J.P.Morgan

Global Commodities Research
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Commodities risk premium during MENA conflict

In times of war oil adds to gains while gold retraces lower

- **While the escalation between Iran and the US appears to have reached a relative climax following President Trump's speech, we think Iran could potentially continue its affront through a low intensity strategy.**
- **We maintain our Brent oil price forecast of $67/bbl for 1Q20 and $64.5/bbl average for the year; however, reflecting concerns about supply vulnerabilities, additional risk premium could be required.**
- **Short-lived disruptions to Kurdistan (KRG) oil production (500 kbd) or a military assault on Iran (300 kbd in exports) would warrant a $1/bbl risk premium to any baseline forecast.**
- **A wider internal conflict in Iraq could potentially destabilize a much larger 4 mbd of oil production, warranting a $5/bbl premium.**
- **A large-scale disruption like a blockade of the Strait of Hormuz should boost oil prices 21% and add $14/bbl to the baseline.**
- **Positioning provides scope for another $10-11/bbl price gain, confirming $80/bbl as the short-term max price ceiling.**
- **The risk premium boost to gold prices during MENA military conflicts, while sizeable (5-10%), ultimately proves fleeting as more certainty around the situation emerges.**
- **We maintain our gold price forecast of $1,500/oz 1Q20 and $1,550/oz 2Q20, primarily driven by continued low real yields given a forecasted 2Q Fed cut and the ongoing shift towards average inflation targeting.**
- **Industrial metals have historically consistently sold off following the outbreak of a war in the Middle East, declining on average 6% during the first 10 weeks of the conflict.**
- **For base metals, we believe Chinese demand will remain the ultimate catalyst for price, regardless of military conflict in the Middle East. We maintain an average copper price forecast of $6,200/mt in 1Q20 and $6,000/mt in 2Q20.**
- **Pertinent to commodities, US rates and the broad US dollar do not exhibit consistent behavior around the onset of military conflicts, reflecting the state of underlying growth instead.**

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See page 10 for analyst certification and important disclosures, including non-US analyst disclosures.

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Demand for safe haven assets surged beginning last Friday after a US strike killed a top Iranian commander and the Middle Eastern country vowed “severe retaliation.” The situation further escalated on Wednesday after Iran attacked two US-Iraqi airbases, sparking fears that the attack could prove to be a precursor to a larger military conflict between the two nations. The developments roiled financial markets, with the gold price piercing through $1,600/oz for the first time since 2013 and the Brent crude price surging to $71/bbl. After the initial uncertainty, the retaliation was broadly perceived as a measured response overall and President Trump further struck a tone of de-escalation (at least for the near term) in his televised address on Wednesday. In response, gold slumped below $1,560/oz while Brent price retraced to $65/bbl.

All things considered it appears that both countries are stepping back from the brink and are pursuing a path of de-escalation for the time being, meaning the current episode has likely reached a relative climax. **However, it’s hard to ignore the larger trend over the past six to nine months of increased tensions and hostilities between the US and its allies in the region and Iran** (downing of a US drone, oil tanker and infrastructure sabotage even before the current events). Therefore we think it is useful to detail the potential price impacts for oil, gold and base metals were tensions to re-escalate in the future and spill over into a more serious military conflict.

Wars are difficult to predict and should never be taken lightly, but history can offer a guide. To gauge the market's likely reaction to any future military re-escalation, we compiled a list of four MENA-centered geopolitical incidents since 1980 that resulted in a widespread military conflict. All four events involved participation by the US to varying degrees as well as at least one major oil-producing Middle Eastern or North African nation and resulted in a disruption (or credible fear of disruption) to global oil supplies **(Table 1)**.

With the usual caveats about small sample size and the danger of averages, a historical analysis of price performance over these four past military conflicts indicates that oil prices have typically continued to gain through the early stages of a military conflict in the MENA while gold has swiftly retraced lower once the uncertainty in the lead up to war is erased. Base metals, on the other hand, have consistently sold off at the onset of military escalation, staying depressed for quite some time **(Exhibit 1)**.

