	2.81%	2.48%	1.92%	1.85%	1.45%	1.30%
17/07/1963	04/04/1969	69	3.00	0.50	6.00	3.00	Dec 69	77	1.27%	1.58%	1.39%	1.19%	1.51%	1.46%	2.09%	1.52%	2.00%	1.80%	1.83%	1.91%	2.03%
01/03/1972	01/05/1974	26	3.50	2.00	13.00	9.50	Nov 73	20	1.74%	1.73%	1.84%	2.26%	1.46%	1.13%	3.37%	2.94%	2.40%	2.85%	2.57%	2.43%	2.29%
01/12/1976	03/03/1980	39	4.75	1.13	20.00	15.25	Jan 80	37	2.31%	2.40%	2.61%	2.48%	1.79%	1.81%	2.53%	2.79%	3.09%	2.85%	3.16%	3.14%	2.90%
07/08/1980	05/12/1980	4	9.50	0.50	20.00	10.50	Jul 81	11	2.59%	2.29%	2.03%	1.91%	1.26%	0.12%	2.15%	4.67%	4.64%	3.34%	2.28%	2.06%	2.15%
02/05/1983	21/08/1984	15	8.50	1.13	11.75	3.25	Jul 90	86	1.84%	1.33%	1.09%	1.54%	1.67%	2.13%	2.97%	3.03%	2.92%	2.88%	2.46%	2.31%	2.02%
16/12/1986	04/09/1987	9	5.88	0.12	7.25	1.37	Jul 90	43	1.88%	1.54%	1.45%	1.26%	1.14%	1.41%	1.08%	1.43%	1.62%	1.84%	1.84%	1.86%	1.77%
29/03/1988	24/02/1989	11	6.50	0.25	9.75	3.25	Jul 90	28	1.61%	1.52%	1.64%	1.84%	2.07%	2.49%	1.35%	2.30%	2.03%	2.08%	1.94%	1.84%	1.46%
04/02/1994	01/02/1995	12	3.00	0.25	6.00	3.00	Mar 01	85	1.30%	1.43%	1.34%	1.23%	1.48%	1.86%	1.47%	1.87%	1.50%	1.40%	1.29%	1.27%	1.37%
30/06/1999	16/05/2000	11	4.75	0.25	6.50	1.75	Mar 01	21	1.51%	1.48%	1.40%	1.53%	1.63%	1.30%	1.16%	1.62%	1.91%	1.84%	1.54%	1.35%	1.13%
30/06/2004	29/06/2006	24	1.00	0.25	5.25	4.25	Dec 07	42	1.10%	1.27%	1.39%	1.65%	1.55%	1.45%	1.61%	1.53%	1.55%	1.59%	1.58%	1.57%	1.42%

Hike Cycle Timing			Moves				Next Recession		CPI (QoQ)												
Start Date	End Date	Duration (Months)	Pre-Cycle Rates Level	First Hike Size	End Level of Rates	Total Hiking	Next Recession	Time to it (Months)	Prior 36m	Prior 24m	Prior 18m	Prior Year	Prior Half Year	Prior Quarter	Quarter of move	Next Quarter	Next Half Year	Next Year	Next 18m	Next 24m	Next 36m
15/04/1955	23/08/1957	28	1.50	0.25	3.50	2.00	Aug 57	28	0.13%	0.05%	-0.12%	-0.19%	-0.19%	0.00%	0.00%	0.75%	0.19%	0.46%	0.55%	0.64%	0.66%
12/09/1958	11/09/1959	12	1.75	0.25	4.00	2.25	Apr 60	19	0.66%	0.76%	0.77%	0.70%	0.88%	0.35%	0.00%	0.00%	0.00%	0.34%	0.29%	0.30%	0.31%
17/07/1963	04/04/1969	69	3.00	0.50	6.00	3.00	Dec 69	77	0.28%	0.33%	0.33%	0.33%	0.33%	0.33%	0.33%	0.65%	0.33%	0.32%	0.32%	0.36%	0.53%
01/03/1972	01/05/1974	26	3.50	2.00	13.00	9.50	Nov 73	20	1.23%	1.09%	0.96%	0.81%	0.61%	0.74%	0.73%	0.72%	0.84%	1.13%	1.47%	1.81%	2.03%
01/12/1976	03/03/1980	39	4.75	1.13	20.00	15.25	Jan 80	37	2.04%	1.63%	1.49%	1.35%	1.51%	1.41%	1.04%	2.23%	2.13%	1.63%	1.91%	1.91%	2.33%
07/08/1980	05/12/1980	4	9.50	0.50	20.00	10.50	Jul 81	11	2.61%	3.02%	3.39%	3.42%	3.84%	3.25%	1.57%	2.74%	2.64%	2.63%	1.98%	1.93%	1.52%
02/05/1983	21/08/1984	15	8.50	1.13	11.75	3.25	Jul 90	86	1.69%	1.27%	0.82%	0.89%	0.00%	0.31%	1.63%	1.21%	0.90%	1.04%	0.95%	0.98%	0.80%
16/12/1986	04/09/1987	9	5.88	0.12	7.25	1.37	Jul 90	43	0.75%	0.61%	0.59%	0.44%	0.64%	0.64%	0.27%	1.45%	1.35%	1.09%	1.10%	1.09%	1.11%
29/03/1988	24/02/1989	11	6.50	0.25	9.75	3.25	Jul 90	28	0.77%	0.68%	0.88%	1.09%	0.83%	0.35%	0.95%	1.29%	1.41%	1.22%	1.18%	1.25%	1.24%
04/02/1994	01/02/1995	12	3.00	0.25	6.00	3.00	Mar 01	85	0.72%	0.70%	0.65%	0.68%	0.48%	0.48%	0.96%	0.54%	0.74%	0.71%	0.67%	0.70%	0.70%
30/06/1999	16/05/2000	11	4.75	0.25	6.50	1.75	Mar 01	21	0.48%	0.39%	0.39%	0.43%	0.43%	0.67%	0.73%	1.02%	0.63%	0.92%	0.77%	0.86%	0.66%
30/06/2004	29/06/2006	24	1.00	0.25	5.25	4.25	Dec 07	42	0.51%	0.59%	0.58%	0.43%	0.59%	1.68%	1.23%	0.11%	0.16%	0.63%	0.61%	0.84%	0.78%

Source: Deutsche Bank, GFD, Moody's

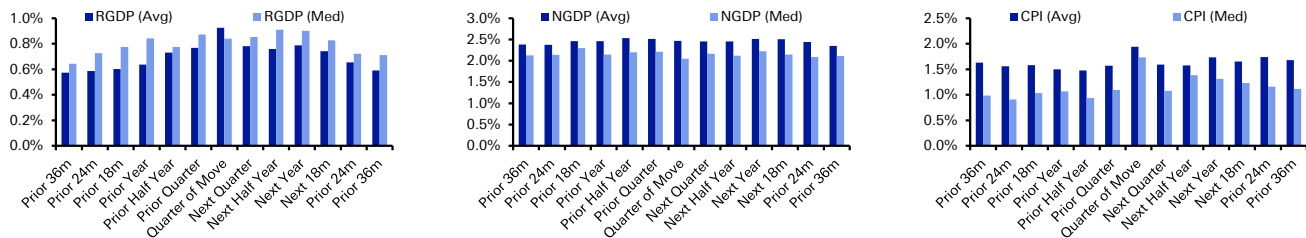




UK results

Outside of the US, the UK is the country that the market sees as being next in-line for an interest rate hike over the next 12 months. Given this we've repeated the exercise using only UK data. The analysis covers 35 Bank of England hiking cycles since 1914. We don't have a long enough history for credit spreads to include in the analysis but we include all the other variables used in the US example.

Figure 19: Impact of First UK Rate Hike in the Cycle on UK Economic Variables ('Quarterised', QoQ)



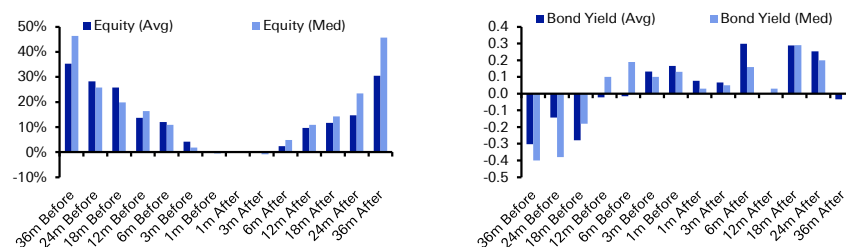
Source: Deutsche Bank, GFD

Similar to the US results, UK real GDP growth steadily climbs in the quarters prior to the first hike in the cycle and then on average starts to decline steadily in the subsequent quarters. The median readings show more of a plateau in growth after the hike but on both measures the acceleration of growth does slow in the quarter of the hike.

With regards to inflation, like with the US, there does seem to be a slight bias to slightly higher inflation after the first hike. This probably shows the momentum that was there before the tightening which the first hike can't on its own immediately reverse. There are no clear trends in nominal GDP as slightly lower real growth is cancelled out by slightly higher inflation.

In terms of market reaction to the first hike, UK equities clearly see weaker performance a year after than a year before. There is an improvement as the year progresses though as after 3 months equities have typically been lower and although a positive number returns after 6 months, the 12 month performance is comfortably more than double the 6 month one.

Figure 20: Impact of First UK Rate Hike in the Cycle on UK Assets (Absolute, Cumulative)



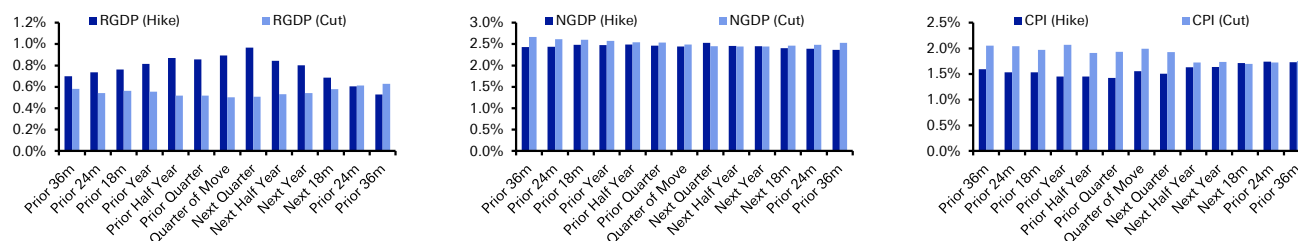
Source: Deutsche Bank, GFD

Bond yields seem to rise a year before and for at least three years after the first hike in the cycle, although the data is a little bit trendless.



Looking at all hikes and all cuts together, real GDP has a bias to peak out in the quarter after the 'average' hike. The subsequent quarters see a sharper drop and 18 months after, growth is lower than 18 months before. Like with the US this perhaps shows that the impact of cumulative hikes which start to slow activity beyond the time frame suggested by the first hike exercise. Interestingly CPI continues to rise through the post hike quarters and tends to keep falling post the loosening quarters. Like with the US it suggests that inflation may be more structural and linked to certain regimes and is less influenced by monetary policy than many would think.

Figure 21: Impact of All UK Rate Hikes in the Cycle on UK Economic Variables ('Quarterised', QoQ)

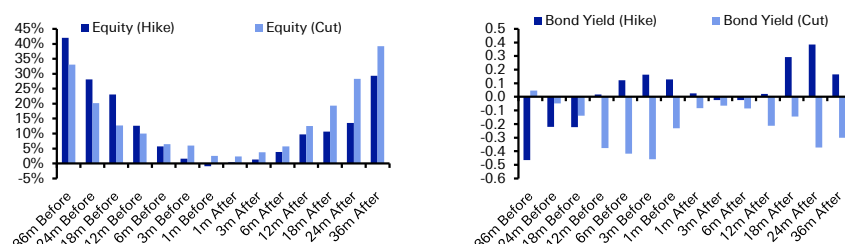


Source: Deutsche Bank, GFD

For all hikes UK equities have a slight bias to lower returns a year after the 'average' hike than a year before but it's not sizeable. As would be expected, equities react more favourably to the 'average' easing cycle than to the average tightening cycle even if the difference isn't large.

For the average of all hikes, UK bonds actually see their worst performance in the 6m before the hike whereas they're stable in the quarters after. This is again likely due to the immediate negative reaction of bonds to the first hike in the cycle which shows up in these averages (i.e. hikes have already influenced the 'before' period).

Figure 22: Impact of All UK Rate Hikes in the Cycle on UK Assets (Absolute, Cumulative)

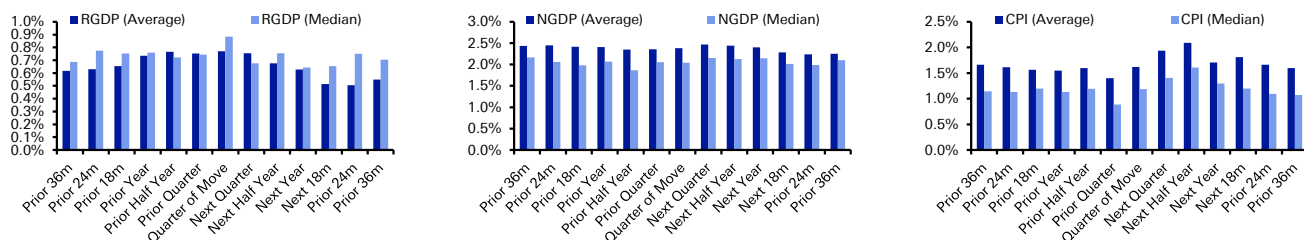


Source: Deutsche Bank, GFD

For completeness and comparison we also show the data for the first and last hike for all variables. Real GDP tends to peak in the quarter of the last hike with inflation troughing in the quarter before. Bond yields fall sharply after the last hike having been consistently higher in the prior periods. Equities perform relatively poorly in the first 6 months after the last hike but after this they rebound strongly and see superior performance in all subsequent periods than they did in the equivalent period before the last hike.

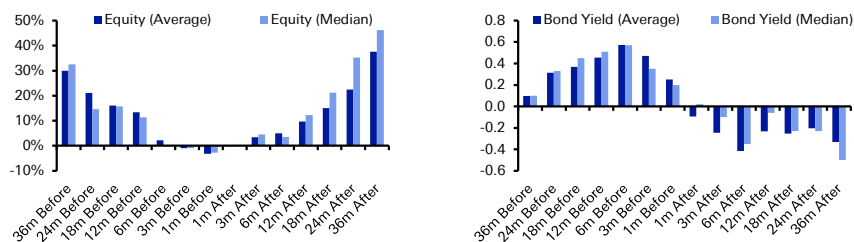


Figure 23: Impact of the Last UK Rate Hikes in the Cycle on UK Economic Variables ('Quarterised', QoQ)



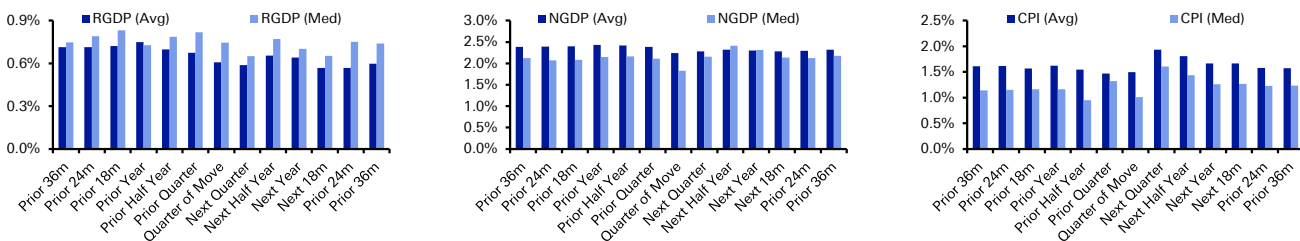
Source: Deutsche Bank, GFD

Figure 24: Impact of the Last UK Rate Hikes in the Cycle on UK Assets (Absolute, Cumulative)



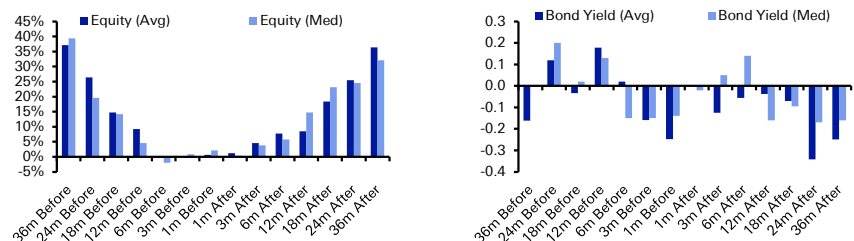
Source: Deutsche Bank, GFD

Figure 25: Impact of First UK Rate Cut in the Cycle on UK Economic Variables ('Quarterised', QoQ)



Source: Deutsche Bank, GFD

Figure 26: First Cut Impact of First UK Rate Hike in the Cycle on UK Assets (Absolute, Cumulative)



Source: Deutsche Bank, GFD



Conclusion

History tells us that a rate hike cycle takes time to impact the economy and asset prices. For the US, Real GDP still typically tends to climb for around 6 months after the rate cycle turns before drifting progressively lower over subsequent quarters. By the time we reach the last hike in a cycle growth falls quite significantly and stays lower for many quarters after.

For US asset markets, equities and credit continue to perform after the first hike but seem to stall 12-24 months after. Bond yields typically climb immediately and for around the next 12 months. After the last hike, risk aversion tends to be the dominant theme though with lower equities, lower yields and wider spreads the immediate outcome. So all this would argue that the first hike is less important but as the hiking cycle builds it eventually has a negative impact on the economy and risk.

However is this time different? In our study since 1950, all hiking cycles to date have been in a super cycle of increasing leverage with growth eclipsing pre-recession peaks very quickly post the recovery commencing. By contrast this has been a uniquely slow recovery from what was the worst recession in the sample period. This has also been by far the longest period without a rate hike after the previous recession ended. In the twelve cycles since 1950, the median length of time until the first hike once the last recovery starts is 30 months. This current cycle is 74 months and counting and without a rate move, eclipsing the previous high of 35 months without a rate hike. So a caveat to our analysis.



Peak Asset Prices?

In this section we wanted to try to assess whether in a world of extremely loose monetary policy and extraordinary accumulations of financial assets by Central Banks, we do live in a period of generally expensive global asset prices relative to history or whether expensive asset classes are more selectively spread throughout the system. For this analysis we have looked at what are probably the largest and most influential assets for the global economy and financial markets. These are government bonds, equities and housing. To compare different periods through time we wanted to use data back as far as possible but also to use the same countries for each asset to standardise the analysis. We also wanted to use countries that were reasonably important to the global economy. We were left with 15 countries with a consistent long-term history across all three assets. These were; Australia, Canada, Denmark, Finland, France, Germany, Italy, Japan, Korea, Netherlands, Spain, Sweden, UK and the US. EM countries are difficult to include as data doesn't stretch back far enough for historical comparisons to be made. As such we've excluded them from this analysis. So this is essentially a DM exercise.

Whilst the data for bonds and equities often stretches into the nineteenth century we don't have any consistent house price data (or income data to assess price to income) back beyond 1970. So the aggregated series has just bonds and equities until 1970 at which point we introduce housing into the analysis. We would contend that housing bubbles on the scale of that seen over the last three decades are a modern day, debt fuelled phenomenon (see Figure 40 in the housing sub-section) so the fact that we cannot go back beyond 1970 is perhaps of only minor consequence to our overall conclusions.

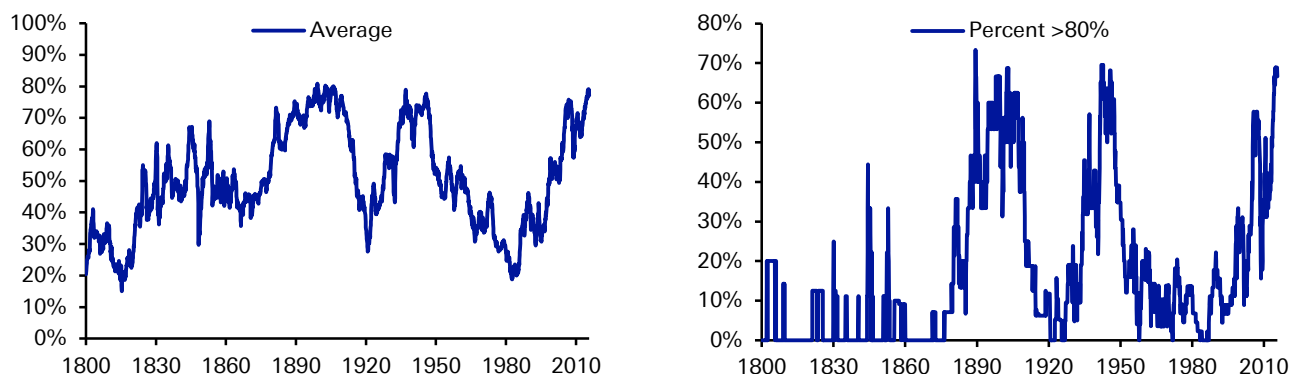
When valuing any assets, the methodology is always open to interpretation. As a rule we tried to use the most robust one that allows us to go back as far as possible. For bonds we have used two different simple techniques and have reproduced the aggregate results using both techniques. Firstly we simply look at where nominal yields are relative to their past and secondly where real yields are. For real yields we have used a 5-year rolling average of inflation to smooth out the inevitable short-term spikes that spot inflation would bring. For housing we wanted to use price to income but found that we had more countries with data extending back to 1970 if we analysed how far each was away from its real adjusted trend. Whether we used price to income or real prices, the results were pretty similar so we decided to use the latter as it gave us more data points. For equities our valuation technique will probably be the most controversial. Here we used Nominal GDP as our deflator of long-term total return indices. We'll run through our methodology in more detail when we break down the equity section but the motivation was that PE ratios tend not to be available beyond the last few decades for more than a few countries. Given that over the long run earnings should broadly be tied to nominal GDP, we think this is a good long-term valuation tool. For some countries the results will look more realistic than others but over a wider sample these should even each other out. More on this in the separate section.

For all countries and aggregations we have produced the results as percentiles relative to their long-term trend with 100% meaning the asset is at its most expensive ever relative to its trend and 0% being the cheapest. For the aggregates we have not weighted by size of the economy and have simply used averages.

Figure 27 shows the aggregate, across the three assets, using nominal bond yields. We also show what percent of observations through time are in their top 20% of valuations (i.e. above 80% on our measure) relative to history. This helps identify periods with a high/low concentration of highly valued assets.



