UBS ETF *Market Matters*

Grexit (lessons from the past stress events)

- The economic exposure to Greece amongst Eurozone corporates appears very modest. This suggests limited impact (in the long-run) for the ongoing Eurozone recovery, should a Grexit turn as the outcome. This, however, does not rule out potential of short-term shock.
- We study behaviour of key equity, government and currency benchmarks in view of past stress events. A cross-asset study looks into what one may expect under different stress scenarios.
- Europe-concentrated equity exposure implies weak or zero hedge for Grexit-associated tail risk. Gold (and CHF), as well as short-duration *risk free* fixed income appear to perform well shortly following stress events, and de-correlate from equity.

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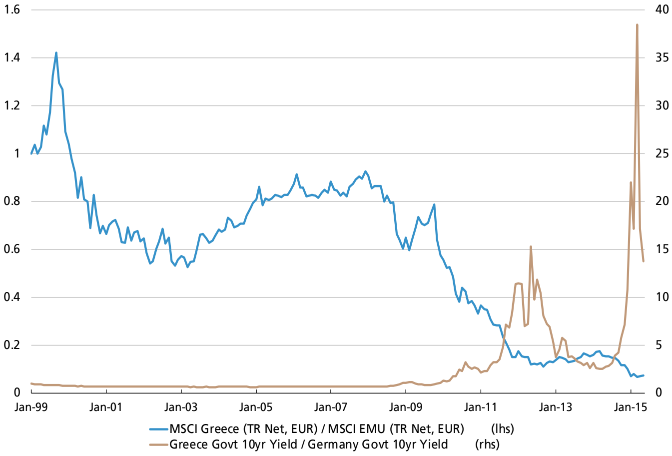
Should the Greek government fail to reach an agreement with its creditors and international partners during the meetings scheduled for the coming days, a further intensification in the crisis seems likely. A vast number of institutions have just published their views on possible scenarios, and their spillover effects. There are generally three scenarios being considered, 1) Greece exits the euro area; 2) capital controls are imposed on Greek banks (incl. changes to the ECB's provision of Emergency Liquidity Assistance), and 3) a last minute agreement is reached in the next days. UBS Wealth Management Chief Investment Office currently assigns 30-40% likelihood of Greece exiting the euro (Source: UBS WM CIO, *Greece: Negotiations move to heads of state,* 19 June 2015). The purpose of this note is to evaluate the economic relevance of Greece based on exposure of various corporate revenues sourced in Greece. In addition, we aim to find patterns in past stress events (those that arrived as *pure* shocks and those that arrived as *anticipated-to-some-degree* shocks). We look into key equity benchmarks, short-duration *risk-free* bonds, and *safe* currencies incl. CHF and Gold.

The importance of Greece (in view of asset valuations)

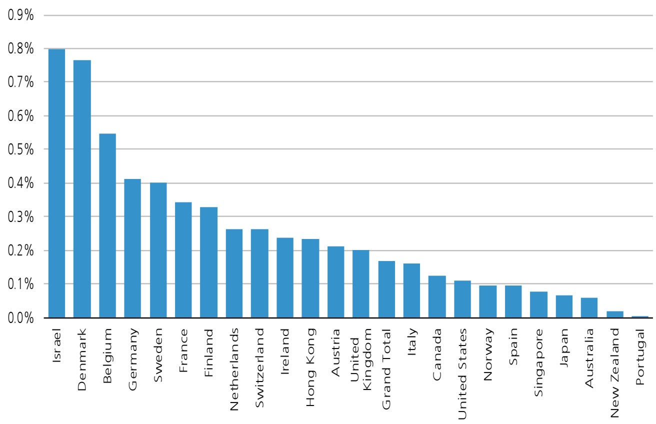
The market capitalization of the Greek stock exchange has radically shrunk, whilst Greek yields have dramatically increased, in particular in relative terms as seen in **Figure 1.** Markets clearly echo the situation of the Greek economy, continuously deteriorating since 2009, and factor in possible Grexit event. The critical question is whether there will be any spillover effects for non-Greek assets. The answer will depend on how pro-active involvement of the ECB would be. Instead of political considerations, we look first into economic dependence upon Greece. MSCI Economic Exposure Security Data modules provide geographic revenue breakdowns by country and by region for the companies covered by the MSCI All-Country World Index (Source: MSCI Economic Exposure Data Methodology, November 2013). **Figure 2** shows the share of economic exposure of developed markets towards Greece, based on consolidated revenues. Israeli companies, followed by Danish and Belgian companies, source slightly more than 0.5% of their revenue in Greece. In total, Eurozone listed-companies gained approx. 3% of their 2014 revenue in Greece. Emerging market companies appear to be substantially less dependent on Greece, as seen in **Figure 3**. Overall, Greece has modest economic weight in the Eurozone (amongst listed companies), suggesting limited impact (in the long-run) on the ongoing Eurozone recovery should an exit from euro be the final outcome. This, however, does not rule out potential of short-term shock, so we analyse past stress events to better understand spillover effects.