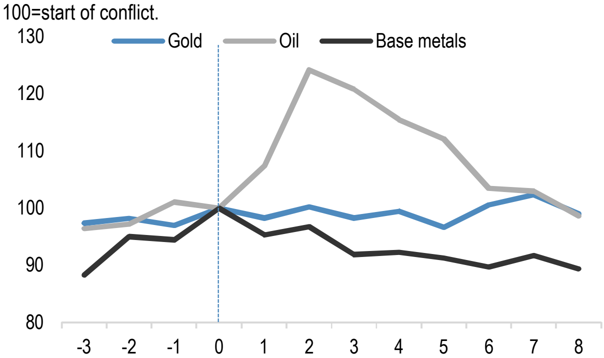
Table 1: Armed conflicts in the Middle East/North Africa involving a major oil producing country

Conflict	Conflict Details	Crude Market Details	Start Date
1980 Iran-Iraq War	War sparked by Iraq's invasion of Iran following a history of border disputes and the 1979 Iranian Revolution.	Iran's retaliation to the initial invasion included large-scale aerial bombings throughout Iraq including oil facilities and refineries (Kirkuk) further heightening supply fears already stoked by the Iranian Revolution.	22-Sep-80
1990 Gulf War	US-led coalition war against Iraq following Iraq's August 1990 invasion of Kuwait spurred by disagreements around oil production.	President Bush announced the first emergency use of the SPR in his address announcing Operation Desert Storm on 16-Jan-1991 with 17.3mb of the 33.75mb offered ultimately being sold.	02-Aug-90
2003 Iraq War	US-led coalition invasion of Iraq resulting in the overthrow of Saddam Hussein and the Ba'ath Party government.	No SPR release. Seizing and securing oil infrastructure was prioritized resulting in limited damage overall.	19-Mar-03
2011 NATO-led military intervention in Libya	NATO-led coalition military intervention in response to the escalating Libyan Civil War resulting in the overthrow of the Gaddafi government.	The US and its partners in the International Energy Agency (IEA) announced a release of 60mb (30mb from the US SPR) on 23-Jun-2011.	15-Feb-11

Source: J.P. Morgan, US Department of Energy

Based solely on the historical average, we could expect Brent oil prices to increase 20% over the first three months of military conflict. Gold on the other hand, would likely mirror its price performance in the last few days again, rallying around 5-10% in the days leading up to the brink only to swiftly erase those gains as the uncertainty fades, even if military conflict were to break out. Base metals would likely drop anywhere from 3-5% over the first week of military escalation and stay depressed for quite a while. **However, the world has changed since the last oil shock in 2011 and historical comparisons shouldn't be applied at face value.**

Exhibit 1: Average price performance of select commodities before and after the start of military conflicts outlined in Table 1
X-axis: number of months before/after start of military action; Y-axis: Index, 100=start of conflict.



Source: Bloomberg, S&P, J.P. Morgan Commodities Research

On oil, a drastic decentralization of global energy production, especially the emergence of the US as world's leading oil producer, **has limited the degree to which political and military conflicts in the Middle East spill over into global energy markets.** The fact that the US is now a net exporter of oil for the first time in 70 years has clearly dampened oil's price sensitivity to supply shocks over the past few years. Indeed we estimate that under current market conditions a 'historical' average risk premium of 20% is unjustifiably large, implying a serious threat to oil supply **(Table 2)**. Overall, absent a material escalation that encompasses a larger part of the region, we believe the price impact of wider-spread military conflict would likely be contained, however a mild to moderate supply impact (0.3-4.0 mbd) would warrant a \$1-\$5/bbl risk premium to any baseline forecast. For now we maintain our price forecast of \$67/bbl for 1Q20 and \$64.50/bbl average for the year.

On gold, we still think fundamental drivers, like US real yields, would remain the primary medium-term catalyst for prices. Our MENA conflict analysis below indicates that the risk premium boost to gold prices, while sizeable, ultimately proves fleeting and is actually fairly hard to consistently pinpoint relative to military escalation. As we have seen in the past few days, this means gold could certainly rise again sharply (5-10%) in the days leading up to any potential future military escalation between the US and Iran but, it will likely just as swiftly deflate as more certainty around the situation emerges.

As for our base case at the moment, we still see gold supported above \$1,500/oz in the medium-term (\$1,500/oz 1Q20 average and \$1,550/oz 2Q20 average forecast), however, this view is primarily driven by continued low real yields given a forecasted 2Q Fed cut and the ongoing shift towards average inflation targeting.