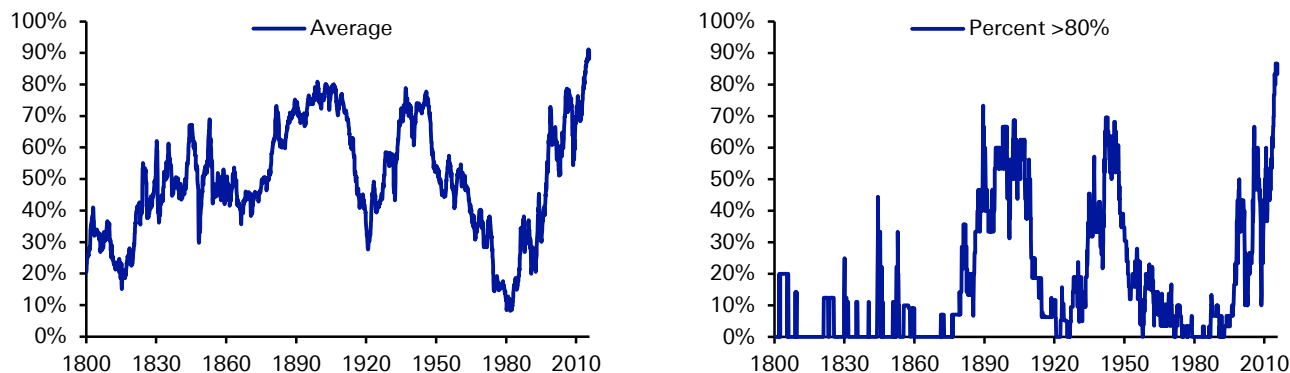
Figure 27: Aggregated 15 DM Country Average Bond (Nominal Yields), Equity & Housing Percentile Valuations (left) with Percentage of Observations in Top 20% vs. History (right)



Source: Deutsche Bank, GFD

So in aggregate, across these three main asset classes, average valuations are close to the highest they've ever been relative to their long-term trend. The current reading of just under 80% is similar to that seen at the turn of the twentieth century and during the 1940s when financial markets were artificially repressed around war time. Given that the housing data doesn't get integrated into the results until 1970 it's interesting to see just the bond and equity component aggregated in Figure 28.

Figure 28: Aggregated 15 DM Country Average Bond (Nominal Yields) & Equity Valuations (left) with Percentage of Observations in Top 20% vs. History (right)



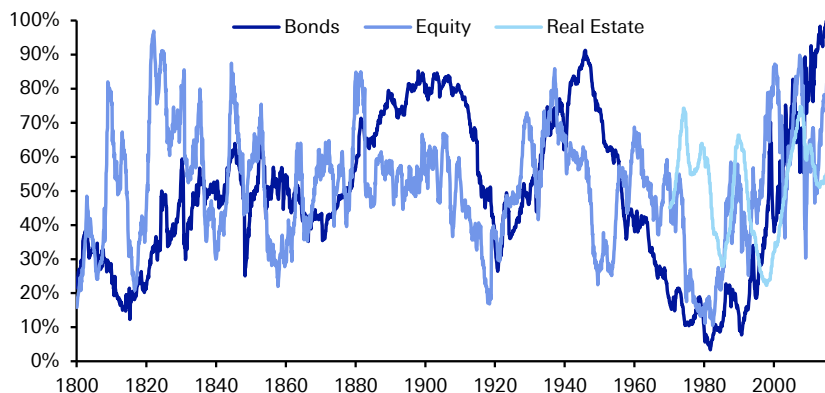
Source: Deutsche Bank, GFD

So on these valuation metrics, bonds and equities are at their highest ever combined valuations when aggregated across these 15 countries. In addition, 83% of observations are in their top 20% of valuations through history.

Figure 29 then shows the three asset classes on the same chart through time to see how the valuations have changed relative to each other.



Figure 29: Average Percentile Valuations for 15 DM Countries' Bond (Nominal Yields), Equity & Housing vs. History



Source: Deutsche Bank, GFD

Interestingly housing is back to 50% on this measure having peaked at 75% in 2007. As we'll see in the separate housing section, this masks a wide range of valuations amongst the individual countries. Bonds are quite clearly close to 100% on this measure reflecting the fact that yields are still close to multi-century all time lows. For equities the current figure is 77% (down from 83% earlier in 2015), still high relative to history but shy of the last two peaks of 90% in May 2007 and 87% at various points in 2000. Interestingly in the 2000 equity bubble, housing was generally in the low 30% region and bonds the low 40% region. In 2007, both bonds and housing were in the mid 70% area. When aggregated though, current 2015 levels are higher on average across the three asset classes than where they were back in 2007.

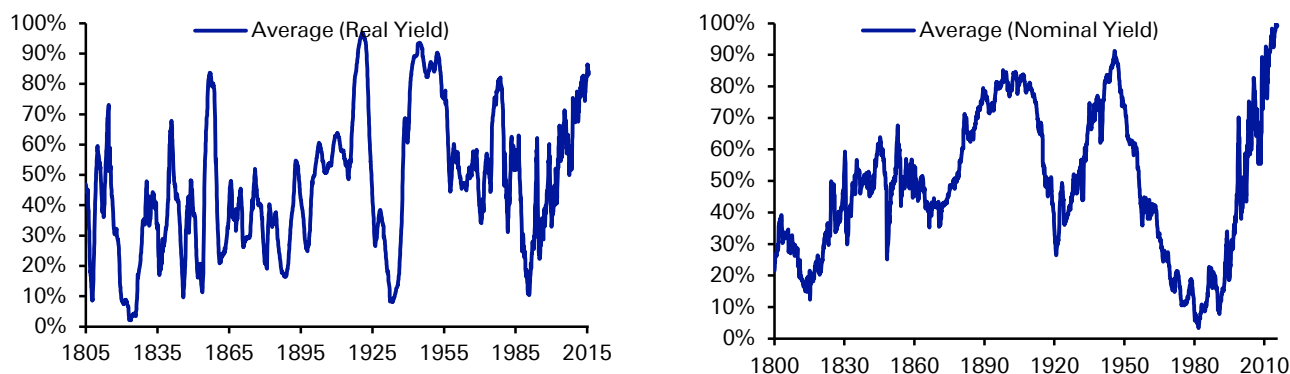
We now look at the separate asset classes in more detail showing the results from the individual countries used in the study. We also consider alternative valuation techniques.

Bonds

Figure 32 shows the results from the 15 individual countries on a straight nominal yield basis and then Figure 33 shows them on a real yield basis. Each country's data is then represented as a percentile relative to this long-term history. As we've already discussed, the majority of global bond markets currently see nominal yields close to their all-time lows which means the aggregate average percentile across the 15 countries in our sample is 99.3%, having been as high as 99.9% back in January 2015. We prefer the simple nominal series over the real yield series as nominal yields better reflect your potential future total return prospects. Real yields can be more volatile and reflect a temporary inflation regime. It's also near impossible to predict future inflation over a bond's lifetime and in this analysis we've used a rolling 5-year measure as a proxy for the current inflation environment. Interestingly the aggregate results are currently similar when looking at this analysis on a real yield basis albeit with less extreme numbers. Figure 30 shows the average percentile for the 15 countries on a real basis alongside the earlier nominal findings. It shows the current real adjusted average is 83%, rather than the 99% for nominal yields. However this is still the highest valuation level since the 1950s.



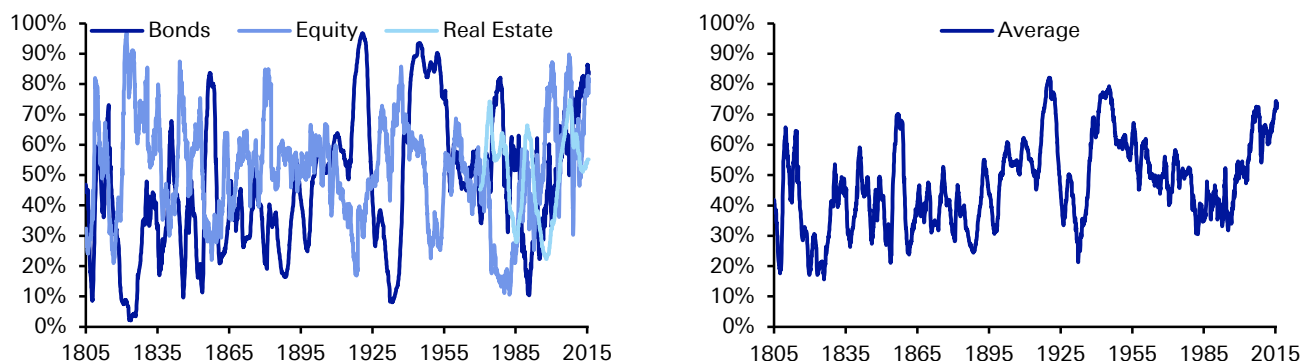
Figure 30: Aggregated Average 15 DM Country Bond Yields Percentile Valuations Real (left), Nominal (right)



Source: Deutsche Bank, GFD

We then show the results of the 15 country, 3 asset class analysis using real yields instead of nominal yields. As can be seen the results are similar but very slightly less extreme.

Figure 31: Average Percentile Valuations for 15 DM Countries' Bond (Real Yields), Equity & Housing vs. History (left) and Aggregated 15 DM Country Average Bond (Real Yields), Equity & Housing Percentile Valuations (right)



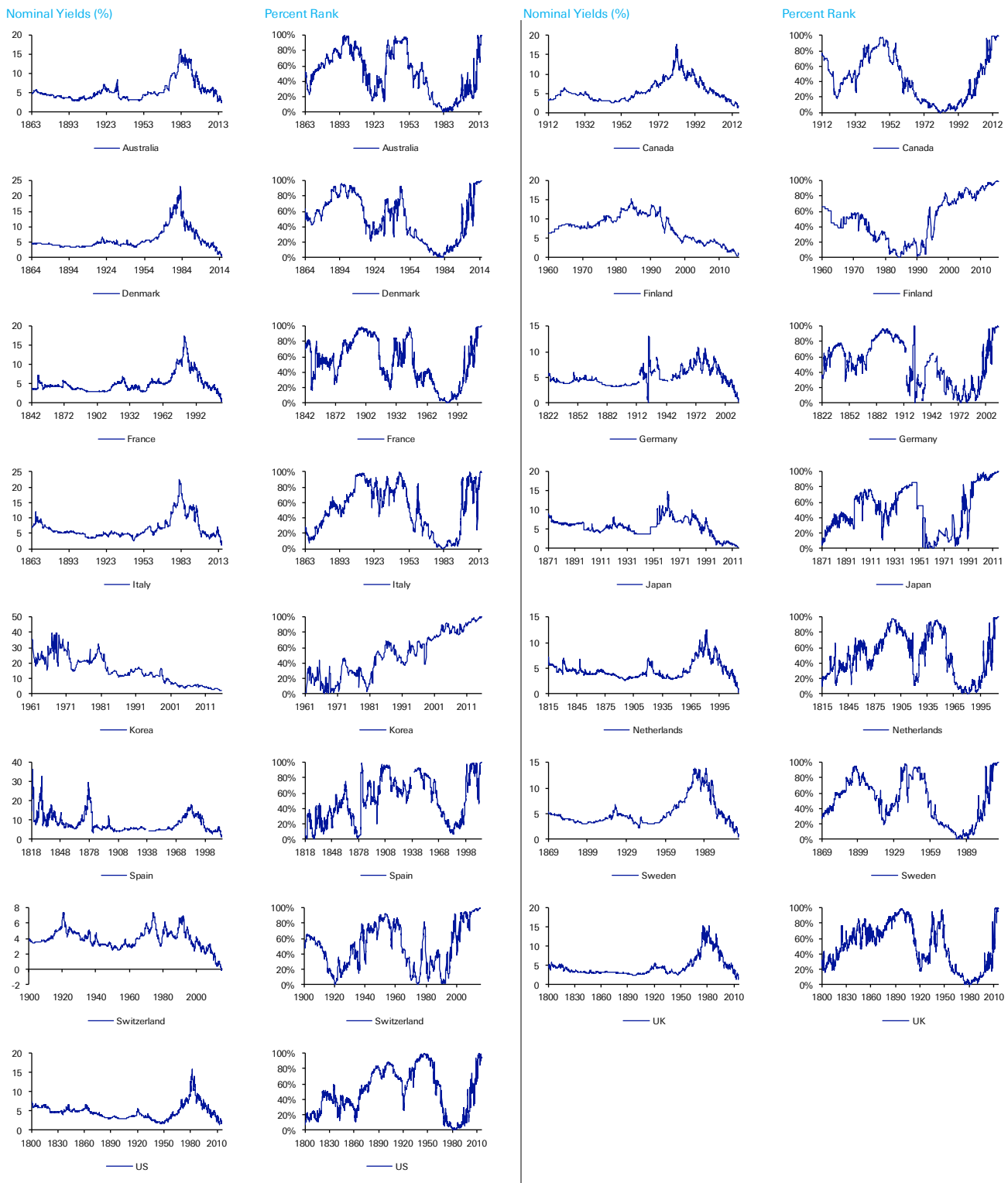
Source: Deutsche Bank, GFD

As discussed at the top of this section we now show the individual 15 countries that have been aggregated to make up the bond part of this analysis. We show their nominal and real yields and the associated percentiles relative to history.

Overall, bonds are clearly very expensive relative to history especially on a nominal basis. These results are pretty much widespread across our sample countries.



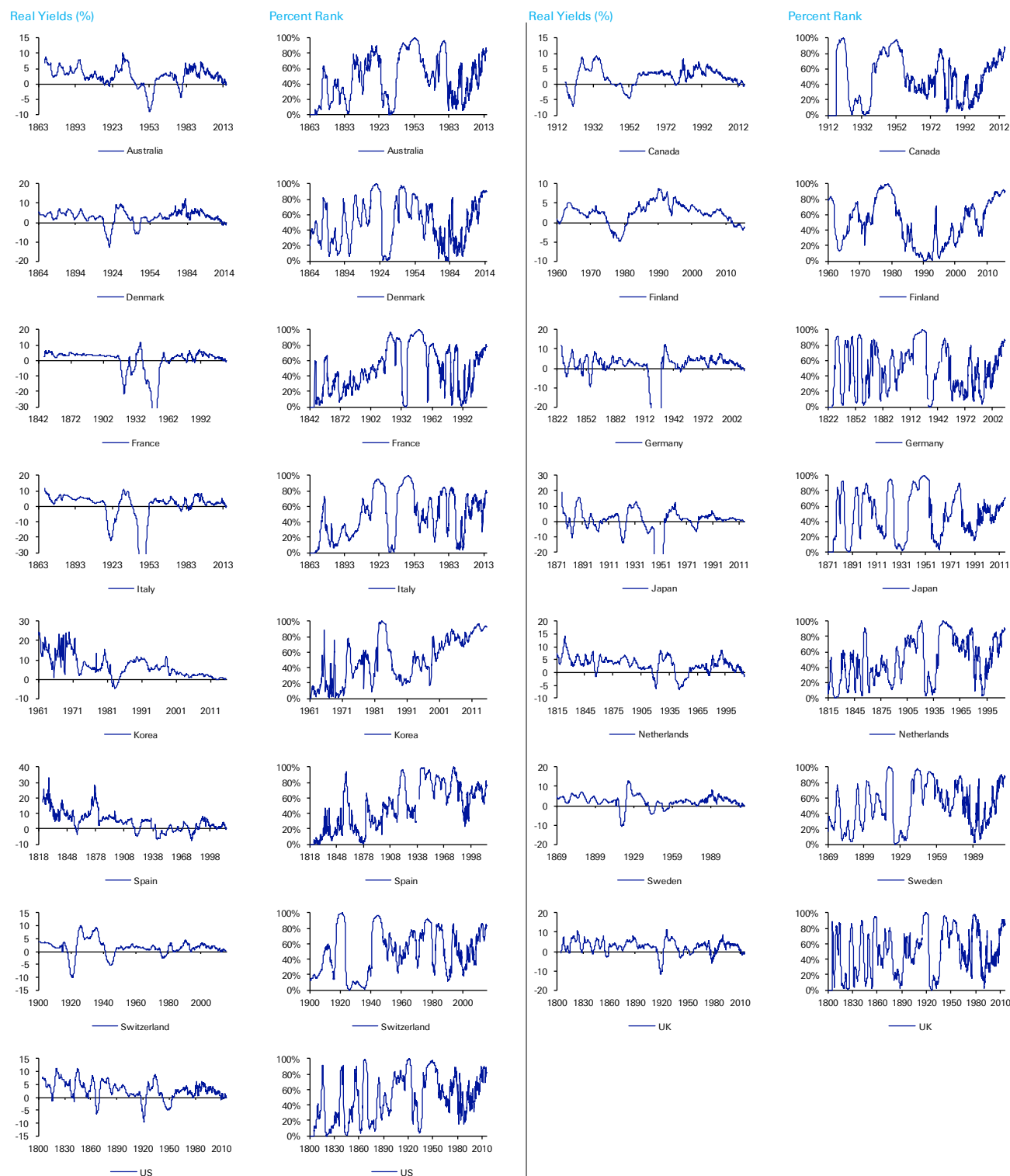
Figure 32: Nominal Yields and Associated Percentiles vs. History for our 15 Sample Countries



Source: Deutsche Bank, GFD



Figure 33: Real Yields and Associated Percentiles vs. History for our 15 Sample Countries



Source: Deutsche Bank, GFD



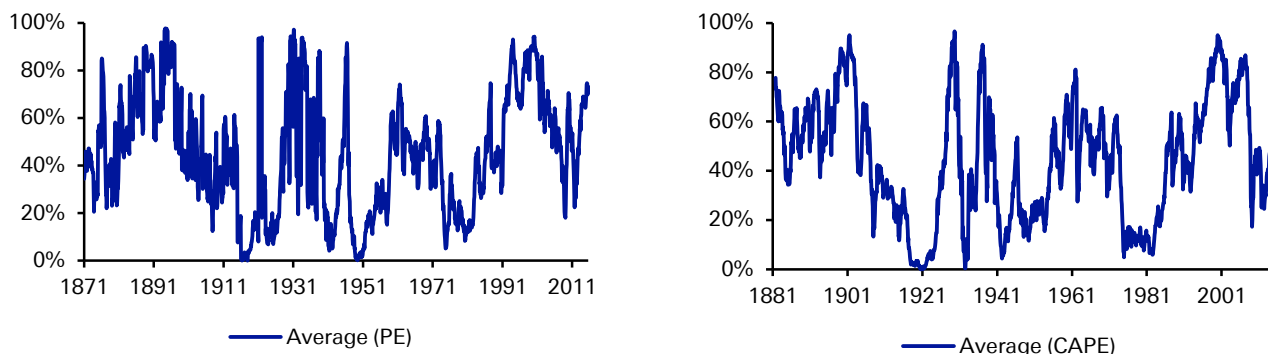
Equities

As discussed earlier this section will likely see the most controversial valuation technique. In Figure 37 at the end of this short section, the 15 core countries' total return series are deflated using their own domestic nominal GDP (NGDP) through time and we then assess how far they are from this long-term trend through history. We use total returns as dividend policy changes over time which could influence price comparisons from one era to another. The big advantage in using NGDP is that it allows us to stretch the analysis back several decades and in several cases to the nineteenth century.

We think nominal GDP is a better deflator for equities than CPI as it should better reflect the long-term trend in earnings. CPI says nothing about the quality of real GDP across different eras. Indeed over the last few decades nominal GDP growth has steadily declined, consisting of both lower inflation and lower real growth. So if you simply deflate by CPI you would not pick up the progressive global slowing of activity around the world which should in theory impact earnings.

To see how this technique compares to more established ones, Figure 34 looks at similar percentile results using both PE and CAPE valuation measures for the 15 countries in the study. The actual average PEs and CAPEs are shown in Figure 35. CAPE is the cyclically adjusted PE ratio and looks at earnings on a rolling 10 year basis rather than using spot earnings which are clearly likely to be more volatile. Up until the 1960s, there were less than a handful of countries with data available but we've included the full series below to add depth to the analysis. We show the results from the individual countries alongside their percentiles in Figure 37-Figure 39.

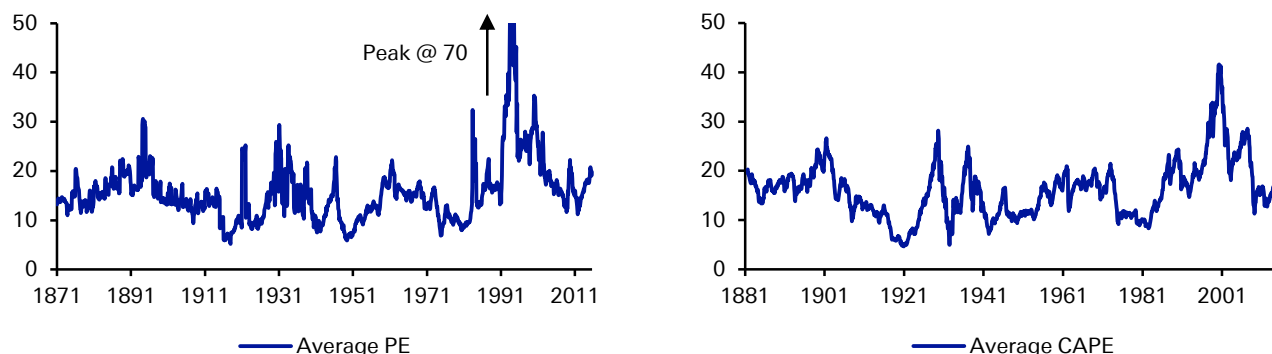
Figure 34: Average PE (left) and CAPE (right) Percentile Valuations for Equities for our 15 Sample Countries vs. History



Source: Deutsche Bank, GFD



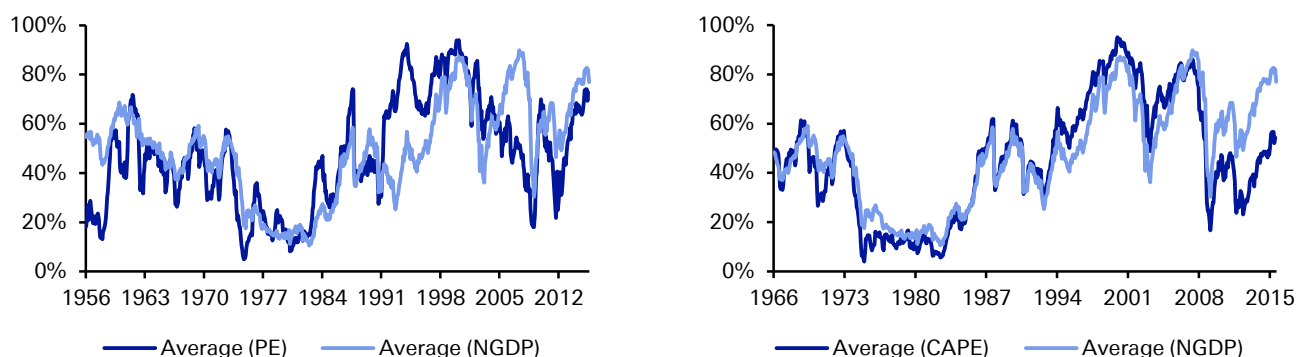
Figure 35: Average PE (left) and CAPE (right) Ratios for our 15 Sample Countries



Source: Deutsche Bank, GFD

For further comparison, Figure 36 compares the results from our valuations using nominal GDP with the aggregated results over a shorter time horizon for PE and CAPE ratios relative to each countries trend.

