US Market Stressed Period Review

Shaolun(Alan) Du,
Portfolio Analyst, Advocate Capital Management, LLC
E-mail: Shaolun.du@gmail.com

Abstract

In this paper, we review typical rates and currency when market stressed. We start with a defination of market stressed period followed by historical review of US swap rates movements, basis spread movements and major currency movements. For each stressed period, we reviewed S&P 500 index US swap rate maturity 2Y,5Y,10Y,20Y,30Y and currency USD currency index and Gold price, Oil price from commodity market. After each review section we would provide a summary table of all three different types of market instruments features.

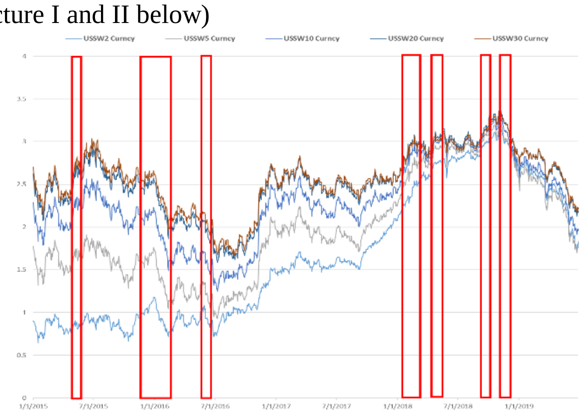
Keywords: Market Stressed, Rates, Basis, Currency

1. Motivation and Overview

As a manager in tail risk hedging business, one of the important risk contributions comes from large liquidity squeeze. Financial market is built from four cornerstones: Stock market, Commodity market, Bond market and Currency market. As squeeze happened, money flow within-or-out the financial system which caused large movements of all financial products. As a starting point we are trying to narrow the subject to focus only on interest rates. Interest rates set the backbone of the whole system since it represents the cost of borrowing money and the opportunity cost of being lazy. To have a better understanding of rates movements provides us with deep knowledge of how to make correct and profitable strategies.

In this paper, we premierily focus on US market and try to demisfy rates movement when there is a liquidty squeeze. As a well known effect that all rates starts to fall badly when there is a huge demand for liquidity in a short time. We should expect to see a large drop in all interests rates across the board.

In this section we will look back starting from 2015, and gave a general outlook of all historical liquidity shocks. (See picture I and II below)



Picture 1 US historical swap rates (2,5,10,20,30) plot

Picture 2 US historical OIS 5Y rates and USD index plot

- Period One, May 2015 (Greek crisis) on June 30, 2015, Greece became the first developed country to fail to make an IMF loan repayment on time (payment was made with a 20-day delay). At that time, debt levels had reached €323bn or some €30,000 per capita (a per capita value still below the OECD average, but high as a percentage of the respective GDP).
- Period Two, from Dec 2015 to Feb 2016 (Oil/China Deval/High Yield): Starting from the end of 2015 China gegan to devaluation its currency and market strated to discard high yield bond, flight-to-quality movements.
- Period Three, Jun 2016 (Brexit): Brexit is a portmanteau of "British" and "exit") is the withdrawal of the United Kingdom (UK) from the European Union (EU). Following a referendum held on 23 June 2016 in which 51.9 percent of those voting supported leaving the EU, the Government invoked Article 50 of the Treaty on European Union, starting a two-year process which was due to conclude with the UK's exit on 29 March 2019. That deadline has since been extended to 31 October 2019.
- Period Four, Feb – Mar 2018: Return of volatility is a market phenomenon as the volatility of equity and all other market segment asset price starts to

raise in volatility. Starting from the end of Jan 2018 US equity market dropped over 10% in a short period and bouncing back 7% in just one week. And after that equity market strated to say good-by to low volatility condition compared to periods before 2018.

- Period Five, May 2018: Argentina/Turkey/Italian crises. On May 18 2018, Argentina's struggle this week to prevent a collapse in its currency and soaring interest rates from destabilising its ailing economy appeared to have ended in failure on Friday, leaving it to seek financial aid from the International Monetary Fund. On May 2018, Italy has been plunged back into crisis mode after several weeks of protracted negotiations between anti-establishment groups ultimately failed to produce a new coalition government.
- Period Six, Oct 2018: Global equity selloff. On October 10, global equity markets tumbled, led by the US, with the S&P 500 Index declining -3.3%. The VIX Index—a measure of US equity market volatility—spiked above 20 to its highest level in six months. The event was US equity market centric, while the response in other assets and regions was relatively modest.
- Period Seven, Dec 2018: Worst December for equities since 1931. Following glabal equity selloff event in Oct in the same year at Dec the equity market dropped even more and showed the worst dcemeber equtiy return since 1931.