Finally for base metals, we believe Chinese demand will remain the ultimate catalyst for price, regardless of military conflict in the Middle East, with the trajectory of global manufacturing and the progress in US/China trade negotiations remaining the largest risk factors. So while the results of the conflict analysis are pretty consistently bearish, we believe the drag from any future MENA military conflict will be minor compared to the influence of these other major catalysts. As for our current base case, we continue to think that 1Q20 likely represents a peak in base pricing this year as Chinese demand deteriorates later into the year, dragging industrial prices lower beginning next quarter. To this end, if anything, military escalation in the coming months would likely serve to expedite our forecasted bearishness.

Oil – markets appear fairly valued

While the escalation between Iran and the US appears to have reached a relative climax following President Trump's speech, we think **Iran could potentially continue its affront through a low intensity strategy**. We expect this could involve possible attacks on oil facilities including Iraq, Kurdistan and possibly Kuwait.

Saudi and UAE oil facilities are also at risk but it is far less likely that Iran will seek to attack through drones or missiles not least because the element of surprise has gone and that this would mean a direct confrontation with US allies. Moreover, we don't believe Iran will undertake a further direct retaliation against the US mainly as this would mean a full escalation which it neither wants nor can afford from a fiscal standpoint. This also means that the Strait of Hormuz is not likely to be used as leverage against the US, although attacks on tankers should not be ruled out.

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Baseline: $67/bbl price forecast for 1Q20. Compared to last year, our 2020 market balance assumes more demand, given the bottoming in global manufacturing and the likelihood of US-China trade deal, and significantly less supply than we previously expected, given the OPEC+ over-compliance and the new-found focus of US producers on returns rather than volumes. The resultant tighter balance (200 kbd deficit vs 100 kbd deficit in 2019) warrants an average Brent oil price of $67/bbl in 1Q20 and $64.5/bbl for the full year. As long as the current tensions don't lead to actual oil supply disruptions we believe our $67/bbl price forecast is 'fundamentally' justifiable based on our supply-demand assumptions for the current quarter.

Table 2: Oil price scenarios for various levels of potential supply disruption

	Loss rate	Barrels lost by duration…		Oil price impact (%) by duration…		Oil price impact ($/bbl) by duration…	
	(mbd)	1 week	1 month	1 week	1 month	1 week	1 month
1. Iran attacks Iraqi oil production in Kurdistan (production impact)	-0.5	-4	-15	0	1	0	1
2. Military assault on Iran (impact on exports)	-0.3	-2	-9	0	1	0	1
3. Conflict in Iraq (impact on exports)	-4	-28	-122	2	8	1	5
4. Blockade of the Strait of Hormuz (impact on exports)	-10	-70	-304	5	21	3	14

Source: J.P. Morgan

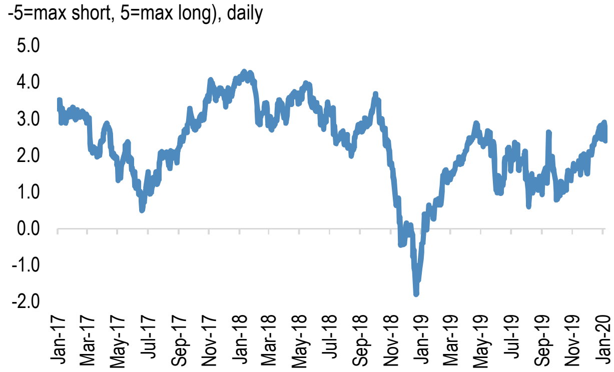
Mild to moderate supply disruptions: $1/bbl - 5/bbl risk premium. Reflecting concerns about supply vulnerabilities, additional risk premium could be required. Disruptions to Kurdistan (KRG) oil production or a military assault on Iran could likely impact 500 kbd and 300 kbd of oil exports, respectively. If the outage lasts for a month, applying the general equilibrium model developed by our economists to the oil production shock, we estimate the risk premium at around $1/bbl (see here for original derivation and here for the most recent application). A wider internal conflict in Iraq, which could severely disrupt Iraqi oil production in the South, could potentially destabilize a much larger 4 mbd of oil production, warranting a $5/bbl premium **(Table 2)**.