Figure 36: Comparing PE (left) and CAPE (right) Percentile Valuations with our NGDP Valuation Technique



Source: Deutsche Bank, GFD

The aggregated results using the PE ratios are broadly similar to our NGDP deflated valuation technique. There is some evidence to say the nominal deflator method has been a better predictor of future performance. For example, PEs on this measure were high relative to history throughout the 1990s bull market, with the NGDP measure only starting to suggest high valuations towards the latter half of the decade. The NGDP technique also showed that equities were very stretched in the middle of 2007 whereas PE ratios didn't – perhaps because of bubble type earnings in some sectors leading to artificially lower PEs than the reality should have suggested. One could argue that PE better reflected value in the trough of 2009, but overall the NGDP method seems to more reflect where value has been through time.

Moving onto CAPEs, the proponents would suggest that it gives a truer picture of trend earnings as it smoothes out excessive peaks and troughs and assumes the longer-term trend stays intact. Interestingly this measure tracks our NGDP technique fairly closely until the middle of the last decade. From this point they diverge significantly with CAPEs making global equities look much cheaper over the intervening period right up to the present day.



The reason for this is because NGDP has slowed markedly over the past decade thus dragging earnings lower in most countries. The CAPE analysis will not fully capture this as it will assume mean reversion back to the old trend of growth and earnings. The CAPE analysis will be slow to factor in the possibility that the upward trend line in earnings has been changed by recent events. Indeed for many countries, especially in Europe, earnings are still below their peak seen before the financial crisis. The CAPE analysis will therefore adjust current earnings higher for most countries assuming an eventual rebound.

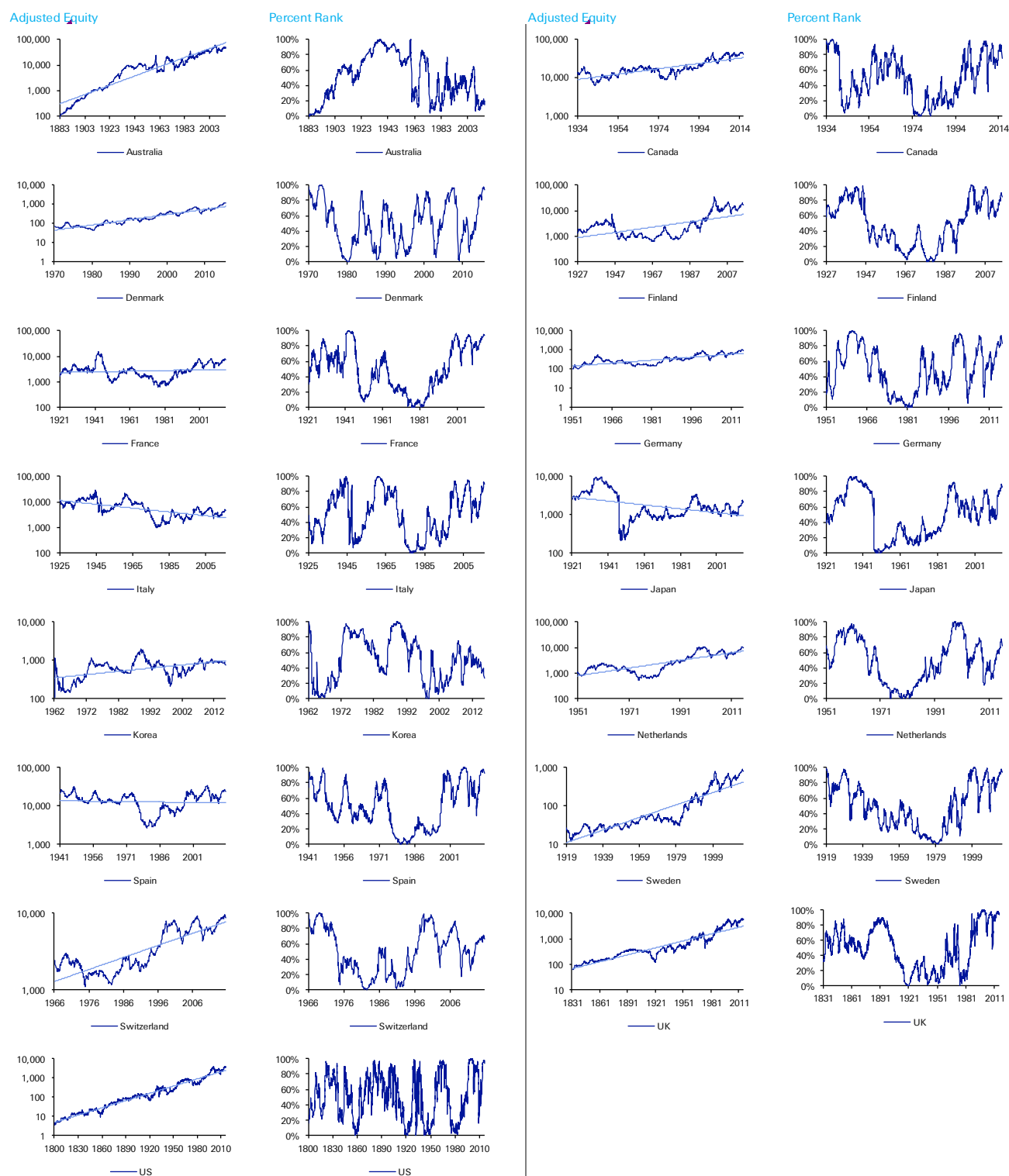
Interestingly the main exception is the US where earnings are currently at their peak and have grown well above trend over the past decade. So here we have a rare example of CAPE being higher than PE. US company earnings have been astonishingly resilient to both the financial crisis and the slower trend of economic growth seen over the past decade.

To conclude on equities, one can argue aggregate global equities don't look quite as expensive when using PE ratios, however the magnitude of valuation gap is low relative to our NGDP technique. When using CAPEs equities look a lot cheaper, however on a DM-wide basis (ex-US) this requires one to assume a return to pre-crisis NGDP and earnings trends before too long.

Perhaps the main criticism of the NGDP valuation technique is that in an increasingly globalised world, a higher share of company earnings have come internationally with the cost base also diversified. The US could certainly say they are at the front of this trend. So the domestic economy is perhaps less important than it once was. At an aggregate level this should even itself out to some degree but given our 15 countries are DM countries the analysis would miss any gains from EM growth or lower costs from producing in these areas. It is very difficult to quantify this impact over time but even in EM, growth is currently slowing more rapidly than it is in DM so even this might even out over time.



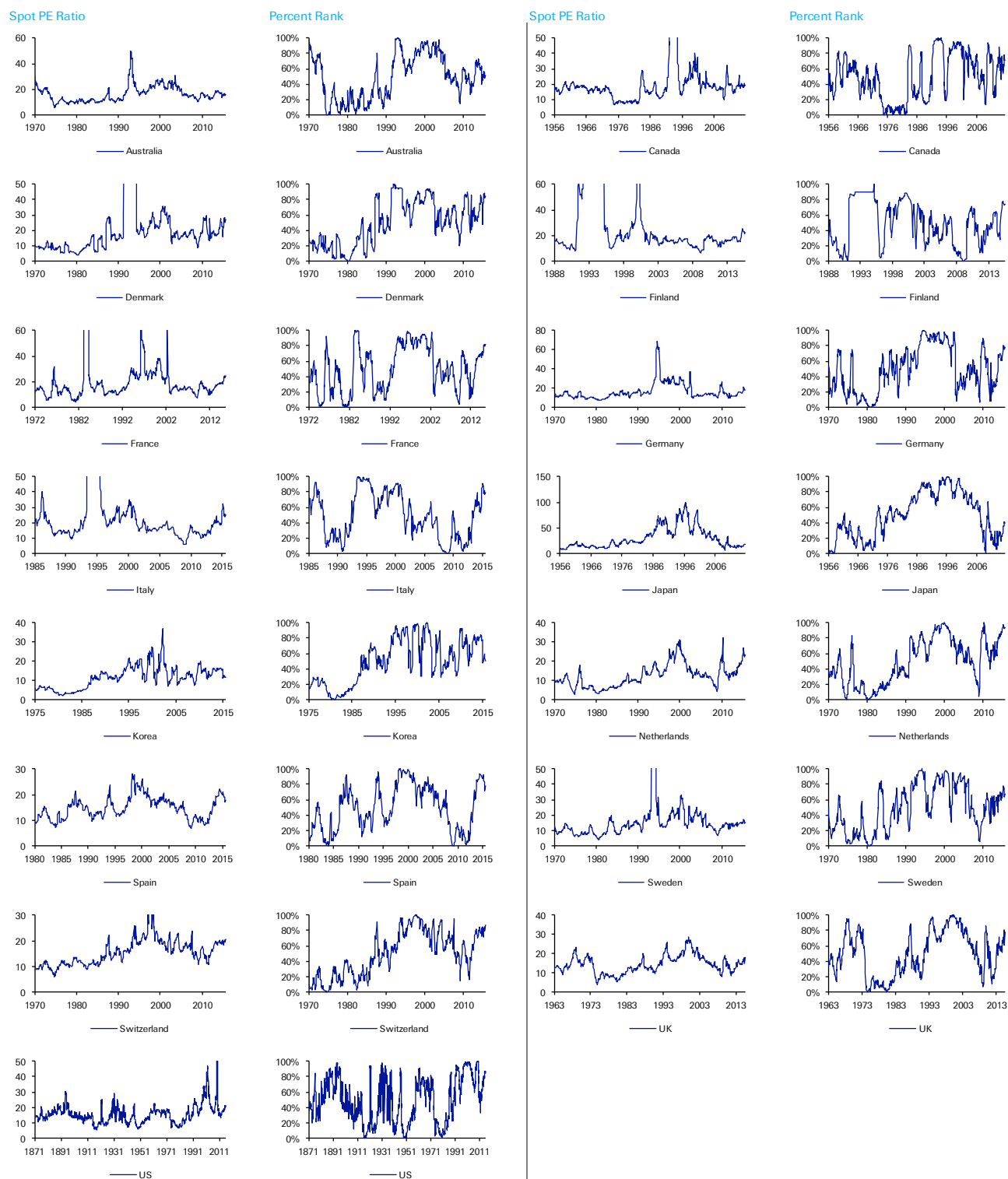
Figure 37: Equities vs. NGDP and Associated Percentiles vs. History for our 15 Sample Countries



Source: Deutsche Bank, GFD



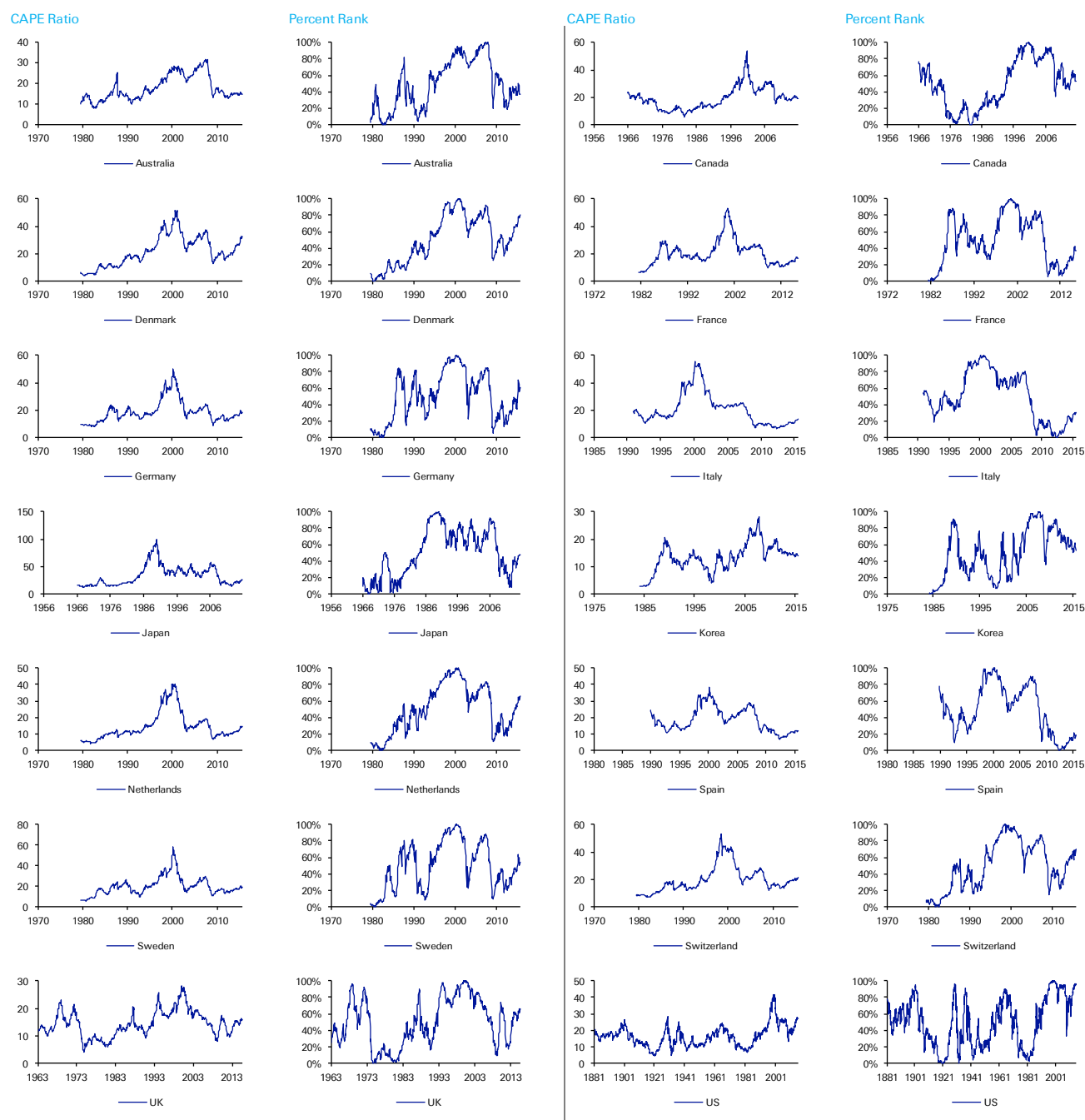
Figure 38: Equity PE Ratios and Associated Percentiles vs. History for our 15 Sample Countries



Source: Deutsche Bank, GFD



Figure 39: Equity CAPE Ratios and Associated Percentiles vs. History for our 15 Sample Countries (where available)



Source: Deutsche Bank, GFD



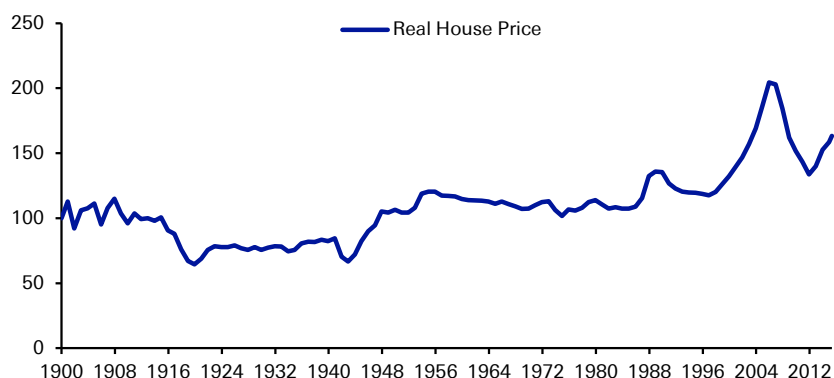
Housing

As discussed at the start of this section we struggle to source data for enough countries back beyond 1970. So we have started the data in this year. As also discussed earlier, the preferred valuation tool - namely price to income - has slightly less data for some countries than simply valuing to the trend relative to domestic CPI. Fortunately the results are fairly similar so we've used the latter which allows us to use more data. In Figure 41 and Figure 42 overleaf we show the full results for all 15 countries.

Although we don't have data back before 1970, there are some individual series available to expand the narrative. Figure 40 shows the CPI adjusted price of US housing back to 1900. The interesting conclusion from the chart is that US housing valuation fluctuations were fairly tame prior to the last couple of decades and that bubbles were non-existent over this period at the national US level. The inter-war period saw a depressed period for valuations but real adjusted prices were not notably higher at the end of the 1990s than they were in 1900.

If this is representative of other countries which we suspect it is then the widespread volatility and ultimately high property valuations seen over the last two-three decades across the world are unique. As such we are confident that prices over this period have been at their peak through modern history and the 1970- data reflects the asset class at its most expensive point historically.

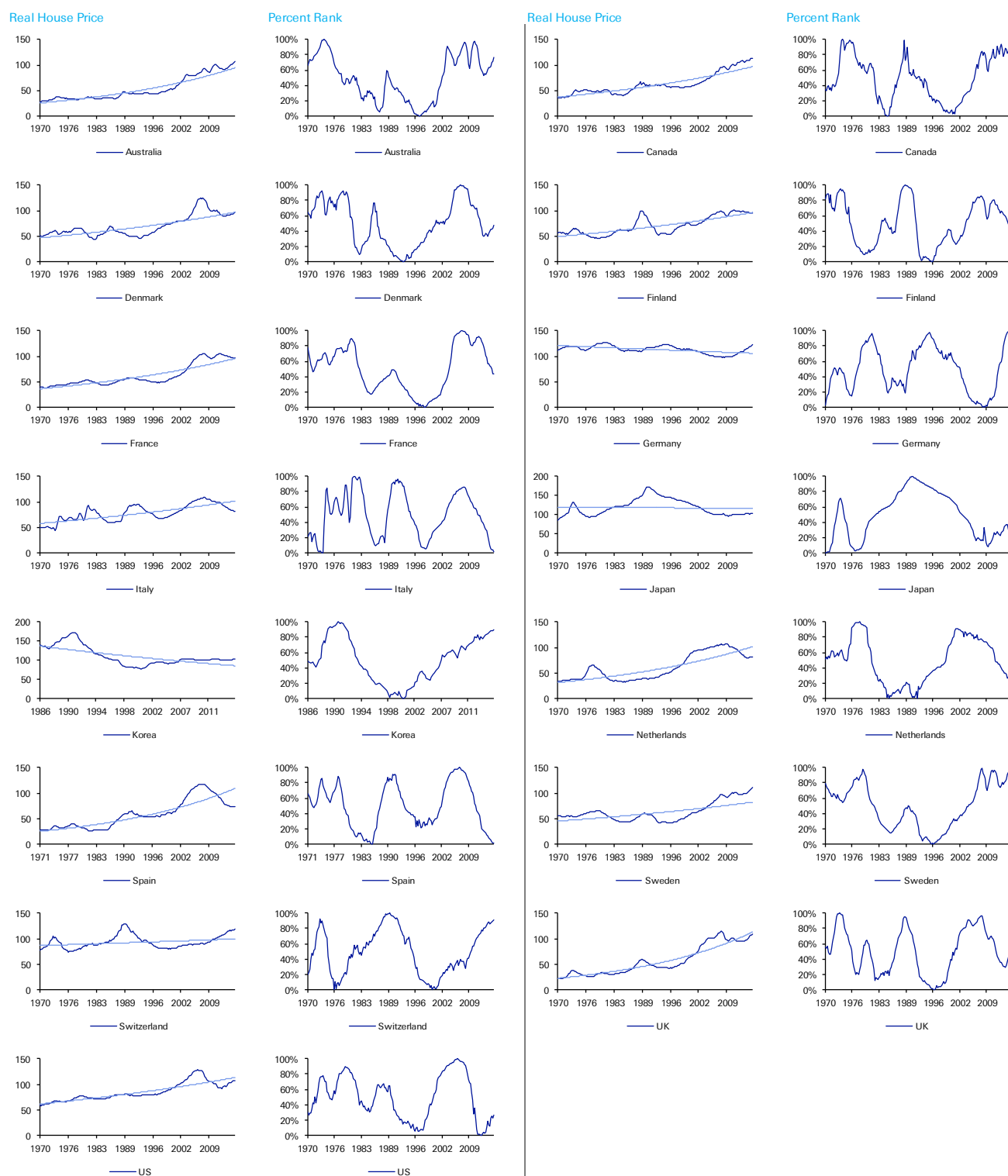
Figure 40: US Real House Prices



Source: Deutsche Bank, *Irrational Exuberance* (Robert Shiller)