Basically there are seven separated time window when the US market get liquidity squeeze and all of them closely related to market stressed event(all types of crisis). In the next section we will review all these market crisis event and get a basic iead of when, how and why they are happening and key market movements during these squeezed period.

- crisis in Turkey. It was characterized by the Turkish lira (TRY) plunging in value, high inflation, rising borrowing costs, and correspondingly rising loan defaults. The crisis was caused by the Turkish economy's excessive current account deficit and large amounts of private foreign-currency denominated debt, in combination with President Recep Tayyip Erdoğan's increasing authoritarianism and his unorthodox ideas about interest rate policy.

2. Quant-preview of Market During Squeezed Periods

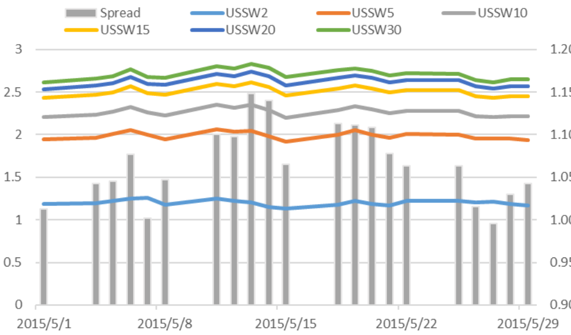
In this section, we provide several key market measurements to quantify market performance during squeezed period. We separate financial market into 4 different sectors; currency, bond(rates), equity and commodity. Different measure are applied ontop of these market with a focusing on US and US-related market as following:

- Currency market: USD currency index taken from Bloomberg (Ticker:BBDXY) , Individual currency against USD value taken from Bloomberg.
- Equity market: S&P 500 index value.
- Rates market: US swap rates with maturity 2,5,10,20,30 year and 10Y-2Y spread.
- Commodity market: Gold price index and Oil price index.

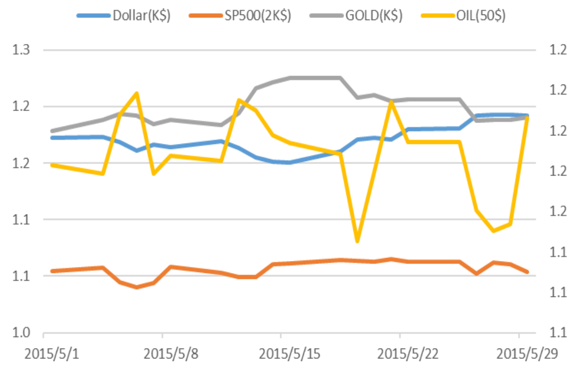
Reason for these market insturment selection is simple: as the market gets a shock and the shock propagates to differnet market sectors and regions, investors generally will flight-to-quality and flight-to-liquidity. The combined of the consequence would be a raise in USD, a drop in equity, a drop in rates plus narrow in rate spread and a raise in gold price and some effects in commodity price. In the following are movement summaries listed in chronological order:

2.1 Period One, May 2015, Greek crisis:

*Time window for this period selected as 01-May-2015 to 31-May-2015.



Picture 3 Swap rates (2,5,10,20,30) and spread plot period 1



Picture 4 Major asset class movement plot period 1

This type of shock is generated by some country cannot hold its own debt payment and a financial crisis happended. Market response to this type of shock as shown in the above graph is a huge raise in Dollar index. However, Rate market, SP500 index and gold price seems to be quiet more calm. In the response to this financial crisis shock, dollar index went up by 1.7%. As comparison we also see gold price went down by 1.0%. Also the spread went up first and then reverted down quickly as the event tended to fly away.

Summary

Asset Type	Return	Std.	Return/Std.	Max-Min (%)
SP500	-0.04%	0.71%	-0.1	2.40%
Dollar	1.68%	1.12%	1.5	3.59%
GOLD	1.03%	1.22%	0.8	3.99%
OIL	1.94%	1.82%	1.1	6.20%
OIS5Y	-0.02%	0.04%	-0.4	0.14%
Swap Rates	0.01%	0.05%	0.2	0.15%
*Spread	0.03%	0.04%	0.7	0.15%