Large-scale supply disruptions: $14/bbl risk premium. On the other side of the spectrum, the possibility of significantly larger supply losses should warrant a much elevated risk premium. Here, the prospect that Iran might blockade the Strait of Hormuz should have unprecedented implications for global energy markets given that some 20% of the world's oil supply (20 mbd in 2018) passes through the Strait along with one-third of the world's LNG cargoes. A 10mbd disruption of flows for a month translates to a 0.83 mbd loss for the year and would likely boost oil prices 21% and add $14/bbl to the baseline **(Table 2)**. While seemingly small in comparison to the production impact, it underscores the unprecedented resilience in the global oil markets. Saudi Arabia succeeded remarkably well to restore capacity after the attack on its oil facilities last September, demonstrating a large degree of flexibility. US production is also providing a whole new level of liquidity to the markets and there is plenty of spare capacity in OPEC+ nations. The perception effect also matters. If the market assigns a higher probability of the supply shock to last beyond one month, premium could easily double or triple.

Positioning provides scope for another $10-11/bbl price gain, confirming $80/bbl as the short-term max price ceiling. Investors positioning in both WTI and Brent reversed from the lows around the time of the Saudi attack in mid-September to reasonably extended (2.9 on a scale from -5/+5) **(Exhibit 2)**.

For more details, please see *Oil Markets Weekly: Fundamentals trump geopolitics as oil rally fades*, Deshpande et al., 8 January 2020.

Exhibit 2: Price momentum proxy for net investor Brent oil positioning
-5=max short, 5=max long), daily



Source: Bloomberg, J.P. Morgan Commodities Research

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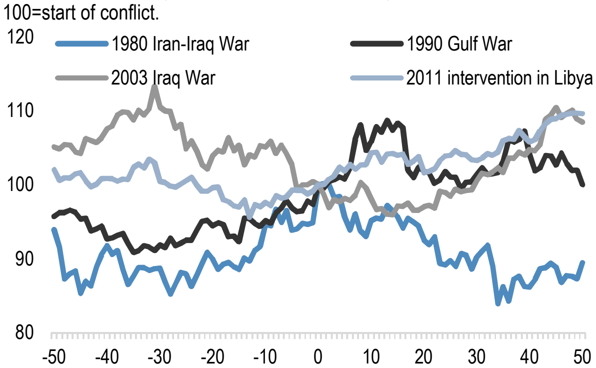
Gold – easy come, easy go

Safe-haven buying energized gold prices in the last few days, extending the late-December rally by more than 5% as prices shot above $1,600/oz early on Wednesday before settling back down to below $1,560/oz after it became clearer the current flare up had likely reached its relative climax. The price action over the last few days closely matches gold's historical reaction to previous military escalations in the Middle East.

While gold has not demonstrated a consistent pattern of performance over the four previous armed Middle Eastern conflicts listed above, aspects of gold's price action over three of the conflicts (the September 1980 breakout of the Iran-Iraq War, the 1990/91 Gulf War and the 2003 Iraq War) do mirror each other, shedding some light on the potential path of gold prices were tensions to re-escalate. More specifically, we do see relative spikes in gold prices around all three of these military escalations but 1) the exact timing of when gold price surges vis-à-vis military action varies a lot and 2) the bulk of the risk-premium gains are rarely maintained for more than a few days in nearly every instance **(Exhibit 3)**.

Exhibit 3: Price performance of gold before and after the start of the military conflicts outlined in Table 1

X-axis: number of days before/after start of military action; Y-axis: Index, 100=start of conflict.