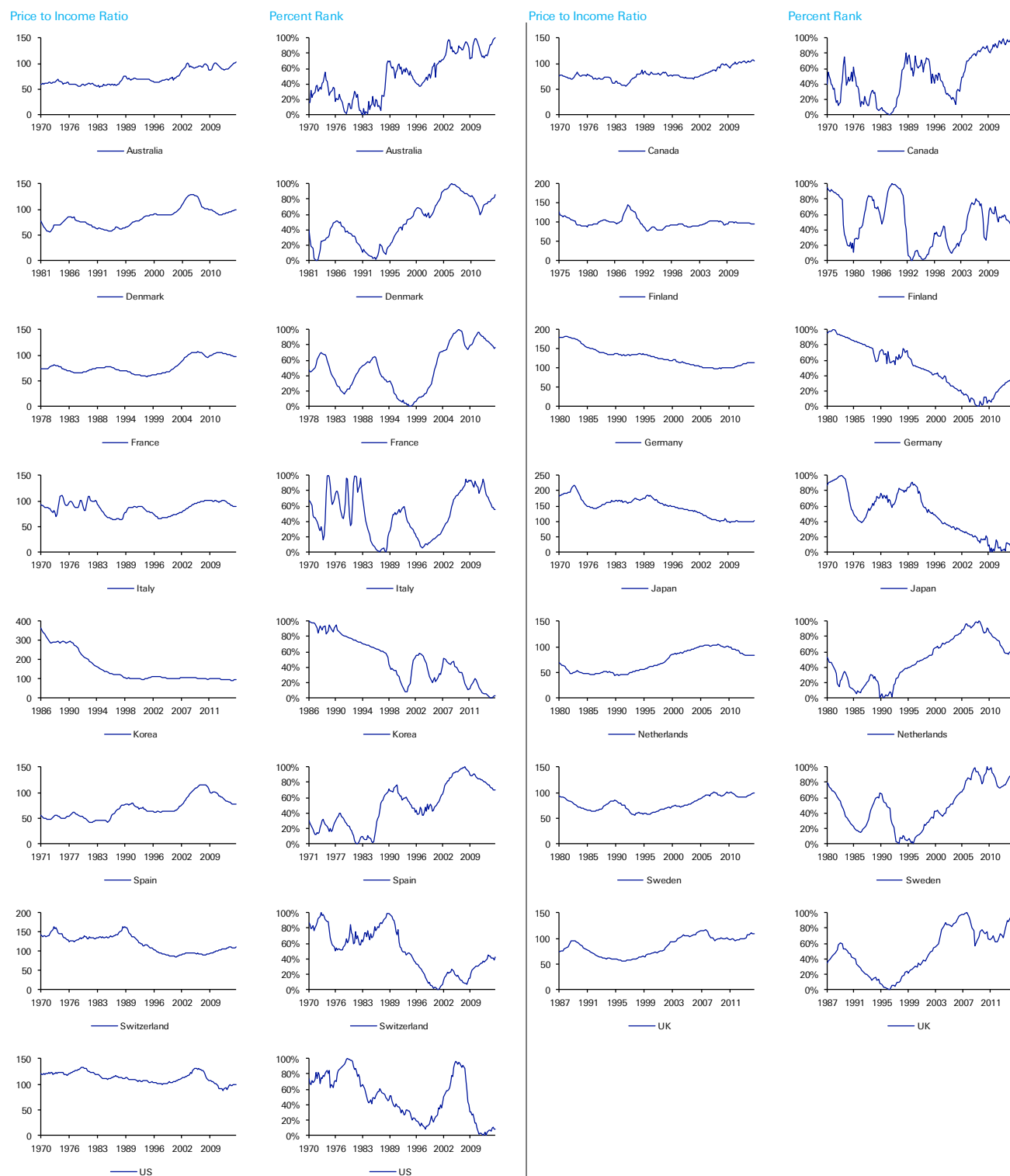
Figure 41: Real Adjusted House Prices and Associated Percentiles vs. History For Our 15 Sample Countries



Source: Deutsche Bank, OECD



Figure 42: Housing Price to Income Ratios and Associated Percentiles vs. History For Our 15 Sample Countries



Source: Deutsche Bank, OECD

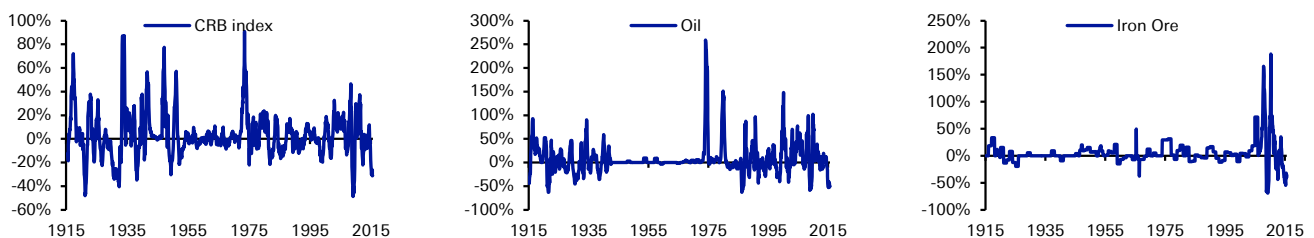


The recent commodity decline in historical context

We wanted to end this chapter looking at commodities which given the last 12 months of declines are certainly not at peak levels relative to history. As we'll see in this section, assessing long-term valuations is very difficult as each individual commodity has different real term and often opposing trends. Given our desire in this year's study to look at topical themes, it is interesting to put the recent plight of the asset class in some historical context.

Figure 43 shows the YoY change in the CRB Index, Oil and Iron Ore over the last 100 years. These have been some of the hardest hit commodities but the selling pressure has been fairly widespread. This has certainly been one of the most savage annual declines in history across the asset class. In Oil the fall to the recent lows in late August ensured we saw the 4th worst 12-month rolling percentage decline in the last 100 years – only 6 years after the 2009 slump which saw a similar magnitude fall.

Figure 43: YoY Change in Selected Commodities

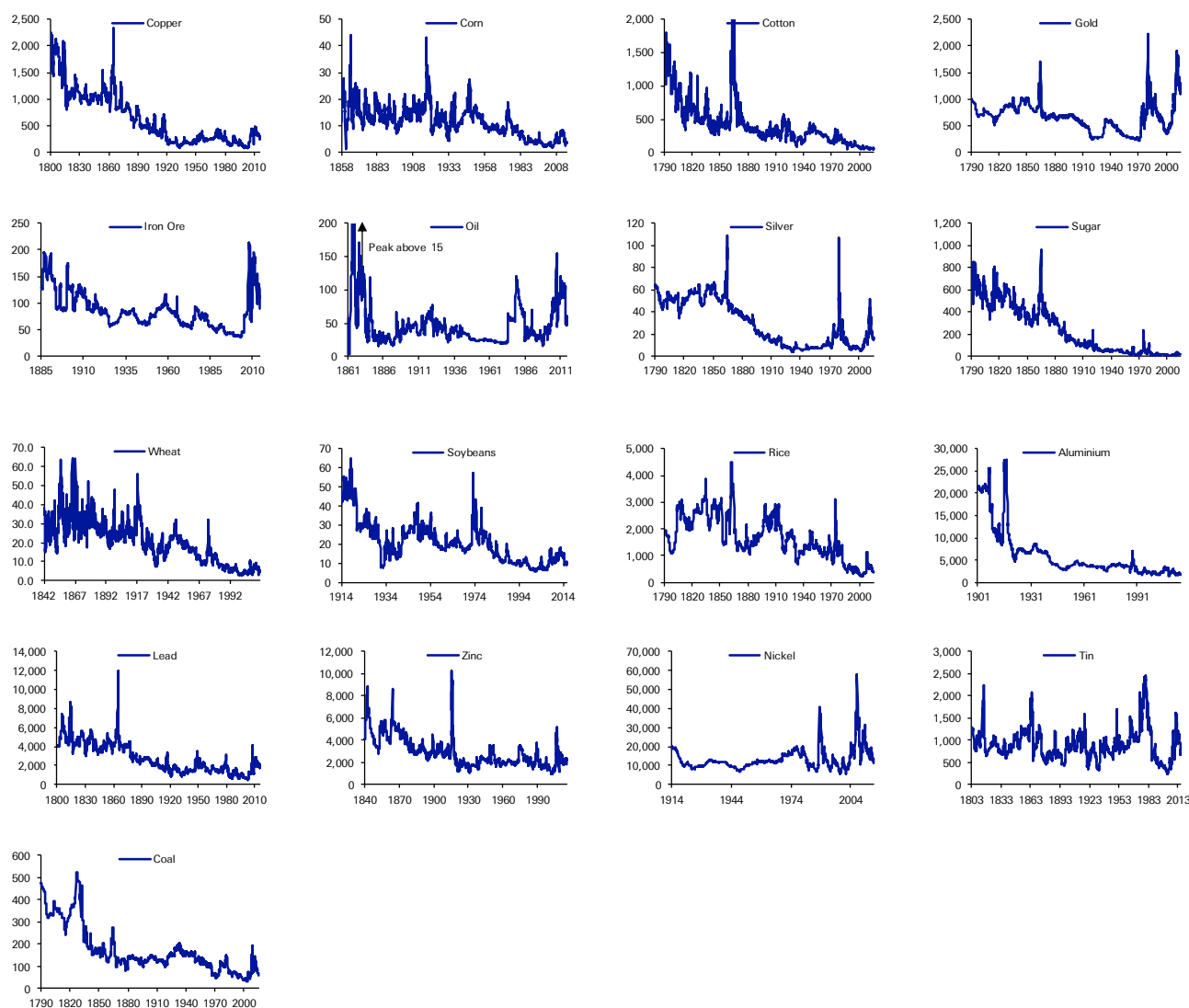


Source: Deutsche Bank, GFD

In this section we also wanted to highlight the prevailing long-term trends across a wide range of commodities. We always struggle to assess long-term valuations in the asset class as it's tough to establish what the trend should be over time. Figure 44 shows long-term real adjusted prices for a series of commodities with prices going back in many cases over 200 years.



Figure 44: Long-Term Real (US CPI) Adjusted Prices of Selected Commodities



Source: Deutsche Bank, GFD

What is clear is that many commodities, especially agricultural products, have actually been on a consistent downward price trend relative to inflation through history. Intuitively this makes sense for agricultural products as they are clearly renewable and although there are land and yield constraints we would speculate that productivity gains in harvesting these renewable products have outstripped population growth. Malthusian theories have clearly not been borne out by the historical price data. This makes assessing valuations on a long-term basis pretty tough as long-term mean reversion doesn't seem to exist.

For hard commodities that have to be mined they generally have a finite supply. So although mining techniques likely become more efficient with productivity increasing, we are dealing with factors of production that take millions of years to naturally evolve and then ultimately seconds to consume. As such there is good reason why prices have out-performed agricultural commodities through history.



There is also likely to be a long lead time in increasing/decreasing production as it involves huge fixed costs. Bottlenecks can therefore easily form which creates price volatility. The last decade or so perhaps illustrates this best. China have been huge consumers/stockpilers of such commodities which first led to huge price spikes well above their long-term trend. However as growth has slowed and the composition of growth has moved away from mass construction the demand picture looks or is perceived to look very different. The recent volatility of Oil and China-centric commodities is testament to this.

If you look at the oil price historically, even with the 55% fall since its peak in 2011, it's hard to say it looks cheap over a long-term basis. Obviously such an analysis ignores short-term supply and demand dynamics but it perhaps shows just how much prices have soared well above their long-term trend in recent years

So this short section shows that commodities have differing long-term price trends and also that many hard commodities have been close to historically high levels in recent years either due to China or due to extremely loose monetary policy. However many have now corrected although it's hard to say they are cheap relative to their long-term trends.



The Economic and Financial Market Impact of Large Currency Moves

We have moved into an era where currency policy is increasingly being used (openly or discreetly) to engineer better domestic economic outcomes. QE in particular has led to large moves in many currencies since the financial crisis and it's hard to argue with the proposition that we're in a global currency war, even if the hostilities are yet to get too confrontational. In recent weeks China seems to have dipped its toes into the currency wars water with a small devaluation. Is this the first step towards a more significant move which would escalate hostilities? Subsequent moves in other EM currencies suggest that it's already had an impact. In addition to this, this year we have seen debate about Euro membership for Greece. Would they be better off exiting the single currency with a large associated devaluation or would it be a false economy?

On the other side on the ledger we have witnessed a period of a steadily strengthening dollar and a Swiss currency that has appreciated again after the Euro peg was dropped earlier this year. What are the implications historically of such a move. The results of our analysis will hopefully give us a deeper understanding of all these issues.

With this in mind, we examine currency moves of 15% or more (in either direction) for 15 DM and 10 EM countries relative to the US dollar with data stretching back almost 200 years for some countries. The results are shown for the impact on the economy and asset prices. The DM database stretches back into the 19th century with EM data typically going back a few decades. We've compiled the analysis separately for the two regions given the different motivations for the moves and the differences in their economies and asset markets.

In our analysis we look at both the raw changes to macro and market variables before and after major depreciations and also at changes in these variables relative to what was happening in the US as we are using the USD as the basis of measuring the FX move. We also exclude hyperinflationary periods and major moves generated by wars from the analysis due to their unique nature and the all-consuming swings they generate in the variables we want to analyse. The main impact of this on the DM analysis is to exclude analysis of much of WW1, interwar and WW2 Europe and on the EM analysis is to remove a number of hyperinflationary periods. Both the market and macro results are presented as annualised growth/change/inflation rates over the entire period referred to (i.e. the 5Y inflation rate refers to the annualised inflation rate over those 5 years).

Developed market results

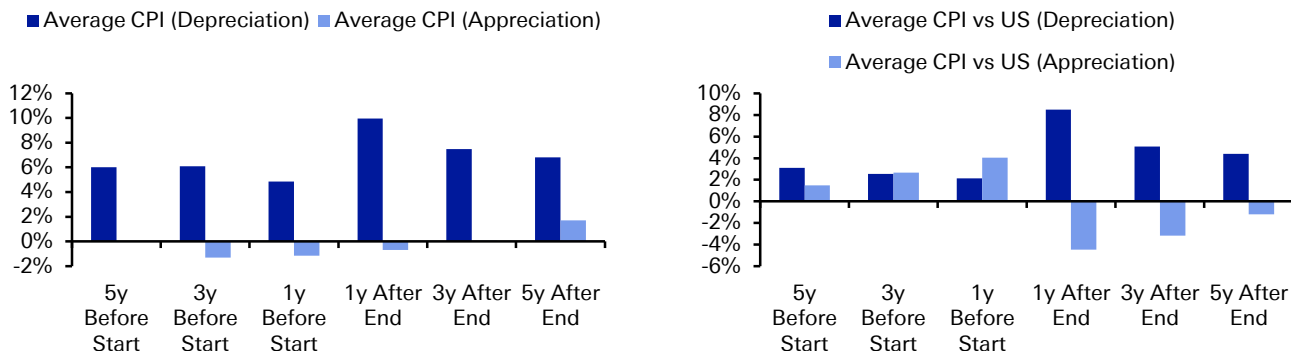
Figure 45 shows that countries that devalue generally have notably higher CPI in the 5 year lead up to the devaluation than those who see an appreciation. This probably reflects domestic economies with internal cost pressures which in turn builds pressure on the currency. For those about to appreciate, the lead up is one of very low inflation/mild deflation. This also makes sense as their cost pressures are likely to be well contained. It wouldn't take much inflation amongst their trading partners (in this case the US) to see upward pressure on their own currency.

After the 'event', the devaluers see even higher inflation across the entire next 5 year period while the re-valuers see no discernible pick-up in inflation.



However these are the raw domestic numbers, when we compare with the US (our control), it's revealing that there is a big swing between the two camps. Those that devalue see a sizable increase in inflation relative to the US and those that re-value see notable relative deflation.

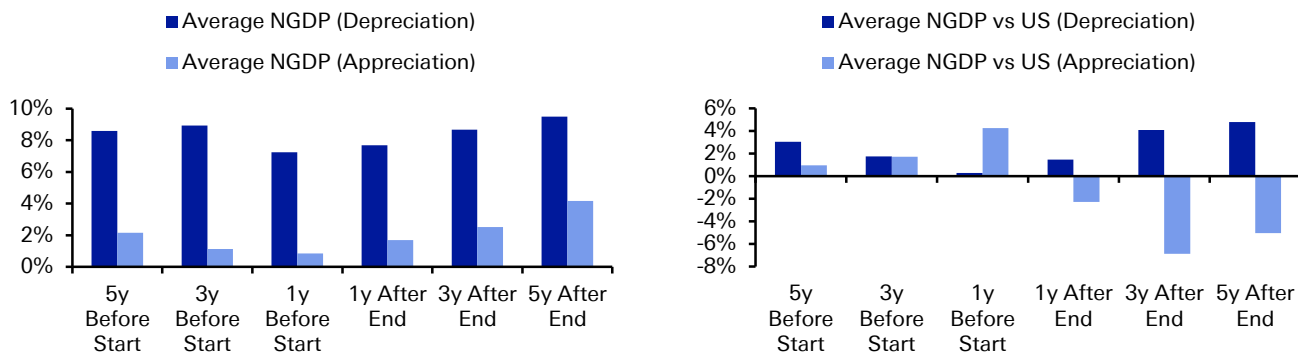
Figure 45: Impact of Major DM FX Moves (vs. US \$) on Inflation. Domestic (left) and Relative to US (right)



Source: Deutsche Bank, GFD

The results are similar in shape and profile when looking at nominal GDP as seen in Figure 46 below. Like with CPI there is a big difference in the data between countries that are likely to depreciate versus appreciate. Nominal GDP is much higher for the former most likely reflecting the higher inflation seen in Figure 45.

Figure 46: Impact of Major DM FX Moves (vs. US \$) on Nominal GDP. Domestic (left) and Relative to US (right)

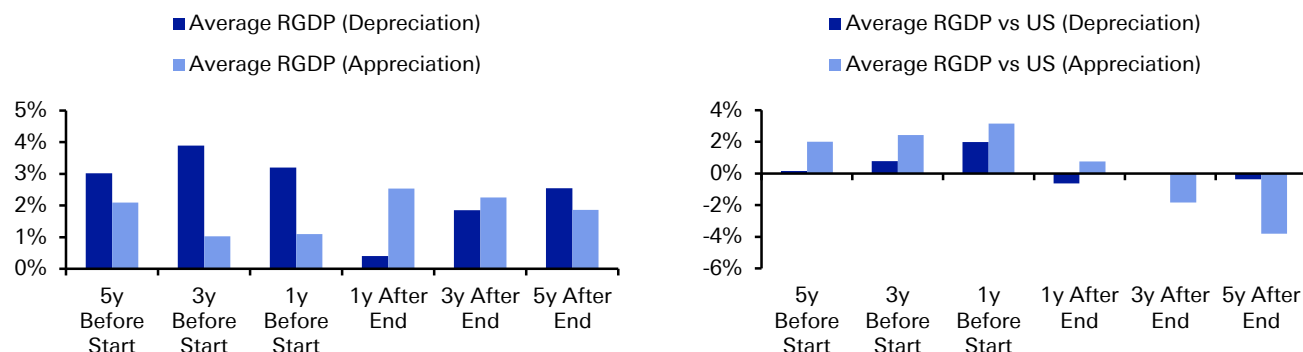


Source: Deutsche Bank, GFD

In real GDP terms in Figure 47 growth does seem to decline sharply in absolute terms a year after devaluation (likely related to whatever development drove the FX move) but has almost recovered by the end of the 5 year period. Interestingly an appreciation has led to slightly stronger real GDP growth across the subsequent 5 year period. The comparison to the US is probably more instructive and it shows a big drop in relative real growth after a re-valuation, one that actually gets worse through the horizon period. It's hard to see much real GDP change relative to the US after a devaluation which is bad news for those countries looking for a quick growth fix via a weakening currency.



Figure 47: Impact of Major DM FX Moves (vs. US \$) on Real GDP. Domestic (left) and Relative to US (right)



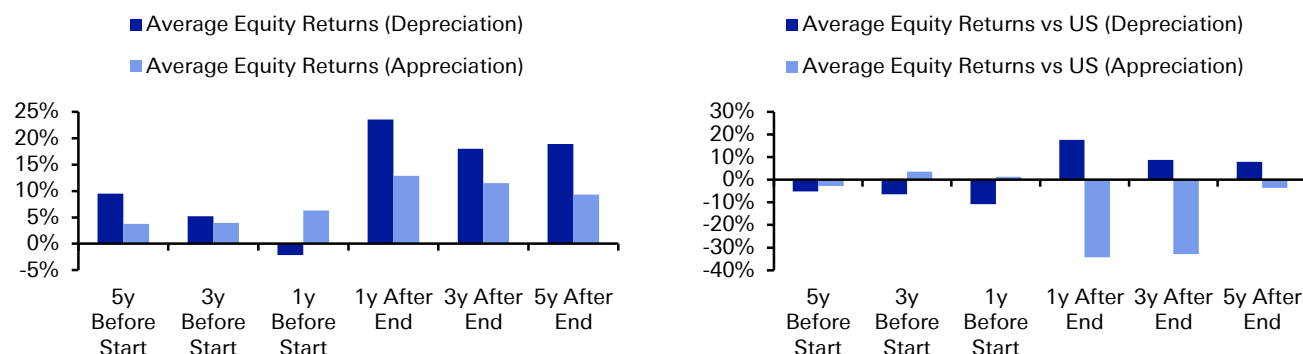
Source: Deutsche Bank, GFD

So from the analysis so far it's clear that most of the impact from the major exchange rate move is through inflation and with it nominal GDP growth. There is not much evidence that devaluation improves real GDP growth domestically or relative to the US.

Market moves

Figure 48 shows the same exercise but for equities.

Figure 48: Impact of Major DM FX Moves (vs. US \$) on Equities. Domestic (left) and Relative to US (right)



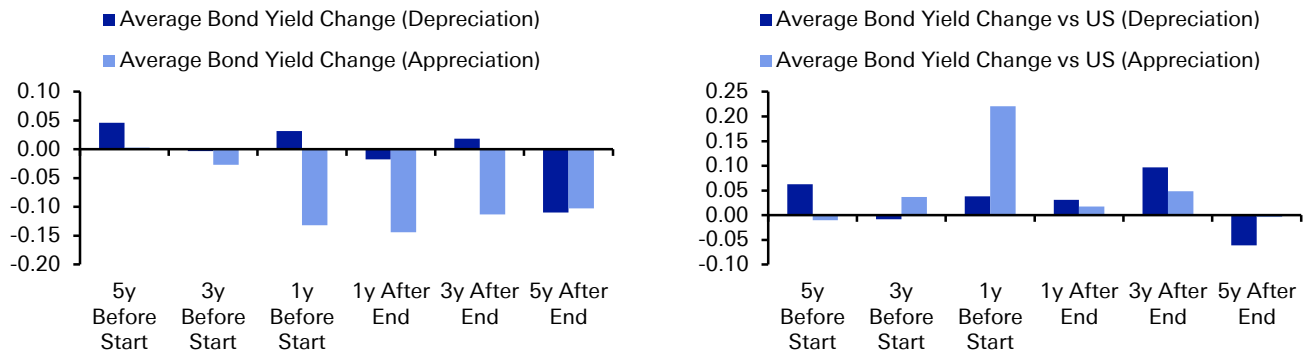
Source: Deutsche Bank, GFD

It's quite clear that domestic equities see a major lift after a devaluation having seen deteriorating returns leading into the event. It's perhaps surprising to see an acceleration in performance after a re-valuation but the magnitude is far less than in the case of devaluing. The results make more intuitive sense when comparing relative to US equities in Figure 48, RHS. Devaluation leads to decent out-performance vs. US equities and appreciation even greater under-performance, especially in the first three years.