*Spread for US swap rate 10Y-2Y

Table 1 Summary of asset movements period 1

Intermarket Correlation

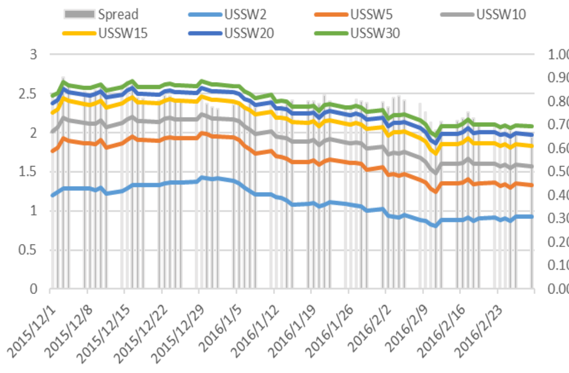
	Dollar	OIS 5Y	SP500	GOLD	OIL	10Y Rates	Spread
Dollar	1.00						
OIS 5Y	-0.07	1.00					
SP500	0.17	-0.40	1.00				
GOLD	-0.54	-0.13	0.49	1.00			
OIL	-0.50	0.07	-0.37	0.23	1.00		
10Y Rates	-0.44	0.83	-0.21	0.30	0.29	1.00	
Spread	-0.63	0.30	0.17	0.71	0.38	0.77	1.00

Table 2 Summary of correlation period 1

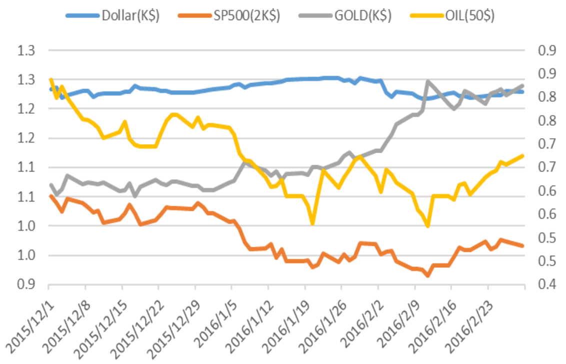
The inter-market correlation matrix shows all correlations between different market movements. In response to this market shock, we see because of the shock mainly happended in a specific country and not propagate enough to influence other country, the equity market in US was unchanged and the Gold price was up 1%. However, in this case, as invester feared of the future of a specific country, they would flight-to-quality to the most trustness country and that why dollar idnex went up quiet a lot in this shock period.

2.2 Period Two, Dec 2015 to Feb 2016, Oil/China Deval/High Yield:

*Time window for this period selected as 01.Dec.2015 to 30.Feb.2016 as the crisis composed a series events in this period.



Picture 5 Swap rates (2,5,10,20,30) and spread plot period 2



Picture 6 Major asset class movement plot period 2

As shown above, this market stressed period can be identified as a quick drop(-8%) in equity market as well as oil market(-19%). In response to this shock, market shows a flight-to-quality movement as the swap rates drops around 40bps across the board and gold price went up by 15% and the swap rate spread narrowed by 17bps. This serise of movements are all typical internal flight-to-quality movements which leaves USD currency index unchanged during this period.

Summary

Asset Type	Return	Std.	Return/Std.	Max-Min (%)
SP500	-8.10%	3.75%	-2.2	13.01%
Dollar	-0.31%	0.87%	-0.4	2.92%
GOLD	15.84%	5.77%	2.7	18.29%
OIL	-19.35%	8.84%	-2.2	37.37%
OIS5Y	-0.46%	0.24%	-2.0	0.74%
Swap Rates	-0.44%	0.23%	-1.9	0.74%
*Spread	-0.17%	0.06%	-3.1	0.26%

*Spread for US swap rate 10Y-2Y

Table 3 Summary of asset movements period 2

Intermarket Correlation

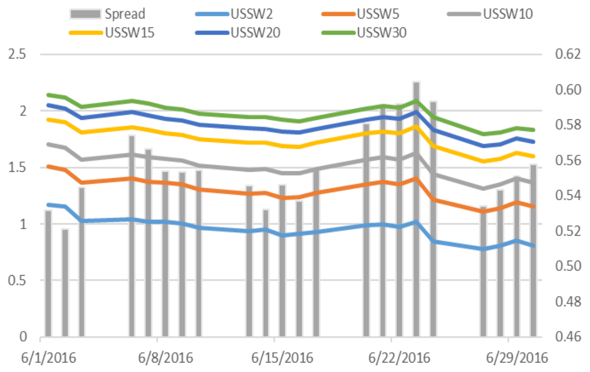
	Dollar	OIS 5Y	SP500	GOLD	OIL	10Y Rates	Spread
Dollar	1.00						
OIS 5Y	0.19	1.00					
SP500	-0.24	0.81	1.00				
GOLD	-0.41	-0.93	-0.64	1.00			
OIL	-0.20	0.77	0.94	-0.62	1.00		
10Y Rates	0.18	1.00	0.80	-0.94	0.76	1.00	
Spread	0.20	0.74	0.52	-0.83	0.54	0.78	1.00