Source: Bloomberg, J.P. Morgan

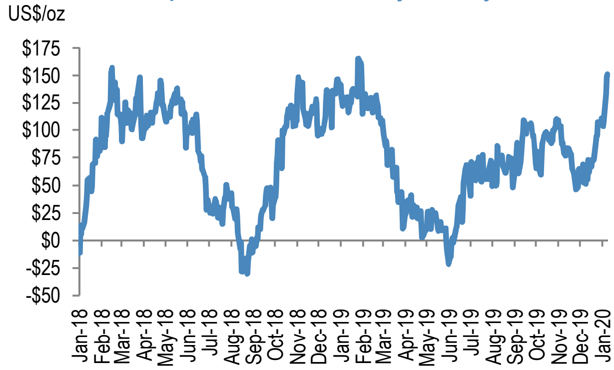
Looking chronologically, the 1980 breakout of the Iran-Iraq war seems to be the most 'textbook' representation in that the gold price rallied pretty steadily for the month before the breakout of war (~13%), peaked one day after Iraq invaded Iran and subsequently sold off by ~11% in the following month. Moving on, the gold price surged sharply three discrete times over the 1990/91 Gulf War (over the month following Iraq's invasion of Kuwait in August 1990, over the second half of September 1990 as the US lined up a broad coalition opposing Iraq, and in the month leading up to the start of Operation Desert Storm in January 1991), yet each relative rally was quickly unwound. For example, on average, gold rallied roughly 6% over the two weeks prior to the three peaks mentioned above, only to selloff by about 7% in the two weeks after. Finally, in the run-up to the 2003 Iraq war, gold prices actually peaked out a month and one half (~30 trading days) before the actual US invasion as the US was pushing to build international consensus for the upcoming military action. Yet the rally and selloff were just as sharp as the previous examples with gold increasing 7% in the two weeks preceding the peak and declining 10% after the top was in place. As you can see, the +5% rally followed by a 4% selloff from the peak over the last few trading days closely resembles these previous episodes, and even suggests further downside for gold in the very near-term if tensions continue to further de-escalate in the coming days.

It is interesting to note that the early-2011 military intervention in Libya appears to have had little influence on gold prices as nosediving US real yields and the broadening Eurozone debt crisis propelled a near-nonstop gold rally throughout our observation period as bullion was on its way towards a peak of $1,900/oz later that year.

From our admittedly small sample size analysis above, the best we can say about the gold price impact of Middle Eastern armed conflict among oil rich countries is that the risk premium boost to gold prices, while sizeable, ultimately proves fleeting and is actually fairly hard to consistently pinpoint relative to military escalation. This keeps us wary about buying into gold solely on the back of any re-escalating tensions between the US and Iran, unless the expected trade duration is very short. Essentially, continued escalating headlines are needed to keep gold's risk premium mounting. Those may indeed come but the reversal when they stop could be quite swift.

Exhibit 4: Gold's premium/discount to 10-year real yields

US$/oz



Source: J.P. Morgan, Bloomberg

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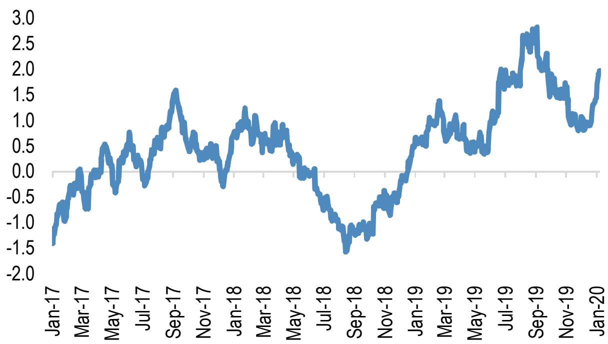
Regardless of geopolitics, we still think gold fundamentals, i.e. US real yields, will remain the driving medium-term catalyst for gold. Here, the current spot gold price appears about $140/oz rich relative to real yields, more than twice the premium averaged in early December and approaching the recent peaks of around $150-160/oz reached in 2018/19 **(Exhibit 4)**. Relatedly, investor net length has turned overextended (+2 on a scale of -5/+5) even if it is not quite at the +2.7 reached at the end of August **(Exhibit 5)**. For context, after reaching that level, gold shed more than 4% of its value in the following week.

Exhibit 5: Price momentum proxy for net investor gold positioning

-5 = max short, +5 = max long, daily



Source: CFTC, Bloomberg

Putting it all together, geopolitical risk premium has proven to be quite fleeting in previous instances of Middle East conflict, a trend we are seeing echoed in the last few days. In fact, now that the near-term crest has likely been reached in the current flare up, we could even see further unwind in the coming days given the likely positioning buildup and fundamental premium extension we have witnessed in the last few days. As for our base case, we still see gold supported above $1,500/oz in the medium-term ($1,500/oz 1Q average and $1,550/oz 2Q average forecast) as we believe the underlying fundamentals do remain supportive given our economists continue to call for a Fed cut next quarter.

