

ENERGY & METALS CONSENSUS FORECASTS®

Commodity Price
Surveys Since 1995

WTI Al Cu Ni Pb Zn Sn Fe Au Ag Pt \$

**Survey Date
June 19, 2017**

Energy & Metals Consensus Forecasts surveys more than 40 energy and metals analysts every month for a range of commodity price forecasts. The results covering over 30 commodities – together with reference data, analysis, special surveys, and the underlying global macroeconomic outlook – are sent to subscribers by express mail and e-mail.

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Real (Inflation-Adjusted) Commodity Price Trends and Forecasts: A Special Analysis

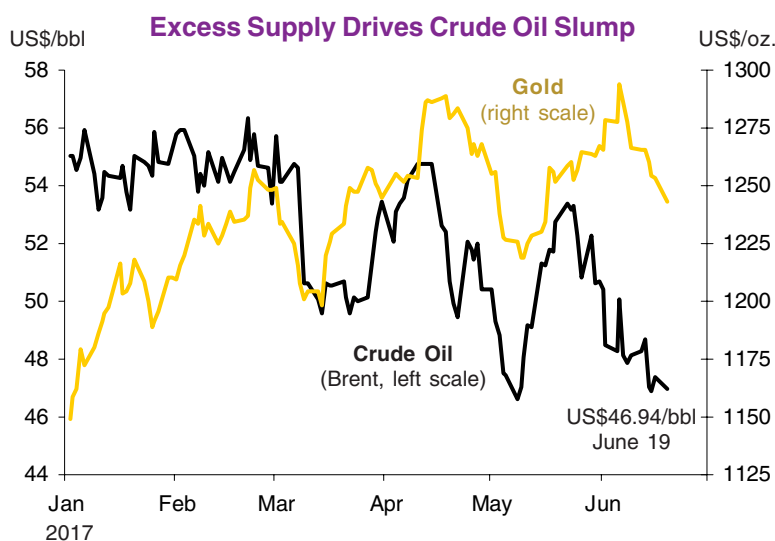
In this month's special analysis on pages 26 and 27, we review how major commodity prices have moved in recent years and consider how inflation-adjusted price projections can alter sentiment over the longer-term horizon.

Overview

More panellists have scaled back their near-term commodity price forecasts, following another largely weak spot price performance in Q2. Grabbing the headlines have been **Brent** and **WTI** (chart below and pages 6-7), as they tumbled below US\$50/bbl in response to unsuccessful efforts from OPEC-Russia to restrict supply and slash bloated global inventory levels. An extension of their self-imposed deal was announced in late May, but the move failed to convince investors that it would be deep enough to contain a reinvigorated US shale industry. In addition, the eruption of a diplomatic feud between Saudi Arabia and Qatar has added to Middle East tensions and threatened to un-

(continued on page 2)

Our next issue of **Energy & Metals Consensus Forecasts** will be available end of the day **July 21, 2017**.



(continued from front page)

dermine co-operative efforts from the cartel. **Base Metals** lost momentum, too, as bearish sentiment from energy spread and earlier disruptions to supply (including labour strikes at the Escondida mine in Chile and outages caused by a tropical cyclone in north east Australia) subsided. Our latest survey has been conducted at a time of fresh optimism in the outlook for the US dollar (see page 3), the strength of which would make commodities more expensive in local currency terms. An improvement in the global economic outlook, notably in Europe, should provide energy and metals some future support. Yet, as theory suggests, an upturn in demand might not trigger an increase in price in a highly competitive environment. Certainly, despite supply side reforms in China and efforts to shutdown inefficient and high emission production facilities, significant idle capacity exists, which could be restarted quickly and cap price pressures. On page 5 we feature updated **Long-Term Forecasts** for over 25 commodities, covering the years **2017 to 2026**.

SUMMARY OF SELECT ENERGY & METALS CONSENSUS FORECASTS

See individual commodity pages for mineral specifications	See page	% change since end Dec. 2016	Spot Price Jun. 19 2017	(Nominal, Quarterly Averages) Consensus Forecasts			Forecast % Change to Jun. 2018 Quarter
				Dec. 2017	Mar. 2018	Jun. 2018	
Crude Oil - Brent (US\$/bbl)	6	-17.5%	46.94	56.43	56.39	56.82	+21.0%
- WTI (US\$/bbl)	7	-17.7%	44.24	54.78	54.84	55.03	+24.4%
Natural Gas (US, US\$/MMBtu)	9	-22.3%	2.860	3.147	3.194	3.101	+8.4%
Coal (Steaming, US\$/tonne)	10	+22.7%	73.61 ¹	71.94	69.33	67.73	-8.0%
Uranium (US\$/lb)	11	-2.0%	19.85	26.11	28.89	30.11	+51.7%
Aluminium (US\$/tonne)	12	+8.6%	1862	1885	1877	1868	+0.4%
Alumina (US\$/tonne)	13	-18.9%	283.4	299.7	301.1	298.4	+5.3%
Copper (US\$/tonne)	14	+3.4%	5687	5719	5669	5691	+0.1%
Nickel (US\$/tonne)	15	-11.1%	8895	10099	10435	10567	+18.8%
Lead (US\$/tonne)	16	+5.3%	2113	2201	2176	2161	+2.3%
Zinc (US\$/tonne)	17	-1.1%	2535	2764	2746	2726	+7.5%
Tin (US\$/tonne)	20	-6.1%	19815	20132	20149	20291	+2.4%
Steel (HRC, Europe, US\$/tonne)	18	-2.6%	565.0	503.8	498.3	490.8	-13.1%
Iron Ore (N. China. Fine, US\$/tonne)	19	+10.7%	62.50 ¹	60.57	58.88	58.42	-6.5%
Gold (US\$/oz.)	22	+8.3%	1243	1245	1244	1247	+0.3%
Silver (US\$/oz.)	23	+1.5%	16.48	17.78	17.97	17.96	+9.0%
Platinum (US\$/oz.)	24	+1.7%	924	1001	1041	1047	+13.3%
Palladium (US\$/oz.)	25	+25.6%	856.9	790.4	807.0	806.3	-5.9%

¹ Consensus Forecasts for the Current Quarter

NOTES, ABBREVIATIONS, WEIGHTS AND MEASURES

- | | |
|---|--|
| □ EIA – Energy Information Agency (USA) | □ e – Estimate |
| □ LME – London Metal Exchange | □ na – Not Available |
| □ LBMA – London Bullion Market Association | □ fob – Free On Board |
| □ LPPM – London Platinum and Palladium Market | □ bbl – Barrel |
| □ NYMEX – New York Mercantile Exchange | □ dltu – Dry long tonne unit (1/100 of a dry long tonne) |
| □ COMEX – New York Commodities Exchange | □ dmtu – Dry metric tonne unit (1/100 of a dry metric tonne) |
| □ ICE – Intercontinental Exchange | □ MMBtu – Millions of British Thermal Units (Btu) |
- All individual commodity forecasts on pages 6-25 (pages 4-23 in abridged versions) are listed in descending order of their approximate 1-year percentage change estimates. Consensus forecasts are mean averages of individual quarterly average forecasts.
 - Historical price data in this publication has been provided by Commodity Research Bureau and other sources.
 - Gross Domestic Product (GDP) is expressed in real (i.e. inflation-adjusted) terms. GDP and Industrial Production are expressed as average percentage changes over the previous calendar year unless otherwise indicated.
 - 1 kilogram = 32.1507 troy ounces
 - 1 short ton = 0.907 metric tonnes = 2000 pounds
 - 1 kilogram (kg) = 2.2046 pounds
 - 1 barrel = 42 US gallons
 - 1,000 kilograms = 1 metric tonne = 2204.6 pounds
 - 10 Therms of Natural Gas = 1 million Btu = 1MMBtu
 - 1 long tonne = 1.016 metric tonnes = 2240 pounds
 - 1 metric/long tonne unit (MTU/LTU) = 1/100 of a metric/long tonne

Economic growth rates provide a valuable insight into the behaviour of energy and metals prices, with industrial production growth forecasts in particular giving an overview of the likely demand for many commodities. The forecasts below are taken from the current issues of our publications *Consensus Forecasts – G7 & Western Europe*, *Asia Pacific Consensus Forecasts*, *Eastern Europe Consensus Forecasts* and *Latin American Consensus Forecasts*.

REAL GDP GROWTH

(% change on previous year)

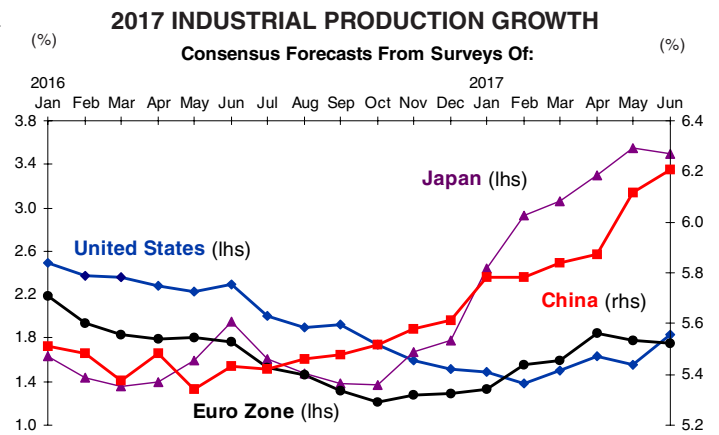
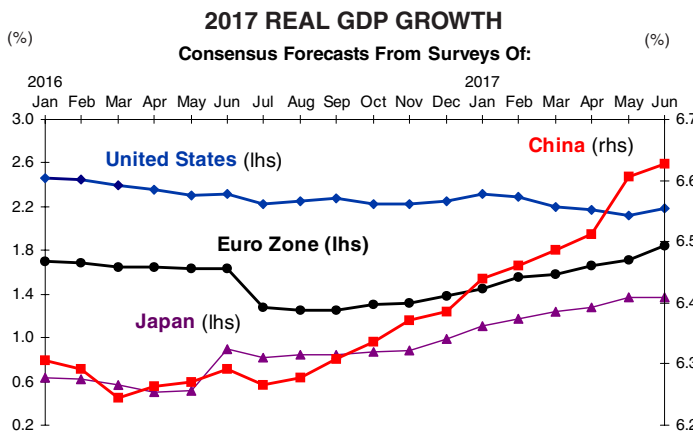
	2014	2015	2016	Consensus Forecasts	
				2017	2018
United States	2.4	2.6	1.6	2.2	2.4
China	7.3	6.9	6.7	6.6	6.2
Japan	0.2	1.1	1.0	1.4	1.1
Euro zone	1.3	1.9	1.7	1.8	1.6
World¹	3.1	2.8	2.5	2.9	3.0

¹ Country weights available to qualified subscribers upon request.

INDUSTRIAL PRODUCTION GROWTH

(% change on previous year)

	2014	2015	2016	Consensus Forecasts	
				2017	2018
United States	3.1	-0.7	-1.2	1.8	2.3
China	8.3	6.1	6.0	6.2	5.6
Japan	2.1	-1.2	-0.2	3.5	1.5
Euro zone	0.8	2.1	1.4	1.8	1.7
World	3.2	1.5	1.7	3.1	2.8



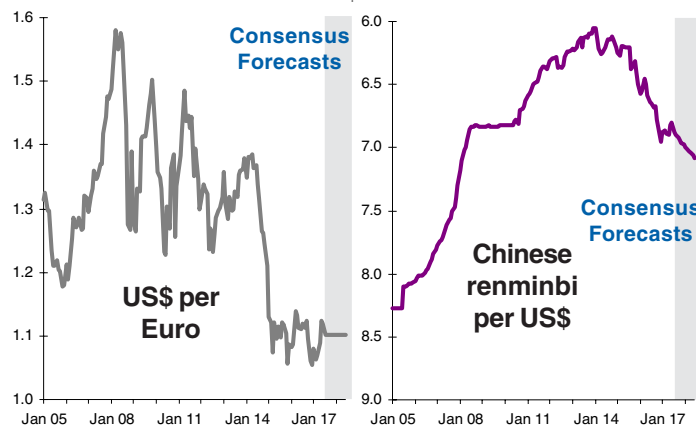
Firmer China and Moderate US Growth in 2017

Optimism in 2017 forecasts for the US economy has thus far been short supply, in contrast with China and the euro zone. Whereas the consensus is predicting that US growth will average 2.2% in 2017, down a tick from our survey in January, those for China (+0.2%-points), Japan (+0.3%) and the euro zone (+0.4%) have been revised higher. Early waves of confidence after Donald Trump was elected as the new US President in November 2016 have diminished, amid delays to his promised tax cuts, deregulation and infrastructure investment. Yet our panel has upgraded its 2018 US GDP growth forecast (+0.1%), as some stimulus is expected to eventually feed through to the economy.

Changes to Consensus GDP Growth Forecasts

	Jan. 9, 2017 Survey		Jun. 12, 2017 Survey		% -point Change	
	2017	2018	2017	2018	2017	2018
United States	2.3	2.3	2.2	2.4	-0.1	+0.1
China	6.4	6.1	6.6	6.2	+0.2	+0.1
Japan	1.1	0.9	1.4	1.1	+0.3	+0.2
United Kingdom	1.4	1.4	1.6	1.4	+0.2	0.0
Euro zone	1.4	1.5	1.8	1.6	+0.4	+0.1
World	2.8	2.9	2.9	3.0	+0.1	+0.1

Source: Consensus Economics



EXCHANGE RATES

(per US dollar)

Source: Foreign Exchange Consensus Forecasts, June 12, 2017

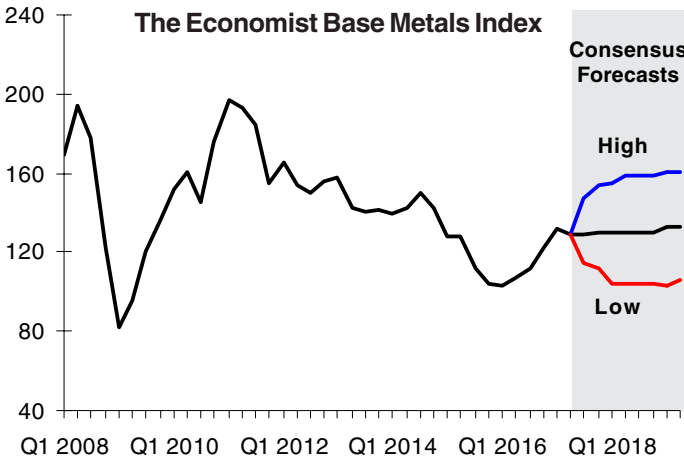
	Spot Rate Jun. 12, 2017	Consensus Forecasts			
		End Sep 2017	End Jun 2018	% change from spot	End Jun 2019
Euro¹	1.120	1.102	1.103	-1.6	1.117
Japanese yen	109.8	112.5	113.9	-3.6	115.1
Australian dollar¹	0.754	0.736	0.727	-3.6	0.734
Chinese renminbi	6.798	6.926	7.079	-4.0	7.053
Canadian dollar	1.344	1.355	1.334	+0.8	1.295
Brazilian real	3.296	3.267	3.354	-1.7	3.629
Indian rupee	64.45	64.89	66.05	-2.4	66.84

US Dollar Bouyed by Hawkish Fed Statements

The US dollar inched higher late last week, after the US Fed hiked rates by another 25 basis points and underlined intentions to unwind its enormous bond portfolio. Expectations ahead of the rate decision had been mixed, as a recent spate of weak economic indicators raised the likelihood of a

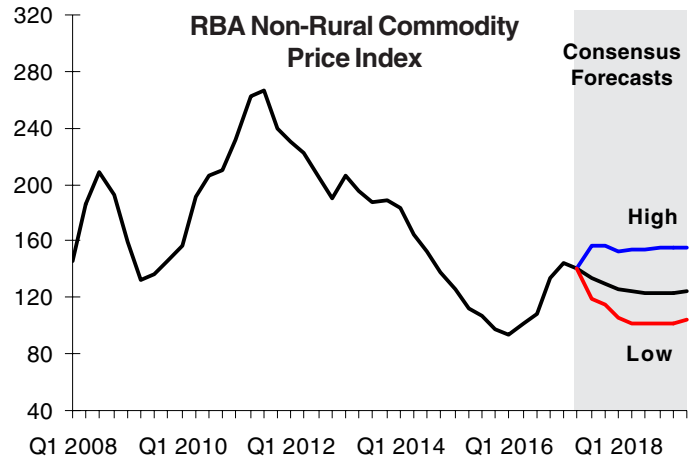
more dovish stance. Yet the growth slowdown is thought to be transitory and underlying fundamentals in the US economy remain sound. Currencies that benefited from a softer dollar performance in the year to date could see some of their advances reversed as a consequence, including the Japanese yen and the Brazilian real (table above).

Commodity price indices are useful aggregates of individual commodity price trends. We focus here on two commodity price indices: **The Economist Base Metals Index** (which weights the prices of major base metals according to their share of world trade in 2005) and the **Reserve Bank of Australia (RBA) Non-Rural Commodity Price Index** (which weights the prices of major minerals according to their share of Australian exports in 2015/2016). Both indices are expressed as US\$ prices in a given base year and track the performance of their particular subset of commodities. In addition to showing historical data from the two indices, we also show consensus forecasts for both over the next eight quarters. These are calculated from weighting consensus commodity price forecasts from this edition's survey. In the first two charts below, we also show the highest and lowest projections over the forecast horizon in order to illustrate the range of forecasts.



Weights By Share of World Trade:

Aluminium (47%), Copper (32%), Nickel (8%), Zinc (7%), Lead (3%), Tin (3%)



Weights By Share of Australia Export Values:

Coking Coal (21%), Thermal Coal (14%), Gold (13%), Iron Ore Lump (13%), Aluminium (11%), Alumina (10%), LNG (7%), Copper (4%), Nickel (4%), Zinc (2%), Lead (1%)

The Economist Base Metals Index is a sub-index of the headline Economist Commodity Price Index, containing six base metals: Aluminium, Copper, Lead, Nickel, Tin and Zinc. The index base year is **2005 = 100**, and the headline index is available in sterling and euros, as well as US dollars. It is published on a weekly basis. *Energy & Metals Consensus Forecasts* then converts this week-by-week data into quarterly averages and calculates the index forecasts by using our panellists' projections for the individual metals.

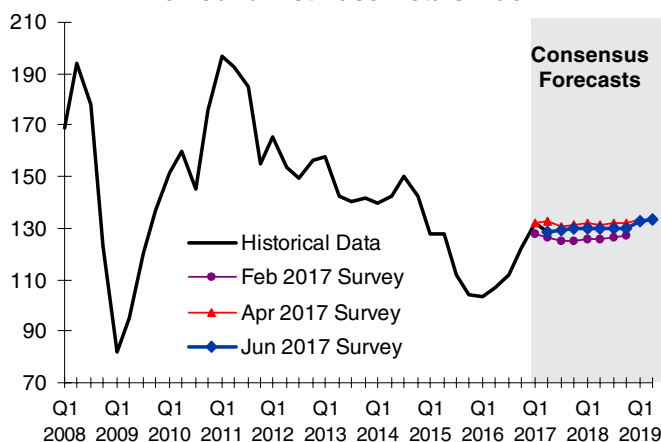
The RBA Non-Rural Commodity Price Index is a sub-index of the RBA's Headline Index of Commodity Prices. The index uses an Australian fiscal base year **2015/2016** (July to June) and weights major minerals (listed above) according to their share of Australian export values. Oil is excluded while liquefied natural gas (LNG) is included (it is some 7% of the index, but is not included in *Energy & Metals Consensus Forecasts* calculations, as we do not survey for LNG forecasts).