For bonds (Figure 49) the trends are less clear. There is some evidence that yields fall both before and after an appreciation but when compared to the US market this fall is not present. Perhaps secular drivers of bond yields are more important and absorb the impact of a changing inflation rate?



Figure 49: Impact of Major DM FX Moves (vs. US \$) on Bonds. Domestic (left) and Relative to US (right)

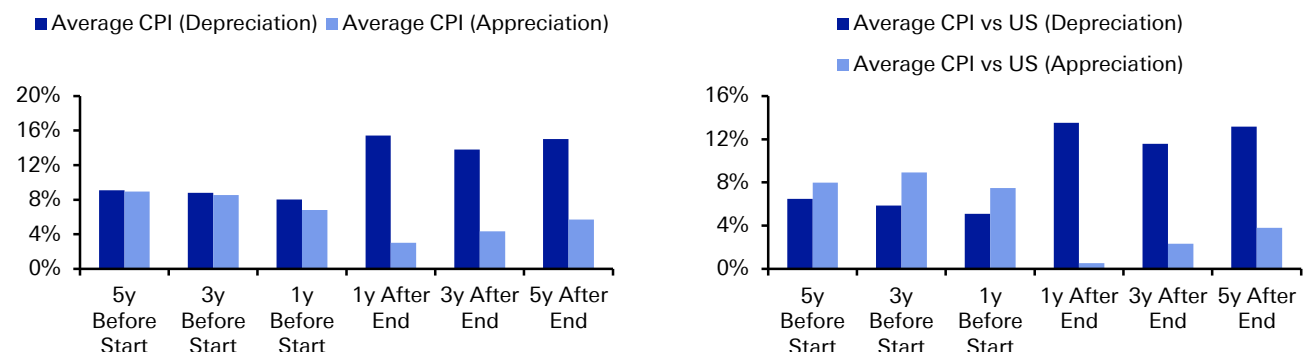


Source: Deutsche Bank, GFD

EM results

For EM nations, with regards to CPI (Figure 50), a major depreciation has a big impact on inflation, pushing it notably higher, absolutely and relative to the US. In contrast a big appreciation has exactly the opposite impact. This is text book stuff but it's nice to see such strong evidence supporting the outcome one would expect.

Figure 50: Impact of Major EM FX Moves (vs. US \$) on Inflation. Domestic (left) and Relative to US (right)



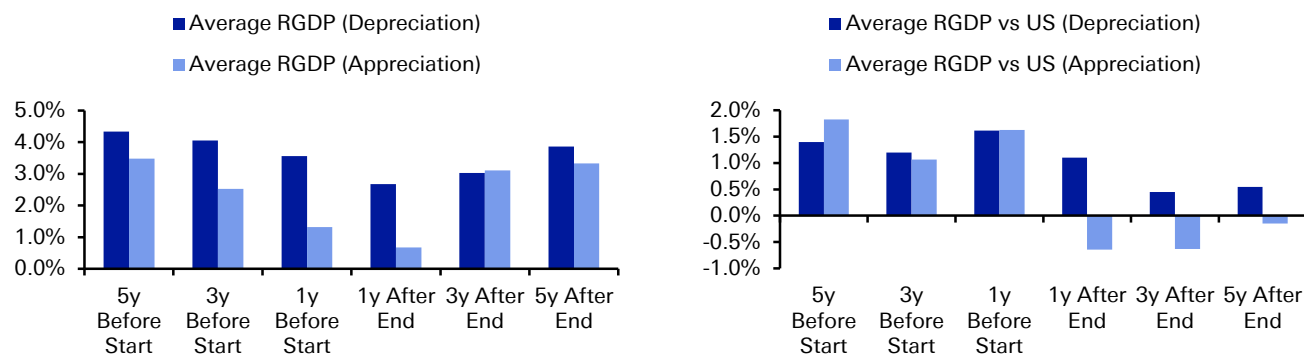
Source: Deutsche Bank, GFD

Where the results are more interesting are for Real (Figure 51) and Nominal (Figure 52) GDP. For a major depreciation, there is evidence that Real GDP growth falls immediately after and takes several years to approach levels seen before the move. Relative to the US there is evidence that we see a permanent long-term decline in the amount of excess real growth over and above the US after devaluation. This could potentially reflect stresses building up in the lead-up to the devaluation as much as the move itself. For a major appreciation, there is a notable loss of real output growth relative to the US but domestic growth actually recovers.

With the results for NGDP it seems that the higher inflation and lower real growth after a major depreciation cancel each other out to a degree. Net net, there may be a slight increase in NGDP growth but it is marginal and shows that most of the impact of a devaluation for EM countries historically has been for higher inflation.

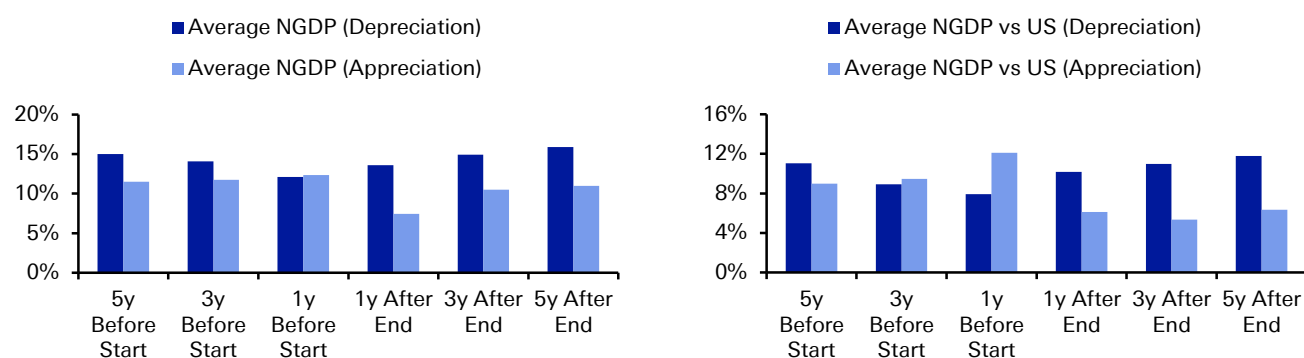


Figure 51: Impact of Major EM FX Moves (vs. US \$) on Real GDP. Domestic (left) and Relative to US (right)



Source: Deutsche Bank, GFD

Figure 52: Impact of Major EM FX Moves (vs. US \$) on Nominal GDP. Domestic (left) and Relative to US (right)



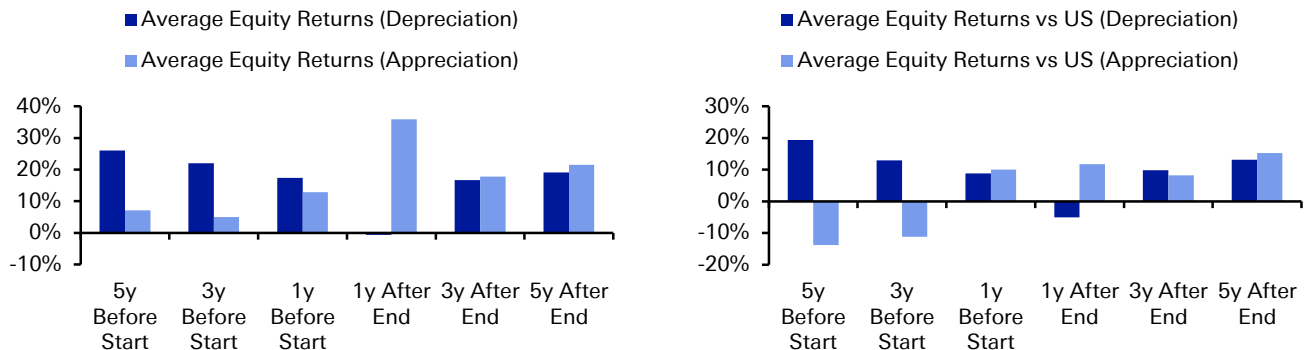
Source: Deutsche Bank, GFD

In terms of equities (Figure 53), a depreciation doesn't seem to help on an absolute or relative basis versus the performance beforehand. Could this be because an EM devaluation is often likely to be due to economic issues that may not have been addressed by simply devaluing?

An appreciation actually sees a slight improvement in equity performance domestically and relative to the US. Maybe this is due to domestic economic strength leading to the revaluation – a move that initially hinders performance. However after this the underlying economic strength is often maintained and equities eventually take it in their stride and prosper again.



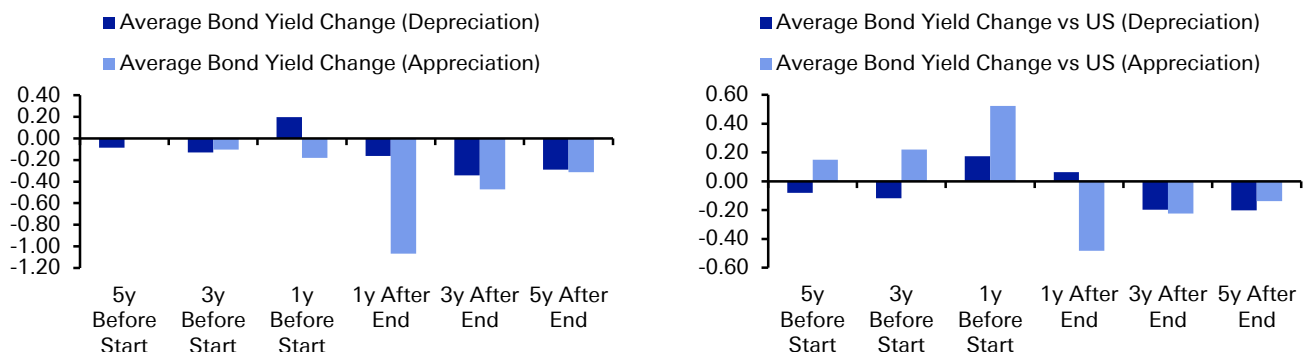
Figure 53: Impact of Major EM FX Moves (vs. US \$) on Equities. Domestic (left) and Relative to US (right)



Source: Deutsche Bank, GFD

For bonds, there does seem to be a bias to lower absolute and relative yields after both major depreciations and appreciations. Perhaps this reflects the fact that over the three decades or so of data which forms the bulk of the EM analysis data set, there has been a general tightening of spreads. It's been generally a period of falling yields and EM convergence with the US. If one had to highlight a major move it would be that after an appreciation the initial reaction is to see a sharp fall in yields on both an absolute and relative basis.

Figure 54: Impact of Major FX Moves (vs. US \$) on Bonds. Domestic (left) and Relative to US (right)



Source: Deutsche Bank, GFD

Conclusion

The most interesting finding in this chapter is the lack of evidence suggesting that a major devaluation helps push real GDP higher. This is true for both DM and EM countries. Perhaps it reflects the fact that the devaluation arose due to structural weakness in the economy that a currency move could not fix. Where it does make a difference is through higher inflation which in a world of high debt and low inflation may still be an attractive option for some countries. Domestic equities also increase which may help domestic investors.

For those that see an appreciation there is evidence to suggest that the pace of growth and inflation slows relative to the US and that equities sharply underperform. So this might be a warning to the US itself that tightening policy while much of the rest of world compete in a currency war may have significant ramifications.



Mean Reversion Conclusions

We now move on to the data-heavy back section of the report which includes all the long-term returns data from bonds and equities across numerous global markets. First we update our annual mean reversion exercise. One of the original motivations for first compiling this report back in 2005 was the belief that traditional developed world asset classes exhibited a rhythm of returns through time that were subject to clear mean reversion tendencies. In every edition of this report we've updated what we consider to be the potential future returns of various asset classes based on them mean reverting over different time horizons.

This is a US centric exercise given the long unbroken history available. However we continue to include EUR and GBP credit. In Figure 55 we show what nominal and real returns could be over the next decade if assets revert back to their long-term average valuations. A brief appendix is posted at the end of this section that takes us through our methodology for the mean reversion exercise. It basically assumes that earnings, PE valuations, inflation, real yields and economic growth return to their long-run averages/trend.

The results are only meant to be a relative value guide and work best on a relative basis across asset classes and the longer the time horizon you view them over. As discussed earlier, we have mainly concentrated on US assets in this section. This enables us to delve deeper into history to analyse the long-term rhythm of returns. In reading the results, hopefully one will be able to understand the type of returns that a sophisticated Developed Market sees through time.



Figure 55: Potential Annualised Returns Based on Full Mean Reversion over Different Time Horizons

		Actual LT Annualised Return*		Mean Reversion Expected Nominal Returns			Mean Reversion Expected Real Returns		
		Nominal	Real	3yr	5yr	10yr	3yr	5yr	10yr
US Assets	Equity (Trend Earnings/Average PE)	8.5%	6.7%	-15.1%	-7.4%	-1.1%	-16.9%	-9.2%	-2.9%
	Equity (Trend Earnings/Average PE since 1958)	8.5%	6.7%	-6.9%	-2.0%	1.7%	-8.8%	-3.9%	-0.1%
	Treasury (10yr)	5.1%	3.3%	-4.1%	-1.0%	1.3%	-6.1%	-2.9%	-0.5%
	Treasury (30yr)	4.7%	1.6%	-6.7%	-2.6%	0.6%	-8.7%	-4.5%	-1.2%
	IG Corporate Bond	5.7%	2.6%	-1.9%	0.8%	2.9%	-4.0%	-1.1%	1.1%
	BBB Bond	6.6%	3.8%	-0.4%	2.0%	3.8%	-2.5%	0.0%	1.9%
	Property	3.5%	0.4%	-10.7%	-5.9%	-2.2%	-12.6%	-7.7%	-3.9%
	Gold	1.9%	0.2%	-17.5%	-10.3%	-4.5%	-19.2%	-12.0%	-6.2%
	Oil	1.4%	-0.8%	-2.6%	-0.9%	0.4%	-4.6%	-2.8%	-1.4%
High Yield	USD High Yield	8.4%	5.6%	2.2%	3.9%	5.3%	0.0%	1.9%	3.4%
	Treasury (Duration Matched)	6.1%	3.4%	-2.4%	0.0%	1.8%	-4.5%	-1.9%	0.0%
	EUR High Yield			-3.6%	-0.3%	2.3%	-5.6%	-2.2%	0.4%
	Treasury (Duration Matched)			-4.7%	-1.8%	0.4%	-6.8%	-3.7%	-1.4%
iBoxx EUR	Corporate Bond			-3.5%	-0.7%	1.4%	-5.6%	-2.6%	-0.4%
	BBB Bond			-2.8%	-0.2%	1.7%	-4.8%	-2.1%	-0.1%
	Non-Financial Bond			-4.2%	-1.1%	1.2%	-6.2%	-3.0%	-0.6%
	Non-Financial BBB Bond			-3.2%	-0.5%	1.5%	-5.2%	-2.5%	-0.3%
	Bund (Duration Matched)			-4.5%	-1.6%	0.5%	-6.5%	-3.5%	-1.3%
iBoxx GBP	Corporate Bond			-4.3%	-0.6%	2.2%	-6.3%	-2.5%	0.5%
	BBB Bond			-1.5%	1.1%	3.1%	-3.5%	-0.8%	1.3%
	Non-Financial Bond			-5.2%	-1.2%	1.9%	-7.2%	-3.1%	0.1%
	Non-Financial BBB Bond			-2.4%	0.5%	2.7%	-4.4%	-1.4%	0.9%
	Gilt (Duration Matched)			-5.7%	-2.0%	0.9%	-7.6%	-3.8%	-0.9%
iBoxx USD	Corporate Bond			-1.1%	1.3%	3.1%	-3.2%	-0.7%	1.2%
	BBB Bond			0.5%	2.3%	3.6%	-1.7%	0.3%	1.8%
	Non-Financial Bond			-1.6%	0.9%	2.9%	-3.7%	-1.0%	1.1%
	Non-Financial BBB Bond			0.0%	1.9%	3.5%	-2.2%	0.0%	1.6%
	Treasury (Duration Matched)			-4.1%	-1.0%	1.3%	-6.1%	-2.9%	-0.5%

Note: * - Based on longest available series in our historical returns analysis.
Source: Deutsche Bank, GFD, Mark-it Group

For equities we use two slightly different methods. Method 1 simply looks at mean reverting earnings back to their long-term trend and PE ratios back to their long-term average. Method 2 recognises that earnings growth may have increased (albeit slightly) post 1958 and uses the trend line of earnings seen since then and the (again slightly higher) average PE ratio seen since. We have often noted that up until 1958 dividend yields were always above bond yields. This situation reversed for the next 50 years when in November 2008 S&P 500 dividends briefly crossed above bond yields again. Since this point the two have crossed a few times. In fact over the past year we have seen them cross again. However despite 10 year Treasury yields remaining fairly low and range bound over the past year the latest point shows Treasury yields back above the c.2.0% dividend yield currently offered by the S&P 500.

The jury is still out however as to whether the post 1958 move to lower dividends and perhaps higher earnings growth has actually been positive or negative for equity returns. We think the jury is still out as there is no conclusive evidence that earnings have broken permanently higher (and not just cyclically) from their long-term trend post-1958. Basically when we look at our long database of returns, performance seems to be superior when investors receive higher dividends rather than when companies retain dividends and attempt to expand their businesses. We've written about this in length in previous studies for those that want to explore the arguments further.



Overall this leaves us preferring method 1 over the very long-term but we've included both results in the exercise for those that think it's a slightly different market now to that seen prior to 1958 and the great dividend crossover.

If we use method 1, annualised real returns on this method show a negative trend over the next decade. In fact based on this analysis even nominal returns look to be negative. The returns are slightly better if you use method 2 although real returns over the next decade still just about fall into negative territory. The important point to note is that the returns based on this analysis are comfortably below the longer-term averages using either method. This backs up our claim that US equities are expensive on an historical basis.

Before we move on from equities we should stress that the biggest problem with valuations today is that earnings/profits in the US are at a very high share of GDP relative to history. If this does eventually mean revert, our low future return numbers are absolutely justifiable. If however we've moved to a permanent new plateau of higher earnings relative to the size of the economy then our numbers are too low.

Potential Treasury returns for both 10yr and 30yr Treasuries sit in between the results for the two different methods for equities. Mean reverted returns are actually broadly similar to what we showed in last year's study. If we assume mean reversion over the next decade then 30yr Treasuries are expected to return around 0.6% p.a. in nominal terms and -1.2% in real terms. The outcome for 10yr Treasuries is slightly better with expected returns of 1.3% p.a. and -0.5% p.a. in nominal and real terms respectively.

Future credit returns also look challenging based on this analysis but given the spread widening we've seen YTD they are higher than we showed last year. Potential LT IG corporate and BBB returns are around 3% p.a. and 4% p.a. respectively in nominal terms if we assume mean reversion over the next decade. This is still below the LT average levels of around 6% p.a. but real returns are expected to be positive. Perhaps more importantly is that excess returns are expected to be in excess of 2% p.a. which is higher than the long-term average.

Extending this analysis to the iBoxx indices we can see that while real returns for EUR corporate bonds are expected, over 10 years, to be negative, GBP and USD real returns are expected to be positive. Again the key point here is that excess returns are expected to be positive across all currencies, which sits well with our general view that credit spreads are not anywhere close to the extreme tights of history. In fact most iBoxx indices are actually wider than their long-term median levels.

Looking now at HY we can see the potential real returns for USD HY assuming mean reversion over the next decade are notably higher than we showed in last year's study at 3.4% p.a. (5.3% p.a. in nominal terms). While these levels are still below the long-term average levels, just as we saw with IG credit expected excess returns (3.4% p.a.) are higher than the long-term average although only around 1% higher than expected IG excess returns (partly due to duration). For EUR HY expected returns over the next decade are notably lower than for USD HY but they are still positive with excess returns of nearly 2% p.a. This analysis assumes long-term average levels of default but it's worth highlighting that defaults over the past decade have been consistently and significantly lower than long-term averages.

For property, using Robert Shiller's long-term data back to 1900, the asset class still appears expensive on a mean reversion basis. In nominal terms our mean reversion suggests house prices could fall by around 2% p.a. over the



next decade. This is a third year in a row where expected returns have fallen, reflecting continued improvement in US real estate. We should note that this exercise purely looks at mean reverting to its long-term trend relative to inflation (back to 1900). In the earlier section on global asset prices, we looked at global house prices against income since 1970. On this basis US property looks cheaper relative to history. However the upward path of real prices since this point has probably been influenced by very low and consistently falling bond yields since the early 1980s. The pure mean reversion of real prices back to 1900 does a better job of smoothing out secular trends. In the US where supply constraints are less of an issue than say the UK, we do wonder whether property should outstrip the pace of inflation over the very long-run.

Finally we look at commodities. In recent studies our mean reversion exercise has highlighted that both Oil and Gold were likely to have poor decades in both nominal and real terms. Given the significant re-pricing we've seen for oil over the past 12 months (a drop of around 50% since the last study) our mean reversion exercise now shows a positive expected nominal return over the next decade and only a marginally negative real return. So much cheaper but only really back closer to its long-term real price trend. While Gold has also fallen over the past year it has not been to the same extent and therefore while expected returns are higher than they were a year ago they are still expected to be comfortably negative at -4.5% and -6.2% p.a. in nominal and real terms respectively.

We now look at the methodology of this mean reversion exercise and then move on to the data bedrock of the piece which is the database of long-term returns across the globe. First we look at the US and then other international markets.

Mean reversion assumptions

As an appendix to this section we outline the methodology and the variables that we have mean reverted in order to calculate potential returns for the various asset classes discussed in this study.

Inflation

The starting point, which is essential for calculating possible future returns across all asset classes (including equities), is to get a future CPI time series. For this we have just reverted the YoY growth in CPI to its long-term average (around 3.2%).

Equities

For equities although we have used slightly different methodologies the broad principles were the same. Essentially we first calculate a mean reverted price series. We do this by first reverting real earnings back to their long-term trend line. We mean revert the current PE ratio back to its long-term average. Combining the reverted earnings and PE ratios we then calculate a price. In order to calculate total returns we have assumed real dividends revert back to their long-term trend line. By combining the prices and the dividends we calculate total returns. As already mentioned we used two slightly different methodologies the specific of which are outlined in the bullets below.