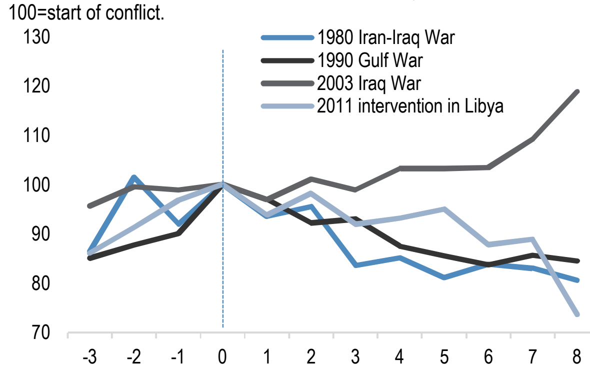
Industrial Metals – bearish but in the backseat

Base metals have largely ignored the tit for tat between the US and Iran, broadly chopping sideways despite the outsized moves in precious metals. When we run the same historical analysis around military escalations in the Middle East, the main takeaway is the consistency with which industrial metals have historically sold off following the outbreak of war in the region **(Exhibit 6)**.

More specifically, the GSCI Industrial Metals spot index decreased in the week following the start dates of all four conflicts outlined in Table 1, decreasing by about 4% on average.

Exhibit 6: Price performance of base metals before and after the start of the military conflicts outlined in Table 1

X-axis: number of months before/after start of military action; Y-axis: Index, 100=start of conflict.



Source: Bloomberg, S&P, J.P. Morgan

Base metals prices have historically remained depressed for a while after the start of conflict as well. Across all the scenarios we examined, base metals prices remained roughly on par with (within +2%) or below the level at which they traded when war broke out for roughly 10 weeks following the initial outbreak of conflict, with the average decline after those 10 weeks amounting to -6% across all four conflict scenarios. Even from this point, only the 2003 Iraq War bucks the trend with metals rallying over the late-stages of our observation window given the emergence of the China-driven supercycle.

Admittedly the analysis is based on a small sample size and China was only a dominant consumer like it is today in half of the historical scenarios we examined but the consistency of the selloff across our analysis should give base metals bulls a pause were tensions to re-escalate more seriously in the future. In the meantime, relatively subdued Chinese demand on the back of more cautious stimulus will remain the major macro driver of base metals this year, in our opinion. Moreover, the trajectory of global manufacturing and the progress on US/China trade negotiations will still likely be the dominant risk factors, even if tensions were to escalate once again. As for our base case, fundamentally, we continue to view 1Q20 as the likely peak for base metals prices this year as Chinese demand deteriorates later into the year, dragging industrial prices lower beginning next quarter. Any sort of military re-escalation in the Middle East, were it to come in the next couple months, would likely expedite this bearishness, however, we ultimately

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believe the drag from a conflict will be minor compared to the influence of these other major catalysts.

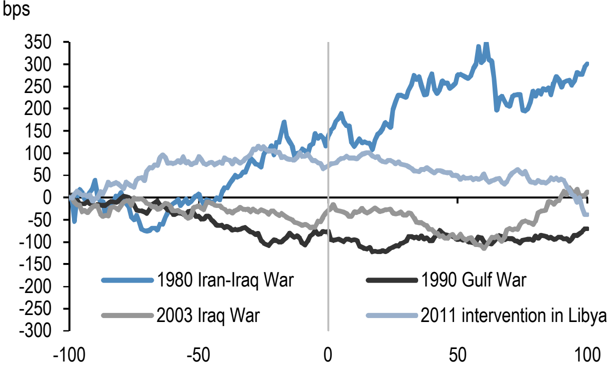
Similar to our views on metals, history indicates that broader macro forces will remain the primary driver of US Treasuries and the US dollar even if the threat of military conflict were to seriously re-escalate.