Recent Historical Data and Projections Using Consensus Forecasts

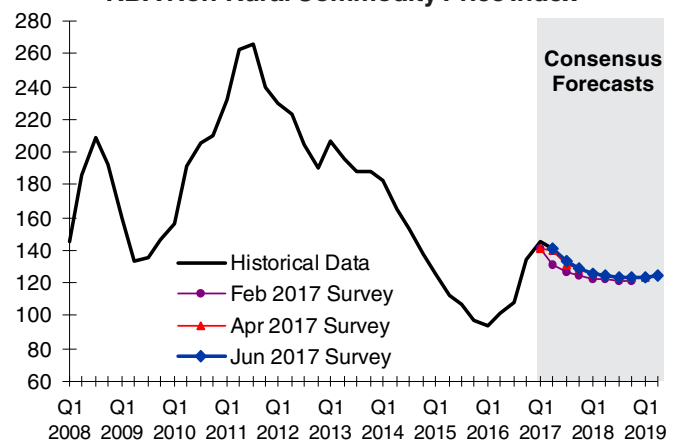
	2016		2017				2018				2019	
	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	
Economist Base Metals Index	122.0	131.8	128.8	129.3	130.2	129.9	129.9	130.1	129.8	132.5	133.1	
RBA Non-Rural Commodity Price Index	134.3	152.0	140.6	133.4	129.1	125.7	124.8	123.6	123.3	123.2	124.5	

(all index values are quarterly averages)

Changes in the Consensus: The Economist Base Metals Index



Changes in the Consensus: RBA Non-Rural Commodity Price Index



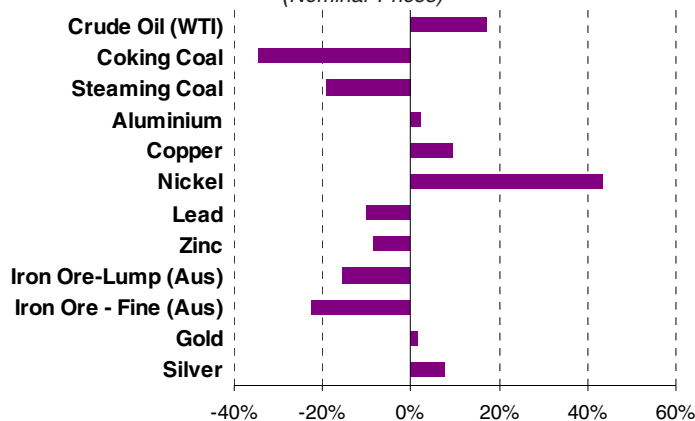
Individual nominal forecasts available in the Excel spreadsheet.

Long-term price forecasts provide a foundation for expected returns from both existing production facilities and those under development. In addition to their annual forecasts for the years 2017 to 2021, the table below summarises our panel's Long-Term 5-10 year average estimates (2022-2026) in nominal and real (inflation adjusted) 2017 dollar terms.

See individual commodity pages for mineral specifications	US\$ Average		Consensus Forecasts						
	2015	2016	(US\$ Nominal, Annual Averages)					Long-Term (2022-2026 Average)	
			2017	2018	2019	2020	2021	Nominal	Real
Crude Oil - Brent	52.40	43.74	53.78	56.91	58.84	61.56	63.38	65.58	60.98
- WTI	48.74	43.21	52.01	55.13	56.37	59.35	60.93	61.09	57.83
RBOB Gas (US)	1.913	1.453	1.653	1.695	1.782	1.880	2.020	na	na
Gas Oil (Europe)	495.4	396.5	468.4	491.1	524.2	561.4	616.4	na	na
Natural Gas - US	2.624	2.511	3.085	3.162	3.212	3.235	3.312	3.556	3.141
- UK, pence	42.95	35.27	42.02	40.23	39.75	48.50	55.00	na	na
Coking Coal - Contract	101.6	119.4	182.0	123.0	114.7	116.1	118.9	126.2	115.1
Thermal Coal - Contract	71.30	66.09	83.52	77.12	71.50	69.07	67.52	65.16	61.05
- Spot	56.84	54.42	70.17	67.52	62.87	62.04	62.58	64.34	59.58
Uranium	36.82	26.77	24.10	30.83	36.65	41.22	46.62	48.32	43.65
Aluminium	1662	1605	1879	1867	1846	1873	1919	2120	1886
Alumina	310.0	253.8	309.9	296.7	295.5	297.9	303.2	334.7	303.0
Copper	5502	4863	5730	5701	5867	6153	6263	6508	5978
Nickel	11829	9587	9871	10667	12027	13105	14146	16455	14628
Lead	1786	1870	2206	2141	2062	1985	1980	2033	1868
Zinc	1931	2093	2716	2715	2563	2465	2481	2520	2228
Cobalt	13.27	11.87	23.08	20.39	19.08	18.30	18.50	15.35	13.23
Tin	16083	18002	20047	20171	20008	19889	19669	22522	19590
Manganese	3.083	4.338	5.159	4.196	3.807	3.821	3.846	4.221	3.910
Molybdenum	6.691	6.507	7.676	7.439	7.750	7.991	8.275	8.621	7.755
Rutile	865.3	709.8	773.0	868.7	922.8	960.8	1019	1065	965.3
Ilmenite	124.2	104.5	126.8	132.8	143.1	151.0	163.9	156.9	141.9
Zircon	1100	1032	1001.7	1091	1148	1199	1246	1231	1099
Steel - HRC, Europe	432.9	458.3	555.6	485.5	475.7	483.4	488.1	509.2	446.2
HRC, USA	484.9	545.5	635.5	595.5	586.1	600.9	628.1	700.7	619.4
HRC, China	299.5	337.4	417.6	411.3	417.6	431.7	434.8	478.3	421.1
Iron Ore - Lump (Aust)	57.53	54.27	68.97	57.98	58.02	57.88	58.40	63.85	58.48
Fine (Aust)	45.43	48.08	60.02	48.30	46.03	46.28	46.56	54.22	48.68
Fine (Brz)	43.40	49.82	55.55	48.71	50.07	52.12	54.12	na	na
Gold	1160	1248	1243	1249	1271	1278	1264	1313	1179
Silver	15.69	17.08	17.55	18.05	18.46	18.85	18.89	19.72	18.19
Platinum	1044	986.3	977	1064	1165	1221	1257	1252	1177
Palladium	687.5	612.2	787.6	816.7	859.7	883.5	871.5	734.5	662.2

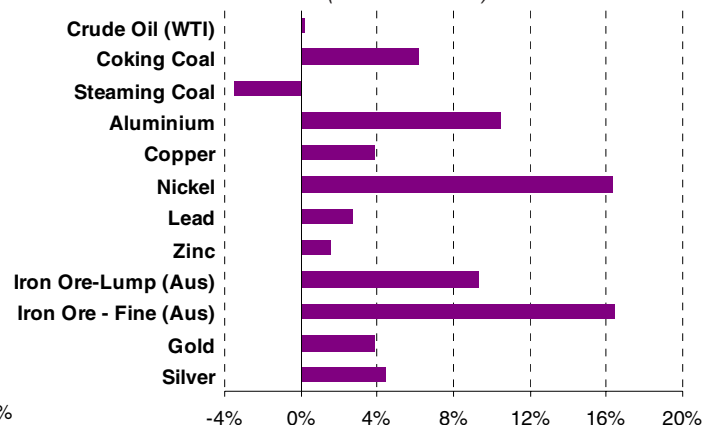
% Change Between 2017 and 2021

(Nominal Prices)



% Change Between 2021 and Long-Term Average

(Nominal Prices)



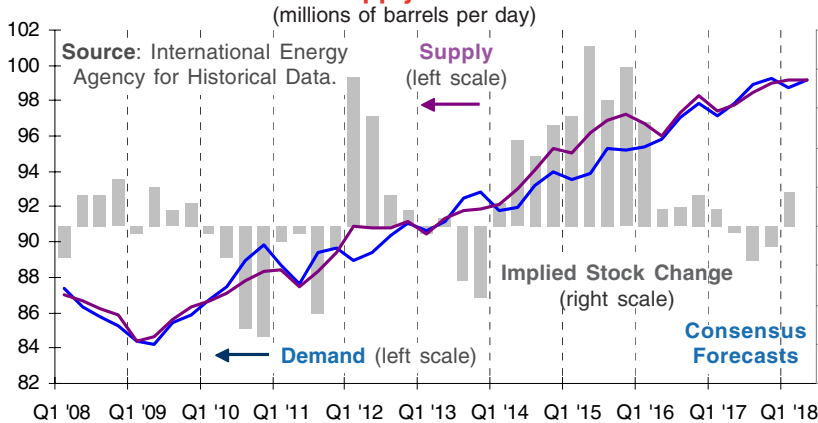
Brent Crude Oil Forecasts, US\$/barrel

Nominal, Quarterly Averages, Annual Price Forecasts on Page 5

Survey Date Spot (Jun. 19): US\$ 46.94	Sep '17	Dec '17	Mar '18	Jun '18	% change from spot	Sep '18	Dec '18	Mar '19	Jun '19
Lloyds Bank	60.00	62.00	67.00	69.00	47.0%	70.00	70.00	na	na
Credit Suisse	61.00	62.00	64.50	65.50	39.5%	65.50	64.50	65.00	65.00
ABN Amro	55.00	60.00	60.00	65.00	38.5%	65.00	60.00	60.00	65.00
UBS	62.50	64.00	65.00	65.00	38.5%	65.00	65.00	70.00	70.00
BNP Paribas	58.00	65.00	64.00	63.00	34.2%	63.00	61.00	65.00	na
Citigroup	60.00	65.00	59.00	63.00	34.2%	61.00	58.00	52.00	52.00
Deloitte Access Economics	54.82	57.36	59.52	61.35	30.7%	62.91	64.23	65.35	66.31
GKI Research	55.00	57.00	60.00	60.00	27.8%	60.00	62.00	62.00	65.00
Standard Chartered	55.00	58.00	62.00	59.00	25.7%	59.00	na	na	na
Australia Dept of Industry	57.30	58.10	59.00	58.70	25.1%	57.90	58.90	59.00	62.28
Investec	55.00	55.00	58.00	58.00	23.6%	58.00	58.00	58.00	58.00
Scotiabank	56.25	57.25	57.00	58.00	23.6%	60.00	61.00	na	na
Ecoanalitica	52.16	57.92	57.99	57.99	23.5%	57.99	57.99	64.08	64.08
Peasco Economics	51.53	54.11	56.27	57.96	23.5%	59.12	60.60	62.11	63.67
Moody's Analytics	54.48	56.00	56.90	57.70	22.9%	58.47	59.40	60.22	60.88
Capital Economics	52.50	57.50	59.00	57.50	22.5%	56.50	55.50	na	na
Societe Generale	57.50	60.00	60.00	57.50	22.5%	60.00	60.00	65.00	65.00
Euromonitor International	56.00	56.48	56.90	57.29	22.1%	57.62	57.88	58.00	58.10
Macquarie	56.00	59.00	58.50	57.00	21.4%	55.50	54.50	56.00	59.00
Banco de Credito del Peru	54.00	54.00	54.85	55.85	19.0%	56.35	56.35	57.35	57.35
Deutsche Bank	50.00	55.00	52.00	55.00	17.2%	55.00	55.00	54.30	54.30
Liberum Capital	50.00	50.00	50.00	55.00	17.2%	55.00	55.00	55.00	55.00
Econ Intelligence Unit	54.50	56.00	56.00	53.00	12.9%	49.00	51.00	52.00	53.00
P K Verleger	49.00	50.00	52.00	53.00	12.9%	54.00	56.00	57.00	59.00
Morgan Stanley	51.89	52.08	52.28	52.13	11.0%	51.98	51.79	51.77	51.36
Commonwealth Bank	54.00	56.00	50.00	52.00	10.8%	55.00	52.00	47.50	45.00
Oxford Economics	50.00	51.00	51.50	51.50	9.7%	52.00	52.00	58.93	58.93
ING Bank	45.00	45.00	40.00	45.00	-4.1%	50.00	50.00	45.00	50.00
JP Morgan	56.00	57.00	48.00	43.00	-8.4%	44.00	45.00	na	na
China Int'l Capital Corp	45.00	45.00	44.50	40.50	-13.7%	43.50	44.50	45.50	44.00
Consensus (Mean)	54.31	56.43	56.39	56.82	21.0%	57.28	57.14	57.84	58.43
High	62.50	65.00	67.00	69.00		70.00	70.00	70.00	70.00
Low	45.00	45.00	40.00	40.50		43.50	44.50	45.00	44.00
Standard Deviation	4.16	4.97	6.06	6.40		5.97	5.74	6.45	6.79

Survey of April 18, 2017		Crude Oil Volumes - Supply and Demand Consensus Forecasts							
World	(millions of barrels per day)	2016 Q3	Q4	2017 Q1	Q2	Q3	Q4	2018 Q1	Q2
Supply		97.30	98.30	97.41	97.79	98.44	98.98	99.16	99.19
Demand		97.05	97.90	97.19	97.87	98.88	99.24	98.72	99.18
Balance		0.25	0.40	0.22	-0.08	-0.44	-0.26	0.43	0.01

Global Crude Oil Supply and Demand Balances

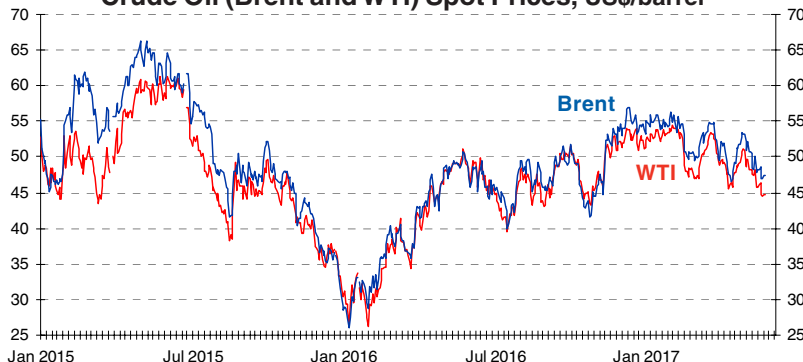


Brent at a Seven Month Low

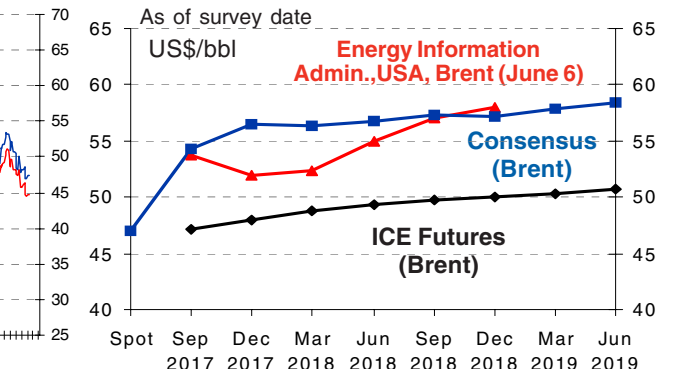
- ◆ Brent has lost more than 10% of its value in recent weeks, as it became clear that efforts to drain bloated global inventory levels have thus far been in vain.
- ◆ OPEC and Russia agreed in late May to extend their production cuts by another nine months. However, stockpiles in the US remain high, driven by a surge in output from shale producers.
- ◆ A more balanced relationship between global supply and demand now looks unlikely to emerge until early 2018.

(Continued on page 7)

Crude Oil (Brent and WTI) Spot Prices, US\$/barrel



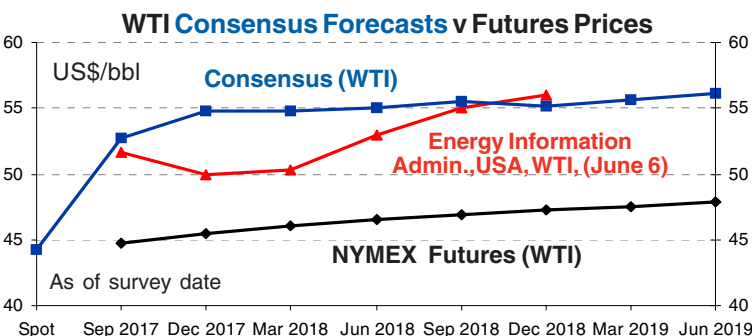
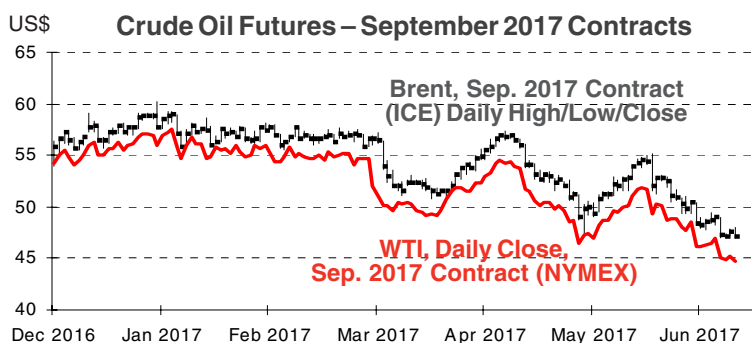
Brent Consensus Forecasts v Futures Prices



WTI Crude Oil Forecasts, US\$/barrel

Nominal, Quarterly Averages, Annual Price Forecasts on Page 5

Survey Date Spot (Jun. 19): US\$ 44.24	Sep '17	Dec '17	Mar '18	Jun '18	% change from spot	Sep '18	Dec '18	Mar '19	Jun '19
Lloyds Bank	58.00	60.00	64.00	66.00	49.2%	67.00	67.00	na	na
ABN Amro	55.00	60.00	60.00	65.00	46.9%	65.00	60.00	55.00	60.00
Credit Suisse	60.00	60.00	61.50	63.50	43.5%	63.50	61.50	62.50	62.50
UBS	60.50	62.00	63.00	63.00	42.4%	63.00	63.00	68.00	68.00
Ecoanalitica	51.62	57.38	60.86	60.86	37.6%	60.86	60.86	62.90	62.90
BNP Paribas	55.00	61.00	61.00	60.00	35.6%	61.00	59.00	64.00	na
Citigroup	57.00	62.00	56.00	60.00	35.6%	58.00	54.00	49.00	49.00
Investec	55.00	55.00	58.00	58.00	31.1%	58.00	58.00	58.00	58.00
Australia Dept of Industry	56.42	57.23	58.15	57.85	30.8%	57.04	58.04	58.14	61.42
GKI Research	53.00	54.00	57.00	57.00	28.8%	57.00	59.00	59.00	62.00
Euromonitor International	54.61	55.27	55.80	56.25	27.1%	56.59	56.85	56.95	57.03
CIBC	51.00	51.00	56.00	56.00	26.6%	56.00	56.00	na	na
Standard Chartered	52.00	56.00	60.00	56.00	26.6%	56.00	na	na	na
Capital Economics	52.50	56.50	57.00	55.50	25.5%	54.50	53.50	na	na
Pezco Economics	49.04	51.49	53.55	55.16	24.7%	56.26	57.67	59.11	60.59
P K Verleger	51.00	52.00	54.00	55.00	24.3%	56.00	58.00	59.00	61.00
Scotiabank	54.00	55.00	54.00	55.00	24.3%	57.00	58.00	na	na
Societe Generale	55.00	57.50	57.50	55.00	24.3%	57.50	57.50	62.00	62.00
Moody's Analytics	51.48	53.00	53.90	54.70	23.6%	55.47	56.40	57.22	57.88
Banco de Credito del Peru	53.00	53.00	53.50	54.50	23.2%	55.00	55.00	56.00	56.00
Macquarie	53.50	57.00	56.50	54.00	22.1%	52.50	51.00	52.50	55.00
Deutsche Bank	47.00	52.00	49.00	52.00	17.5%	52.00	52.00	51.30	51.30
Econ Intelligence Unit	52.95	54.29	54.13	51.34	16.1%	47.49	49.39	50.35	51.34
Morgan Stanley	49.70	50.08	50.20	50.41	13.9%	50.45	50.37	50.34	48.98
Commonwealth Bank	52.00	54.00	48.00	50.00	13.0%	52.00	48.00	43.50	41.00
Oxford Economics	48.28	49.25	49.73	49.73	12.4%	50.21	50.21	56.90	56.90
ING Bank	45.00	45.00	40.00	45.00	1.7%	50.00	50.00	45.00	50.00
JP Morgan	53.00	54.00	45.00	40.00	-9.6%	41.00	42.00	na	na
China Int'l Capital Corp	43.50	43.50	43.00	39.00	-11.8%	42.00	43.00	44.00	43.00
Consensus (Mean)	52.76	54.78	54.84	55.03	24.4%	55.46	55.19	55.68	56.17
High	60.50	62.00	64.00	66.00		67.00	67.00	68.00	68.00
Low	43.50	43.50	40.00	39.00		41.00	42.00	43.50	41.00
Standard Deviation	3.92	4.55	5.85	6.40		5.98	5.73	6.54	6.83



Bearish Near Term WTI Price Outlook

- ◆ WTI slipped below US\$45/bbl last week, after the latest inventory report from the Energy Information Agency revealed a drop in demand and an increase in the supply of US crude oil products like gasoline.
- ◆ US shale producers have ramped up production of the fossil fuel in response to the earlier sharp price increase. According to Baker Hughes, the number of rigs punching new wells in the US has climbed for 22 straight weeks to 747 (933 including gas).
- ◆ WTI could be affected by the debated 2018 budget proposals to shrink the Strategic Petroleum Reserve (SPR), a cushion against supply shocks. However, while the US is no longer as reliant on imports as before, some warn of possible risks like a collapse in supply from Venezuela. In addition, reductions in the SPR could undermine efforts by OPEC to reduce global inventory levels.