- Method 1: We revert earnings, PE ratios and dividends back to their long-term trend/averages using all available data back to 1871.
- Method 2: We revert earnings, PE ratios and dividends back to their long-term trend/averages based on data since 1958. As already mentioned this recognises that earnings growth may have increased (albeit slightly) post 1958 and the previously discussed dividend crossover.



Treasury/Government bond mean reversion

For Treasuries and other Government bond series we have reverted to the long-term average real yield which has been calculated by subtracting YoY CPI from the nominal bond yield. We can then use these yields to calculate prospective returns.

Corporate bond mean reversion (IG and HY)

For corporate bonds we mean revert credit spreads to their long-term average level. These spreads coupled with the already calculated Treasury/Government bond yields give us an overall corporate bond yield that can be used to calculate possible future returns. We have used appropriate duration matched Treasury/Government yields for the various different corporate bond series.

For the iBoxx indices, which only have data back to 1999, we have created a longer-term spread series by regressing the iBoxx spread data against the Moody's long-term spread series. The results of the regression can be used to calculate a longer-term spread series, which can be used to calculate the long-term average level that is then used for mean reversion purposes.

For further details on how we have calculated bond returns (both Government and corporate) please refer to a previous version of this report (100 Year of Corporate Bond Returns Revisited, 5th November 2008).

US property and commodity mean reversion

For both US property and the various commodity series we have calculated a real adjusted price series and simply mean reverted to the long-term average level of these series.



Historical US Asset Returns

We now look at long-term US returns going back to the start of the 19th century (where possible). Figure 56 and Figure 57 show why we invest in assets over the medium to long-term. Using data going back over 200 years, it is quite clear that history tells us that holding cash on deposit has been a recipe for wealth erosion. We split the data up by nominal and real returns through different time periods. We also show returns annualised within each decade and also by 50 year buckets. This hopefully helps us see both cyclical and secular trends.

Over the entire sample period, Equities outperform Corporate Bonds, which outperform Government Bonds, which outperform Cash, which interestingly has outperformed the Commodities analysed in this section. Over the last 100 years (since 1916), where we have data for the widest selection of assets, Equities outperform 30yr Governments by 4.7% p.a., Corporates by 3.9% p.a. and Cash by 6.3% p.a. (on a nominal basis).

So through time equities have clearly outperformed other assets. The same is also true for the last 5 years even though the annualised nominal return has dropped to just below 12%. The next best performing asset class has been long dated Treasuries with 30yr bonds returning nearly 8% p.a. in total return. Credit returns (both IG and HY) have been negatively impacted by replacing a solid year of returns from 2010 with this year's weaker returns and in the case of IG losses. IG credit returns are broadly in line with the long-term averages while HY returns over the past 5 years are comfortably below these averages.

It has continued to be a tough time for commodities. Within our study Wheat (-12.4%), Oil (-11.7%) and Copper (-11.6%) have all seen double digit annualized negative returns in nominal terms over the past 5 years as commodities have struggled YTD. Gold has also had another fairly weak year so far with the annualized nominal return for the past 5 years now at -4.4% and comfortably below the long-term average of 1.9%.

Property (US) is an asset class that has only just out-paced inflation (0.4% p.a. real) over the long-term. We would stress that this is a price-only series and doesn't include potential rental yields but it's a reminder that real adjusted capital returns in the asset class can be minimal over longer time periods, especially in markets like the US where overall ample space and a lack of restrictive planning prevents their being a national supply shortage relative to demand.

Non-financial IG Corporate Bonds have steadily out-performed Government Bonds over all medium-term time periods. The levels of defaults historically seen in IG very rarely erode the additional spread the asset class provides. Periods of under-performance are much more likely to be driven by temporary spread widening. These spread changes tend to be highly cyclical whereas equity and Treasury valuations tend to exhibit a more secular pattern. HY is still a fairly new market in the context of this study, with new issuance (rather than simply fallen angels) only existing from the mid 1980s. In this time, we've been through longer and less frequent business cycles than long-term history, but also through two deep default cycles (2000-2003 and 2007-2009), with the former far worse for HY (especially in Europe) than it was for the overall economy. So we would argue that we don't have enough data yet to assess what a likely long-term return number for HY should be. However the excess return of 2.3% p.a. over Government Bonds since we have data might be argued to be disappointing relative to the lower risk returns seen in IG credit. Much of this 'disappointment' has been obscured by the high total returns in



fixed income which has given the asset class a healthy 5.6% p.a. nominal return over the last 25 years (since 1991) and 6.1% p.a. since 1986. This is relevant as HY investors are more total return biased than the more excess return biased IG investors.

In the following section (starting on page 54) we extend the analysis of historical asset returns to equity and bond markets around the world.

Figure 56: Nominal Returns for US Assets over Different Time Horizons

	Equity	Corp Bond	AAA Bond	BBB Bond	Treasury (10Yr)	Treasury (30Yr)	HY Bond	Treasury (HY Matched)	Treasury Bill	House Prices (Price Only)	Gold	Copper	Oil	Wheat
last 5yrs (2011-2015)	11.60%	6.50%	5.93%	6.30%	4.19%	7.62%	6.02%	2.10%	0.05%	4.33%	-4.39%	-11.52%	-11.65%	-12.44%
last 10yrs (2006-2015)	6.85%	6.42%	6.12%	6.53%	4.94%	5.82%	7.15%	4.09%	1.11%	-0.35%	8.17%	0.71%	-2.14%	2.06%
last 15yrs (2001-2015)	4.70%	8.05%	7.83%	8.04%	5.19%	6.51%	7.55%	4.00%	1.45%	3.17%	9.98%	6.91%	4.15%	3.30%
last 25yrs (1991-2015)	9.63%	8.78%	8.49%	9.03%	6.65%	7.91%	8.72%	5.58%	2.77%	3.37%	4.02%	2.80%	2.22%	1.62%
last 50yrs (1966-2015)	9.55%	7.88%	7.57%	8.18%	7.26%	6.97%			5.06%	4.88%	7.17%	3.86%	5.81%	1.74%
last 75yrs (1941-2015)	11.13%	5.99%	5.59%	6.50%	5.47%	5.04%			3.95%	4.76%	4.77%	4.07%	4.30%	2.03%
last 100yrs (1916-2015)	9.80%	5.88%			5.19%	5.08%			3.55%	3.80%	4.09%	2.39%	3.13%	1.15%
last 125yrs (1891-2015)	9.32%				4.73%				3.39%		3.26%	1.93%	3.43%	1.20%
last 150yrs (1866-2015)	8.87%				4.74%				3.46%		2.45%	0.97%	1.36%	0.97%
last 175yrs (1841-2015)	8.83%				4.85%				3.68%		2.31%	1.28%		
last 200yrs (1816-2015)	8.53%				4.89%						1.99%	0.89%		
since 1800	8.52%				5.07%						1.90%	0.70%		
since 1900	9.48%	5.67%			4.75%	4.70%			3.48%	3.48%	3.51%	2.19%	2.97%	1.54%
since 1920	9.99%	6.13%	5.89%	6.59%	5.32%	5.19%			3.54%	3.67%	4.26%	2.69%	2.41%	0.51%
since 1930	9.44%	6.06%	5.82%	6.51%	5.30%	5.09%			3.51%	4.03%	4.77%	3.06%	3.31%	1.32%
since 1971	10.27%	9.10%	8.66%	9.52%	7.62%	7.78%			5.00%	4.97%	7.86%	3.41%	6.11%	1.87%
since 1986	10.21%	9.32%	8.99%	9.54%	7.21%	8.44%	8.36%	6.10%	3.47%	4.02%	3.96%	4.36%	2.08%	0.40%
RETURNS BY DECADE														
1800-1809	11.09%				9.12%						0.00%	-1.62%		
1810-1819	4.91%				6.23%						0.00%	-4.63%		
1820-1829	6.94%				5.53%						0.00%	-1.63%		
1830-1839	5.34%				2.75%						0.67%	1.38%		
1840-1849	7.83%				7.47%				5.02%		-0.03%	-2.57%		
1850-1859	1.62%				3.98%				5.08%		0.00%	2.35%		5.70%
1860-1869	18.34%				6.30%				5.04%		1.81%	1.90%	-12.73%	-1.80%
1870-1879	7.73%				3.67%				4.11%		-1.78%	-2.05%	-14.26%	5.23%
1880-1889	5.68%				5.48%				3.04%		0.00%	-1.66%	-0.70%	-5.09%
1890-1899	5.37%				3.93%				2.33%		0.00%	-1.26%	4.88%	-1.21%
1900-1909	9.92%	4.39%			1.63%	2.17%			3.04%	1.97%	0.00%	-3.55%	-1.43%	6.06%
1910-1919	4.35%	2.62%			2.52%	2.52%			3.28%	3.15%	0.00%	3.34%	13.33%	7.19%
1920-1929	14.78%	6.74%	6.52%	7.31%	5.48%	6.05%			3.88%	0.65%	0.00%	-0.48%	-4.98%	-6.18%
1930-1939	-0.47%	6.50%	7.48%	6.44%	3.95%	5.49%			0.58%	-1.21%	5.41%	-3.51%	-1.81%	-2.22%
1940-1949	8.99%	3.93%	2.92%	5.44%	2.70%	2.42%			0.48%	8.12%	1.47%	4.00%	0.28%	7.64%
1950-1959	19.26%	0.16%	-0.08%	0.59%	0.39%	-0.50%			2.02%	2.97%	-1.38%	5.96%	1.46%	-0.69%
1960-1969	7.76%	0.57%	0.42%	0.89%	2.76%	0.51%			4.06%	1.85%	0.04%	5.43%	0.78%	-2.96%
1970-1979	5.77%	5.34%	5.02%	5.85%	6.08%	3.71%			6.48%	7.99%	32.23%	6.28%	28.04%	11.43%
1980-1989	17.47%	13.72%	13.03%	14.44%	12.78%	12.64%			9.13%	6.94%	-2.85%	0.57%	-5.40%	-0.74%
1990-1999	18.21%	9.31%	8.84%	9.99%	7.98%	8.40%	10.59%	7.23%	4.95%	2.67%	-4.02%	-2.12%	1.67%	-6.31%
2000-2009	-0.95%	8.87%	8.91%	8.68%	6.63%	7.03%	6.30%	5.81%	2.74%	3.95%	14.32%	13.96%	11.91%	6.67%
2010-2015	12.17%	7.31%	6.96%	7.22%	4.70%	7.95%	7.37%	2.69%	0.06%	2.87%	0.58%	-4.98%	-7.66%	-0.33%
RETURNS BY HALF CENTURY														
1800-1849	7.20%				6.20%						0.13%	-1.83%		
1850-1899	7.61%				4.67%				3.91%	#N/A	0.00%	-0.16%		0.48%
1900-1949	7.39%	4.82%			3.25%	3.72%			2.24%	2.49%	1.35%	-0.09%	0.89%	2.34%
1950-1999	13.55%	5.70%	5.33%	6.22%	5.91%	4.84%			5.30%	4.46%	4.00%	3.17%	4.72%	-0.03%
2000-2015	3.78%	8.28%	8.17%	8.13%	5.90%	7.38%	6.70%	4.63%	1.73%	3.54%	8.96%	6.45%	4.13%	3.99%

Note: 2015 Returns are calculated up to 31August. So for example the last 5 years data is actually for 4 years and 8 months, 10 years for 9 years and 8 months. Source: Deutsche Bank, GFD



Figure 57: Real Returns for US Assets over Different Time Horizons

	Equity	Corp Bond	AAA Bond	BBB Bond	Treasury (10yr)	Treasury (30yr)	HY Bond	Treasury (HY Matched)	Treasury Bill	House Prices (Price Only)	Gold	Copper	Oil	Wheat
last 5yrs (2011-2015)	9.92%	4.89%	4.33%	4.69%	2.62%	5.99%	4.42%	0.56%	-1.46%	2.76%	-5.83%	-12.86%	-12.98%	-13.76%
last 10yrs (2006-2015)	4.91%	4.49%	4.19%	4.59%	3.03%	3.90%	5.20%	2.20%	-0.72%	-2.16%	6.21%	-1.12%	-3.91%	0.20%
last 15yrs (2001-2015)	2.57%	5.85%	5.63%	5.83%	3.04%	4.34%	5.36%	1.88%	-0.62%	1.07%	7.74%	4.73%	2.03%	1.19%
last 25yrs (1991-2015)	7.15%	6.32%	6.03%	6.56%	4.24%	5.47%	6.25%	3.19%	0.45%	1.03%	1.66%	0.47%	-0.10%	-0.68%
last 50yrs (1966-2015)	5.23%	3.63%	3.33%	3.92%	3.03%	2.76%			0.92%	0.75%	2.95%	-0.23%	1.64%	-2.27%
last 75yrs (1941-2015)	7.02%	2.07%	1.69%	2.57%	1.57%	1.15%			0.11%	0.88%	0.89%	0.22%	0.45%	-1.74%
last 100yrs (1916-2015)	6.41%	2.61%			1.94%	1.83%			0.35%	0.59%	0.87%	-0.77%	-0.05%	-1.98%
last 125yrs (1891-2015)	6.32%				1.86%				0.55%		0.42%	-0.87%	0.59%	-1.57%
last 150yrs (1866-2015)	6.58%				2.53%				1.28%		0.30%	-1.16%	-0.78%	-1.16%
last 175yrs (1841-2015)	6.54%				2.65%				1.50%		0.16%	-0.85%		
last 200yrs (1816-2015)	6.71%				3.13%						0.28%	-0.80%		
since 1800	6.72%				3.33%						0.22%	-0.96%		
since 1900	6.25%	2.55%			1.66%	1.61%			0.42%	0.42%	0.46%	-0.83%	-0.07%	-1.46%
since 1920	7.12%	3.37%	3.13%	3.82%	2.58%	2.46%			0.85%	0.97%	1.55%	0.01%	-0.26%	-2.11%
since 1930	6.15%	2.87%	2.63%	3.30%	2.14%	1.93%			0.39%	0.90%	1.62%	-0.04%	0.20%	-1.73%
since 1971	5.97%	4.85%	4.42%	5.25%	3.43%	3.58%			0.91%	0.88%	3.66%	-0.62%	1.98%	-2.10%
since 1986	7.40%	6.53%	6.21%	6.75%	4.47%	5.67%	5.60%	3.40%	0.82%	1.36%	1.30%	1.70%	-0.53%	-2.16%
RETURNS BY DECADE														
1800-1809	11.09%				9.12%						0.00%	-1.62%		
1810-1819	4.56%				5.87%						-0.34%	-4.96%		
1820-1829	9.05%				7.62%						1.98%	0.31%		
1830-1839	3.23%				0.70%						-1.35%	-0.65%		
1840-1849	10.82%				10.45%				7.94%		2.75%	0.13%		
1850-1859	0.07%				2.39%				3.47%		-1.53%	0.79%		4.08%
1860-1869	13.58%				2.02%				0.81%		-2.29%	-2.20%	-16.24%	-5.75%
1870-1879	10.20%				6.04%				6.50%		0.47%	0.19%	-12.30%	7.64%
1880-1889	5.68%				5.48%				3.04%		0.00%	-1.66%	-0.70%	-5.09%
1890-1899	5.23%				3.79%				2.19%		-0.13%	-1.39%	4.74%	-1.34%
1900-1909	7.36%	1.95%			-0.74%	-0.22%			0.63%	-0.41%	-2.34%	-5.80%	-3.73%	3.58%
1910-1919	-2.78%	-4.39%			-4.48%	-4.49%			-3.78%	-3.90%	-6.84%	-3.72%	5.59%	-0.14%
1920-1929	15.87%	7.75%	7.53%	8.33%	6.48%	7.06%			4.87%	1.61%	0.95%	0.46%	-4.08%	-5.29%
1930-1939	1.60%	8.72%	9.72%	8.65%	6.11%	7.69%			2.67%	0.85%	7.60%	-1.50%	0.24%	-0.19%
1940-1949	3.45%	-1.36%	-2.31%	0.07%	-2.52%	-2.79%			-4.63%	2.62%	-3.69%	-1.29%	-4.83%	2.17%
1950-1959	16.67%	-2.02%	-2.25%	-1.60%	-1.80%	-2.67%			-0.20%	0.74%	-3.52%	3.66%	-0.75%	-2.84%
1960-1969	5.11%	-1.89%	-2.05%	-1.59%	0.23%	-1.96%			1.51%	-0.65%	-2.41%	2.84%	-1.69%	-5.34%
1970-1979	-1.51%	-1.90%	-2.20%	-1.43%	-1.21%	-3.43%			-0.85%	0.56%	23.14%	-1.03%	19.23%	3.76%
1980-1989	11.78%	8.22%	7.56%	8.90%	7.32%	7.19%			3.84%	1.76%	-7.55%	-4.30%	-9.98%	-5.54%
1990-1999	14.83%	6.19%	5.73%	6.85%	4.90%	5.30%	7.43%	4.17%	1.95%	-0.26%	-6.77%	-4.92%	-1.23%	-8.99%
2000-2009	-3.42%	6.15%	6.19%	5.97%	3.97%	4.36%	3.65%	3.17%	0.18%	1.36%	11.46%	11.12%	9.12%	4.01%
2010-2015	10.50%	5.70%	5.36%	5.62%	3.13%	6.34%	5.76%	1.16%	-1.43%	1.33%	-0.93%	-6.40%	-9.05%	-1.82%
RETURNS BY HALF CENTURY														
1800-1849	7.70%				6.70%						0.60%	-1.37%		
1850-1899	6.85%				3.93%				3.19%		-0.70%	-0.86%	#N/A	-0.23%
1900-1949	4.91%	2.41%			0.87%	1.33%			-0.11%	0.13%	-0.98%	-2.40%	-1.44%	-0.02%
1950-1999	9.17%	1.62%	1.27%	2.12%	1.83%	0.79%			1.24%	0.43%	-0.01%	-0.81%	0.68%	-3.88%
2000-2015	1.58%	5.98%	5.88%	5.84%	3.66%	5.10%	4.44%	2.41%	-0.43%	1.35%	6.64%	4.19%	1.92%	1.78%

Note: 2015 Returns are calculated up to 31August. So for example the last 5 years data is actually for 4 years and 8 months, 10 years for 9 years and 8 months. Source: Deutsche Bank, GFD

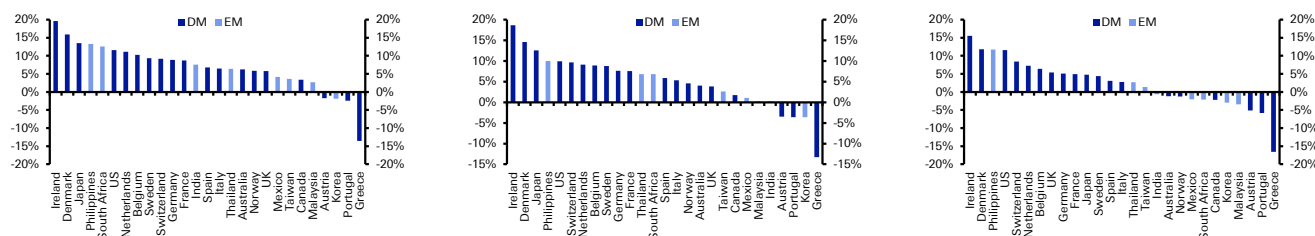




Historical International Asset Returns

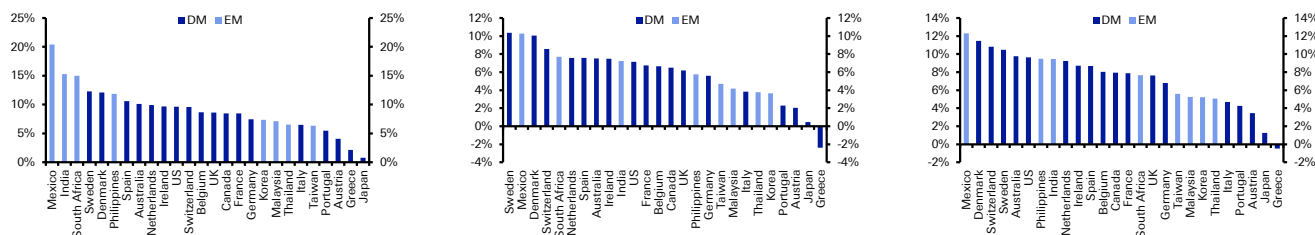
International equity return charts

Figure 58: Last 5 Years Annualised Equity Returns – Nominal (left), Real (middle), USD (right)



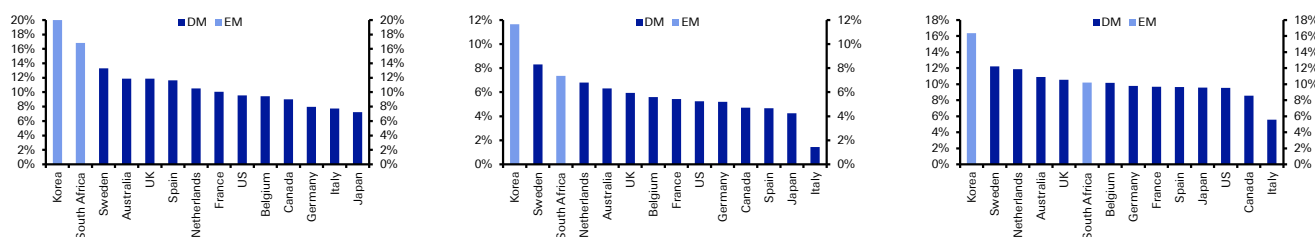
Source: Deutsche Bank, GFD

Figure 59: Last 25 Years Annualised Equity Returns – Nominal (left), Real (middle), USD (right)



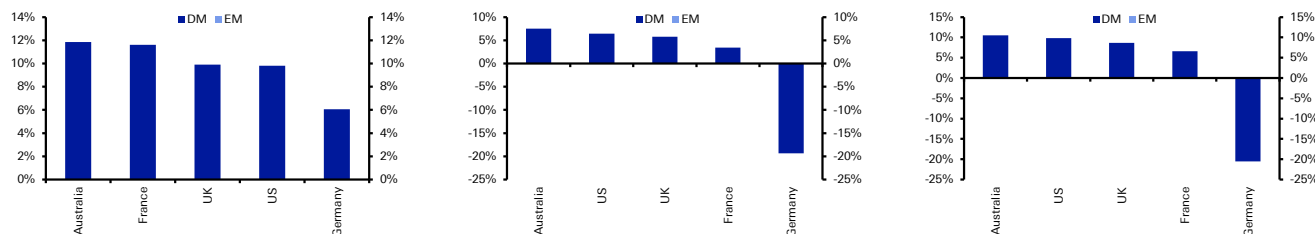
Source: Deutsche Bank, GFD

Figure 60: Last 50 Years Annualised Equity Returns – Nominal (left), Real (middle), USD (right)