Figure 1: Greece vs. Eurozone



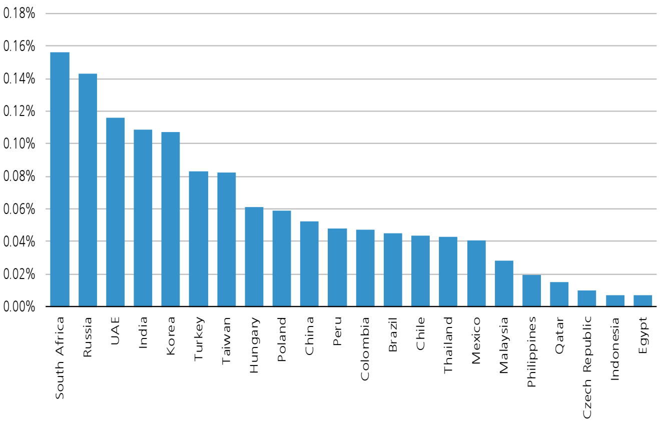
Source: MSCI, Bloomberg. UBS Global AM, as of 31 May 2015

Figure 2: Developed Markets: Economic Exposure to Greece (in %)
(based on fiscal year ending 2014, in USD)



Source: MSCI, UBS Global AM, as of 31 May 2015

Figure 3: Emerging Markets: Economic Exposure to Greece (in %)
(based on fiscal year ending 2014, in USD)



Source: MSCI, UBS Global AM, as of 31 May 2015

Realized spillovers (lessons from past stress events)

We identified the most important stress events, going back to 2000, see **Table 1**. We study behaviour of main equity benchmarks (in local currency terms), short-duration *risk-free* bond indices (in local currency terms), and *safe* currencies, CHF and Gold. The time period of about one quarter following the stress event is analysed. The events were ranked from a *pure* shock (like September 11) to *anticipated-to-some-degree* shocks (like Argentina halting payments on its debt in December 2001). In this order (subjective ranking), these are shown in **Figure 4** to **Figure 9**. In addition, we computed the cross-asset unconditional correlation matrix (i.e. using all available data), and *stress* correlation matrix (i.e. using one-quarter data following the event). The correlation matrices are shown in **Table 4** and **Table 5** (post-Lehman case), respectively. The key lessons from the stress events were summarized in **Table 2**, and contrasted with long-run patterns. To summarize, volatility generally increased across all asset classes, and mostly for equity. Depending on the severity of stress event, equity may experience 10-15% of drawdown (e.g. September 11 or USA downgrade). Correlation within equity generally increases, and particularly strongly for related regions (e.g. EMU, UK and Switzerland). Europe-concentrated equity exposure has a weak hedge for Grexit-associated tail risk, whilst broader equity exposure (rather currency hedged due to additional currency volatility) could diversify this risk. Equity risk can be offset with *risk-free* fixed income. The negative correlation between equity and risk-free fixed income strongly upsurges following stress events, i.e. there is a run for the most liquid Treasuries or Bunds. Notably, when reviewing figures showing the behaviour of assets, Gold typically gains in value, at least in the short-run. Similar holds true for CHF, however to a lower degree. These currencies have therefore historically worked as a *tail* hedge. This is confirmed in **Table 3,** which cardinally ranks (from the best to the worst) assets in view of their absolute performance (i.e. with no risk adjustment), over a longer period and following stress events. Gold (and CHF), as well as short-duration *risk free* fixed income performed well shortly following the stress events, whilst equity performed poorly. The longer the period of time following stress event, the more investors turn to a *risk-on* mode.