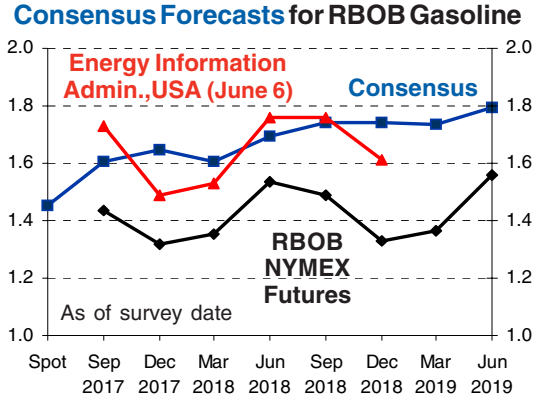
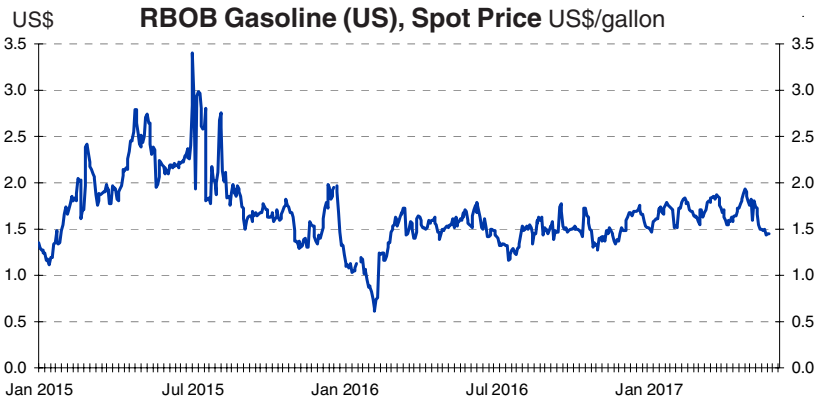
US Crack Spread

Crude oil is refined into numerous saleable products including gasoline and Gas Oil (or heating oil). The crack spread is used to estimate the profitability of refining the raw material. When the spread is positive, the price of the refined products is above that of crude oil, helping profitability. The chart opposite shows a commonly used 3:2:1 crack spread, reflecting a ratio of refinery output of 2 barrels of RBOB gasoline and 1 barrel of US heating oil from 3 barrels of WTI crude oil.

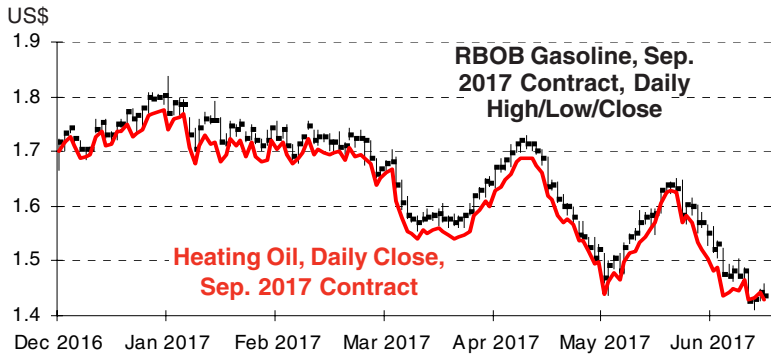
RBOB Gasoline (US) Forecasts, US\$/gallon, fob

Nominal, Quarterly Averages, Annual Price Forecasts on Page 5

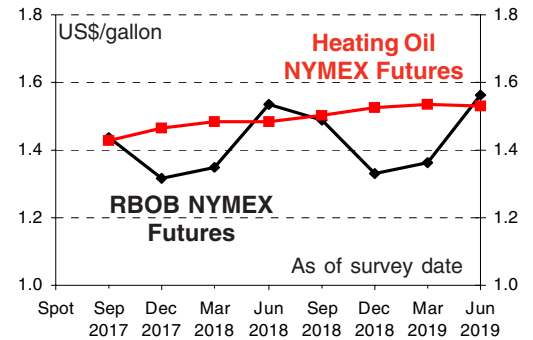
Survey Date Spot (Jun. 19): US\$ 1.452	Sep '17	Dec '17	Mar '18	Jun '18	% change from spot	Sep '18	Dec '18	Mar '19	Jun '19
GKI Research	1.600	1.700	1.800	1.900	30.9%	2.000	2.100	2.100	2.200
BNP Paribas	1.830	1.900	1.760	1.790	23.3%	1.930	1.810	1.790	na
Deutsche Bank	1.550	1.530	1.420	1.700	17.1%	1.670	1.490	1.600	1.600
Societe Generale	1.670	1.750	1.750	1.670	15.0%	1.730	1.730	1.800	1.800
P K Verleger	1.520	1.540	1.560	1.640	12.9%	1.670	1.700	1.680	1.770
ING Bank	1.450	1.450	1.350	1.450	-0.1%	1.450	1.600	1.450	1.600
Consensus (Mean)	1.603	1.645	1.607	1.692	16.5%	1.742	1.738	1.737	1.794
High	1.830	1.900	1.800	1.900		2.000	2.100	2.100	2.200
Low	1.450	1.450	1.350	1.450		1.450	1.490	1.450	1.600
Standard Deviation	0.134	0.168	0.192	0.151		0.199	0.209	0.220	0.245



RBOB/Heating Oil Futures – September 2017 Contracts (NYMEX)



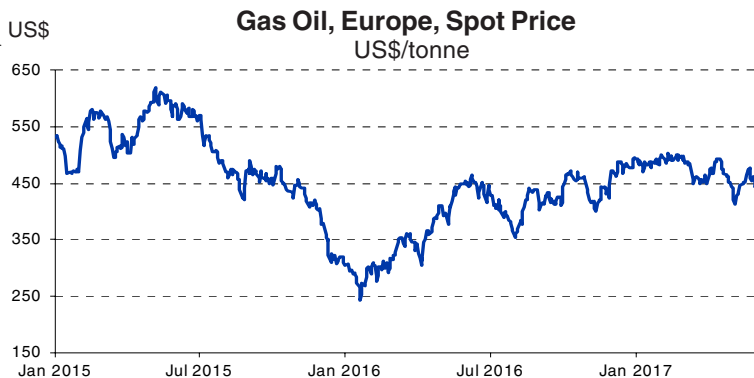
Futures Prices For RBOB and Heating Oil



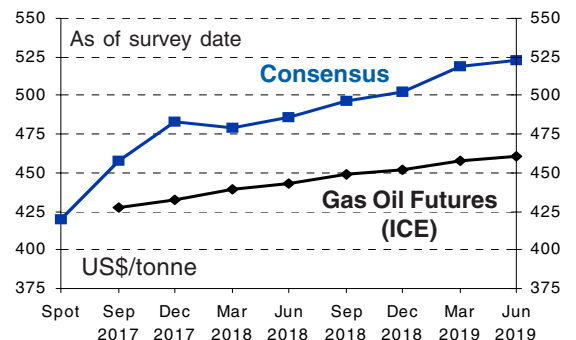
European Gas Oil Forecasts, US\$/tonne, fob

Nominal, Quarterly Averages, Annual Price Forecasts on Page 5

Survey Date Spot (Jun. 19): US\$ 419.3	Sep '17	Dec '17	Mar '18	Jun '18	% change from spot	Sep '18	Dec '18	Mar '19	Jun '19
BNP Paribas	507.0	559.0	566.0	551.0	31.4%	544.0	536.0	581.0	na
GKI Research	470.0	490.0	520.0	520.0	24.0%	520.0	540.0	540.0	560.0
Societe Generale	503.0	525.0	525.0	503.0	20.0%	523.0	523.0	611.0	611.0
Deutsche Bank	438.4	483.4	458.9	487.2	16.2%	490.8	495.0	510.9	510.9
P K Verleger	454.0	463.0	469.0	481.0	14.7%	493.0	510.0	508.0	521.0
ING Bank	375.0	375.0	335.0	375.0	-10.6%	410.0	410.0	365.0	410.0
Consensus (Mean)	457.9	482.6	479.0	486.2	16.0%	496.8	502.3	519.3	522.6
High	507.0	559.0	566.0	551.0		544.0	540.0	611.0	611.0
Low	375.0	375.0	335.0	375.0		410.0	410.0	365.0	410.0
Standard Deviation	48.7	62.7	80.8	60.0		47.0	48.2	85.6	74.2



Gas Oil Consensus Forecasts v Futures Prices



Natural Gas (US, Henry Hub) Forecasts, US\$/MMBtu

Nominal, Quarterly Averages, Annual Price Forecasts on Page 5

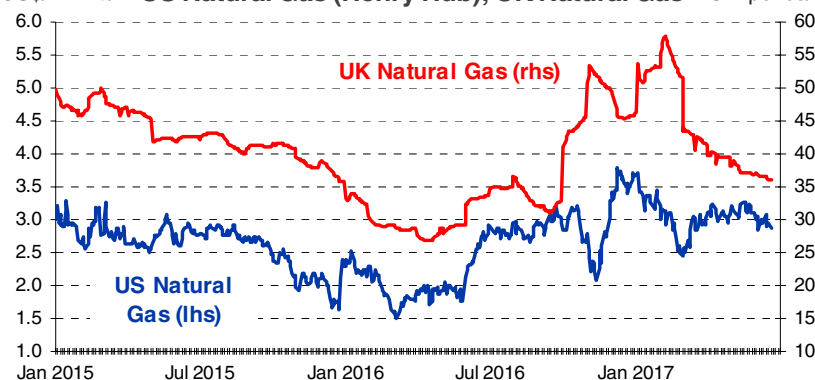
Survey Date Spot (Jun. 19): US\$ 2.860	Sep '17	Dec '17	Mar '18	Jun '18	% change from spot	Sep '18	Dec '18	Mar '19	Jun '19
Macquarie	3.150	3.500	3.500	3.700	29.4%	3.200	3.000	2.800	2.900
GKI Research	3.200	3.400	3.500	3.600	25.9%	3.600	3.600	3.700	3.800
Societe Generale	3.430	3.460	3.680	3.570	24.8%	3.500	3.500	3.060	3.060
Capital Economics	3.125	3.375	3.500	3.500	22.4%	3.625	3.750	na	na
Investec	3.200	3.200	3.300	3.300	15.4%	3.300	3.300	3.300	3.300
ABN Amro	2.750	2.750	3.250	3.250	13.6%	3.250	3.500	3.500	3.500
Euromonitor International	3.217	3.213	3.216	3.245	13.5%	3.269	3.298	3.315	3.351
Oxford Economics	2.800	2.900	3.000	3.200	11.9%	3.013	3.013	3.113	3.113
Credit Suisse	3.634	3.391	3.634	3.149	10.1%	3.391	3.391	3.149	3.149
Moody's Analytics	3.040	3.030	3.090	3.140	9.8%	3.330	3.450	3.520	3.570
Econ Intelligence Unit	3.190	3.480	3.340	3.120	9.1%	3.510	3.740	3.860	3.760
Lloyds Bank	3.100	3.200	3.200	3.050	6.6%	3.100	3.200	na	na
Citigroup	3.500	3.500	3.200	3.000	4.9%	2.900	3.000	3.000	3.000
Liberum Capital	3.000	3.000	3.000	3.000	4.9%	3.000	3.000	3.000	3.000
UBS	3.000	3.250	3.000	3.000	4.9%	3.000	3.000	3.250	3.250
Deutsche Bank	3.050	3.000	3.000	2.900	1.4%	2.900	3.200	3.100	3.100
Morgan Stanley	3.262	3.341	3.463	2.869	0.3%	2.880	2.965	3.147	2.700
Scotiabank	3.050	3.250	3.300	2.850	-0.3%	2.800	3.250	na	na
CIBC	2.950	2.950	2.800	2.800	-2.1%	2.800	2.800	na	na
Commonwealth Bank	2.719	2.838	3.038	2.728	-4.6%	2.790	2.900	3.090	2.793
Standard Chartered	2.750	2.700	2.750	2.650	-7.3%	2.700	na	na	na
ING Bank	2.800	2.500	2.500	2.600	-9.1%	2.800	3.000	2.800	2.900
Consensus (Mean)	3.087	3.147	3.194	3.101	8.4%	3.121	3.231	3.218	3.191
High	3.634	3.500	3.680	3.700		3.625	3.750	3.860	3.800
Low	2.719	2.500	2.500	2.600		2.700	2.800	2.800	2.700
Standard Deviation	0.243	0.287	0.297	0.305		0.290	0.281	0.291	0.321

UK Natural Gas Forecasts, UK pence/therm

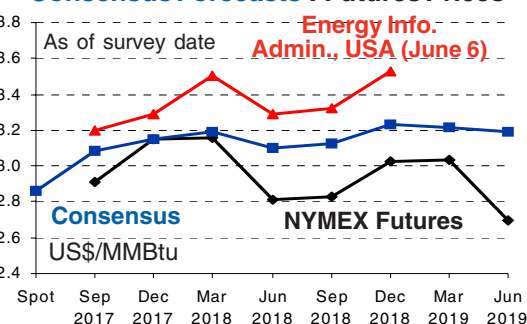
Nominal, Quarterly Averages, Annual Price Forecasts on Page 5

Survey Date Spot (Jun. 19): 35.93 pence	Sep '17	Dec '17	Mar '18	Jun '18	% change from spot	Sep '18	Dec '18	Mar '19	Jun '19
GKI Research	40.00	43.00	45.00	50.00	39.2%	50.00	51.00	52.00	52.00
Lloyds Bank	40.00	46.00	45.00	41.00	14.1%	41.00	46.00	na	na
ABN Amro	41.00	38.00	38.00	38.00	5.8%	35.00	32.00	35.00	35.00
Capital Economics	42.50	42.50	39.00	37.50	4.4%	36.50	35.50	na	na
ING Bank	35.00	35.00	35.00	35.00	-2.6%	37.00	37.00	38.00	40.00
Consensus (Mean)	39.70	40.90	40.40	40.30	12.2%	39.90	40.30	41.67	42.33
High	42.50	46.00	45.00	50.00		50.00	51.00	52.00	52.00
Low	35.00	35.00	35.00	35.00		35.00	32.00	35.00	35.00
Standard Deviation	2.82	4.36	4.45	5.83		6.07	7.90	9.07	8.74

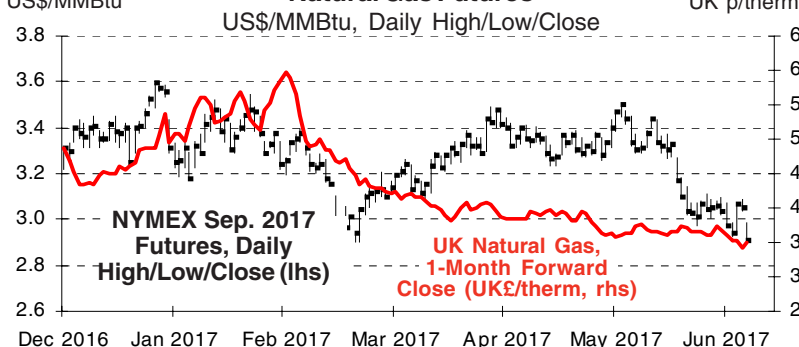
US\$/MMBtu US Natural Gas (Henry Hub); UK Natural Gas UK pence/therm



US Natural Gas Consensus Forecasts v Futures Prices



Natural Gas Futures US\$/MMBtu, Daily High/Low/Close UK p/therm



UK Price Should Begin to Recover

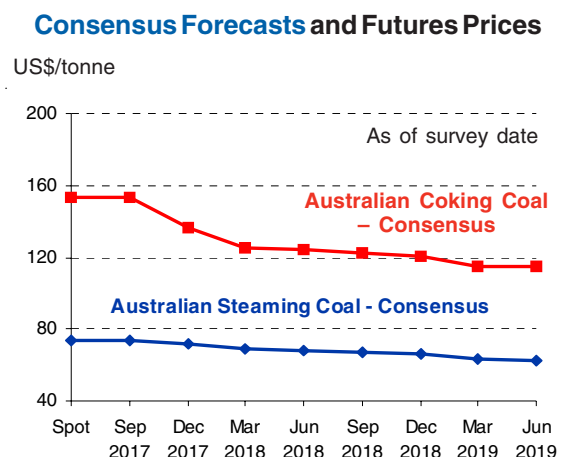
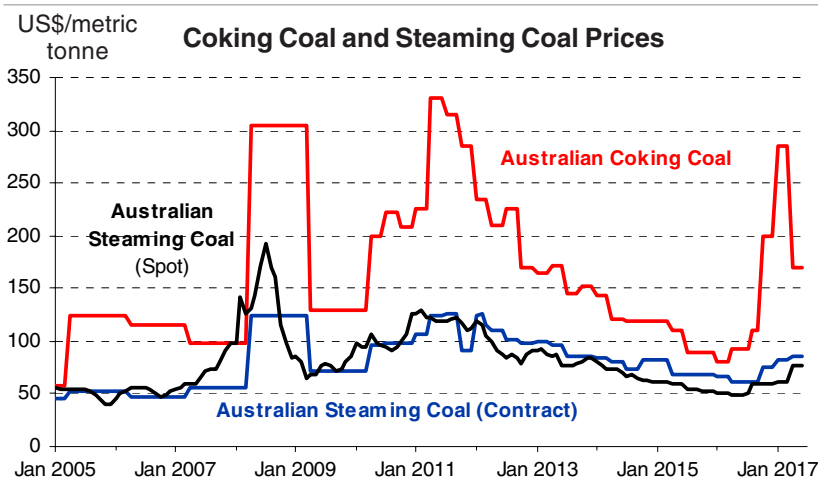
- ◆ Despite tensions in the Middle East, which threaten to affect LNG deliveries, UK Natural Gas has tumbled in recent months, from an early February high of near 58.0 pence/therm to around 36.0, a drop of almost 38% (red line in middle left chart).
- ◆ Its slide partly reflects hot weather and disruptions to both storage and exports caused by maintenance. As normal operations will eventually resume, the consensus is predicting that UK Natural Gas will climb 12.2% to 40.30 pence/therm by Q2 2018.