Source: Deutsche Bank, GFD

Figure 61: Last 100 Years Annualised Equity Returns – Nominal (left), Real (middle), USD (right)

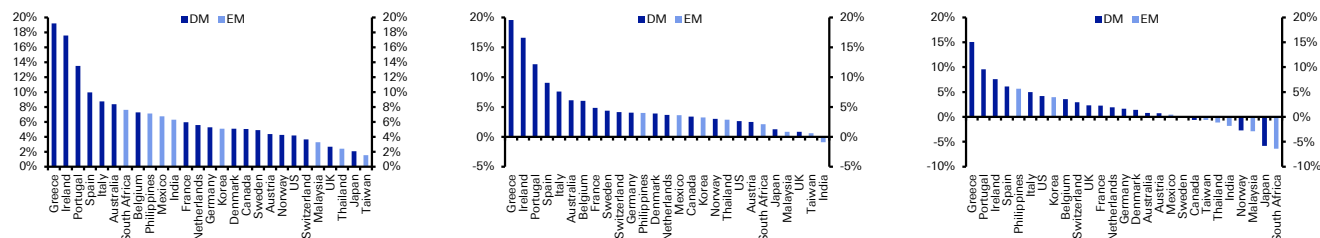


Source: Deutsche Bank, GFD



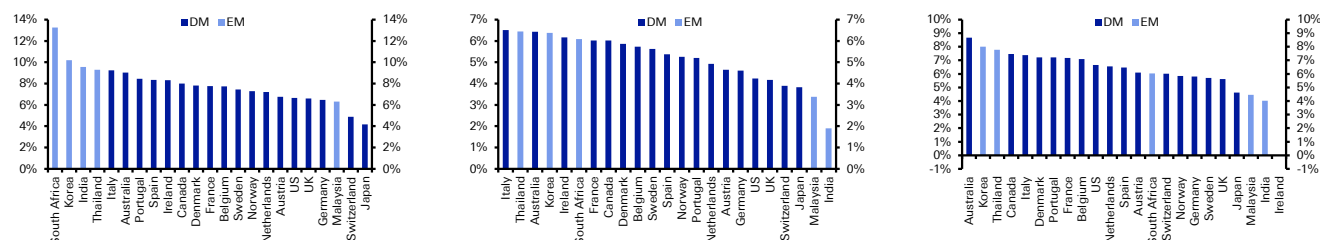
International 10 year government bond return charts

Figure 62: Last 5 Years Annualised 10 Year Government Bond Returns – Nominal (left), Real (middle), USD (right)



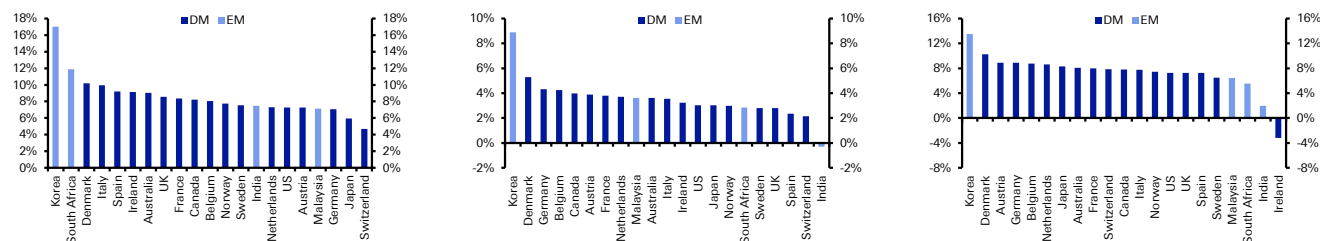
Source: Deutsche Bank, GFD

Figure 63: Last 25 Years Annualised 10 Year Government Bond Returns – Nominal (left), Real (middle), USD (right)



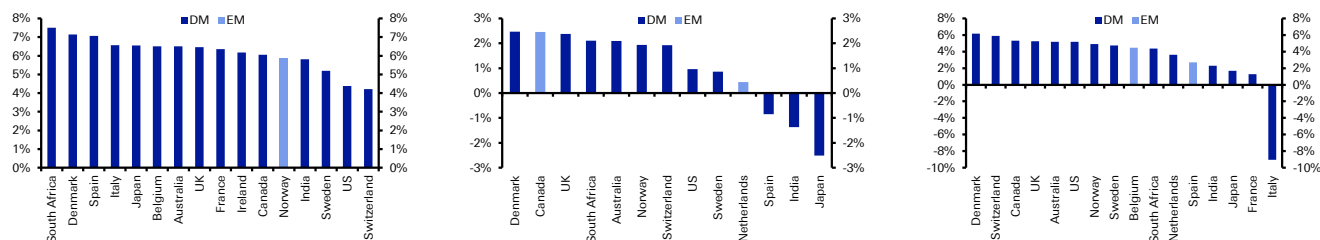
Source: Deutsche Bank, GFD

Figure 64: Last 50 Years Annualised 10 Year Government Bond Returns – Nominal (left), Real (middle), USD (right)



Source: Deutsche Bank, GFD

Figure 65: Last 100 Years Annualised 10 Year Government Bond Returns – Nominal (left), Real (middle), USD (right)

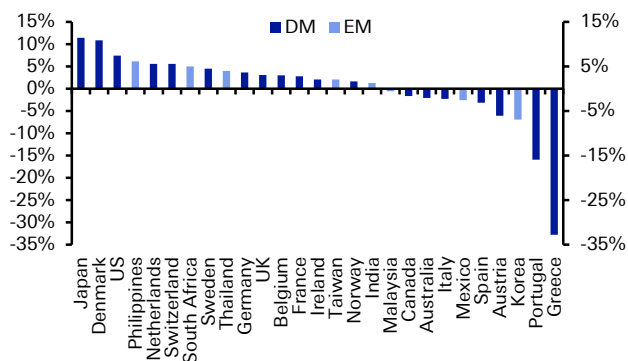


Source: Deutsche Bank, GFD



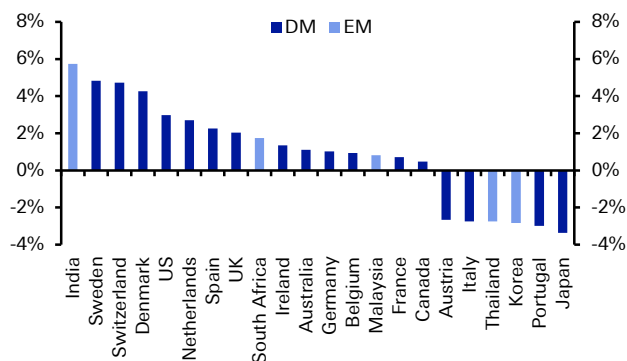
International equity minus bond return charts

Figure 66: Last 5 Yrs Annualised Equity-Bond Return



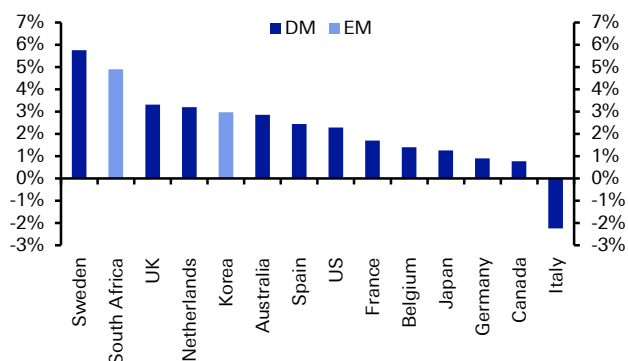
Source: Deutsche Bank, GFD

Figure 67: Last 25 Yrs Annualised Equity-Bond Return



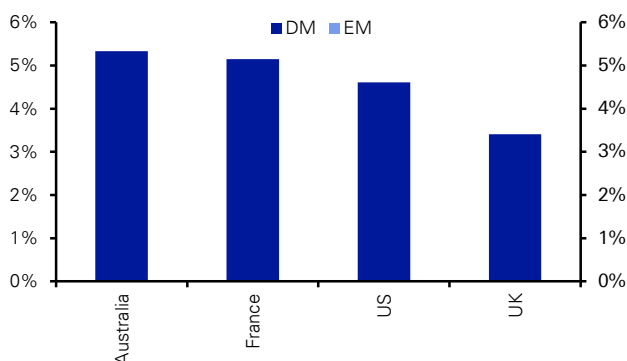
Source: Deutsche Bank, GFD

Figure 68: Last 50 Yrs Annualised Equity-Bond Return



Source: Deutsche Bank, GFD

Figure 69: Last 100 Yrs Annualised Equity-Bond Return



Source: Deutsche Bank, GFD

Figure 70: Developed Market Nominal Annualised Equity and Bond Returns

	Returns by Decade																														
	Last 5yrs	Last 10yrs	Last 25yrs	Last 50yrs	Last 100yrs	Since 1900	Since 1800	1800- 1809	1810- 1819	1820- 1829	1830- 1839	1840- 1849	1850- 1859	1860- 1869	1870- 1879	1880- 1889	1890- 1899	1900- 1909	1910- 1919	1920- 1929	1930- 1939	1940- 1949	1950- 1959	1960- 1969	1970- 1979	1980- 1989	1990- 1999	2000- 2009	2010- 2015		
EQUITY																															
Australia	6.3%	5.3%	10.1%	11.9%	11.8%	11.8%											7.9%	13.6%	9.7%	15.4%	10.2%	10.1%	15.3%	14.0%	8.6%	17.7%	11.0%	8.9%	5.5%		
Austria	-1.7%	-3.0%	4.1%																						6.5%	16.3%	1.4%	7.4%	1.5%		
Belgium	10.2%	3.8%	8.7%	9.4%																				3.4%	7.2%	20.6%	11.4%	1.8%	9.7%		
Canada	3.4%	4.9%	8.5%	9.0%																		8.4%	13.3%	10.0%	10.4%	12.2%	10.6%	5.6%	5.6%		
Denmark	15.9%	9.9%	12.1%																						7.9%	23.8%	11.1%	6.7%	18.5%		
France	8.7%	4.3%	8.5%	10.1%	11.6%	10.5%											5.6%	8.1%	16.9%	-1.5%	20.7%	24.0%	4.5%	6.8%	21.9%	14.3%	-0.3%	7.9%			
Germany	8.9%	6.9%	7.5%	8.0%	6.0%	5.5%									7.7%	10.0%	5.1%	5.6%	-18.7%	18.1%	4.5%	-6.0%	25.8%	6.0%	2.2%	15.9%	12.1%	-0.9%	10.4%		
Greece	-13.6%	-14.3%	2.1%																							36.2%	38.3%	-7.2%	-17.3%		
Ireland	19.6%	0.9%	9.7%																								14.4%	-2.8%	16.1%		
Italy	6.4%	0.3%	6.5%	7.7%																	6.5%	30.4%	23.5%	3.7%	-3.0%	28.0%	12.6%	-1.5%	4.6%		
Japan	13.5%	1.1%	0.8%	7.2%																	14.2%	15.9%	33.9%	13.0%	12.3%	21.3%	-4.3%	-5.0%	11.3%		
Netherlands	11.1%	6.2%	9.9%	10.5%																				6.1%	4.4%	21.5%	19.4%	-1.6%	10.8%		
Norway	5.9%	6.7%																											7.8%		
Portugal	-2.4%	-0.8%	5.5%																								11.1%	0.6%	-3.1%		
Spain	6.8%	1.2%	10.6%	11.7%																			13.3%	19.1%	-1.2%	27.4%	18.7%	4.3%	2.5%		
Sweden	9.3%	8.1%	12.3%	13.3%																3.5%	-0.2%	10.5%	16.3%	8.1%	6.7%	32.4%	19.0%	1.3%	12.0%		
Switzerland	9.2%	4.6%	9.6%																						2.0%	10.6%	16.0%	1.1%	8.1%		
UK	5.8%	5.4%	8.6%	11.9%	9.9%	8.6%	6.9%	8.1%	5.4%	4.8%	4.3%	4.8%	3.8%	4.4%	4.9%	5.5%	3.0%	0.6%	1.5%	9.5%	1.9%	8.9%	17.2%	8.3%	10.2%	23.9%	14.9%	1.6%	7.2%		
US	11.6%	6.8%	9.6%	9.6%	9.8%	9.5%	8.5%	11.1%	4.9%	6.9%	5.3%	7.8%	1.6%	18.3%	7.7%	5.7%	5.4%	9.9%	4.3%	14.8%	-0.5%	9.0%	19.3%	7.8%	5.8%	17.5%	18.2%	-0.9%	12.2%		
BOND																															
Australia	8.4%	6.8%	9.0%	9.0%	6.5%	6.1%								5.3%	5.8%	5.1%	3.5%	3.4%	2.1%	4.6%	4.7%	5.1%	3.1%	4.2%	6.9%	12.4%	12.9%	6.7%	8.1%		
Austria	4.4%	4.0%	6.7%	7.3%																	0.4%	7.0%	6.4%	6.2%	8.1%	8.7%	8.5%	5.8%	4.7%		
Belgium	7.3%	5.1%	7.7%	8.0%	6.5%	5.6%						3.7%	6.1%	5.0%	5.3%	4.8%	2.6%	2.8%	-1.1%	8.5%	2.9%	4.9%	4.3%	4.4%	6.3%	12.0%	10.4%	6.0%	6.3%		
Canada	5.1%	5.2%	8.0%	8.2%	6.2%	5.6%								5.0%	7.2%	5.3%	3.6%	1.8%	2.8%	5.8%	5.2%	3.5%	1.5%	3.7%	6.8%	13.4%	10.7%	6.8%	5.4%		
Denmark	5.1%	4.7%	7.8%	10.2%	7.5%	6.8%	5.9%	3.6%	4.9%	10.6%	4.0%	3.6%	4.8%	4.6%	6.0%	4.9%	3.2%	3.7%	-0.5%	7.4%	6.0%	4.8%	4.5%	4.1%	10.1%	18.9%	11.2%	6.1%	5.7%		
France	5.9%	4.9%	7.8%	8.4%	6.5%	5.6%	6.2%	23.1%	6.0%	10.6%	3.7%	0.5%	6.7%	4.9%	6.0%	4.5%	4.3%	3.1%	-1.0%	7.3%	3.8%	2.8%	4.8%	4.3%	6.1%	14.9%	10.7%	5.9%	5.8%		
Germany	5.3%	4.8%	6.5%	7.1%																	7.5%	-17.3%	5.9%	5.8%	8.1%	8.2%	6.9%	5.8%	5.5%		
Greece	19.2%	5.3%																										5.3%	8.7%		
Ireland	17.6%	6.3%	8.3%	9.1%	6.3%	5.6%												1.5%	-0.7%	6.2%	3.8%	7.1%	-0.6%	3.4%	5.5%	18.4%	10.6%	5.1%	9.8%		
Italy	8.7%	5.4%	9.2%	10.0%	7.1%	6.5%			14.3%	10.2%	7.2%	5.6%	6.3%	1.0%	12.3%	6.4%	5.9%	5.1%	1.5%	2.9%	5.9%	5.0%	3.3%	5.0%	6.5%	17.3%	14.3%	5.8%	7.0%		
Japan	2.1%	2.1%	4.2%	6.0%	6.6%	6.1%										7.0%	5.7%	5.8%	1.4%	7.8%	8.2%	4.1%	5.9%	12.3%	6.8%	9.2%	7.2%	1.8%	2.2%		
Netherlands	5.6%	4.8%	7.2%	7.3%	4.2%	4.0%	5.0%	3.8%	17.7%	8.9%	3.2%	5.5%	5.7%	2.4%	6.0%	6.2%	2.6%	2.6%	2.1%	6.3%	4.7%	4.6%	0.2%	-7.7%	7.5%	9.6%	8.7%	5.9%	5.7%		
Norway	4.2%	4.1%	7.3%	7.7%	6.0%	5.6%					4.0%	3.9%	3.3%	3.6%	5.5%	6.8%	1.3%	3.7%	1.2%	6.9%	4.2%	12.1%	-3.6%	5.0%	4.6%	11.9%	11.7%	5.4%	4.7%		
Portugal	13.5%	6.2%	8.4%																							19.5%	10.9%	6.7%	8.4%		
Spain	9.9%	6.1%	8.3%	9.2%	7.1%	6.9%	8.5%	3.6%	13.6%	23.3%	9.8%	15.6%	9.5%	2.4%	10.7%	11.4%	5.2%	8.9%	2.7%	5.3%	5.8%	5.9%	2.8%	4.8%	6.0%	16.3%	12.1%	5.6%	7.7%		
Sweden	4.9%	4.4%	7.4%	7.5%	5.8%	5.4%									5.9%	6.4%	3.5%	3.4%	-1.2%	6.7%	5.6%	7.3%	1.3%	3.6%	4.3%	12.4%	11.9%	5.6%	4.6%		
Switzerland	3.7%	3.4%	4.9%	4.7%	4.4%																6.0%	4.2%	4.1%	2.7%	2.9%	5.8%	3.9%	5.9%	4.3%	3.7%	
UK	2.7%	3.8%	6.6%	8.6%	6.5%	5.6%	4.8%	6.1%	4.1%	7.2%	3.3%	3.8%	3.3%	2.8%	3.8%	2.7%	2.9%	1.2%	-1.1%	5.2%	7.1%	3.3%	3.4%	5.0%	9.4%	14.0%	10.2%	5.4%	3.2%		
US	4.2%	4.9%	6.7%	7.3%	5.2%	4.8%	5.1%	9.1%	6.2%	5.5%	2.8%	7.5%	4.0%	6.3%	3.7%	5.5%	3.9%	1.6%	2.5%	5.5%	4.0%	2.7%	0.4%	2.8%	6.1%	12.8%	8.0%	6.6%	4.7%		

Note: 2015 Returns are calculated up to 31August. So for example the last 5 years data is actually for 4 years and 8 months, 10 years for 9 years and 8 months. Source: Deutsche Bank, GFD