Table 4 Summary of correlation period 2

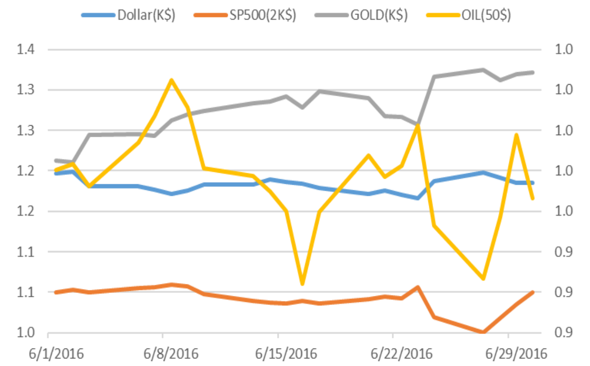
The inter-market correlation matrix shows all correlations between different market movements. In response to this market shock, Rates and Gold reponse well because of global flight-to-quality movements caused investor bought in Gold and government bond. But this time, dollar index seemed to be under performed by a drop of 0.31%. This type of movement probably caused by the event itself, as we can see as the shock happened investro tends to switch their asset class in hand from risky to quality. However, investor are not taking action in international asset allocation(dollar stays stable).

2.3 Period Three, Jun 2016, Brexit:

*Time window for this period selected as 01.Jun.2016 to 30.Jun.2016.



Picture 7 Swap rates (2,5,10,20,30) and spread plot period 3



Picture 8 Major asset class movement plot period 3

Brexit is a world-watched global risk event, and eventually caused market generated a huge risk-off(flight-to-quality) event in a very short period. As shown in the above graph, around 23 Jun. 2016 equity market got a huge drop and quickly reconverted back in just 2 days. In the meantime, gold price also went up a lot but never return back. Also swap rates market dropped overall around 30bps but the rate spread first went up and returned back. For the whole month equity maket stay unchanged but gold price rose a lot by around 9%, dollar index dropped about 1% and swap rates overall dropped around 30bps.

Summary

Asset Type	Return	Std.	Return/Std.	Max-Min (%)
SP500	-0.02%	1.39%	0.0	5.65%
Dollar	-0.98%	0.74%	-1.3	2.73%
GOLD	8.98%	2.68%	3.3	9.37%
OIL	-1.39%	2.54%	-0.5	10.24%
OIS5Y	-0.40%	0.12%	-3.4	0.44%
Swap Rates	-0.34%	0.10%	-3.2	0.39%
*Spread	0.03%	0.02%	1.1	0.08%

*Spread for US swap rate 10Y-2Y

Table 5 Summary of asset movements period 3

Intermarket Correlation

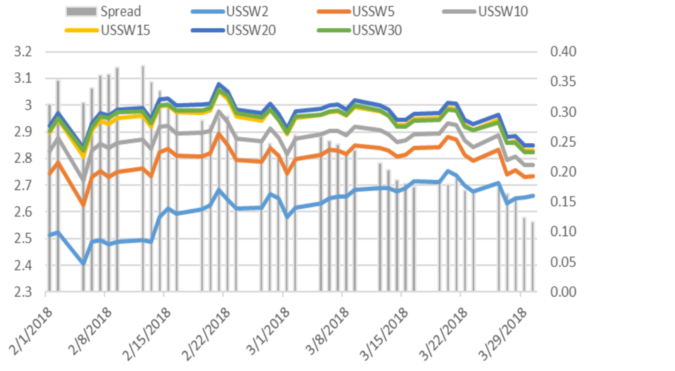
	Dollar	*OIS 5Y*	*SP500*	*GOLD*	*OIL*	*10Y Rates*	*Spread*
Dollar	1.00						
OIS 5Y	-0.17	1.00					
SP500	-0.51	0.84	1.00				
GOLD	0.04	-0.95	-0.78	1.00			
OIL	-0.53	0.59	0.78	-0.45	1.00		
10Y Rates	-0.29	0.98	0.85	-0.91	0.61	1.00	
Spread	-0.74	0.03	0.16	0.09	0.29	0.21	1.00