Table 1: Realized stress events

Terrorist Attack, Sep. 11, 2001	Greek Debt Restructuring, Mar. 9, 2012
Lehman Default, Sep. 15, 2008	Detroit Default, Jul. 18, 2013
SNB CHF/EUR floor removal, Jan. 15, 2015	Argentine Default, Dec 24, 2001
S&P downgrades U.S. credit rating, Aug. 5, 2011	

Source: UBS Global AM, as of 31 May 2015

Table 2: Cross-asset patterns: long-run vs. stress

Measure	Long-run	Stress
Equity Volatility	Moderate ~16%	High/Extreme >40-50%
Equity Correlation	Moderate/High ~30-60%	High >50-60%
Regional Equity Correlation	High ~60%%	Extreme >90%
Fixed Income Volatility	Very low ~1%	Low ~3%
Equity/Fixed Income Correlation	Moderately Negative ~ -30%	Strongly Negative ~ <-50%
Currency Volatility	Low ~10-15%	High ~ >20%
Gold		Additional Pressure
CHF		Additional Pressure

Source: UBS Global AM, as of 31 May 2015

Table 3: Cross-asset performance: long-run vs. stress (green=positive performance, red=negative performance)

Long-run (2001-2015)	Stress + 1month	Stress + 3months
MSCI Emerging Markets	GOLDLNPM Index	GOLDLNPM Index
GOLDLNPM Index	iBoxx Germany 1-3 TR Index	iBoxx Germany 1-3 TR Index
MSCI Australia	Barclays US Treasury 1-3 TR Index	Barclays US Treasury 1-3 TR Index
MSCI Canada	CHFUSD Curncy	MSCI Emerging Markets
MSCI USA	MSCI Australia	MSCI Australia
MSCI United Kingdom	MSCI United Kingdom	MSCI EMU
MSCI World	MSCI Emerging Markets	MSCI United Kingdom
CHFUSD	MSCI EMU	MSCI Switzerland
MSCI Japan	MSCI USA	MSCI World
Barclays US Treasury 1-3 TR Index	MSCI World	CHFUSD Curncy
iBoxx Germany 1-3 TR Index	MSCI Canada	MSCI Canada
MSCI Switzerland	MSCI Switzerland	MSCI USA
MSCI EMU	MSCI Japan	MSCI Japan

Source: UBS Global AM, as of 31 May 2015

Past performance is not a reliable indicator for the future.

Table 4: Unconditional correlation matrix with volatilities on the diagonal (in italics).
(daily data, total return net, in local currencies, 01 Jan. 2001 – 29 May 2015)

	MSCI World	MSCI Emerging Markets	MSCI USA	MSCI EMU	MSCI Japan	MSCI United Kingdom	MSCI Switzerland	MSCI Canada	MSCI Australia	GOLDLNPM Index	Barclays US Treasury 1-3	iBoxx Germany 1-3	CHFUSD
MSCI World	*15.8%*												
MSCI Emerging Markets	65.0%	*15.9%*											
MSCI USA	91.7%	44.7%	*19.6%*										
MSCI EMU	82.7%	59.7%	59.8%	*21.7%*									
MSCI Japan	36.5%	56.5%	12.2%	28.1%	*21.9%*								
MSCI United Kingdom	78.4%	59.1%	54.4%	89.8%	28.4%	*19.0%*							
MSCI Switzerland	73.3%	54.9%	50.9%	84.3%	30.2%	81.7%	*18.8%*						
MSCI Canada	75.9%	50.2%	73.4%	54.5%	20.7%	53.5%	47.0%	*18.1%*					
MSCI Australia	34.2%	60.2%	13.4%	31.3%	56.7%	32.5%	31.3%	20.0%	*16.3%*				
GOLDLNPM Index	-0.5%	13.4%	-2.8%	-2.6%	6.5%	1.8%	-6.5%	9.6%	9.7%	*18.2%*			
Barclays US Treasury 1-3	-35.0%	-21.8%	-33.2%	-30.7%	-6.4%	-28.9%	-26.6%	-27.0%	-5.8%	8.3%	*1.5%*		
iBoxx Germany 1-3	-39.2%	-29.8%	-28.4%	-45.2%	-16.4%	-41.2%	-42.7%	-25.0%	-15.4%	11.2%	49.1%	*1.1%*	
CHFUSD	-6.1%	1.8%	-5.9%	-5.1%	0.3%	-2.6%	-17.4%	0.7%	3.3%	26.5%	24.7%	9.5%	*12.0%*