Consensus Price for Q3: US\$153.3 e		Australian Coking Coal Forecasts, US\$/metric tonne, Contract Price							
	Sep '17	Dec '17	Mar '18	Jun '18	% change from Q3	Sep '18	Dec '18	Mar '19	Jun '19
Investec	180.0	180.0	160.0	160.0	4.3%	155.0	155.0	150.0	150.0
RBC Capital Markets	190.0	160.0	150.0	150.0	-2.2%	150.0	150.0	120.0	120.0
Australia Dept of Industry	160.0	160.0	145.0	140.0	-8.7%	135.0	135.0	130.0	124.5
Credit Suisse	170.0	150.0	130.0	130.0	-15.2%	130.0	130.0	120.0	120.0
Deutsche Bank	140.0	130.0	130.0	130.0	-15.2%	120.0	110.0	120.0	120.0
Macquarie	175.0	140.0	125.0	130.0	-15.2%	130.0	125.0	125.0	130.0
UBS	155.0	135.0	120.0	120.0	-21.7%	120.0	120.0	100.0	105.3
Morgan Stanley	140.0	130.0	125.0	115.0	-25.0%	112.0	110.0	108.0	105.0
Liberum Capital	125.0	110.0	110.0	110.0	-28.3%	110.0	110.0	110.0	110.0
Societe Generale	125.0	110.0	110.0	110.0	-28.3%	110.0	110.0	110.0	110.0
Commonwealth Bank	140.0	120.0	110.0	100.0	-34.8%	93.6	94.2	94.7	95.2
ING Bank	140.0	110.0	90.0	90.0	-41.3%	100.0	100.0	95.0	85.0
Consensus (Mean)	153.3	136.3	125.4	123.8	-19.3%	122.1	120.8	115.2	114.6
High	190.0	180.0	160.0	160.0		155.0	155.0	150.0	150.0
Low	125.0	110.0	90.0	90.0		93.6	94.2	94.7	85.0
Standard Deviation	21.7	22.7	19.6	20.4		18.7	18.9	15.8	16.9

Consensus Price for Q3: US\$73.61 e		Australian Steaming Coal Forecasts, US\$/metric tonne, Spot Price							
	Sep '17	Dec '17	Mar '18	Jun '18	% change from Q3	Sep '18	Dec '18	Mar '19	Jun '19
Investec	81.48	81.48	77.60	77.60	5.4%	73.72	73.72	70.08	70.08
RBC Capital Markets	75.00	75.00	75.00	75.00	1.9%	75.00	75.00	70.00	70.00
Econ Intelligence Unit	80.60	78.50	76.50	74.00	0.5%	73.50	73.30	63.00	60.00
Macquarie	79.50	72.00	73.00	73.00	-0.8%	65.00	65.00	65.00	65.00
UBS	74.00	75.00	73.00	71.00	-3.5%	73.00	76.00	71.00	70.25
Australia Dept of Industry	75.00	75.00	75.00	70.00	-4.9%	70.00	70.00	70.00	69.25
Deutsche Bank	71.00	71.00	70.00	70.00	-4.9%	70.00	70.00	67.00	67.00
Credit Suisse	75.00	75.00	68.00	68.00	-7.6%	68.00	68.00	65.00	65.00
Capital Economics	75.00	72.50	69.00	66.50	-9.7%	64.00	61.50	na	na
Euromonitor International	83.98	76.66	70.46	66.15	-10.1%	63.21	61.61	60.85	60.93
Liberum Capital	65.00	65.00	65.00	65.00	-11.7%	65.00	65.00	65.00	65.00
Morgan Stanley	70.00	65.00	65.00	65.00	-11.7%	65.00	65.00	64.00	60.00
Commonwealth Bank	70.00	70.00	68.00	62.00	-15.8%	58.00	55.00	52.00	50.00
ING Bank	55.00	55.00	45.00	45.00	-38.9%	50.00	50.00	47.00	42.00
Consensus (Mean)	73.61	71.94	69.33	67.73	-8.0%	66.67	66.37	63.84	62.65
High	83.98	81.48	77.60	77.60		75.00	76.00	71.00	70.25
Low	55.00	55.00	45.00	45.00		50.00	50.00	47.00	42.00
Standard Deviation	7.41	6.69	8.07	7.88		6.85	7.58	7.15	8.41

Consensus Price for Q3: US\$84.06 e		Australian Steaming Coal Forecasts, US\$/metric tonne, Contract Price							
	Sep '17	Dec '17	Mar '18	Jun '18	% change from Q3	Sep '18	Dec '18	Mar '19	Jun '19
Consensus (Mean)¹	84.06	84.06	83.49	75.85	-9.8%	74.57	74.57	73.86	72.32
High	86.00	86.00	86.00	84.97		80.00	80.00	80.00	80.00
Low	81.50	81.50	80.00	68.00		68.00	68.00	68.00	64.00
Standard Deviation	1.69	1.69	2.28	5.57		3.91	3.91	3.72	4.94

¹ Individual forecasts available in the Excel spreadsheet.

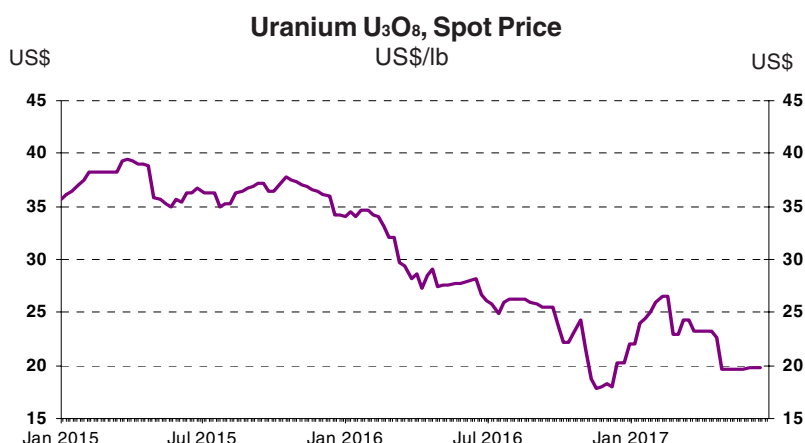


Survey Date Spot
(Jun. 19): **US\$ 19.85**

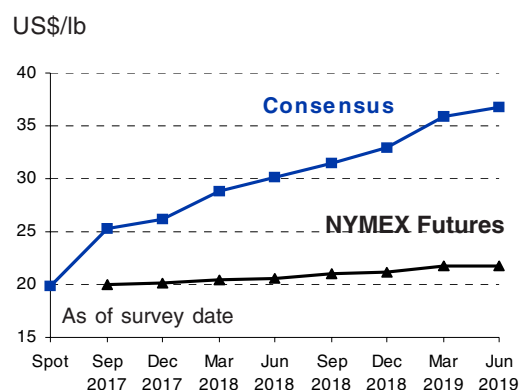
Uranium U₃O₈ Forecasts, US\$/lb

Nominal, Quarterly Averages

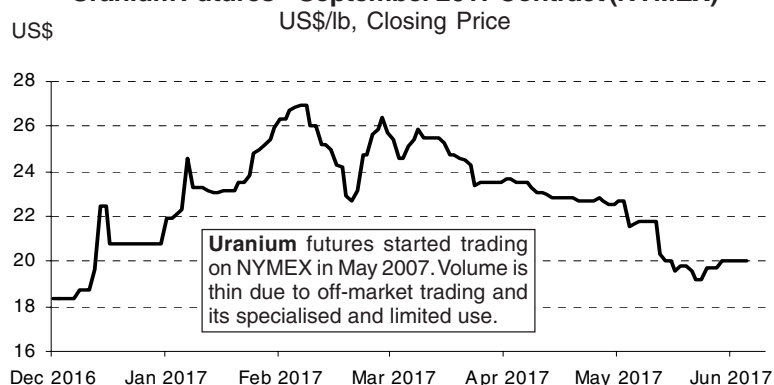
	Sep '17	Dec '17	Mar '18	Jun '18	% change from spot	Sep '18	Dec '18	Mar '19	Jun '19
Credit Suisse	35.00	35.00	45.00	45.00	126.7%	45.00	45.00	50.00	50.00
Commonwealth Bank	25.00	27.00	29.00	31.00	56.2%	32.00	32.00	32.00	32.00
Australia Dept of Industry	26.67	28.00	30.00	30.00	51.1%	32.00	35.00	40.00	40.33
Investec	26.00	26.00	30.00	30.00	51.1%	34.00	34.00	38.00	38.00
Liberum Capital	20.00	25.00	25.00	30.00	51.1%	30.00	35.00	35.00	40.00
RBC Capital Markets	25.96	25.96	30.00	30.00	51.1%	30.00	30.00	35.00	35.00
UBS	28.00	28.00	28.00	30.00	51.1%	35.00	40.00	45.00	45.00
Macquarie	22.00	21.00	22.00	24.00	20.9%	24.00	24.00	24.00	27.00
Morgan Stanley	19.00	19.00	21.00	21.00	5.8%	21.00	21.00	24.00	24.00
Consensus (Mean)	25.29	26.11	28.89	30.11	51.7%	31.44	32.89	35.89	36.81
High	35.00	35.00	45.00	45.00		45.00	45.00	50.00	50.00
Low	19.00	19.00	21.00	21.00		21.00	21.00	24.00	24.00
Standard Deviation	4.78	4.54	6.97	6.55		6.82	7.39	8.68	8.31



Consensus Forecasts v Futures Prices



Uranium Futures – September 2017 Contract (NYMEX)



Hard to be Bullish in the Near Term

- ◆ The recent decline in Uranium appears to have reached a bottom as it stabilised at just below US\$20/lb. In addition to weak demand, support for the atomic fuel has been eroded by a renewed slump in alternative energy sources, like crude oil (pages 6-7).
- ◆ The current price level is well below what is economically viable for even the most efficient miners and would need to increase in order to encourage investment.
- ◆ Optimism in the long-term hinges on nuclear power plants under construction, although some units could have their lifespans extended on improvements in operational safety.

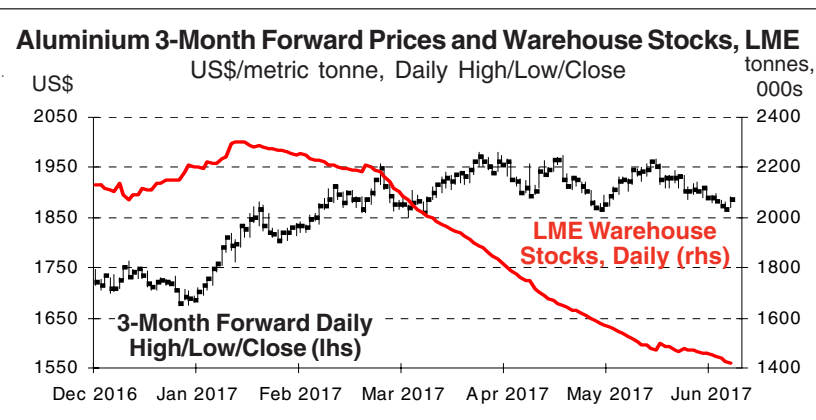
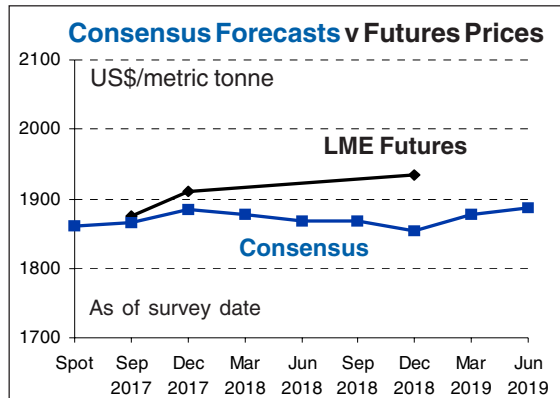
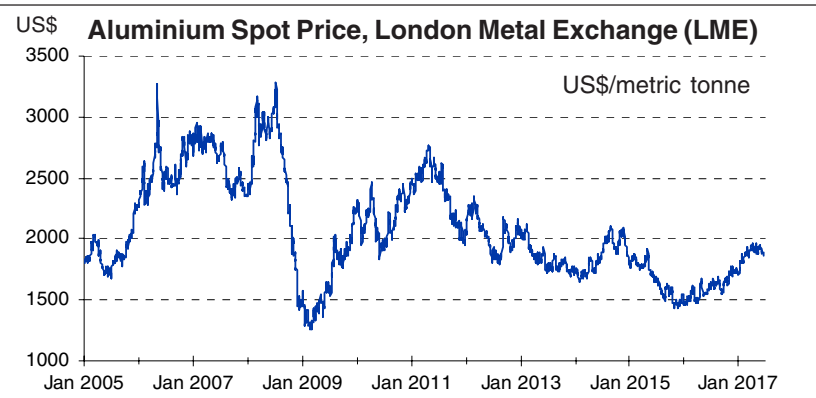
World Nuclear Electricity Production (2010)

Producers (% share of World)	Installed Capacity (Gigawatts)	Nuclear power as a % of total domestic electricity
USA 30.4%	USA 101	France 75.9%
France 15.6%	France 63	Ukraine 47.3%
Japan 10.4%	Japan 49	South Korea 29.9%
Russia 6.2%	Russia 24	Japan 26.0%
S. Korea 5.4%	Germany 20	Germany 22.6%

Uranium futures began trading on NYMEX in May 2007 in an attempt to introduce greater price transparency. Volumes and liquidity are currently very low (see chart above left).

Futures Market: NYMEX Pricing: US\$/lb Contract Size: 250lbs Trading Months: 60 consecutive months. Settlement price: The final settlement price is the spot-month end price published by UxC.

Survey Date Spot Price (Jun. 19): US\$ 1862	Aluminium Forecasts, US\$/metric tonne, fob <small>Nominal, Quarterly Averages</small>									
	Sep '17	Dec '17	Mar '18	Jun '18	% change from spot	Sep '18	Dec '18	Mar '19	Jun '19	
Standard Chartered	1950	2100	2100	2200	18.2%	2150	na	na	na	
Investec	1984	1984	2028	2028	9.0%	2161	2161	2205	2205	
Moody's Analytics	1945	1984	2004	2024	8.7%	2044	2064	2064	2064	
Pezco Economics	1936	1957	1979	2000	7.4%	2021	2043	2065	2087	
Prometeia	1951	1956	1975	1981	6.4%	1986	1960	1970	1976	
Societe Generale	1880	1940	1950	1975	6.1%	1965	1965	2000	2000	
IHS Markit	1943	2020	2023	1963	5.5%	1997	2058	2078	2060	
Macquarie	1915	1900	2000	1950	4.8%	1850	1750	1675	1625	
BIPE	1890	1920	1880	1910	2.6%	1880	1890	na	na	
ABN Amro	1935	1975	2023	1900	2.1%	2032	2010	na	na	
Econ Intelligence Unit	1900	1980	2000	1900	2.1%	1850	1850	1880	1800	
ING Bank	1800	1800	1850	1900	2.1%	1850	1850	1860	1855	
China Int'l Capital Corp	1867	1833	1850	1875	0.7%	1830	1810	1850	1875	
Scotiabank	1874	1874	1874	1874	0.7%	1874	1874	1984	na	
RBC Capital Markets	1786	1786	1874	1874	0.7%	1874	1874	1874	1874	
UBS	1808	1874	1918	1874	0.7%	1830	1830	1808	1874	
Citigroup	1980	1940	1900	1870	0.5%	1850	1870	1885	1885	
Deutsche Bank	1850	1900	1820	1850	-0.6%	1870	1890	1900	1900	
Oxford Economics	1840	1820	1800	1815	-2.5%	1823	1823	1917	1917	
Morgan Stanley	1830	1874	1852	1808	-2.9%	1852	1852	1852	1852	
Euromonitor International	1847	1815	1789	1777	-4.5%	1765	1758	1753	1761	
Australia Dept of Industry	1653	1727	1764	1766	-5.1%	1768	1779	1817	1829	
Capital Economics	1875	1825	1790	1765	-5.2%	1740	1715	na	na	
Commonwealth Bank	1874	1808	1720	1676	-10.0%	1676	1676	1676	1676	
CIBC	1786	1786	1676	1676	-10.0%	1676	1676	na	na	
Credit Suisse	1800	1875	1700	1675	-10.0%	1650	1650	1625	1625	
Liberum Capital	1653	1653	1543	1543	-17.1%	1543	1543	1543	na	
Consensus (Mean)	1865	1885	1877	1868	0.4%	1867	1855	1876	1887	
High	1984	2100	2100	2200		2161	2161	2205	2205	
Low	1653	1653	1543	1543		1543	1543	1543	1625	
Standard Deviation	85	97	130	135		146	144	160	151	



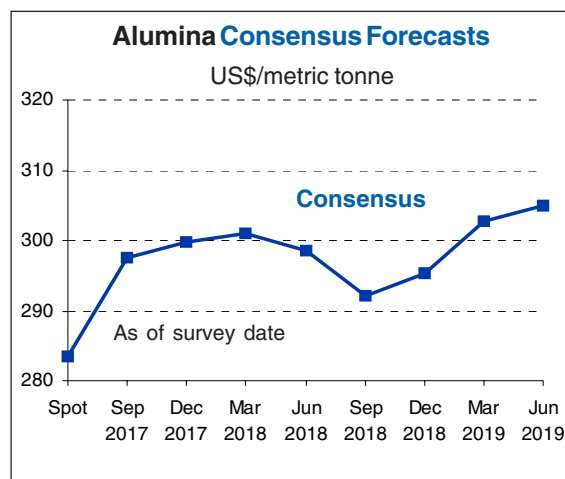
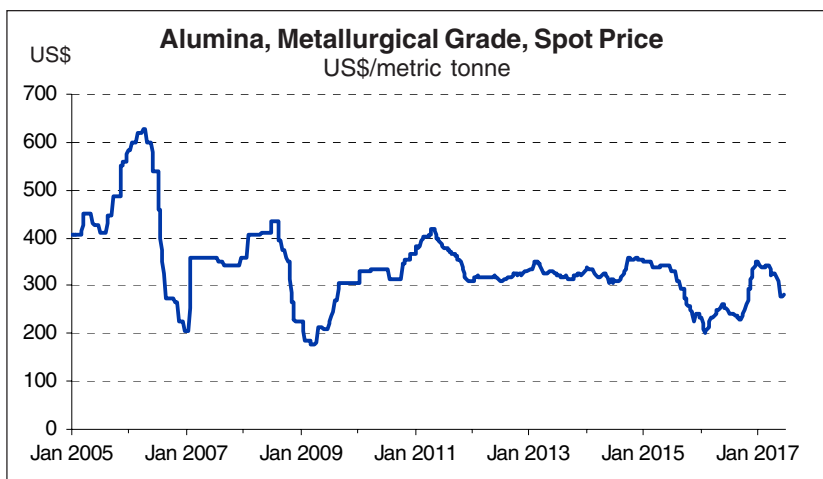
- Negligible Price Movements**
- ◆ Uncertainty over Chinese smelter production has largely been the driver of this year's price gains, as Beijing promised to implement supply-side reforms to curb over capacity and tackle air pollution.
 - ◆ The recent spot price trend suggests that the base metal is hitting resistance close to US\$2000/T. Observers are wary of the threat of new capacity from more efficient producers, while export shipments of semi-manufactured metal flowing out of China have risen, highlighting concerns over excess supply.
 - ◆ Price is likely to remain close to current levels over the next year (consensus).