Table 6 Summary of correlation period 3

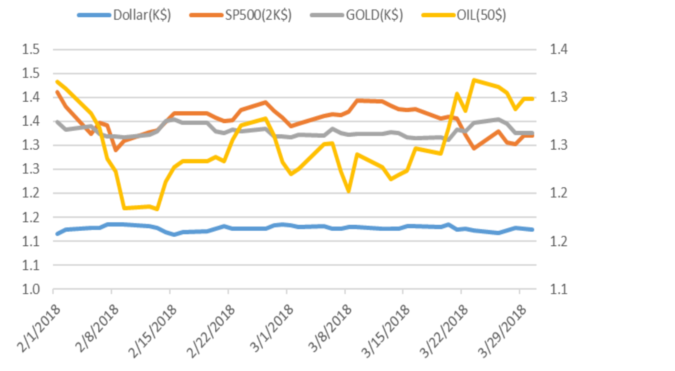
The inter-market correlation matrix shows all correlations between different market movements. In response to this market shock, Rates and Gold reponse well because of global flight-to-quality movements caused investor bought in Gold and government bond. But this time, dollar index seemed to be under performed by a drop of 1%. This type of movement probably caused by the event itself, as we can see as the shock happened investro tends to switch their asset class in hand from risky to quality. However, investor are not taking action in international asset allocation(dollar dops in value).

2.4 Period Four, Feb – Mar 2018, Return of volatility:

*Time window for this period selected as 01.Feb.2018 to 31.Mar.2018.



Picture 9 Swap rates (2,5,10,20,30) and spread plot period 4



Picture 10 Major asset class movement plot period 4

As shown in the above period market strated to gain volatility again as the equity market dropped suddenly in the begaining of Feb and bouncing back qucikly. Market response to this type of shock as shown in the above graph is a stable increase in swap rates and narrower in rates spread. However, SP500 index and GOLD price seems to be down but not large enough compared to other kinds of market shocks. In the response to this volatility return event, interests rate swap rates rose in short end around 14bps and stable in the longer end which caused the spread narrower by around 20bps, also dollar index went up by 0.9% not bad for a flight-to-quality movement. As comparison we also see gold price went down by 1.7%.

Summary				
Asset Type	Return	Std.	Return/Std.	Max-Min (%)
SP500	-6.42%	2.00%	-3.2	8.54%
Dollar	0.91%	0.48%	1.9	1.99%
GOLD	-1.73%	0.86%	-2.0	3.14%
OIL	-1.31%	2.85%	-0.5	10.17%
OIS5Y	0.01%	0.05%	0.2	0.26%
Swap Rates	-0.05%	0.05%	-1.0	0.26%
*Spread	-0.20%	0.07%	-2.7	0.26%

*Spread for US swap rate 10Y-2Y

Table 7 Summary of asset movements period 4

Intermarket Correlation

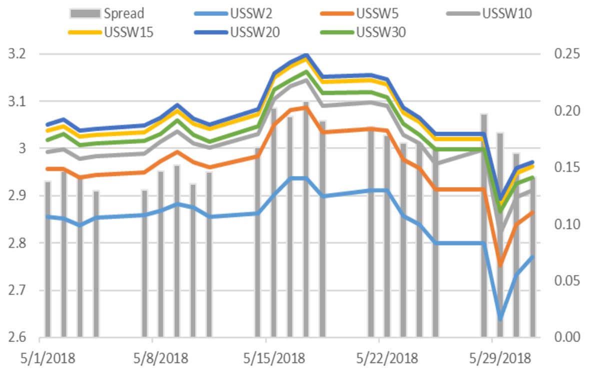
	Dollar	*OIS 5Y*	*SP500*	*GOLD*	*OIL*	*10Y Rates*	*Spread*
Dollar	1.00						
OIS 5Y	-0.28	1.00					
SP500	-0.59	0.65	1.00				
GOLD	-0.96	0.18	0.49	1.00			
OIL	-0.30	0.22	0.67	0.27	1.00		
10Y Rates	-0.18	0.83	0.27	0.10	-0.20	1.00	
Spread	-0.01	-0.57	-0.49	0.02	-0.28	-0.18	1.00

Table 8 Summary of correlation period 4

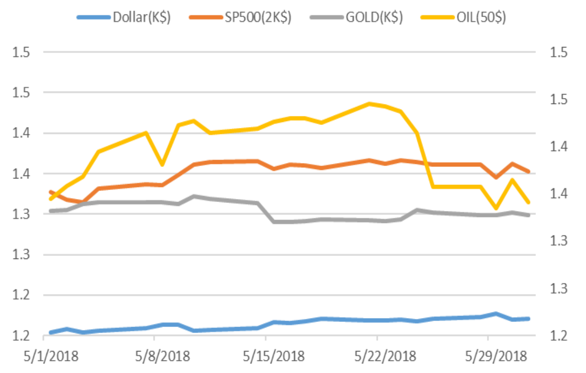
The inter-market correlation matrix shows all correlations between different market movements. In response to this market shock, Dollar reponse well because of global flight-to-quality movements but US rates market shown a short term over-buy in the short end which caused the spread dropped over 20bps in a short period. Compared to Gold price(-1.7%) and rates mevements(spread narrow 20bps), in this case, dollar still can be considered a good hedge.