Treasuries

In order to estimate the potential effects of a protracted conflict between the US and Iran, we can observe how Treasury yields reacted around previous military conflicts in the Middle East. Specifically, **Exhibit 7** shows the cumulative changes in 10-year Treasury yields in the 200 days around the start of previous military escalations. At first glance, we do not find a discernible pattern, with Treasury yields declining ahead of only two of the five episodes (specifically the 1990/91 Gulf War and Operation Desert Storm and 2003 US invasion of Iraq), and also observe mixed results in the aftermath. Perhaps it makes sense that the large rallies in the Treasury market were observed during the episodes in which the US was directly involved, suggesting each rally could reflect increased risk aversion. However, the monetary policy environment likely played a role as well, and it is notable that the Fed was engaged in easing cycles throughout each of these episodes. In order to control for this, we can also look at the 10-year Treasury term premium, estimated by the New York Fed **(Exhibit 8)**.

Exhibit 7: Cumulative changes in 10-year yields around each military conflict outlined in Table 1

bps

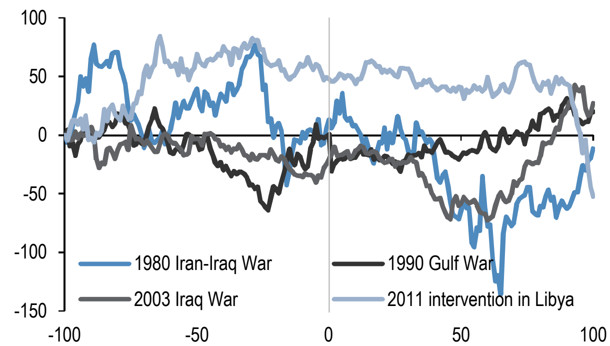


Source: J.P. Morgan

A few observations are worth noting. Unsurprisingly, the observed changes in term premium are much smaller in magnitude than the overall yield moves. On average across the four episodes, we observe a rally in the aftermath, with term premium declining roughly 50bp over the three months following the event, before retracing the move.

Exhibit 8: Cumulative changes in 10-year Treasury term premium around each military conflict in Table 1

bps



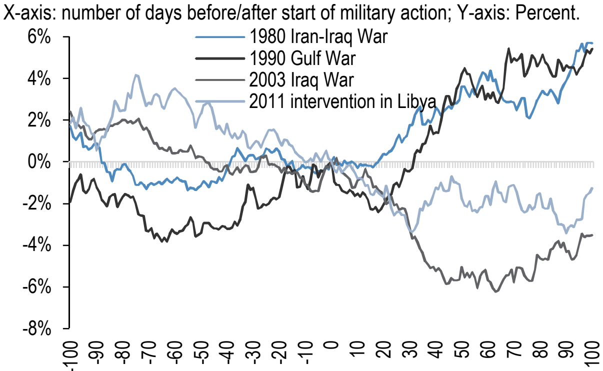
Source: J.P. Morgan, New York Fed

US Dollar

Similarly to rates, looking across MENA military escalations throughout the last forty years, we find that the broad dollar does not exhibit consistent behavior around the onset of military conflicts (Exhibit 9). Generally, the dollar has operated in a broad range of about +5% in the year surrounding the start of the conflict in question, and shows patterns of both strength and weakness over time. Instead, this price action more likely reflects the state of global growth or FX paradigm shifts operating in the background.

Exhibit 9: Price performance of the broad US dollar at the start of the military conflicts outlined in Table 1

X-axis: number of days before/after start of military action; Y-axis: Percent.



Source: Bloomberg, J.P. Morgan

For example, the dollar's strongest performance in the cycle chart was in 1980 and 1990/91, which is intuitive given the dollar's anti-cyclical and safe-haven behavior around recessions. So while there does appear to be some modest dollar softness across the board in the

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immediate wake of escalations, this can at least be partially explained by more medium-term dollar trends in at least half the instances, and underscores that broad macro drivers have generally overwhelmed the impact of military geopolitical engagements in the last few decades. At present, we forecast the dollar slightly higher in 2020 but see potential scope for broad-based USD weakness in the first quarter based on expectations for global growth improvement coupled with a concurrent slowdown in the US.