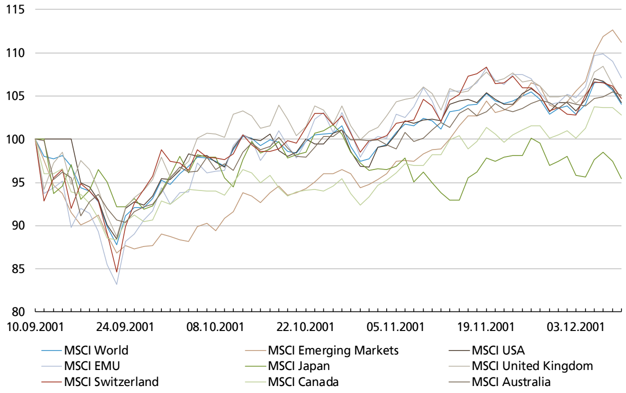
Source: MSCI, Barclays, Bloomberg. UBS Global AM, as of 31 May 2015

Table 5: Stress – post-Lehman default - correlation matrix with volatilities on the diagonal (in italics).
(daily data, total return net, in local currencies, 15 Sep. 2008 – 12 Dec. 2008)

	MSCI World	MSCI Emerging Markets	MSCI USA	MSCI EMU	MSCI Japan	MSCI United Kingdom	MSCI Switzerland	MSCI Canada	MSCI Australia	GOLDLNPM Index	Barclays US Treasury 1-3	iBoxx Germany 1-3	CHFUSD
MSCI World	*54.8%*												
MSCI Emerging Markets	78.4%	*55.5%*											
MSCI USA	91.8%	56.5%	*70.6%*										
MSCI EMU	85.5%	78.0%	61.9%	*60.1%*									
MSCI Japan	46.1%	72.5%	14.6%	53.0%	*68.2%*								
MSCI United Kingdom	82.1%	75.1%	57.0%	97.1%	53.8%	*60.9%*							
MSCI Switzerland	81.5%	70.3%	59.3%	93.9%	48.3%	93.1%	*55.6%*						
MSCI Canada	82.4%	62.0%	76.8%	59.5%	45.7%	59.9%	60.0%	*69.2%*					
MSCI Australia	41.4%	66.1%	13.1%	53.2%	72.5%	53.0%	52.0%	29.9%	*51.3%*				
GOLDLNPM Index	-1.8%	4.5%	-7.0%	-1.3%	21.0%	-0.8%	-10.6%	15.0%	10.8%	*45.0%*			
Barclays US Treasury 1-3	-46.3%	-40.1%	-43.8%	-40.7%	-7.5%	-43.3%	-36.1%	-51.0%	-8.6%	9.3%	*3.8%*		
iBoxx Germany 1-3	-57.4%	-62.1%	-39.0%	-68.7%	-38.7%	-67.1%	-64.6%	-46.3%	-43.1%	4.1%	60.3%	*2.4%*	
CHFUSD	7.1%	10.4%	-9.0%	28.2%	26.4%	27.8%	16.5%	-0.3%	23.6%	37.1%	9.9%	-24.1%	*17.1%*

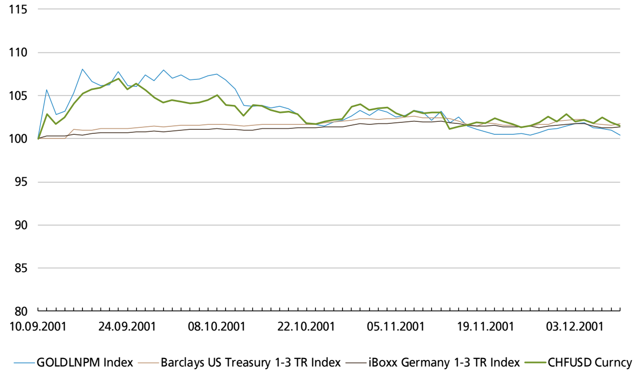
Source: MSCI, Barclays, Bloomberg. UBS Global AM, as of 31 May 2015