2.5 Period Five, May 2018, Argentina/Turkey/Italian crises:

*Time window for this period selected as 01.May.2018 to 31.May.2018.



Picture 11 Swap rates (2,5,10,20,30) and spread plot period 5



Picture 12 Major asset class movement plot period 5

This type of shock is generated by some country cannot hold its own debt payment and a financial crisis happended. Market response to this type of shock as shown in the above graph is a huge drop in interets rates, a huge raise in Dollar index combined with a huge drop in Oil price. However, SP500 index and GOLD price seems to be quiet more calm. In the response to this financial crisis shock, interests rate swap rates dropped overall around 8bps and dollar index went up by 1.4%. As comparison we also see gold price went down by 0.4%.

Summary				
Asset Type	Return	Std.	Return/Std.	Max-Min (%)
SP500	1.90%	1.20%	1.6	3.90%
Dollar	1.43%	0.57%	2.5	1.98%
GOLD	-0.41%	0.78%	-0.5	2.38%
OIL	-0.31%	2.71%	-0.1	8.19%
OIS5Y	-0.10%	0.08%	-1.2	0.35%
Swap Rates	-0.08%	0.08%	-1.1	0.33%
*Spread	0.00%	0.02%	0.2	0.08%

*Spread for US swap rate 10Y-2Y

Table 9 Summary of asset movements period 5

Intermarket Correlation

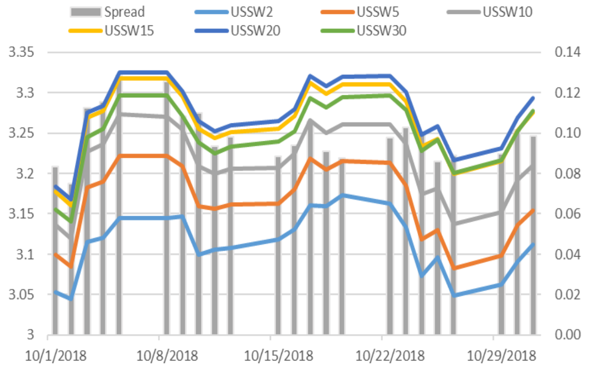
	Dollar	*OIS 5Y*	*SP500*	*GOLD*	*OIL*	*10Y Rates*	*Spread*
Dollar	1.00						
OIS 5Y	-0.11	1.00					
SP500	0.55	0.40	1.00				
GOLD	-0.69	-0.33	-0.35	1.00			
OIL	0.05	0.77	0.61	-0.21	1.00		
10Y Rates	0.02	0.98	0.40	-0.46	0.75	1.00	
Spread	0.77	0.37	0.60	-0.85	0.27	0.48	1.00

Table 10 Summary of correlation period 5

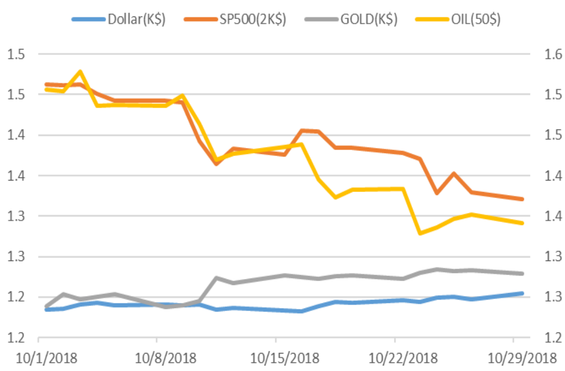
The inter-market correlation matrix shows all correlations between different market movements. In response to this market shock, we see because of the shock mainly happended in a specific country and not propagate enough to influence other country, the equity market in US was even up and the Gold price was down. However, in this case, as invester feared of the future of a specific country, they would flight-to-quality to the most trustness country and that why dollar idnex went up quiet a lot in this shock period.

2.6 Period Six, Oct 2018, Global equity selloff:

*Time window for this period selected as 01.Oct.2018 to 31.Oct.2018.



Picture 13 Swap rates (2,5,10,20,30) and spread plot period 6



Picture 14 Major asset class movement plot period 6

As shown in the above graphs, the driven factor in this shock is a sudden large drop in global equity market as represented by SP500 index(Orange line above, dropped 7% in that period) and Oil dropped by 13%. In the response to flight-to-quality movements, interests rate swap rates dropped overall around 7bps and rate spread went up around 2bps. As comparison we also see gold price went up by 2% and dollar index went down by 2%.