World Aluminium Supply and Demand					May 2017 Consensus Forecasts	
(in millions of tonnes)	2013	2014	2015	2016	2017	2018
World Supply	52.3	53.9	57.9	58.2	60.3	61.7
World Demand	46.5	54.0	57.4	57.8	60.9	63.1
Balance	5.8	-0.1	0.5	0.4	-0.6	-1.4

Historical Estimates Source: Australian Government Department of Industry

Aluminium: Futures Market: LME Pricing: US\$/tonne Contract Size: 25 tonnes Delivery Dates: Daily for cash to 3 month contracts, Wednesdays for 3 month to 6 month contracts; then every third Wednesday for 7 months out to 123 months. **Contracts Traded: 53,073,441 (2016).**

Survey Date Spot Price (Jun. 19): US\$ 283.4	Alumina Forecasts, US\$/metric tonne, fob					Nominal, Quarterly Averages			
	Sep '17	Dec '17	Mar '18	Jun '18	% change from spot	Sep '18	Dec '18	Mar '19	Jun '19
Investec	357.1	357.1	369.1	369.1	30.3%	399.7	399.7	418.9	418.9
Macquarie	295.0	290.0	345.0	360.0	27.0%	290.0	290.0	330.0	320.0
China Int'l Capital Corp	300.3	317.0	311.7	305.0	7.6%	295.0	285.0	290.0	280.0
UBS	290.0	295.0	315.0	305.0	7.6%	290.0	290.0	310.0	301.3
Morgan Stanley	330.0	320.0	300.0	300.0	5.9%	300.0	300.0	300.0	310.0
RBC Capital Markets	295.1	295.1	299.8	299.8	5.8%	299.8	299.8	299.8	299.8
Australia Dept of Industry	266.7	293.1	299.2	286.7	1.2%	277.4	296.0	302.2	298.5
Capital Economics	285.0	275.0	275.0	285.0	0.6%	295.0	300.0	na	na
Credit Suisse	290.0	310.0	290.0	285.0	0.6%	280.0	300.0	290.0	275.0
Liberum Capital	264.6	264.6	246.9	246.9	-12.9%	246.9	246.9	246.9	na
Commonwealth Bank	300.0	280.0	260.0	240.0	-15.3%	240.0	240.0	240.0	240.0
Consensus (Mean)	297.6	299.7	301.1	298.4	5.3%	292.2	295.2	302.8	304.8
High	357.1	357.1	369.1	369.1		399.7	399.7	418.9	418.9
Low	264.6	264.6	246.9	240.0		240.0	240.0	240.0	240.0
Standard Deviation	26.4	25.6	35.1	39.3		41.0	40.7	49.1	48.8

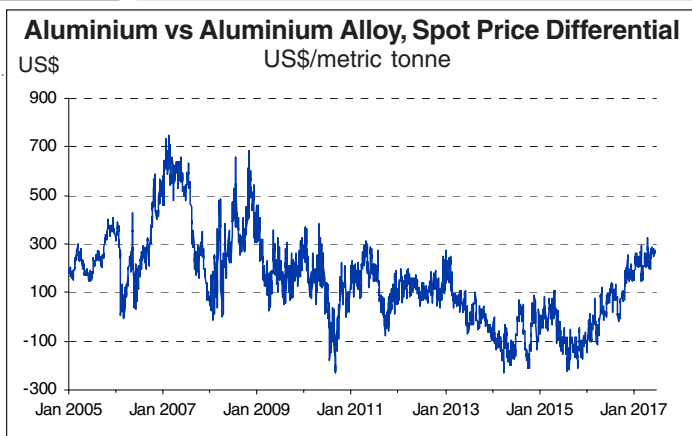
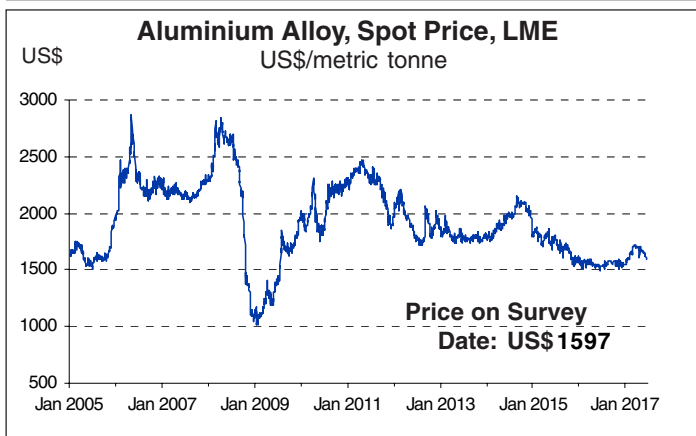


Alumina is derived from bauxite ore and is used to produce primary aluminium at a ratio of two tonnes of alumina per tonne of aluminium. Prices can be linked to the LME primary aluminium price.

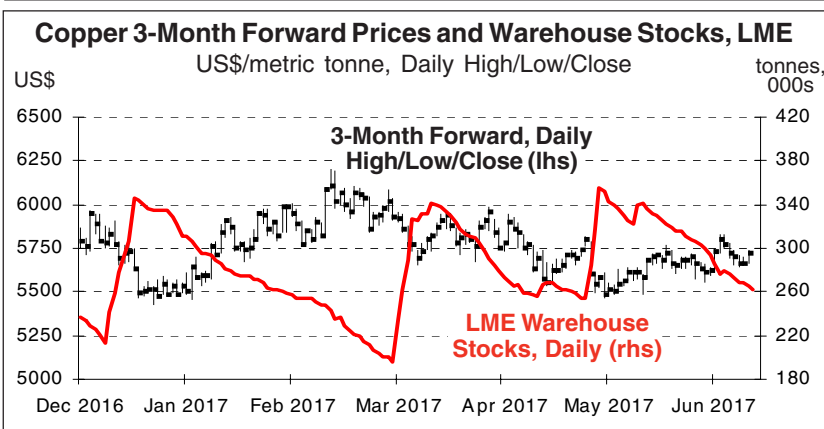
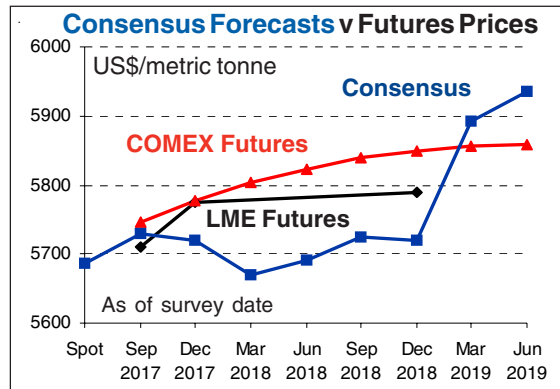
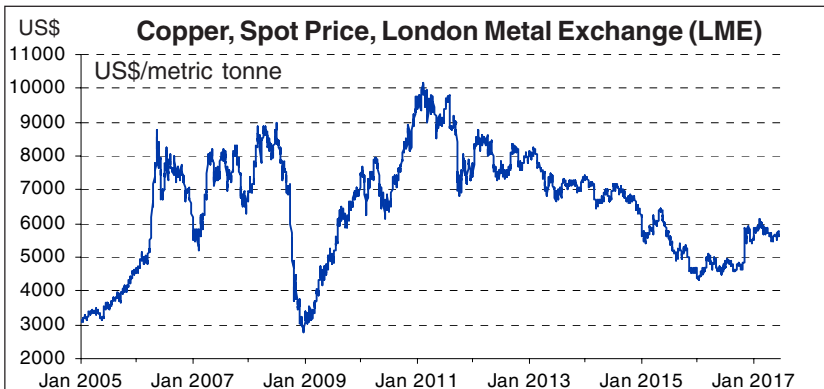
Aluminium Alloy prices provide a reference basis for the secondary aluminium market. **Futures Market:** LME **Pricing:** US\$/tonne **Contract Size:** 20 tonnes **Delivery Dates:** Daily for cash to 3 month contracts, Wednesdays for 3 month to 6 month contracts; then every third Wednesday for 7 months out to 27 months. **Contracts Traded:** 128,006 (2016).

**World Production of Alumina
(108.0 million tonnes, 2014)**

Producer	% of world total
1. China	44.3%
2. Australia	19.0%
3. Brazil	9.8%
4. India	4.7%



Survey Date Spot Price (Jun. 19): US\$ 5687	Copper, Grade A, Forecasts, US\$/metric tonne, fob					Nominal, Quarterly Averages			
	Sep '17	Dec '17	Mar '18	Jun '18	% change from spot	Sep '18	Dec '18	Mar '19	Jun '19
UBS	6944	7055	7165	7165	26.0%	7165	7165	7165	7165
ING Bank	6300	6000	6200	6500	14.3%	6800	6500	6300	6500
Standard Chartered	5800	6200	6500	6500	14.3%	6500	na	na	na
Citigroup	6050	6200	6200	6400	12.5%	6500	6600	6815	6815
Investec	5952	5952	6063	6063	6.6%	6173	6173	6283	6283
RBC Capital Markets	5512	5886	6063	6063	6.6%	6063	6063	6283	6283
Econ Intelligence Unit	5960	6060	6000	6050	6.4%	6000	6000	6000	6300
Prometeia	5731	5817	5965	6031	6.1%	6094	5950	6010	6066
ABN Amro	5945	6075	6057	5979	5.1%	6120	6245	na	na
Moody's Analytics	5715	5704	5772	5911	3.9%	6041	6161	6087	5996
Societe Generale	5560	5800	5750	5900	3.7%	6000	6000	6500	6500
Pezco Economics	5664	5736	5809	5881	3.4%	5953	6026	6101	6176
China Int'l Capital Corp	5640	5600	5650	5850	2.9%	6000	6100	5850	6050
Scotiabank	5512	5512	5842	5842	2.7%	5842	5842	6393	na
Banco de Credito del Peru	5710	5622	5622	5622	-1.1%	5683	5732	5732	5732
IHS Markit	5740	5687	5618	5599	-1.6%	5613	5694	5772	5782
Australia Dept of Industry	5870	5723	5648	5558	-2.3%	5525	5529	5660	5672
Morgan Stanley	5732	5732	5622	5512	-3.1%	5401	5401	5512	5732
Macquarie	5611	5750	5650	5500	-3.3%	5450	5500	5600	5600
Deutsche Bank	5700	5600	5400	5500	-3.3%	5800	6000	6614	6614
Oxford Economics	5820	5650	5530	5498	-3.3%	5592	5592	6035	6035
CIBC	5512	5512	5203	5203	-8.5%	5203	5203	na	na
Capital Economics	5375	5225	5150	5050	-11.2%	5100	5350	na	na
Commonwealth Bank	5291	5071	4850	4850	-14.7%	4630	4630	4630	4630
Credit Suisse	5520	5060	4640	4640	-18.4%	4420	4420	4300	4300
Euromonitor International	5210	4899	4687	4576	-19.5%	4487	4432	4391	4398
Liberum Capital	5290	5290	4408	4408	-22.5%	4408	4408	5510	na
Consensus (Mean)	5728	5719	5669	5691	0.1%	5725	5720	5893	5935
High	6944	7055	7165	7165		7165	7165	7165	7165
Low	5210	4899	4408	4408		4408	4408	4300	4300
Standard Deviation	346	428	591	629		694	683	709	738



Muted Outlook

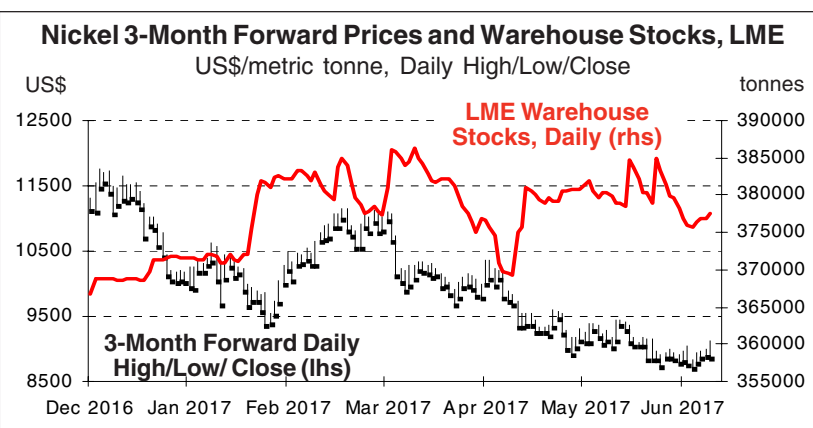
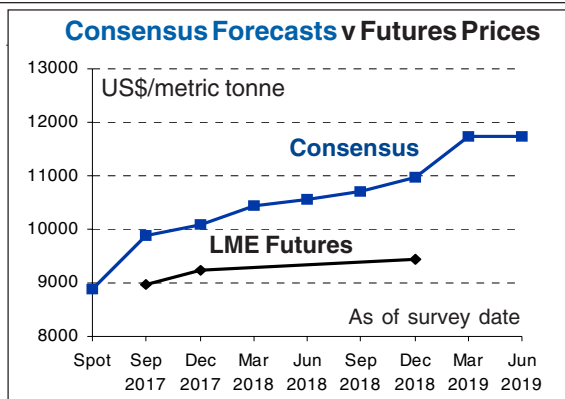
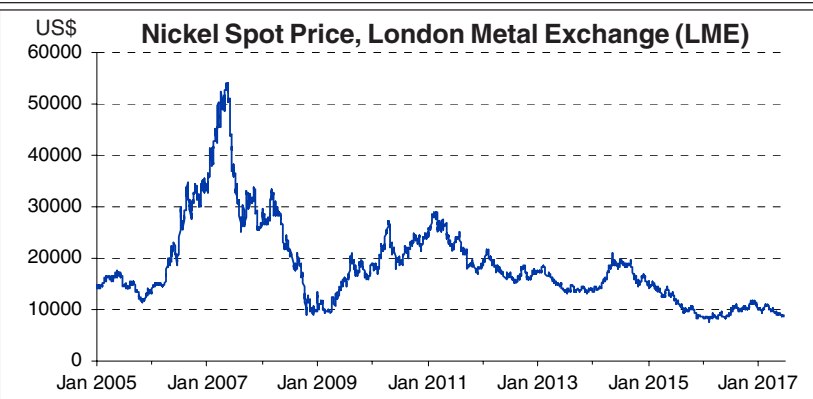
- As expected, the US Fed lifted its funds rate again this month as it gradually shifts away from loose monetary conditions. This has lent support to the US dollar outlook and dampened that of commodities, as they become more expensive in local currency terms.
- Chinese demand concerns have fuelled a pessimistic price scenario, with Beijing keen on cooling elevated levels of credit supply in order to bolster financial stability.
- Supply disruptions in Chile, the world's largest producer, have been partly offset by increases in scrap metal usage.

World Copper Supply and Demand (in millions of tonnes)	May 2017 Consensus Forecasts					
	2013	2014	2015	2016	2017	2018
World Supply	21.1	22.5	22.9	23.3	22.9	23.6
World Demand	21.4	22.9	23.0	23.4	23.8	24.3
Balance	-0.3	-0.4	-0.1	-0.1	-0.9	-0.7

Historical Estimates Source: International Copper Study Group (ICSG)

Copper: Futures Market: LME Pricing: US\$/tonne
Contract Size: 25 tonnes **Delivery Dates:** Daily for cash to 3 month contracts, Wednesdays for 3 month to 6 month contracts; then every third Wednesday for 7 months out to 123 months. **Contracts Traded:** 36,947,881 (2016). **US Futures Market: COMEX Pricing:** USc/lb **Lot Size:** 25,000lbs **Deliverability:** 24 consecutive months.

Survey Date Spot Price (Jun. 19): US\$ 8895	Nickel Forecasts, US\$/metric tonne, fob					Nominal, Quarterly Averages			
	Sep '17	Dec '17	Mar '18	Jun '18	% change from spot	Sep '18	Dec '18	Mar '19	Jun '19
Oxford Economics	11029	11409	11823	12282	38.1%	12537	12537	13950	13950
Morgan Stanley	11464	11464	11464	12125	36.3%	13228	13889	14771	14771
Scotiabank	11023	11023	12125	12125	36.3%	12125	12125	13228	na
RBC Capital Markets	11207	11207	12125	12125	36.3%	12125	12125	13228	13228
IHS Markit	10385	10991	12091	12086	35.9%	12451	12908	13658	13505
Econ Intelligence Unit	11390	12052	12182	12038	35.3%	11156	10311	10068	9933
Australia Dept of Industry	11272	11352	11731	11889	33.7%	12127	12268	13424	13424
Credit Suisse	11025	11025	11575	11575	30.1%	11575	11575	12125	12125
ING Bank	9500	10000	10500	11000	23.7%	10500	10500	10700	10800
Investec	10472	10472	10803	10803	21.4%	11243	11243	13779	13779
UBS	9370	9810	10362	10803	21.4%	11243	11684	11905	11795
CIBC	9921	9921	10318	10318	16.0%	10318	10318	na	na
Citigroup	9000	9400	10100	10200	14.7%	10300	10300	11175	11175
China Int'l Capital Corp	8914	9112	9737	10031	12.8%	9480	9921	9884	10729
ABN Amro	9457	9824	9914	10025	12.7%	10520	11198	na	na
Macquarie	9251	8750	9500	10000	12.4%	10501	10750	10750	11499
Deutsche Bank	9000	10750	10500	10000	12.4%	9800	10700	11500	11500
Societe Generale	9400	9835	9800	10000	12.4%	10000	10000	11000	11000
BIPE	9280	9770	9860	9950	11.9%	10230	10800	na	na
Liberum Capital	9918	9918	9918	9918	11.5%	11020	11020	12122	na
Prometeia	9000	9195	9586	9666	8.7%	9692	9444	9673	9801
Pezco Economics	9272	9390	9508	9625	8.2%	9743	9861	9983	10105
Euromonitor International	9285	9279	9275	9373	5.4%	9450	9566	9692	9923
Capital Economics	8925	9075	9200	9250	4.0%	9300	9425	na	na
Commonwealth Bank	9480	9039	8818	9039	1.6%	9259	9480	9700	9921
Standard Chartered	8750	8500	8500	8500	-4.4%	8500	na	na	na
Consensus (Mean)	9884	10099	10435	10567	18.8%	10709	10958	11729	11735
High	11464	12052	12182	12282		13228	13889	14771	14771
Low	8750	8500	8500	8500		8500	9425	9673	9801
Standard Deviation	915	973	1117	1127		1207	1189	1650	1594



More Abundant Supply

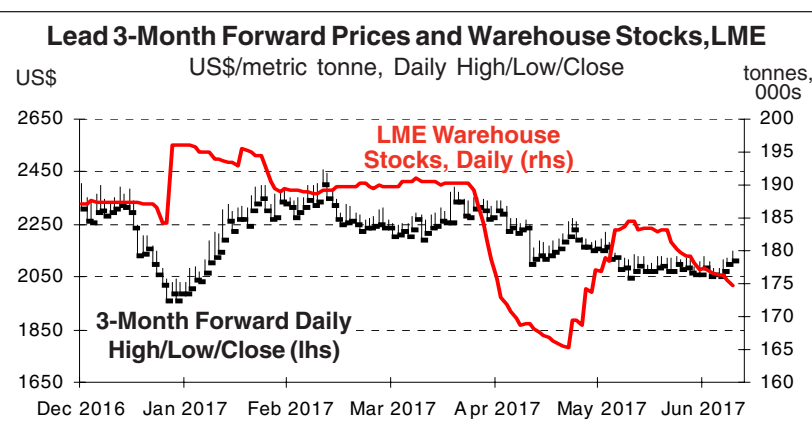
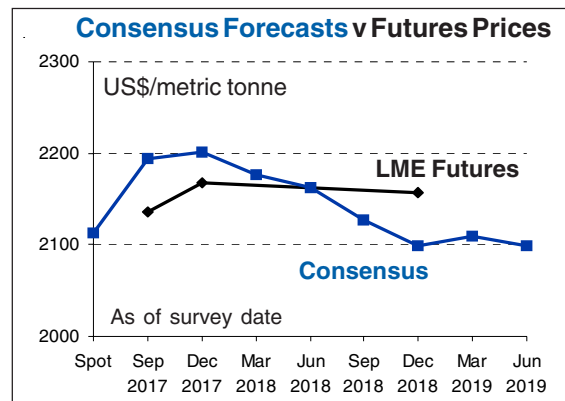
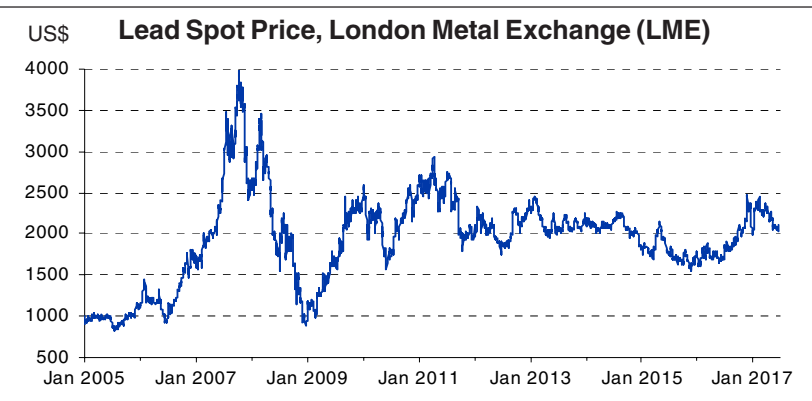
- Prices have tumbled further this month as the base metal, used commonly to make stainless steel (page 18), filtered in the wake of a changing perceptions about supply, which unnerved investors.
- A reversal in the Philippines' hard-line stance on mining activity, coupled with a revival in some ore exports from Indonesia, has dented the previous optimism.
- Prices are expected to mount a recovery from a low level (charts above), not least because persistent weakness will be unprofitable for many producers.