Figure 4a: Equity: Sep. 11, 2001



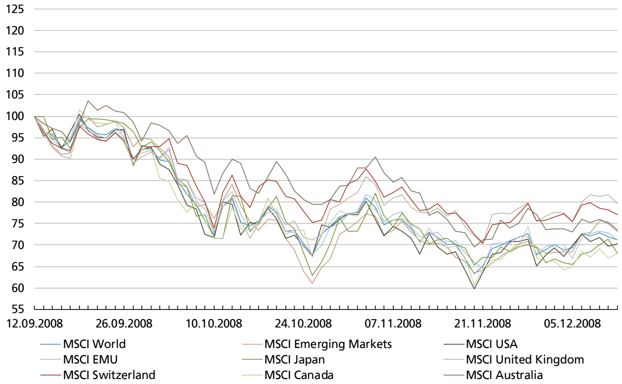
Source: MSCI, UBS Global AM. As of 31 May 2015

Figure 4b: Fixed Income and Currencies: Sep.11, 2001



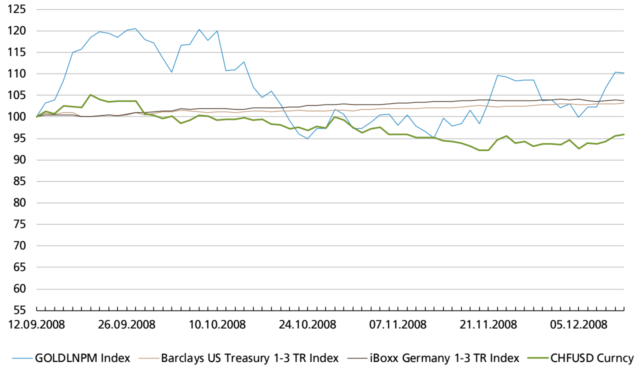
Source: Bloomberg, Barclays, Markit, UBS Global AM. As of 31 May 2015

Figure 5a: Equity: Lehman default, Sep. 15, 2008



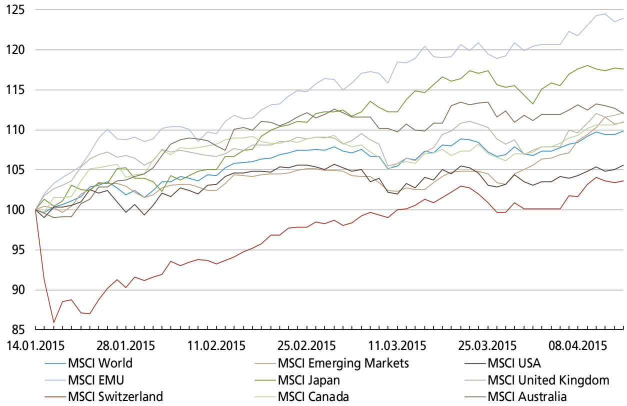
Source: MSCI, UBS Global AM. As of 31 May 2015

Figure 5b: Fixed Income and Currencies: Lehman default, Sep. 15, 2008



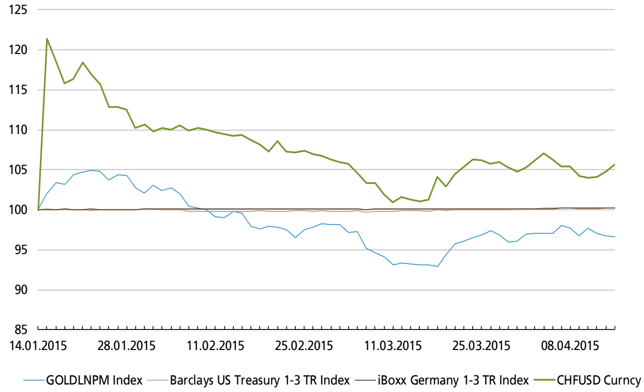
Source: MSCI, UBS Global AM. As of 31 May 2015