Summary

Asset Type	Return	Std.	Return/Std.	Max-Min (%)
SP500	-7.28%	3.14%	-2.3	9.72%
Dollar	2.23%	0.65%	3.4	2.34%
GOLD	2.17%	1.32%	1.6	3.84%
OIL	-13.27%	4.64%	-2.9	14.74%
OIS5Y	0.02%	0.05%	0.5	0.17%
Swap Rates	0.07%	0.05%	1.6	0.15%
*Spread	0.02%	0.01%	1.1	0.05%

*Spread for US swap rate 10Y-2Y

Table 11 Summary of asset movements period 6

Intermarket Correlation

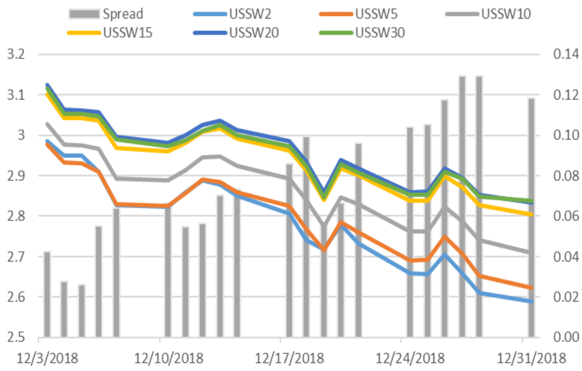
	Dollar	*OIS 5Y*	*SP500*	*GOLD*	*OIL*	*10Y Rates*	*Spread*
Dollar	1.00						
OIS 5Y	-0.40	1.00					
SP500	-0.59	0.58	1.00				
GOLD	0.42	-0.50	-0.86	1.00			
OIL	-0.65	0.51	0.91	-0.90	1.00		
10Y Rates	-0.11	0.90	0.24	-0.15	0.10	1.00	
Spread	-0.01	0.73	0.36	-0.48	0.36	0.68	1.00

Table 12 Summary of correlation period 6

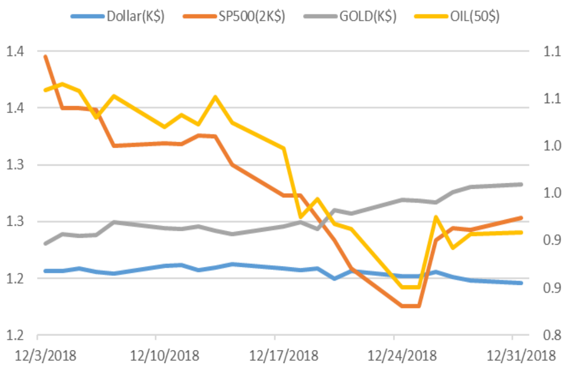
The inter-market correlation matrix shows all correlations between different market movements. In response to this market shock, we take SP500 and Oil movements as given market condition, the highests reponsece instruments here would be Dollar index and GOLD. Rates market and Spread is not reponsing to this shock well enough. What this tells us is when global equity market dropped in a qucik and intense way, Gold and US Dollar response quickly and can be considered as good hedge for this type of market shock.

2.7 Period Seven, Dec 2018, Worst December for equities since 1931:

*Time window for this period selected as 01.Dec.2018 to 31.Dec.2018.



Picture 15 Swap rates (2,5,10,20,30) and spread plot period 7



Picture 16 Major asset class movement plot period 7

As shown in the above graphs, the driven factor in this shock is a sudden large drop in US equity market as represented by SP500 index(Orange line above, dropped 10% in that period) and Oil dropped by 14%. In the response to flight-to-quality movements, interests rate swap rates dropped overall around 30bps and rate spread went up around 8bps. As comparison we also see gold price went up by 4% and dollar index went down by 0.8%.

Summary

Asset Type	Return	Std.	Return/Std.	Max-Min (%)
SP500	-10.16%	4.30%	-2.4	15.74%
Dollar	-0.86%	0.37%	-2.4	1.37%
GOLD	4.21%	1.26%	3.3	4.21%
OIL	-14.24%	6.93%	-2.1	20.25%
OIS5Y	-0.35%	0.10%	-3.6	0.35%
Swap Rates	-0.32%	0.09%	-3.6	0.32%
*Spread	0.08%	0.03%	2.4	0.10%

*Spread for US swap rate 10Y-2Y

Table 13 Summary of asset movements period 7

Intermarket Correlation

	Dollar	*OIS 5Y*	*SP500*	*GOLD*	*OIL*	*10Y Rates*	*Spread*
Dollar	1.00						
OIS 5Y	0.63	1.00					
SP500	0.50	0.86	1.00				
GOLD	-0.82	-0.89	-0.78	1.00			
OIL	0.64	0.88	0.94	-0.84	1.00		
10Y Rates	0.65	0.99	0.87	-0.89	0.90	1.00	
Spread	-0.59	-0.87	-0.76	0.88	-0.82	-0.82	1.00

Table 14 Summary of correlation period 7

The inter-market correlation matrix shows all correlations between different market movements. In response to this market shock, we take SP500 and Oil movements as given market condition, the highests reponsece instruments here would be 10 rates, OIS rates and GOLD. Dollar index and Spread is not reponsing to this shock well. What this tells us is when equity market dropped in a qucik and intense way, rates market and gold response quickly and can be considered as good hedge for this type of market shock.