World Nickel Supply and Demand (in thousands of tonnes)	May 2017 Consensus Forecasts					
	2013	2014	2015	2016	2017	2018
World Supply	1963	1994	1973	1916 e	2049	2242
World Demand	1785	1869	1881	1948 e	2069	2142
Balance	178	125	92	-32	-20	100

Historical Estimates Source: International Nickel Study Group (INSG)

Nickel prices are closely related to demand from stainless steel producers who account for about two-thirds of total demand. **Futures Market:** LME **Pricing:** US\$/tonne **Contract Size:** 6 tonnes **Delivery Dates:** Daily for cash to 3 month contracts, Wednesdays for 3 month to 6 month contracts; then every third Wednesday for 7 months out to 63 months. **Contracts Traded:** 19,947,714 (2016).

Survey Date Spot Price (Jun. 19): US\$ 2113	Lead Forecasts, US\$/metric tonne, fob					Nominal, Quarterly Averages			
	Sep '17	Dec '17	Mar '18	Jun '18	% change from spot	Sep '18	Dec '18	Mar '19	Jun '19
Societe Generale	2520	2700	2800	2900	37.2%	2400	2400	2500	2500
Macquarie	2141	2401	2551	2650	25.4%	2650	2449	2350	2299
Citigroup	2300	2500	2550	2520	19.3%	2520	2580	2545	2545
China Int'l Capital Corp	2345	2480	2475	2400	13.6%	2350	2400	2475	2400
Investec	2315	2315	2381	2381	12.7%	2381	2381	2425	2425
Standard Chartered	2400	2475	2300	2300	8.8%	2300	na	na	na
RBC Capital Markets	2294	2298	2288	2288	8.3%	2288	2288	2249	2249
Econ Intelligence Unit	2260	2300	2300	2280	7.9%	2320	2350	2400	2400
Prometeia	2143	2156	2178	2188	3.6%	2197	2173	2180	2187
Pezco Economics	2135	2137	2140	2143	1.4%	2146	2149	2152	2155
IHS Markit	2110	2118	2140	2122	0.4%	2087	2106	2120	2078
UBS	2381	2205	2094	2094	-0.9%	2094	2094	2094	2094
Banco de Credito del Peru	2145	2094	2094	2050	-3.0%	2028	1984	1984	1984
Morgan Stanley	2094	2094	2028	2028	-4.0%	2028	2028	2094	2094
Oxford Economics	2280	2150	2109	2013	-4.7%	2040	2040	2031	2031
ING Bank	2230	2120	1930	2010	-4.9%	2100	2010	1960	1810
Deutsche Bank	1950	2000	2100	2000	-5.3%	1900	1850	1800	1800
Commonwealth Bank	2315	2205	2094	1984	-6.1%	1874	1764	1653	1543
Capital Economics	2030	1990	1935	1900	-10.1%	1860	1820	na	na
Credit Suisse	1980	1980	1900	1900	-10.1%	1900	1900	1900	1900
Liberum Capital	1984	1984	1873	1873	-11.3%	1873	1873	1873	na
Euromonitor International	1907	1729	1604	1526	-27.8%	1467	1427	1397	1384
Consensus (Mean)	2194	2201	2176	2161	2.3%	2128	2098	2109	2099
High	2520	2700	2800	2900		2650	2580	2545	2545
Low	1907	1729	1604	1526		1467	1427	1397	1384
Standard Deviation	163	220	268	295		266	278	299	314



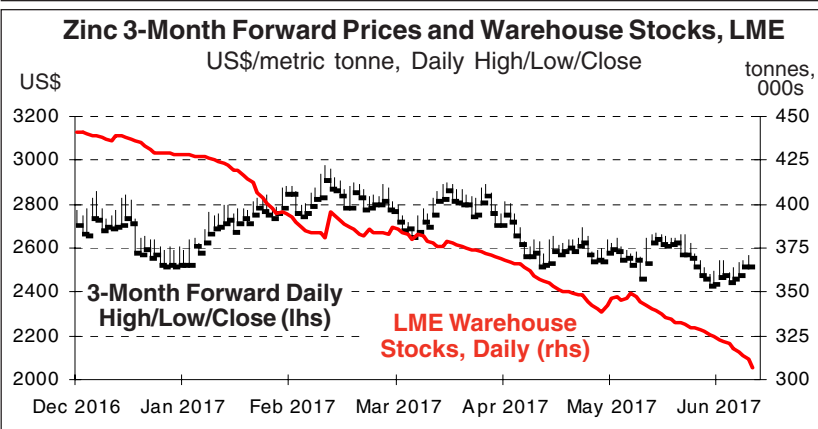
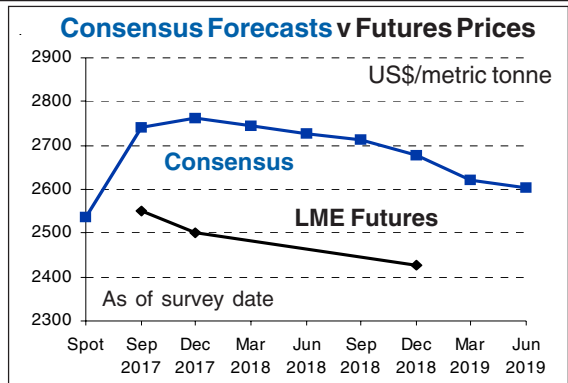
Lead to Trade Above US\$2000/T

- ◆ Forecasts have been little changed in our latest survey, as prices firmed around US\$2113/T. Lead has risen by 5.3% since end-2016 and remains one of the better performing base metals this year.
- ◆ The International Lead and Zinc Study Group reported an 8.4% production surge in refined metal production in the first four months of the year, although this was outstripped by a larger 11.2% climb in global demand.
- ◆ Long-term projections (shown on page 5) indicate that Lead could exceed US\$2000 per tonne until 2020.

World Lead Supply and Demand					May 2017	
(in millions of tonnes)	2013	2014	2015	2016	Consensus Forecasts	
World Supply	11.2	11.0	10.8	11.1	11.8	12.0
World Demand	11.1	10.9	10.9	11.1	11.8	12.0
Balance	0.1	0.1	-0.1	0.0	0.0	0.0

The price of **Lead**, which is used mainly for batteries, can be related to that of zinc as the metals are co-produced. **Futures Market:** LME Pricing: US\$/tonne **Contract Size:** 25 tonnes **Delivery Dates:** Daily for cash to 3 month contracts, Wednesdays for 3 month to 6 month contracts; then every third Wednesday for 7 months out to 63 months. **Contracts Traded:** 10,571,590 (2016).

Survey Date Spot Price (Jun. 19): US\$ 2535	Zinc, Special High Grade, Forecasts, US\$/MT, fob					Nominal, Quarterly Averages			
	Sep '17	Dec '17	Mar '18	Jun '18	% change from spot	Sep '18	Dec '18	Mar '19	Jun '19
China Int'l Capital Corp	3267	3700	3850	3900	53.8%	3900	3850	3800	3800
Scotiabank	2976	2976	3417	3417	34.8%	3417	3417	3307	na
Macquarie	2566	2800	3100	3201	26.3%	3049	2950	2851	2749
Citigroup	2850	3000	3100	3050	20.3%	3000	2950	2925	2925
Standard Chartered	3000	3100	3000	3000	18.3%	3000	na	na	na
RBC Capital Markets	3020	3020	2976	2976	17.4%	2976	2976	3086	3086
Investec	2866	2866	2910	2910	14.8%	2932	2932	2976	2976
Moody's Analytics	2737	2778	2820	2862	12.9%	2891	2920	2949	2949
Pezco Economics	2647	2704	2761	2817	11.1%	2874	2931	2991	3052
ABN Amro	2865	2915	2987	2800	10.5%	2878	2946	na	na
UBS	3307	2976	2866	2756	8.7%	2756	2646	2535	2590
Australia Dept of Industry	2700	2750	2740	2740	8.1%	2720	2690	2580	2560
Banco de Credito del Peru	2756	2756	2734	2734	7.8%	2712	2668	2646	2646
CIBC	2734	2734	2712	2712	7.0%	2712	2712	na	na
BIPE	2590	2640	2610	2650	4.5%	2700	2730	na	na
Econ Intelligence Unit	2740	2744	2700	2650	4.5%	2600	2475	2400	2450
Liberum Capital	2975	2975	2645	2645	4.3%	2424	2424	2204	na
Credit Suisse	2900	2800	2600	2600	2.6%	2600	2600	2400	2400
Deutsche Bank	2500	2750	2646	2600	2.6%	2400	2350	2100	2100
Societe Generale	2250	2470	2500	2450	-3.4%	2800	2800	2700	2700
IHS Markit	2560	2505	2477	2428	-4.2%	2418	2438	2453	2444
Morgan Stanley	2756	2646	2535	2425	-4.3%	2315	2315	2315	2315
ING Bank	2740	2610	2380	2410	-4.9%	2520	2410	2250	2170
Prometeia	2452	2409	2400	2395	-5.5%	2391	2374	2384	2381
Capital Economics	2365	2465	2440	2390	-5.7%	2315	2240	na	na
Commonwealth Bank	2646	2535	2425	2315	-8.7%	2205	2094	1984	1984
Oxford Economics	2550	2450	2320	2305	-9.1%	2314	2314	2351	2351
Euromonitor International	2415	2309	2228	2178	-14.1%	2132	2097	2068	2056
Consensus (Mean)	2740	2764	2746	2726	7.5%	2713	2676	2620	2604
High	3307	3700	3850	3900		3900	3850	3800	3800
Low	2250	2309	2228	2178		2132	2094	1984	1984
Standard Deviation	250	277	349	368		380	393	440	429



- Prices Expected to Rebound**
- Prices have dropped back from highs of almost US\$3000/T earlier in the year, partly on profit-taking as the base metal's performance exceeded expectations.
 - China's desire to ease financial risks by cooling credit supply may impact on the construction and manufacturing sectors. However, inventories of zinc at LME warehouses are tumbling (left chart), while a rise in Chinese refined zinc imports in April may hint at domestic production shortages.
 - Our panel is predicting prices to reaccelerate over the next four quarters.

World Zinc Supply and Demand (in millions of tonnes)	May 2017 Consensus Forecasts					
	2013	2014	2015	2016	2017	2018
World Supply	13.0	13.5	13.7	13.7	14.0	14.5
World Demand	13.2	13.7	13.5	13.9	14.4	14.7
Balance	-0.2	-0.2	0.2	-0.2	-0.4	-0.2

Historical Estimates Source: International Lead and Zinc Study Group (ILZSG)

Zinc's primary use is in galvanising steel. **Futures Market:** LME Pricing: US\$/tonne **Contract Size:** 25 tonnes (+/- 2%) **Delivery Dates:** Daily for cash to 3 month contracts, Wednesdays for 3 month to 6 month contracts; then every third Wednesday for 7 months out to 63 months. **Contracts Traded:** 26,942,407 (2016).

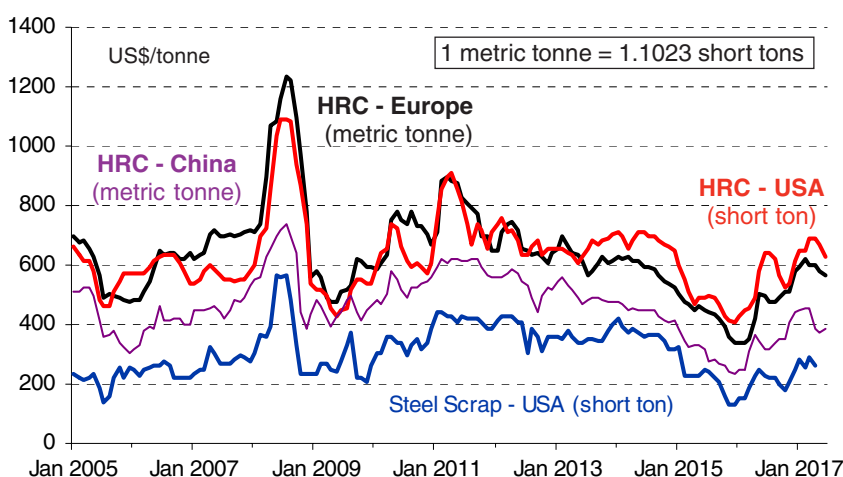
Survey Date Spot Price (Jun. 19): US\$565.0 e		Hot Rolled Coil (Europe, Domestic) Forecasts, US\$/metric tonne, fob							
	Sep '17	Dec '17	Mar '18	Jun '18	% change from spot	Sep '18	Dec '18	Mar '19	Jun '19
MEPS	550.0	525.0	545.0	550.0	-2.7%	535.0	515.0	520.0	520.0
IHS Markit	544.0	517.0	522.4	527.9	-6.6%	519.0	518.7	538.4	539.9
Macquarie	560.0	565.0	565.0	515.0	-8.8%	505.0	490.0	490.0	510.0
Oxford Economics	575.5	531.7	489.9	472.0	-16.5%	472.0	472.0	471.7	471.7
Morgan Stanley	523.2	495.0	481.4	468.2	-17.1%	439.6	425.8	410.7	405.1
Societe Generale	494.0	473.0	466.0	466.0	-17.5%	466.0	466.0	466.0	466.0
Econ Intelligence Unit	490.0	420.0	418.3	436.7	-22.7%	410.0	436.7	500.0	556.7
Consensus (Mean)	533.8	503.8	498.3	490.8	-13.1%	478.1	474.9	485.3	495.6
High	575.5	565.0	565.0	550.0		535.0	518.7	538.4	556.7
Low	490.0	420.0	418.3	436.7		410.0	425.8	410.7	405.1
Standard Deviation	32.7	46.9	50.0	40.6		44.6	35.9	41.6	51.9

Survey Date Spot Price (Jun. 19): US\$630.5 e		Hot Rolled Coil (USA, Domestic) Forecasts, US\$/short ton, fob							
	Sep '17	Dec '17	Mar '18	Jun '18	% change from spot	Sep '18	Dec '18	Mar '19	Jun '19
Consensus (Mean) ¹	615.5	602.1	611.6	596.9	-5.3%	588.9	584.5	587.6	585.9
High	648.9	681.3	729.0	707.2		693.0	710.4	731.7	717.0
Low	583.9	548.9	504.4	480.0		480.3	480.3	474.8	474.8
Standard Deviation	20.7	44.3	67.2	69.2		66.8	75.6	88.4	82.5

Survey Date Spot Price (Jun. 19): US\$385.0 e		Hot Rolled Coil (China, Domestic) Forecasts, US\$/metric tonne, fob							
	Sep '17	Dec '17	Mar '18	Jun '18	% change from spot	Sep '18	Dec '18	Mar '19	Jun '19
Consensus (Mean) ¹	420.4	417.7	418.0	412.0	7.0%	406.7	408.5	411.6	416.3
High	494.0	480.0	466.0	470.0		466.0	490.0	470.0	470.0
Low	335.6	343.7	366.5	358.2		358.2	358.2	360.0	373.5
Standard Deviation	54.5	54.0	42.4	47.1		45.7	56.0	46.8	42.4

¹ Individual forecasts available in the Excel spreadsheet.

Steel – Hot Rolled Coil (HRC) Prices (MEPS)



US and European Prices Set to Drop

- ◆ A drop in the price of coking coal (page 10) and iron ore (next page 19) has reinforced doubt about the demand for steel, which inched lower in May (chart left).
- ◆ Major infrastructure investment initiatives in the US look likely to be delayed, as President Donald Trump has thus far struggled to persuade Congress to approve his ambitious program of national rebuilding.
- ◆ European steel makers fear that current proposals for EU carbon reforms would heavily burden the sector, undermine capex and favour imports of the hard metal from countries without such restrictions.
- ◆ Increases in state spending and efforts to close inefficient steel mills in China have raised the price of reinforced bars.

Steel Production and Consumption (2013)

Producers	% of world total	Consumers	% of world total
1. China	48.2	1. China	46.0
2. Japan	6.9	2. United States	6.5
3. United States	5.4	3. India	5.0
4. India	5.0	4. Japan	4.4
EU	10.4	EU	9.6

Steel Prices are generally set in contracts between major producers and their clients. However, the London Metal Exchange offers a number of steel billet contracts for delivery to locations across Europe, Asia and North America. While there are many varieties of steel, Hot Rolled Coil (HRC) is a commonly referenced price, but regional complexities prevent the emergence of a clear benchmark at present.