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Global Commodities Price Forecasts

Quarterly and annual averages

		Current								Actual change			
		Jan 8	1Q20	2Q20	3Q20	4Q20	2019	2020	2021	Past 1mo	Past 3mos	YTD	Past 12mos
Energy													
WTI Crude	US$/bbl	59.61	62.00	57.00	62.00	59.00	57.03	60.00	57.50	1.0%	11.3%	31.3%	19.7%
Brent Crude	US$/bbl	65.44	67.00	62.00	66.00	63.00	64.19	64.50	61.50	1.9%	10.7%	21.6%	11.4%
Natural Gas	US$/MMBtu	2.14	2.70	2.50	2.60	2.80	2.66	2.65		-4.1%	-3.5%	-27.2%	-27.8%
Base Metals													
Aluminum	US$/mt	1,768	1,790	1,750	1,675	1,700	1,794	1,729	1,700	0.5%	1.2%	-5.1%	-4.2%
Copper	US$/mt	6,152	6,200	6,000	5,800	5,600	6,008	5,900	5,362	1.7%	7.0%	3.4%	4.5%
Nickel	US$/mt	13,968	15,000	13,000	12,000	10,500	13,911	12,625	13,500	5.2%	-21.6%	31.7%	25.7%
Zinc	US$/mt	2,419	2,400	2,300	2,200	2,100	2,552	2,250	1,975	7.9%	-0.4%	-4.0%	-4.4%
Precious Metals													
Gold	US$/t oz.	1,556	1,500	1,550	1,475	1,450	1,392	1,494	1,650	6.5%	4.2%	21.4%	21.1%
Silver	US$/t oz.	18.10	17.86	18.67	17.56	17.06	16.20	17.79	20.40	9.0%	3.4%	16.8%	15.6%
Platinum	US$/t oz.	954	920	950	920	910	865	925	1,000	6.5%	6.1%	19.9%	16.4%
Palladium	US$/t oz.	2,108	1,675	1,600	1,500	1,450	1,540	1,556	1,250	12.0%	23.9%	67.1%	58.7%
Agriculture													
Wheat	USc/bu	553	530	530	520	540	494	530	540	3.9%	12.1%	9.8%	6.8%
Corn	USc/bu	384	410	415	390	410	383	406	418	5.1%	1.1%	2.5%	1.1%
Soybeans	USc/bu	938	930	940	940	960	890	943	960	4.6%	1.6%	6.3%	3.5%
Sugar (ICE #11)	Usc/lb	13.47	14.00	14.50	15.00	15.50	12.35	14.75	15.63	0.7%	8.5%	12.0%	5.6%
Cotton (ICE #2)	Usc/lb	69.96	64.00	63.00	63.00	65.00	67.28	63.75	65.50	7.0%	13.9%	-3.1%	-2.4%
MDE-Bursa Palm Oil	MYR/tonne	3,038	2,650	2,600	2,600	2,750	2,168	2,650	2,763	8.4%	42.3%	51.6%	44.0%
Bulk Commodities													
Iron Ore	US$/mt	87.82	85.00	82.00	80.00	75.00	92.50	80.50	75.00	2.6%	-6.5%	24.4%	21.3%

End of period levels

		Current								Actual change			
		Jan 8	1Q20	2Q20	3Q20	4Q20	2019	2020	2021	Past 1mo	Past 3mos	YTD	Past 12mos
Major Indices													
S&P GSCI ER	Index	235	242	228	242	235	238	235		2.3%	6.8%	13.8%	8.0%
BCOM ER	Index	81	83	80	81	80	81	80		3.1%	3.4%	5.0%	2.1%
GSCI ER Sub-indices													
GSCI Energy	Index	124	129	118	133	126	127	126		1.7%	9.5%	24.6%	15.1%
GSCI Industrial Metals	Index	170	169	162	156	153	169	153		2.5%	0.1%	0.6%	0.5%
GSCI Precious Metals	Index	195	191	189	182	180	191	180		6.7%	3.4%	17.9%	17.3%
GSCI Agriculture and Livestock	Index	63	65	64	63	65	63	65		3.1%	3.9%	-4.9%	-6.8%
BCOM ER Sub-indices													
BCOM Energy	Index	35	37	35	38	38	36	38		1.2%	4.8%	7.7%	2.0%
BCOM Industrial Metals	Index	116	115	109	104	101	115	101		3.5%	-1.4%	5.8%	4.1%
BCOM Precious Metals	Index	191	187	185	177	175	187	175		7.1%	3.2%	17.1%	16.5%
BCOM Agriculture and Livestock	Index	68	70	70	69	69	69	69		2.7%	4.8%	-3.0%	-5.4%

Source: J.P. Morgan.

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