Figure 71: Developed Market Real Annualised Equity and Bond Returns

	Returns by Decade																													
	Last 5yrs	Last 10yrs	Last 25yrs	Last 50yrs	Last 100yrs	Since 1900	Since 1800	1800- 1809	1810- 1819	1820- 1829	1830- 1839	1840- 1849	1850- 1859	1860- 1869	1870- 1879	1880- 1889	1890- 1899	1900- 1909	1910- 1919	1920- 1929	1930- 1939	1940- 1949	1950- 1959	1960- 1969	1970- 1979	1980- 1989	1990- 1999	2000- 2009	2010- 2015	
EQUITY																														
Australia	4.1%	2.7%	7.5%	6.3%	7.5%	7.7%											9.5%	12.3%	4.2%	14.6%	11.3%	4.5%	8.4%	11.2%	-1.4%	8.6%	8.6%	5.6%	3.2%	
Austria	-3.5%	-4.8%	2.0%																						0.5%	12.2%	-1.0%	5.5%	-0.4%	
Belgium	8.9%	2.0%	6.6%	5.6%																				0.6%	0.1%	15.2%	9.1%	-0.3%	8.0%	
Canada	1.7%	3.2%	6.5%	4.7%																		3.7%	10.6%	7.1%	2.7%	5.6%	8.3%	3.5%	3.8%	
Denmark	14.6%	8.1%	10.0%																						-1.6%	16.3%	8.8%	4.7%	16.9%	
France	7.6%	2.9%	6.7%	5.4%	3.4%	3.2%											5.3%	-3.3%	8.3%	-4.3%	-8.8%	17.4%	0.6%	-2.2%	14.1%	12.2%	-2.1%	6.6%		
Germany	7.6%	5.4%	5.6%	5.2%	-19.4%	-17.1%									6.1%	9.6%	5.2%	3.6%	-32.6%	-89.3%	6.5%	-9.5%	23.1%	3.5%	-2.6%	12.8%	9.6%	-2.5%	9.0%	
Greece	-13.3%	-15.5%	-2.4%																							14.3%	25.4%	-10.1%	-17.7%	
Ireland	18.6%	0.1%	7.5%																								11.8%	-5.2%	15.3%	
Italy	5.3%	-1.3%	3.8%	1.4%																	6.1%	-12.8%	19.8%	0.0%	-14.1%	15.9%	8.3%	-3.7%	3.3%	
Japan	12.6%	0.7%	0.5%	4.3%																	10.4%	-25.1%	30.2%	7.1%	3.1%	18.5%	-5.3%	-4.7%	10.6%	
Netherlands	9.1%	4.4%	7.6%	6.8%																				2.0%	-2.6%	18.3%	16.6%	-3.7%	8.8%	
Norway	4.6%	4.8%																											6.2%	
Portugal	-3.6%	-2.2%	2.3%																								5.1%	-1.9%	-4.4%	
Spain	5.9%	-0.4%	7.6%	4.7%																			7.1%	12.6%	-13.9%	16.0%	14.1%	1.3%	1.4%	
Sweden	8.8%	6.7%	10.4%	8.3%																8.4%	-0.9%	6.5%	11.3%	4.1%	-2.0%	23.0%	15.6%	-0.6%	11.1%	
Switzerland	9.7%	4.4%	8.6%																						-2.8%	7.0%	13.6%	0.2%	8.4%	
UK	3.8%	3.0%	6.2%	5.9%	5.7%	4.8%	4.9%	4.6%	6.3%	7.2%	3.7%	6.9%	3.7%	3.9%	5.4%	5.9%	3.0%	-0.2%	-5.8%	12.9%	1.4%	5.9%	12.5%	4.5%	-2.6%	15.9%	11.0%	-0.3%	4.9%	
US	9.9%	4.9%	7.1%	5.2%	6.4%	6.3%	6.7%	11.1%	4.6%	9.1%	3.2%	10.8%	0.1%	13.6%	10.2%	5.7%	5.2%	7.4%	-2.8%	15.9%	1.6%	3.4%	16.7%	5.1%	-1.5%	11.8%	14.8%	-3.4%	10.5%	
BOND																														
Australia	6.1%	4.2%	6.4%	3.6%	2.4%	2.1%									5.6%	4.8%	5.0%	2.3%	-3.0%	3.8%	5.7%	-0.2%	-3.1%	1.7%	-2.9%	3.8%	10.4%	3.5%	5.8%	
Austria	2.5%	2.1%	4.7%	3.9%																			1.5%	2.7%	2.0%	4.8%	5.9%	3.9%	2.8%	
Belgium	6.0%	3.3%	5.7%	4.2%		0.5%						4.8%	5.8%	3.5%	1.5%	3.9%	-0.7%	-0.2%			3.6%	-6.9%	2.2%	1.6%	-0.8%	6.9%	8.2%	3.9%	4.6%	
Canada	3.4%	3.4%	6.0%	4.0%	3.0%															6.7%	7.1%	-1.0%	-0.9%	1.0%	-0.7%	6.8%	8.4%	4.6%	3.6%	
Denmark	3.9%	3.0%	5.9%	5.3%	3.2%	2.8%				20.2%	4.3%	3.9%	3.3%	4.1%	6.2%	5.6%	3.3%	2.6%	-8.8%	8.4%	4.0%	0.3%	0.6%	-1.4%	0.5%	11.7%	9.0%	4.1%	4.2%	
France	4.8%	3.4%	6.0%	3.8%	-1.4%	-1.4%							6.2%	4.2%	5.5%	4.6%	4.5%	2.7%	-11.5%	-0.6%	0.8%	-22.4%	-0.8%	0.4%	-2.8%	7.5%	8.7%	4.0%	4.6%	
Germany	4.0%	3.3%	4.6%	4.3%																	9.5%	-20.4%	3.6%	3.4%	3.0%	5.3%	4.5%	4.0%	4.2%	
Greece	19.6%	3.7%																										2.0%	8.1%	
Ireland	16.6%	5.3%	6.2%	3.2%																	3.0%	1.8%	-4.1%	-0.9%	-6.7%	8.8%	8.0%	2.5%	9.0%	
Italy	7.6%	3.8%	6.5%	3.6%	-2.5%	-1.9%									10.7%	7.1%	6.1%	4.3%	-8.7%	-5.2%	5.5%	-29.8%	0.2%	1.3%	-5.6%	6.3%	9.9%	3.4%	5.7%	
Japan	1.3%	1.7%	3.8%	3.0%	-0.9%	-0.6%											10.5%	-0.9%	2.2%	-7.1%	11.9%	4.6%	-32.7%	3.0%	6.4%	-2.0%	6.7%	6.1%	2.1%	1.5%
Netherlands	3.7%	3.1%	4.9%	3.7%	1.0%	0.9%	3.5%	2.9%	19.2%	10.7%	2.9%	6.9%	5.5%	2.6%	5.8%	8.1%	3.4%	0.7%	-4.6%	8.5%	6.1%	-3.0%	-3.4%	-11.2%	0.3%	6.7%	6.2%	3.6%	3.8%	
Norway	3.0%	2.2%	5.3%	3.0%	2.1%	1.8%					3.2%	2.9%	2.0%	4.5%	5.6%	7.1%	0.5%	2.7%	-9.3%	11.7%	3.1%	7.8%	-8.2%	1.3%	-3.5%	3.4%	9.0%	3.4%	3.2%	
Portugal	12.2%	4.7%	5.2%																								2.4%	4.9%	4.1%	6.9%
Spain	9.0%	4.4%	5.4%	2.4%	0.9%	1.5%				28.2%	7.0%	17.5%	6.8%	2.7%	9.5%	12.2%	5.3%	8.6%	-1.1%	4.5%	0.8%	-3.3%	-2.8%	-0.9%	-7.6%	5.9%	7.8%	2.6%	6.4%	
Sweden	4.4%	3.0%	5.6%	2.8%	1.9%	1.8%									5.9%	6.9%	2.7%	2.3%	-11.0%	11.8%	4.9%	3.4%	-3.0%	-0.2%	-4.2%	4.4%	8.6%	3.7%	3.8%	
Switzerland	4.1%	3.2%	3.9%	2.1%	2.1%															9.5%	5.5%	-0.4%	1.5%	-0.3%	0.8%	0.6%	3.7%	3.3%	4.0%	
UK	0.8%	1.3%	4.2%	2.8%	2.5%	1.8%	2.9%	2.7%	5.0%	9.7%	2.7%	5.9%	3.3%	2.3%	4.3%	3.1%	2.9%	0.5%	-8.1%	8.5%	6.6%	0.5%	-0.7%	1.3%	-3.2%	6.6%	6.5%	3.4%	1.1%	
US	2.6%	3.0%	4.2%	3.0%	1.9%	1.7%	3.3%	9.1%	5.9%	7.6%	0.7%	10.5%	2.4%	2.0%	6.0%	5.5%	3.8%	-0.7%	-4.5%	6.5%	6.1%	-2.5%	-1.8%	0.2%	-1.2%	7.3%	4.9%	4.0%	3.1%	

Note: 2015 Returns are calculated up to 31August. So for example the last 5 years data is actually for 4 years and 8 months, 10 years for 9 years and 8 months. Source: Deutsche Bank, GFD



Figure 72: Developed Market USD Annualised Equity and Bond Returns

	Returns by Decade																												
	Last 5yrs	Last 10yrs	Last 25yrs	Last 50yrs	Last 100yrs	Since 1900	Since 1800	1800- 1809	1810- 1819	1820- 1829	1830- 1839	1840- 1849	1850- 1859	1860- 1869	1870- 1879	1880- 1889	1890- 1899	1900- 1909	1910- 1919	1920- 1929	1930- 1939	1940- 1949	1950- 1959	1960- 1969	1970- 1979	1980- 1989	1990- 1999	2000- 2009	2010- 2015
EQUITY																													
Australia	-1.2%	5.0%	9.8%	10.9%	10.5%	10.6%											8.0%	13.6%	6.9%	18.5%	5.5%	6.4%	15.3%	14.0%	8.5%	13.8%	9.0%	12.4%	1.5%
Austria	-5.1%	-3.5%	3.5%																						14.6%	16.8%	0.0%	11.3%	-2.5%
Belgium	6.4%	3.2%	8.0%	10.2%																				3.4%	13.5%	17.8%	10.1%	5.4%	5.3%
Canada	-2.2%	3.6%	7.9%	8.6%																		8.5%	15.1%	8.7%	9.5%	12.3%	8.1%	9.0%	1.8%
Denmark	11.8%	9.3%	11.5%																						11.5%	21.3%	9.8%	10.5%	13.7%
France	4.9%	3.7%	7.9%	9.7%	6.6%	6.1%											5.7%	0.3%	7.5%	-6.9%	-1.7%	19.9%	3.2%	10.3%	17.6%	12.9%	3.3%	3.6%	
Germany	5.1%	6.3%	6.8%	9.8%	-20.5%	-17.9%									7.6%	10.0%	5.1%	5.6%	-36.5%	-90.5%	10.0%	-29.1%	25.9%	7.3%	10.3%	16.1%	10.5%	2.7%	6.0%
Greece	-16.6%	-14.7%	-0.5%																							17.5%	28.5%	-4.2%	-20.6%
Ireland	15.5%	0.4%	8.7%																								12.2%	0.7%	11.5%
Italy	2.8%	-0.3%	4.7%	5.6%																	6.1%	-7.6%	23.6%	3.6%	-5.4%	22.3%	8.0%	2.1%	0.4%
Japan	4.8%	0.8%	1.3%	9.6%																	6.1%	-25.6%	33.9%	13.0%	16.9%	27.7%	-0.9%	-4.1%	6.5%
Netherlands	7.2%	5.6%	9.2%	11.9%																				6.5%	11.3%	21.4%	17.7%	1.9%	6.4%
Norway	-1.2%	4.6%																											1.5%
Portugal	-5.8%	-1.4%	4.3%																								7.9%	4.2%	-6.9%
Spain	3.1%	0.7%	8.7%	9.7%																			3.8%	17.3%	-0.7%	21.2%	13.9%	8.0%	-1.5%
Sweden	4.4%	7.4%	10.5%	12.2%																6.0%	-1.5%	8.2%	16.3%	8.1%	9.1%	27.2%	15.4%	3.0%	8.9%
Switzerland	8.4%	7.8%	10.8%																						12.7%	11.0%	15.6%	5.6%	9.4%
UK	5.4%	4.2%	7.6%	10.5%	8.7%	7.6%	6.4%	8.1%	5.6%	5.5%	4.3%	4.8%	3.9%	6.4%	2.9%	5.5%	3.1%	0.6%	-1.1%	12.4%	-0.2%	5.2%	17.2%	6.7%	9.3%	20.0%	14.9%	1.6%	6.3%
US	11.6%	6.8%	9.6%	9.6%	9.8%	9.5%	8.5%	11.1%	4.9%	6.9%	5.3%	7.8%	1.6%	18.3%	7.7%	5.7%	5.4%	9.9%	4.3%	14.8%	-0.5%	9.0%	19.3%	7.8%	5.8%	17.5%	18.2%	-0.9%	12.2%
BOND																													
Australia	0.8%	6.5%	8.7%	8.1%	5.2%	5.0%								7.3%	3.8%	5.1%	3.6%	3.4%	-0.5%	7.4%	0.2%	1.5%	3.1%	4.2%	6.8%	8.7%	10.9%	10.1%	4.0%
Austria	0.7%	3.4%	6.1%	8.9%																	3.5%	-18.2%	6.4%	6.3%	16.3%	9.2%	7.0%	9.6%	0.5%
Belgium	3.6%	4.5%	7.1%	8.7%	4.7%	3.8%					3.5%	6.3%	4.9%	5.3%	4.8%	2.6%	2.8%	-8.2%	-3.6%	4.7%	-0.3%	4.3%	4.5%	12.6%	9.4%	9.2%	9.8%	2.0%	
Canada	-0.6%	3.9%	7.5%	7.8%	5.9%	5.3%								8.0%	4.2%	5.3%	3.5%	1.6%	2.0%	6.5%	4.1%	3.6%	3.2%	2.4%	5.9%	13.5%	8.2%	10.2%	1.6%
Denmark	1.4%	4.1%	7.2%	10.3%	6.9%	6.2%			12.3%	6.6%	4.2%	5.3%	6.3%	4.0%	4.9%	3.2%	3.7%	-3.7%	11.1%	2.6%	1.7%	4.5%	3.2%	13.9%	16.5%	10.0%	9.9%	1.4%	
France	2.3%	4.3%	7.2%	8.0%	1.7%	1.4%		3.7%	10.9%	3.7%	0.4%	7.0%	4.9%	5.9%	4.5%	4.4%	3.1%	-8.2%	-1.3%	-1.9%	-16.3%	1.3%	3.0%	9.6%	10.8%	9.4%	9.7%	1.6%	
Germany	1.6%	4.2%	5.8%	8.9%																	13.2%	-37.6%	5.9%	7.1%	16.7%	8.4%	5.4%	9.6%	1.3%
Greece	15.1%	4.7%																										8.7%	4.4%
Ireland	7.6%	2.5%	0.0%	-3.2%	-9.0%	-7.7%											1.5%	-1.5%	7.0%	6.8%	-0.3%	-22.4%	-57.5%	-1.2%	6.4%	-3.4%	2.0%	2.7%	
Italy	5.0%	4.9%	7.4%	7.7%	1.3%	1.4%			11.6%	7.3%	5.2%	6.9%	0.4%	11.5%	7.6%	5.4%	5.8%	-7.5%	-0.8%	5.5%	-25.7%	3.4%	4.9%	3.9%	12.1%	9.6%	9.6%	2.7%	
Japan	-5.8%	1.8%	4.6%	8.3%	2.3%	2.5%									5.4%	0.9%	5.8%	1.5%	7.6%	0.5%	-33.2%	5.9%	12.3%	11.2%	14.9%	11.0%	2.8%	-2.2%	
Netherlands	1.9%	4.3%	6.6%	8.6%	4.4%	4.3%	5.2%	5.4%	16.9%	9.2%	3.1%	5.5%	6.1%	2.2%	5.8%	6.2%	2.6%	2.6%	1.3%	7.2%	7.6%	-2.5%	0.3%	-7.3%	14.7%	9.6%	7.3%	9.6%	1.5%
Norway	-2.7%	2.0%	5.8%	7.4%	5.2%	4.8%					6.7%	4.5%	3.8%	5.3%	3.5%	6.8%	1.4%	3.6%	-1.6%	9.9%	2.5%	6.8%	-3.6%	4.9%	8.6%	8.6%	9.5%	8.9%	-1.4%
Portugal	9.6%	5.7%	7.2%																							7.2%	7.7%	10.5%	4.1%
Spain	6.1%	5.6%	6.5%	7.2%	3.6%	4.1%				24.4%	9.9%	15.8%	9.7%	2.1%	10.1%	10.9%	3.2%	11.0%	3.4%	1.6%	2.7%	-3.3%	-5.8%	3.2%	6.6%	10.6%	7.6%	9.4%	3.4%
Sweden	0.1%	3.7%	5.7%	6.5%	4.9%	4.7%									5.8%	6.3%	3.6%	3.3%	-3.5%	9.3%	4.2%	5.1%	1.3%	3.7%	6.6%	8.0%	8.4%	7.5%	1.7%
Switzerland	2.9%	6.6%	6.0%	7.9%	6.2%															6.9%	5.7%	4.5%	2.7%	2.9%	16.9%	4.3%	5.6%	8.9%	4.9%
UK	2.3%	2.6%	5.6%	7.3%	5.3%	4.5%	4.3%	6.1%	4.4%	8.0%	3.3%	3.7%	3.4%	4.8%	1.9%	2.7%	3.0%	1.2%	-3.6%	8.0%	4.9%	-0.2%	3.4%	3.4%	8.6%	10.4%	10.2%	5.4%	2.4%
US	4.2%	4.9%	6.7%	7.3%	5.2%	4.8%	5.1%	9.1%	6.2%	5.5%	2.8%	7.5%	4.0%	6.3%	3.7%	5.5%	3.9%	1.6%	2.5%	5.5%	4.0%	2.7%	0.4%	2.8%	6.1%	12.8%	8.0%	6.6%	4.7%

Note: 2015 Returns are calculated up to 31August. So for example the last 5 years data is actually for 4 years and 8 months, 10 years for 9 years and 8 months. Source: Deutsche Bank, GFD



Figure 73: Emerging Market Nominal Annualised Equity and Bond Returns

	Returns by Decade																																			
	Last 5yrs	Last 10yrs	Last 25yrs	Last 50yrs	Last 100yrs	Since 1900	Since 1800	1800- 1809	1810- 1819	1820- 1829	1830- 1839	1840- 1849	1850- 1859	1860- 1869	1870- 1879	1880- 1889	1890- 1899	1900- 1909	1910- 1919	1920- 1929	1930- 1939	1940- 1949	1950- 1959	1960- 1969	1970- 1979	1980- 1989	1990- 1999	2000- 2009	2010- 2015							
EQUITY																																				
India	7.6%	12.7%	15.3%																								21.1%	15.2%	9.4%							
Korea	-1.9%	4.2%	7.3%	20.0%																					40.7%	29.2%	4.6%	9.9%	2.0%							
Malaysia	2.7%	8.6%	7.1%																							12.8%	5.6%	7.8%	5.9%							
Mexico	4.1%	11.3%	20.4%																								35.9%	18.3%	6.8%							
Philippines	13.3%	14.3%	11.8%																								9.3%	5.1%	15.7%							
South Africa	12.6%	13.4%	15.0%	16.8%																					16.0%	24.1%	13.9%	14.7%	13.9%							
Taiwan	3.6%	6.1%	6.3%																								3.9%	0.9%	5.1%							
Thailand	6.4%	8.9%	6.5%																							27.3%	-2.4%	8.7%	11.5%							
BOND																																				
India	6.3%	5.0%	9.6%	7.5%	5.9%	5.4%	5.1%	5.7%	6.3%	5.3%	5.5%	4.6%	3.0%	5.1%	4.2%	4.1%	3.1%	2.3%	0.5%	5.9%	8.0%	4.2%	3.0%	4.2%	4.9%	4.4%	14.1%	8.5%	5.2%							
Korea	5.1%	5.6%	10.2%	17.0%																				28.5%	27.2%	22.1%	15.6%	7.7%	5.7%							
Malaysia	3.3%	3.9%	6.3%	7.1%																						11.3%	9.0%	7.6%	5.5%	3.8%						
Mexico	6.7%	8.4%																										14.5%	8.0%							
Philippines	7.1%	10.5%																										16.3%	9.7%							
South Africa	7.6%	7.7%	13.3%	11.9%	8.1%	7.5%									4.6%	5.6%	3.7%	4.8%	2.0%	4.8%	4.8%	3.5%	5.3%	4.9%	7.4%	15.2%	17.5%	12.1%	8.8%							
Taiwan	1.5%	2.2%																										6.9%	1.4%							
Thailand	2.4%	6.3%	9.3%																							13.6%	13.7%	7.9%	3.8%							

Note: 2015 Returns are calculated up to 31August. So for example the last 5 years data is actually for 4 years and 8 months, 10 years for 9 years and 8 months. Source: Deutsche Bank, GFD

Figure 74: Emerging Market Real Annualised Equity and Bond Returns

	Returns by Decade																													
	Last 5yrs	Last 10yrs	Last 25yrs	Last 50yrs	Last 100yrs	Since 1900	Since 1800	1800- 1809	1810- 1819	1820- 1829	1830- 1839	1840- 1849	1850- 1859	1860- 1869	1870- 1879	1880- 1889	1890- 1899	1900- 1909	1910- 1919	1920- 1929	1930- 1939	1940- 1949	1950- 1959	1960- 1969	1970- 1979	1980- 1989	1990- 1999	2000- 2009	2010- 2015	
EQUITY																														
India	0.3%	4.1%	7.2%																								10.6%	8.6%	1.7%	
Korea	-3.6%	1.7%	3.6%	11.7%																					22.3%	20.3%	-0.9%	6.5%	0.0%	
Malaysia	0.3%	6.0%	4.2%																							9.0%	1.7%	5.5%	3.4%	
Mexico	1.1%	7.2%	10.3%																									13.7%	12.7%	3.5%
Philippines	10.0%	10.1%	5.8%																									0.5%	-0.2%	12.3%
South Africa	6.8%	7.0%	7.7%	7.4%																					5.4%	8.3%	4.2%	8.1%	8.4%	
Taiwan	2.6%	4.9%	4.7%																									1.0%	0.0%	4.1%
Thailand	6.8%	7.7%	3.8%																							21.1%	-6.9%	6.1%	11.4%	
BOND																														
India	-0.9%	-3.1%	1.9%	-0.3%	0.4%	0.5%										3.1%	3.5%	1.3%	-4.5%	5.3%	11.4%	-5.2%	1.6%	-1.6%	-2.6%	-4.0%	4.2%	2.3%	-2.3%	
Korea	3.3%	3.1%	6.4%	8.9%																				13.4%	10.5%	13.6%	9.5%	4.5%	3.7%	
Malaysia	0.9%	1.3%	3.4%	3.6%																						5.4%	5.4%	3.6%	3.2%	1.4%
Mexico	3.6%	4.5%																											9.1%	4.5%
Philippines	4.0%	6.4%																											10.5%	6.6%
South Africa	2.1%	1.6%	6.1%	2.8%	2.5%	2.4%											6.0%	-3.0%	4.4%	5.3%	-1.2%	1.6%	2.2%	-2.4%	0.5%	7.5%	5.7%	3.6%		
Taiwan	0.6%	1.1%																											5.9%	0.4%
Thailand	2.9%	5.1%	6.4%																							8.1%	8.5%	5.3%	3.6%	

Note: 2015 Returns are calculated up to 31August. So for example the last 5 years data is actually for 4 years and 8 months, 10 years for 9 years and 8 months. Source: Deutsche Bank, GFD



Figure 75: Emerging Market USD Annualised Equity and Bond Returns

	Returns by Decade																												
	Last 5yrs	Last 10yrs	Last 25yrs	Last 50yrs	Last 100yrs	Since 1900	Since 1800	1800- 1809	1810- 1819	1820- 1829	1830- 1839	1840- 1849	1850- 1859	1860- 1869	1870- 1879	1880- 1889	1890- 1899	1900- 1909	1910- 1919	1920- 1929	1930- 1939	1940- 1949	1950- 1959	1960- 1969	1970- 1979	1980- 1989	1990- 1999	2000- 2009	2010- 2015
EQUITY																													
India	-0.6%	8.4%	9.5%																								10.2%	14.5%	3.1%
Korea	-2.9%	2.5%	5.2%	16.4%																					34.3%	24.9%	-0.7%	9.6%	1.7%
Malaysia	-3.4%	7.5%	5.3%																							10.4%	2.1%	8.9%	2.4%
Mexico	-2.0%	6.3%	12.3%																								19.8%	14.5%	2.5%
Philippines	11.7%	15.8%	9.5%																								2.3%	3.6%	15.5%
South Africa	-2.1%	5.3%	7.7%	10.2%																					14.3%	11.0%	4.2%	12.6%	3.3%
Taiwan	1.4%	6.2%	5.6%																								2.0%	0.7%	4.8%
Thailand	2.7%	10.4%	5.1%																							24.3%	-6.0%	10.0%	10.2%
BOND																													
India	-1.8%	0.9%	4.0%	2.0%	2.7%	2.6%					6.8%	3.7%	3.3%	4.7%	2.1%	2.7%	2.6%	2.3%	3.7%	3.8%	6.0%	0.5%	2.9%	-0.5%	4.3%	-3.2%	3.8%	7.8%	-0.9%
Korea	4.0%	3.9%	8.0%	13.5%																				7.3%	21.4%	18.0%	9.8%	7.5%	5.5%
Malaysia	-2.9%	2.8%	4.5%	6.5%																					15.1%	6.7%	3.9%	6.6%	0.3%
Mexico	0.4%	3.6%																										10.9%	3.6%
Philippines	5.7%	11.9%																										14.6%	9.6%
South Africa	-6.4%	0.0%	6.0%	5.6%	4.5%	4.3%									2.6%	5.6%	3.8%	4.8%	-0.6%	7.6%	2.6%	0.0%	5.3%	4.9%	5.9%	3.0%	7.6%	10.1%	-1.3%
Taiwan	-0.6%	2.3%																										6.7%	1.1%
Thailand	-1.1%	7.8%	7.8%																							10.9%	9.5%	9.1%	2.5%

Note: 2015 Returns are calculated up to 31August. So for example the last 5 years data is actually for 4 years and 8 months, 10 years for 9 years and 8 months. Source: Deutsche Bank, GFD





Appendix 1

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