3. Summary & Conclusion

As a conclusion to above analysis, we can identify two different types of response to market shocks.

- Type One, Financial crisis: Identified as a given country cannot full fill its debt or let its base currency devaluation sharply in a short period.
- Type Two, Markert nervous: Identified as a large drop in equity market or a short-term emergency event.

First, we look into which strategy performed best during each period. Table below shows a summary of all seven market period and the corresponding type also with the market key driven factor during stressed period.

Period	Event	Equity Market	Good Hedge	Classfied Type
May 2015	Greek crisis	Unchanged	Dollar	T1
Dec 2015-Feb2016	Oil/China Deval/High Yield	-8%	Gold/Bond	T2
Jun 2016	Brexit	Unchanged	Gold/Bond	T2
Feb – Mar 2018	Return of volatility	-6%	Dollar	T2
May 2018	Argentina/Turkey/Italian crises	+2%	Dollar	T1
Oct 2018	Global equity selloff	-7%	Dollar/Gold	T2
Dec 2018	Worst December for equities since 1931	-10%	Gold/Bond	T2

Table 15 Summary of events and hedges

As shown above, type one, financial crisis shock always market response with a short-term over buy in dollar and in this case long dollar could be a good hedge. On the other side, type two, market nervous shock still has some idiographic movements and the actually market response really depends on the market real time response. For example, "Brexit" shock did not generate a sharp short-term buy of dollar, but indeed shown as a short-term bond over buy. Probably because the event it self is a market shock but not a crisis. Overall, dollar response pretty well when there is a crisis or market nervous. But if the event it sell is only a "surprise" not really a downside expectation then investor would not make any international asset allocation changes. In case of market nervous period, gold always works as a hedge to equity market. The job of rates hedging is not obvious, as shown above bond works well in these cases: China Deval, Brexit, Worst Dec since 1931. All of them have the same festure as a potential down turn in the economic. To the opposite of shocks those events actually generate a downside economic expectation globally which would be translate into a low inflation and potential rate cut and that is why rates market response well for them.

From another perspective, we aline each protection with corresponding period and see if they performed well. See below summary table.

Asset Class	May 2015	Dec 2015-Feb2016	Jun 2016	Feb – Mar 2018	May 2018	Oct 2018	Dec 2018
SP500	-0.04%	-8.10%	-0.02%	-6.42%	1.90%	-7.28%	-10.16%
Dollar	1.68%	-0.31%	-0.98%	0.91%	1.43%	2.23%	-0.86%
GOLD	1.03%	15.84%	8.98%	-1.73%	-0.41%	2.17%	4.21%
OIL	1.94%	-19.35%	-1.39%	-1.31%	-0.31%	-13.27%	-14.24%
OIS5Y	-0.02%	-0.46%	-0.40%	0.01%	-0.10%	0.02%	-0.35%
Swap Rates	0.01%	-0.44%	-0.34%	-0.05%	-0.08%	0.07%	-0.32%
*Spread	0.03%	-0.17%	0.03%	-0.20%	0.00%	0.02%	0.08%

*Spread for US swap rate 10Y-2Y

Table 16 Summary of assets performance during stressed period

As shown in the above table, let define two other measures as following:

- Effective Ratio=Number of period hedges can go offset to equity when equity is down/Number of total equity down period
- Hedge Capture Rate=Average of hedge change rate/Average of equity change rate, given equity is down

Asset Class	Effective Ratio	Hedge Capture Rate
Dollar	50%	30%
GOLD	83%	121%
*Swap Rates	67%	5%
*Spread	67%	1%

*Spread for US swap rate 10Y-2Y, when equity is down as a hedge the spread should be up

*Swap Rates for US 10Y swap rate, when equity is down as a hedge the rates should be down

As shown in the summary table, in terms of effective ratio, gold can be a good hedge to equity and the capture rate is more than 100% meaning, if we use 1-to-1 matching then the overall portfolio is overhedged. The second best hedges are swaps, as the equtiy goes down, about 67% rates market will go down and the spread between long end and short end goes wider because if there is a shock investor will over buy short-term bond compared to long-term bond.