Figure 6a: Equity: SNB floor removal, Jan. 15, 2015



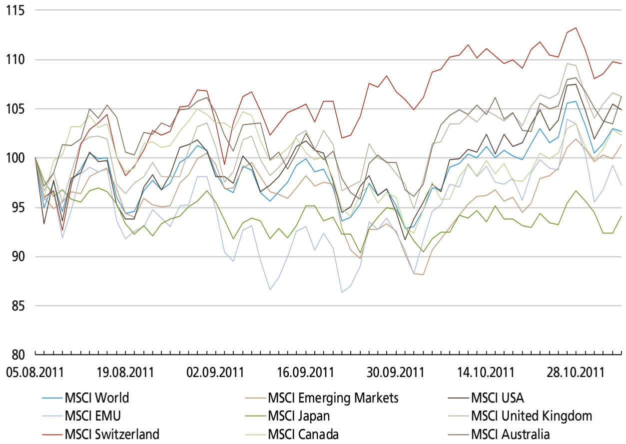
Source: MSCI, UBS Global AM. As of 31 May 2015

Figure 6b: Fixed Income and Currencies:: SNB floor removal, Jan. 15, 2015



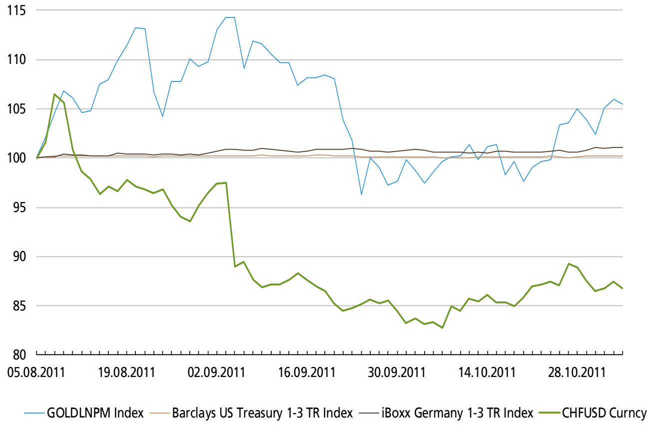
Source: MSCI, UBS Global AM. As of 31 May 2015

Figure 7a: Equity: USA downgrade, Aug. 5, 2011



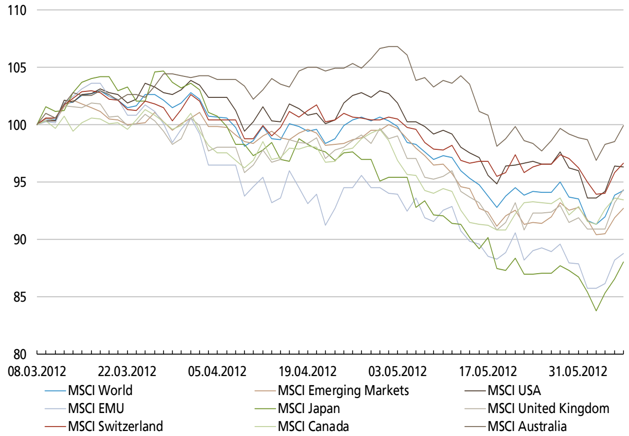
Source: MSCI, UBS Global AM. As of 31 May 2015

Figure 7b: Fixed Income and Currencies:: USA downgrade, Aug. 5, 2011



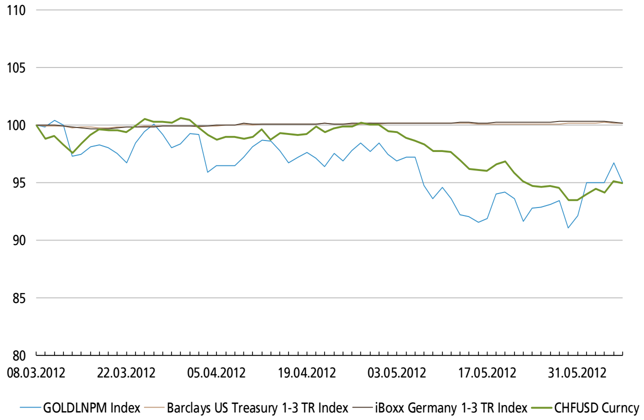
Source: MSCI, UBS Global AM. As of 31 May 2015