Consensus Price for Q3: US\$62.50 e		North China Fines Iron Ore Forecasts, US\$/dry metric tonne, cfr								
	Sep '17	Dec '17	Mar '18	Jun '18	% change from Q3	Sep '18	Dec '18	Mar '19	Jun '19	
CIBC	72.00	72.00	69.00	69.00	10.4%	69.00	69.00	na	na	
Investec	72.00	72.00	68.00	68.00	8.8%	67.00	67.00	66.00	66.00	
Pezco Economics	59.74	62.73	67.12	65.10	4.2%	63.80	65.40	67.36	66.01	
Credit Suisse	70.00	55.00	60.00	65.00	4.0%	55.00	50.00	50.00	50.00	
RBC Capital Markets	80.00	70.00	65.00	65.00	4.0%	65.00	65.00	70.00	70.00	
IHS Markit	61.07	62.96	64.02	63.96	2.3%	61.48	61.88	66.55	65.05	
Euromonitor International	65.13	63.91	62.74	62.00	-0.8%	61.20	60.60	60.14	60.13	
ABN Amro	58.00	60.00	65.00	60.00	-4.0%	67.00	72.00	na	na	
Morgan Stanley	65.00	65.00	60.00	60.00	-4.0%	55.00	55.00	55.00	56.00	
UBS	65.00	60.00	60.00	58.00	-7.2%	55.00	53.00	57.00	55.75	
ING Bank	55.00	55.00	50.00	55.00	-12.0%	55.00	55.00	50.00	60.00	
Scotiabank	65.00	65.00	55.00	55.00	-12.0%	55.00	55.00	55.00	na	
Deutsche Bank	50.00	60.00	55.00	52.00	-16.8%	54.00	54.00	57.00	57.00	
Capital Economics	53.50	51.00	50.00	50.00	-20.0%	51.00	53.50	na	na	
Liberum Capital	50.00	50.00	50.00	50.00	-20.0%	40.00	40.00	40.00	na	
Macquarie	61.00	50.00	50.00	50.00	-20.0%	47.00	47.00	45.00	52.00	
Commonwealth Bank	60.00	55.00	50.00	45.00	-28.0%	45.00	45.00	45.00	45.00	
Consensus (Mean)	62.50	60.57	58.88	58.42	-6.5%	56.85	56.96	56.00	58.58	
High	80.00	72.00	69.00	69.00		69.00	72.00	70.00	70.00	
Low	50.00	50.00	50.00	45.00		40.00	40.00	40.00	45.00	
Standard Deviation	8.13	7.16	7.06	7.25		8.25	8.91	9.31	7.42	

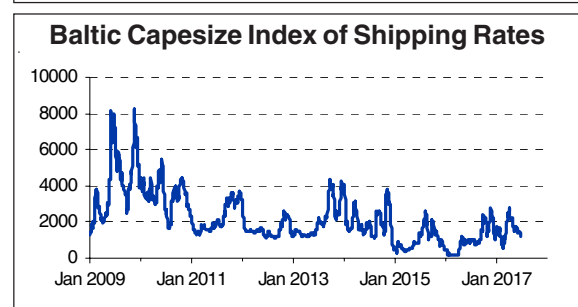
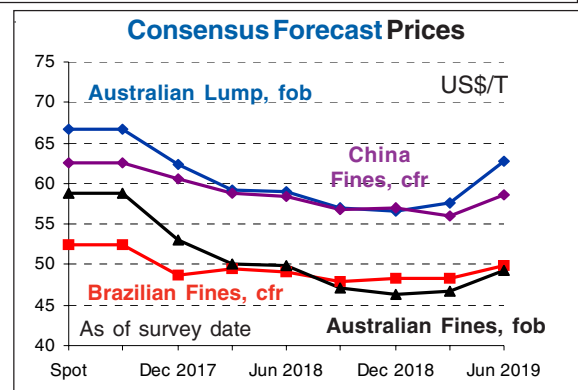
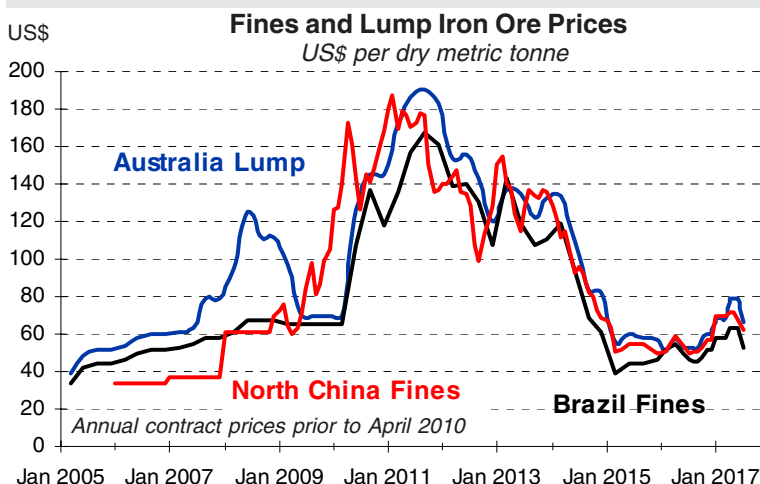
Consensus Price for Q3: US\$58.80 e		Australian Fines Iron Ore Forecasts, US\$/dry metric tonne, fob								
	Sep '17	Dec '17	Mar '18	Jun '18	% change from Q3	Sep '18	Dec '18	Mar '19	Jun '19	
Consensus (Mean)¹	58.80	53.11	50.01	49.82	-15.3%	47.04	46.30	46.78	49.27	
High	71.30	66.00	61.80	61.80		60.60	60.60	59.50	59.50	
Low	44.00	43.50	34.00	34.00		34.00	34.00	34.00	37.33	
Standard Deviation	7.81	7.85	8.38	9.39		8.66	8.76	9.34	7.69	

Q3: US\$66.64 e		Australian Lump Iron Ore Forecasts, US\$/dry metric tonne, fob								
	Sep '17	Dec '17	Mar '18	Jun '18	% change from Q3	Sep '18	Dec '18	Mar '19	Jun '19	
Consensus (Mean)¹	66.64	62.43	59.27	58.92	-11.6%	57.04	56.70	57.54	62.80	
High	80.60	73.20	69.96	69.96		69.98	69.98	69.40	69.40	
Low	49.00	49.00	39.00	39.00		39.00	39.00	39.00	54.00	
Standard Deviation	11.03	10.09	11.84	11.66		11.61	11.52	12.44	6.31	

Consensus Price for Q3: US\$52.36 e		Brazilian Fines Iron Ore Forecasts, US\$/dry metric tonne, cfr								
	Sep '17	Dec '17	Mar '18	Jun '18	% change from Q3	Sep '18	Dec '18	Mar '19	Jun '19	
Consensus (Mean)¹	52.36	48.74	49.55	49.07	-6.3%	47.93	48.30	48.40	49.86	
High	55.00	50.18	53.69	52.08		51.04	52.32	53.89	52.81	
Low	47.79	44.68	44.68	44.68		40.99	41.18	39.28	46.19	
Standard Deviation	3.25	2.71	3.71	3.13		4.67	4.89	6.32	2.74	

¹ Individual forecasts available in the Excel spreadsheet service.

Until April 2014, Iron ore was traded in world markets under contracts, with prices set by negotiation between iron ore producers and steel manufacturers. Three suppliers, Vale, Rio Tinto and BHP Billiton account for most ocean trade in iron ore, of which China remains by far the largest consumer. Fines are the most heavily traded category, while lump has generally traded at a premium price. The annual benchmark price system has been dropped in favour of quarterly prices based on prior average daily spot prices.



Forecasts for the metals shown on this and the next page were provided by the following leading forecasters:

ANZ	ABN Amro	Bank of America – Merrill Lynch
BNP Paribas	Capital Economics	Citigroup
Commonwealth Bank	CPM International	China International Capital Corp.
Credit Suisse	Deutsche Bank	Euromonitor
Economist Intelligence Unit	HWWI	IHS Markit
ING Bank	Investec	JP Morgan
Liberum Capital	Macquarie	Morgan Stanley
Numis Securities	Oxford Economics	Pezco Economics
Prometeia	SG Commodity Research	UBS
	Wilson HTM	

Individual panellist forecasts for these minerals are available as part of our Excel spreadsheet service. Please enquire at editors@consensuseconomics.com.

TIN

(Nominal, Quarterly Averages)

US\$/metric tonne	Consensus (Mean)	% change from spot	Forecast Range	
			High	Low
Spot price	19815			
Sep 2017	20005	1.0%	22500	18242
Dec 2017	20132	1.6%	22000	17433
Mar 2018	20149	1.7%	22500	16583
Jun 2018	20291	2.4%	22500	15987
Sep 2018	20140	1.6%	22500	15463
Dec 2018	20103	1.5%	22000	15049
Mar 2019	20092	1.4%	22000	14686
Jun 2019	20140	1.6%	23001	14455



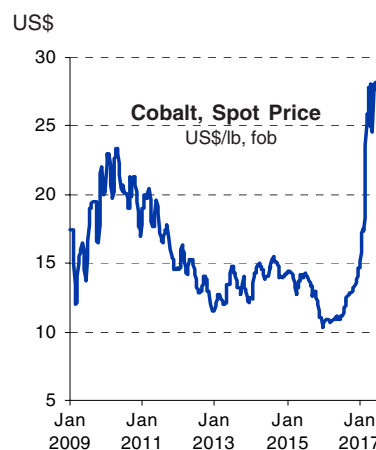
Tin has its physical spot market centred in Kuala Lumpur with the LME recognised as the principal hedging market.

Futures Market: LME Pricing: US\$/tonne **Contract Size:** 5 tonnes (+/- 2%) **Delivery Options:** Daily for cash to 3 month contracts, Wednesdays for 3 month to 6 month contracts; then every third Wednesday for 7 months out to 15 months. **Contracts Traded:** 1,353,350 (2016).

COBALT

(Nominal, Quarterly Averages)

US\$/lb	Consensus (Mean)	% change from spot	Forecast Range	
			High	Low
Spot price	28.15			
Sep 2017	22.79	-19.0%	27.90	15.00
Dec 2017	22.72	-19.3%	28.00	15.00
Mar 2018	20.98	-25.5%	26.00	13.00
Jun 2018	20.59	-26.9%	29.00	13.00
Sep 2018	20.22	-28.2%	30.00	13.00
Dec 2018	19.79	-29.7%	30.00	13.00
Mar 2019	19.47	-30.8%	31.00	13.00
Jun 2019	20.06	-28.7%	31.00	14.75



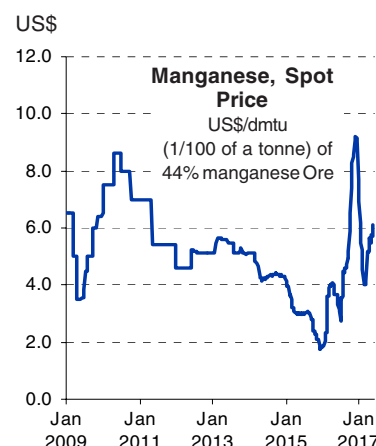
Cobalt is principally used as a super alloying agent because of its anti-corrosive properties. It is commonly a by-product of nickel and used in the production of alloys, catalysts and batteries. Recent high demand has come from electric car makers. The LME launched futures contracts in cobalt in February 2010.

Futures Market: LME Pricing: US\$/tonne **Contract Size:** 1 tonne **Delivery Options:** 1 tonne lots in 100-500kg drums of uniform size and weight.

MANGANESE

(Nominal, Quarterly Averages)

US\$/metric tonne unit	Consensus (Mean)	% change from spot	Forecast Range	
			High	Low
Spot price	6.140			
Sep 2017	4.729	-23.0%	5.650	4.000
Dec 2017	4.544	-26.0%	5.500	3.800
Mar 2018	4.228	-31.1%	5.000	3.640
Jun 2018	4.185	-31.8%	5.000	3.640
Sep 2018	4.185	-31.8%	5.000	3.640
Dec 2018	4.185	-31.8%	5.000	3.640
Mar 2019	4.001	-34.8%	5.000	2.950
Jun 2019	4.075	-33.6%	5.000	2.950



Manganese is not exchange-traded so prices are established by negotiation between buyers and sellers. Negotiations occur in line with the beginning of the Japanese fiscal year in April. Following the setting of prices with Japanese manufacturing companies, similar settlement prices are set worldwide.

The price is based upon a benchmark ore of 44% manganese content, Cif, Tianjin, China.

MOLYBDENUM

(Nominal, Quarterly Averages)

US\$/lb	Consensus (Mean)	% change from spot	Forecast Range	
			High	Low
Spot price	7.300			
Sep 2017	7.422	1.7%	8.300	6.471
Dec 2017	7.421	1.7%	8.485	6.471
Mar 2018	7.402	1.4%	8.838	6.471
Jun 2018	7.422	1.7%	8.998	6.471
Sep 2018	7.477	2.4%	9.019	6.800
Dec 2018	7.456	2.1%	9.155	7.000
Mar 2019	7.794	6.8%	9.325	7.000
Jun 2019	7.804	6.9%	9.509	7.000



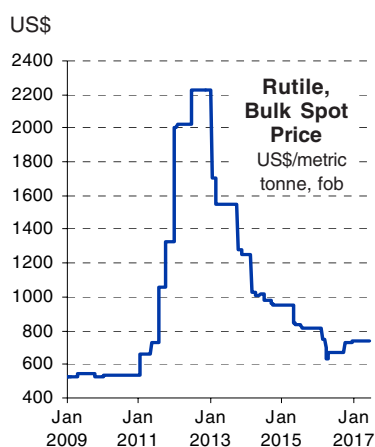
Molybdenum is principally used as an alloying agent in steel because of its anti-corrosive properties. As a by-product of copper, production costs are low and prices can be influenced by the price and demand for nickel and stainless steel, as well as molybdenum roasting capacity.

Futures Market: LME (since February 2010) **Pricing:** US\$/tonne **Contract Size:** 6 tonnes Mo (+/-5% (Mo content 57-63%)) **Delivery Options:** 10 tonnes (RMC), deliverable in 200 or 250kg drums.

RUTILE

(Nominal, Quarterly Averages)

US\$/metric tonne	Consensus (Mean)	% change from spot	Forecast Range	
			High	Low
Spot price	740.0 e			
Sep 2017	805.0	8.8%	900.0	650.0
Dec 2017	808.3	9.2%	900.0	650.0
Mar 2018	856.7	15.8%	1000	675.0
Jun 2018	864.2	16.8%	1000	700.0
Sep 2018	874.8	18.2%	1000	725.0
Dec 2018	879.0	18.8%	1000	750.0
Mar 2019	920.7	24.4%	1100	750.0
Jun 2019	922.8	24.7%	1100	774.0



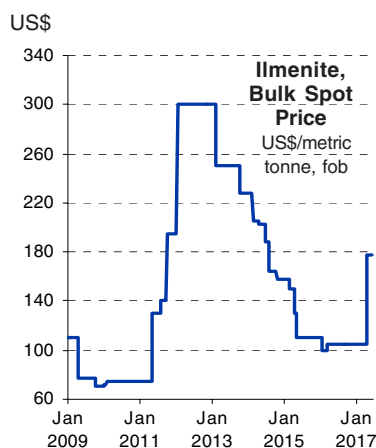
Mineral sand prices are principally determined by derived demand. Rutile is used to make titanium dioxide (it is approximately 95% TiO₂ in its mineral form), which can be used to make titanium or as a white pigment in papers, plastics and paints and cosmetics.

Prices are set under long-term contracts between producers (many of which will produce from mine to end use) and consumers.

ILMENITE

(Nominal, Quarterly Averages)

US\$/metric tonne	Consensus (Mean)	% change from spot	Forecast Range	
			High	Low
Spot price	177.5e			
Sep 2017	122.0	-31.3%	160.0	100.0
Dec 2017	121.0	-31.8%	160.0	95.0
Mar 2018	128.0	-27.9%	160.0	95.0
Jun 2018	133.0	-25.1%	180.0	100.0
Sep 2018	134.6	-24.2%	180.0	100.0
Dec 2018	135.6	-23.6%	180.0	105.0
Mar 2019	141.6	-20.2%	200.0	105.0
Jun 2019	142.1	-19.9%	200.0	110.0



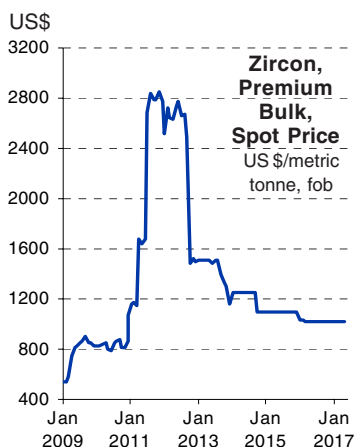
Ilmenite is mined alongside rutile and is also used to make titanium dioxide (it is approximately 54% TiO₂ in its mineral form). Prices are set under long-term contracts. The value of ilmenite is substantially lower than that of rutile and is therefore often used to produce synthetic rutile. 90% of titanium metal is sourced from ilmenite.

Australia is the world's largest producer (55%) of ilmenite and rutile followed by South Africa (24%) and Ukraine (16%).

ZIRCON

(Nominal, Quarterly Averages)

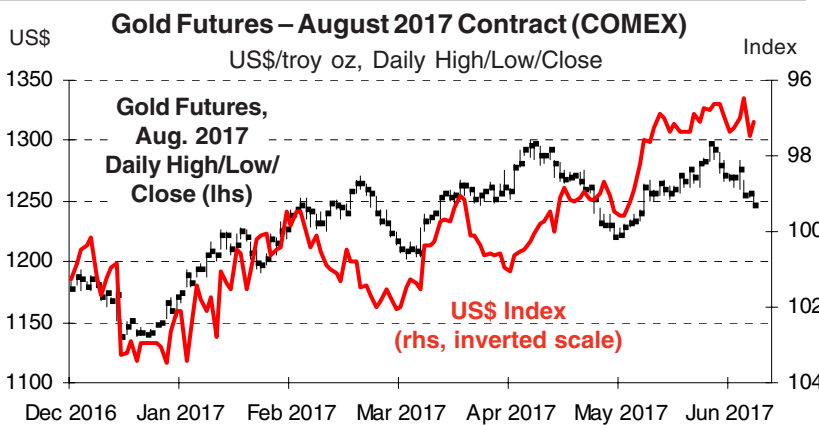
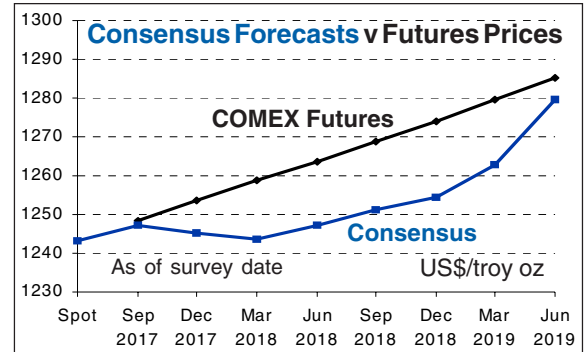
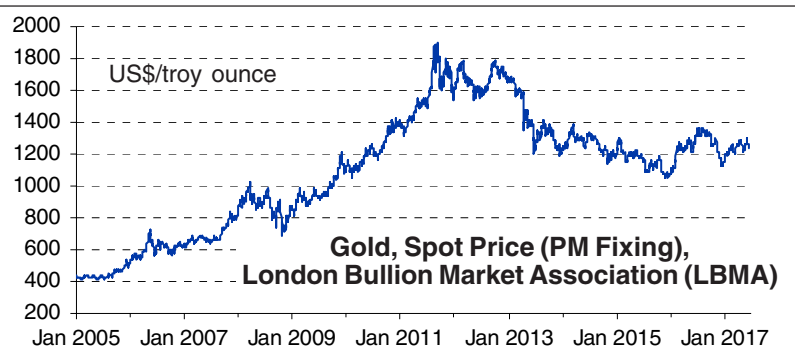
US\$/metric tonne	Consensus (Mean)	% change from spot	Forecast Range	
			High	Low
Spot price	1025 e			
Sep 2017	965.0	-5.9%	1050	825.0
Dec 2017	991.7	-3.3%	1150	800.0
Mar 2018	1071	4.5%	1250	800.0
Jun 2018	1083	5.7%	1300	825.0
Sep 2018	1100	7.3%	1350	850.0
Dec 2018	1108	8.1%	1350	900.0
Mar 2019	1133	10.6%	1300	950.0
Jun 2019	1140	11.2%	1300	950.0



The price of Zircon (which is mainly used in ceramics and tiles) is set under long-term contracts between producers and consumers. It has risen sharply in recent years following the move from spot-trading to contract-trading.

Iluka is the world's largest zircon miner and as a result the most influential in setting a benchmark price. Its Eucla basin in Australia is mined principally for zircon unlike the majority of other mines, for which zircon is a coproduct of rutile and ilmenite.