Figure 8a: Equity: Greek Debt Restructuring, Mar. 9, 2012



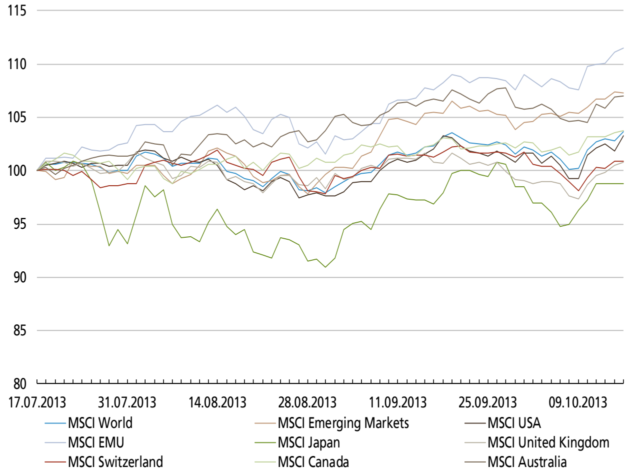
Source: MSCI, UBS Global AM. As of 31 May 2015

Figure 8b: Fixed Income and Currencies: Greek Debt Restructuring, Mar.9, 2012



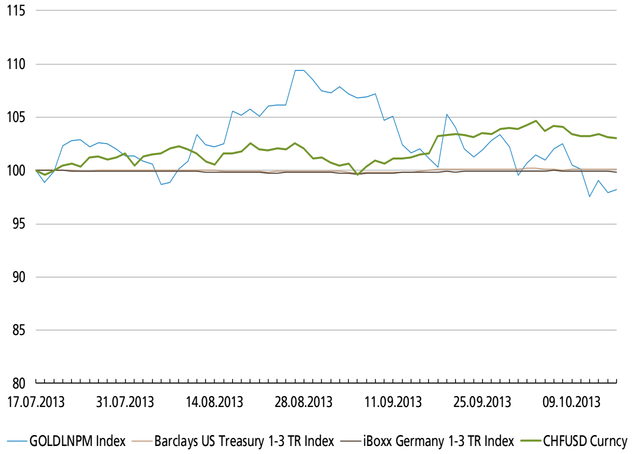
Source: MSCI, UBS Global AM. As of 31 May 2015

Figure 9a: Equity: Detroit Default, Jul. 18, 2013



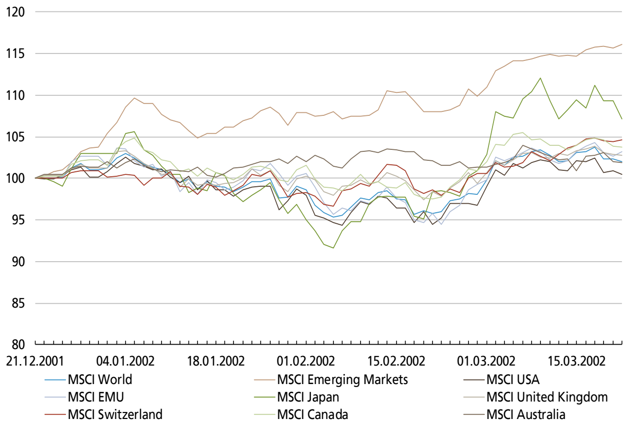
Source: MSCI, UBS Global AM. As of 31 May 2015

Figure 9b: Fixed Income and Currencies: Detroit Default, Jul. 18, 2013



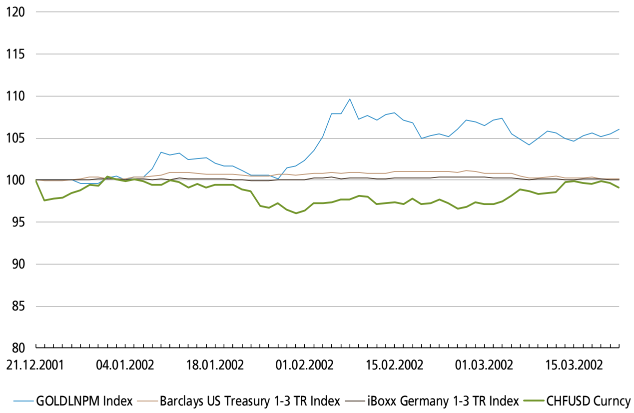
Source: MSCI, UBS Global AM. As of 31 May 2015

Figure 9a: Equity: Argentine Default, Dec 24, 2001



Source: MSCI, UBS Global AM. As of 31 May 2015

Figure 9b: Fixed Income and Currencies: Argentine Default, Dec 24, 2001



Source: MSCI, UBS Global AM. As of 31 May 2015

Past performance is not a reliable indicator for the future.

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