Survey Date Spot Price (Jun. 19): US\$ 1243	Gold Forecasts, US\$/Troy Ounce					Nominal, Quarterly Averages			
	Sep '17	Dec '17	Mar '18	Jun '18	% change from spot	Sep '18	Dec '18	Mar '19	Jun '19
ING Bank	1350	1450	1450	1450	16.6%	1500	1600	1550	1550
Credit Suisse	1375	1400	1375	1375	10.6%	1375	1375	1350	1350
Macquarie	1250	1250	1325	1375	10.6%	1375	1400	1375	1375
Econ Intelligence Unit	1290	1300	1320	1340	7.8%	1300	1280	1330	1350
ABN Amro	1263	1288	1313	1338	7.6%	1388	1350	na	na
UBS	1355	1350	1325	1300	4.6%	1325	1350	1350	1375
RBC Capital Markets	1268	1265	1315	1291	3.8%	1324	1281	1300	1300
Investec	1265	1265	1280	1280	3.0%	1300	1300	1310	1310
Oxford Economics	1265	1270	1265	1260	1.3%	1261	1261	1268	1268
Pezco Economics	1241	1247	1222	1253	0.8%	1228	1234	1209	1246
CIBC	1200	1200	1250	1250	0.5%	1250	1250	na	na
Deutsche Bank	1270	1250	1250	1250	0.5%	1230	1230	1266	1266
Morgan Stanley	1260	1250	1250	1250	0.5%	1250	1250	1210	1210
Scotiabank	1200	1200	1250	1250	0.5%	1250	1250	1300	na
Standard Chartered	1260	1230	1200	1240	-0.3%	1270	na	na	na
Australia Dept of Industry	1197	1203	1222	1238	-0.4%	1250	1255	1247	1226
Banco de Credito del Peru	1230	1225	1225	1225	-1.5%	1220	1220	1250	1250
Citigroup	1200	1210	1200	1220	-1.9%	1250	1300	1350	1350
Commonwealth Bank	1200	1200	1210	1220	-1.9%	1225	1232	1239	1246
Liberum Capital	1200	1200	1200	1200	-3.5%	1200	1200	1200	na
Euromonitor International	1239	1218	1203	1195	-3.9%	1187	1182	1177	1174
Moody's Analytics	1247	1223	1207	1193	-4.0%	1213	1283	1343	1393
China Int'l Capital Corp	1150	1150	1130	1190	-4.3%	1100	1020	1060	1100
Societe Generale	1225	1200	1175	1150	-7.5%	1150	1150	1125	1125
IHS Markit	1227	1192	1163	1150	-7.5%	1148	1146	1144	1127
BNP Paribas	1245	1245	1165	1115	-10.3%	1150	1125	1090	na
Capital Economics	1200	1135	1090	1075	-13.5%	1060	1090	na	na
Consensus (Mean)	1247	1245	1244	1247	0.3%	1251	1254	1263	1280
High	1375	1450	1450	1450		1500	1600	1550	1550
Low	1150	1135	1090	1075		1060	1020	1060	1100
Standard Deviation	51.6	68.6	77.4	82.3		93.7	111.8	107.9	108.1



Prices Fall Following US Fed Hike

- ◆ Gold has become less attractive following the US Fed's decision to hike rates, as it dampened the appeal of the zero-yielding asset.
- ◆ Local reports suggest that demand for gold has soared in India ahead of the introduction of a 3% sales tax on the precious metal at the beginning of July.
- ◆ The outlook continues to be supported by safe haven demand. Global uncertainty has been exacerbated by conflict in the Central Arabian Peninsula and Brexit risks as the UK has started negotiations to leave the EU.

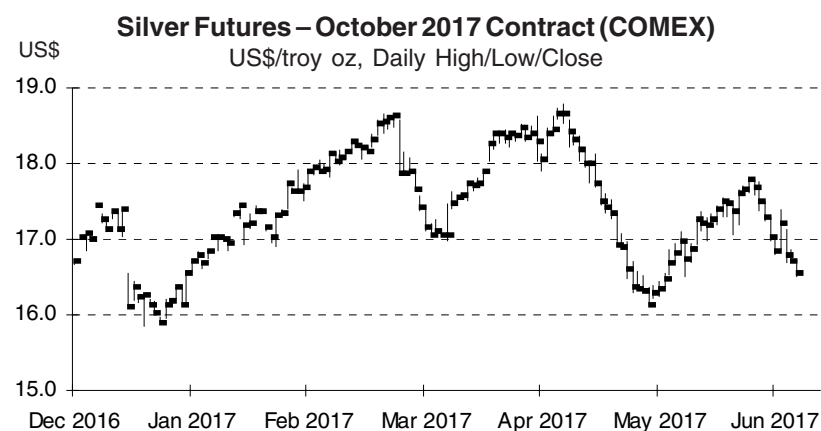
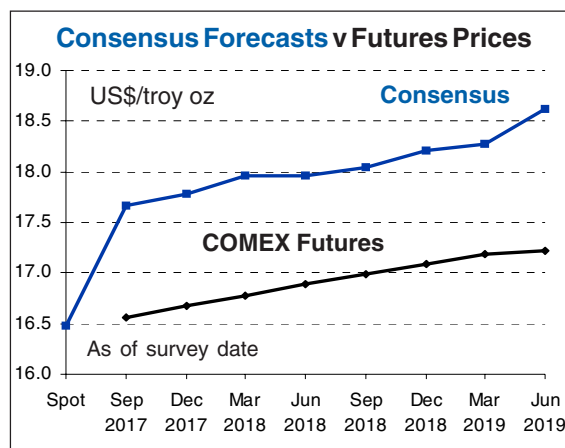
World Gold Supply and Demand (in tonnes)	2013	2014	2015	2016
World Supply ¹	4311	4451	4363	4571
Demand ²	4454	4269	4216	4309
Balance	-143.0	182.0	147.0	262.0

Source: World Gold Council

Gold prices are fixed twice daily by the LBMA providing a benchmark price for trades on various exchanges and over-the-counter trades.

US Futures Market: COMEX Pricing: US\$/troy ounce
Contract Size: 100 troy ounces **Deliverability:** Next 3 calendar months; any February, April, August and October within 23 months; and any June and December within 72 months. **Contracts Traded:** 57,564,840 (2016).

Survey Date Spot Price (Jun. 19): US\$ 16.48	Silver Forecasts, US\$/Troy Ounce <small>Nominal, Quarterly Averages</small>									
	Sep '17	Dec '17	Mar '18	Jun '18	% change from spot	Sep '18	Dec '18	Mar '19	Jun '19	
Macquarie	17.00	18.00	20.00	21.00	27.5%	21.50	21.50	21.00	21.50	
ING Bank	19.50	20.50	20.50	20.50	24.4%	21.50	23.00	23.00	23.50	
ABN Amro	18.50	18.80	19.30	19.80	20.2%	20.30	20.80	na	na	
RBC Capital Markets	19.25	19.25	19.25	19.25	16.8%	19.25	19.25	19.25	19.25	
UBS	19.00	19.50	19.30	19.00	15.3%	19.50	20.20	20.20	20.50	
Banco de Credito del Peru	17.90	18.70	18.70	18.70	13.5%	18.50	18.50	18.00	18.00	
Investec	18.33	18.33	18.55	18.55	12.6%	19.12	19.12	19.26	19.26	
Credit Suisse	17.70	18.60	18.50	18.50	12.3%	18.50	18.50	18.50	18.50	
Scotiabank	17.50	17.50	18.50	18.50	12.3%	18.50	18.50	20.00	na	
Standard Chartered	18.00	17.50	18.30	18.30	11.1%	18.30	na	na	na	
Morgan Stanley	18.20	18.20	18.20	18.20	10.5%	17.60	17.60	17.20	17.20	
CIBC	16.90	16.90	18.10	18.10	9.9%	18.10	18.10	na	na	
Citigroup	17.00	17.25	17.00	17.50	6.2%	17.75	18.00	17.80	17.80	
Deutsche Bank	17.50	17.10	18.50	17.50	6.2%	16.80	17.40	19.00	19.00	
Commonwealth Bank	16.90	17.00	17.20	17.40	5.6%	17.60	17.80	18.00	18.40	
Pezco Economics	16.85	16.93	16.59	17.01	3.2%	16.67	16.75	16.41	16.91	
Liberum Capital	17.00	17.00	17.00	17.00	3.2%	17.00	17.00	17.00	na	
Societe Generale	17.00	16.50	16.00	16.00	-2.9%	16.00	16.00	16.00	16.00	
BNP Paribas	17.55	17.35	16.30	15.70	-4.7%	16.15	15.75	15.10	na	
IHS Markit	16.79	16.53	16.17	15.65	-5.0%	15.71	15.22	15.07	14.92	
Capital Economics	16.63	15.88	15.33	14.98	-9.1%	14.65	15.25	na	na	
Consensus (Mean)	17.67	17.78	17.97	17.96	9.0%	18.05	18.21	18.28	18.62	
High	19.50	20.50	20.50	21.00		21.50	23.00	23.00	23.50	
Low	16.63	15.88	15.33	14.98		14.65	15.22	15.07	14.92	
Standard Deviation	0.86	1.15	1.39	1.57		1.79	2.05	2.11	2.20	



Silver Continues to Trail Gold

- ◆ Prices are down -0.8% from last month. As with gold (page 22), silver prices have declined on the back of the recent US Fed hike.
- ◆ The price ratio between the two precious metals is currently above 1:75, much higher than the long-term average of around 1:60 (red line in middle left chart).
- ◆ Silver is set to strengthen 9.0% to US\$17.96/troy ounce on average in Q2 2018, compared with an increase of only 0.3% for gold. This comes despite a decline in silver mining production last year for the first time since 2002.

World Silver Supply and Demand
(in million ounces)

	2013	2014	2015	2016
World Supply ¹	987.8	1050.7	1039.7	1007.1
Demand ²	1125.8	1118.3	1151.5	1027.8
Balance	-149.2	-63.8	-106.7	-147.5

Source: World Silver Survey 2017, Thomson Reuters/The Silver Institute

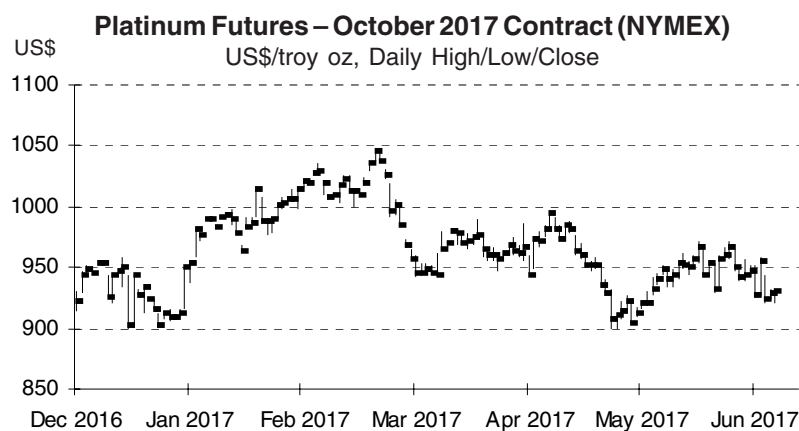
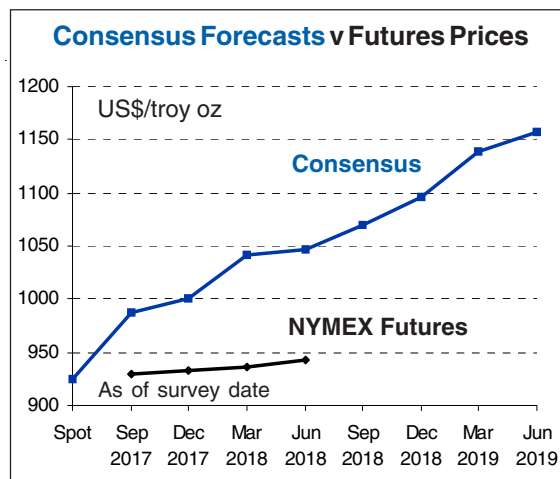
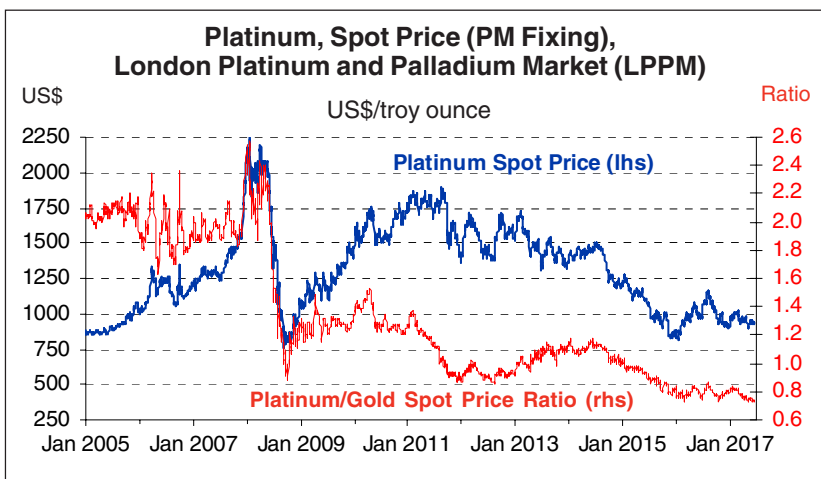
Silver, like gold, has a price set by members of the LBMA which is used as a benchmark for over-the-counter trades.

US Futures Market: COMEX Pricing: US\$/troy ounce
Contract Size: 5,000 troy ounces **Deliverability:** Next 3 calendar months; any January, March, May and September within 23 months; and any July and December within 60 months. **Contracts Traded:** 18,218,740 (2016).

Survey Date Spot Price
(Jun. 19): US\$ 924.2

Platinum Forecasts, US\$/Troy Ounce

	Sep '17	Dec '17	Mar '18	Jun '18	% change from spot	Sep '18	Dec '18	Mar '19	Jun '19
RBC Capital Markets	1050	1075	1150	1150	24.4%	1150	1150	1200	1200
UBS	1100	1140	1140	1140	23.3%	1150	1170	1170	1250
IHS Markit	989	1073	1095	1103	19.3%	1116	1129	1140	1141
Liberum Capital	1050	1050	1100	1100	19.0%	1150	1150	1200	na
Macquarie	935	975	1025	1075	16.3%	1150	1175	1225	1250
Deutsche Bank	990	950	1000	1050	13.6%	1100	1200	1250	1250
Scotiabank	1000	1000	1050	1050	13.6%	1050	1050	1100	na
Standard Chartered	1000	990	1050	1050	13.6%	1050	na	na	na
Morgan Stanley	986	1004	1022	1040	12.5%	1059	1078	1097	1117
ING Bank	960	970	1120	1040	12.5%	1150	1230	1110	1190
ABN Amro	950	963	988	1025	10.9%	1063	1088	na	na
Investec	990	990	1011	1011	9.4%	1040	1040	1048	1048
Citigroup	960	965	980	985	6.6%	990	1000	1150	1150
Societe Generale	925	930	950	975	5.5%	950	950	975	975
Capital Economics	935	945	940	915	-1.0%	890	925	na	na
Consensus (Mean)	988	1001	1041	1047	13.3%	1070	1095	1139	1157
High	1100	1140	1150	1150		1150	1230	1250	1250
Low	925	930	940	915		890	925	975	975
Standard Deviation	48.6	58.4	66.9	62.3		80.2	93.2	78.4	91.8



Prices Subdued Despite Supply Decrease

- ◆ Platinum has barely moved from our last survey. It has risen by just 1.7% in the year to date.
- ◆ Prices remain subdued in spite of supply issues in South Africa, where producers are being forced to close unprofitable mines in a country which accounts for around 70% of global supply of the precious metal.
- ◆ According to Platinum Guild International, consumption in India and the US rose 11.4% and 5.4%, respectively, in 2016. In contrast, it plummeted 8.3% in China, as a result of the slowdown in economic growth.

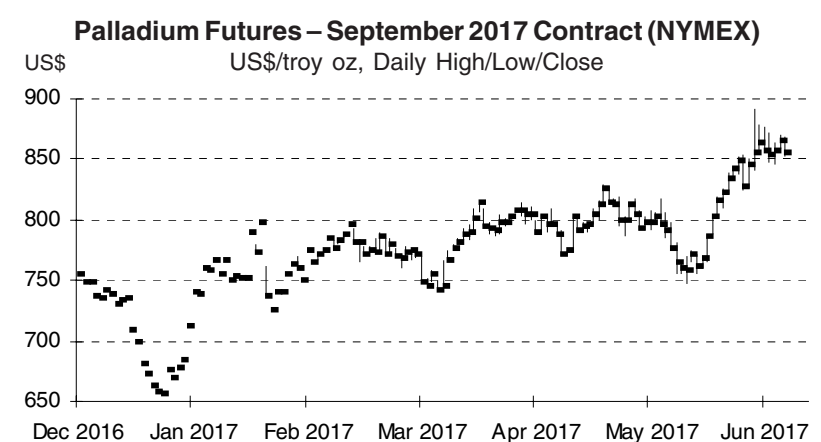
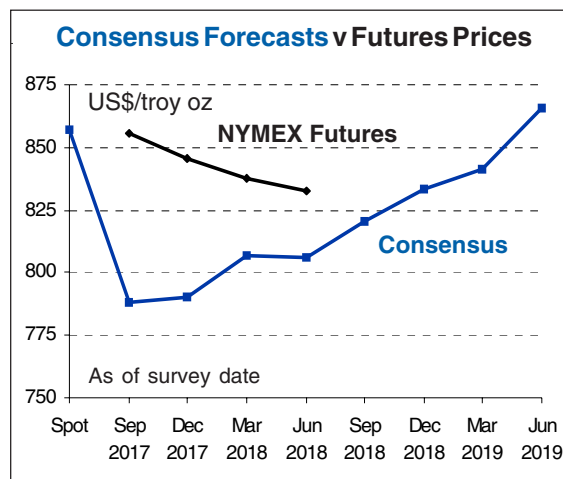
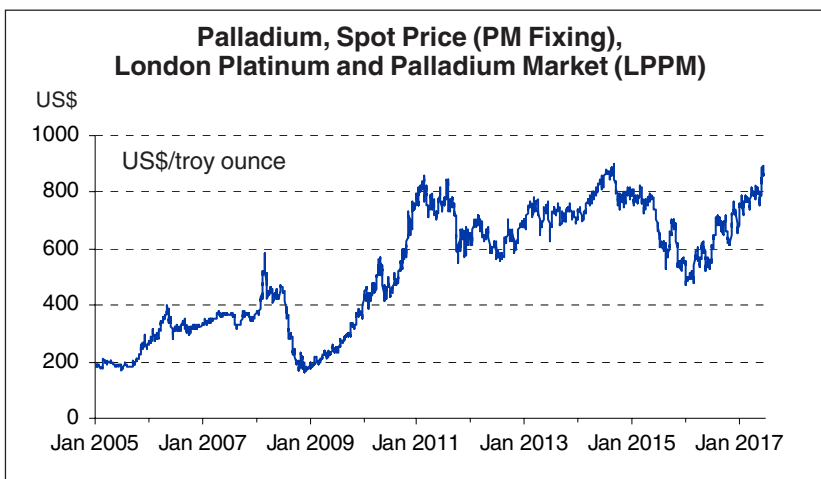
World Platinum Supply and Demand		Total Platinum Supply				Total Platinum Demand			
(in thousands of ounces)		2013	2014	2015	2016	2013	2014	2015	2016
World									
Supply ¹		7835	7265	7905	7965				
Demand ²		8570	7995	8240	8235				
Balance		-735.0	-730.0	-335.0	-270.0				

Source: World Platinum Investment Council

Platinum prices are fixed twice daily by the LPPM to provide a benchmark price in a practice similar to that used for gold and silver.

US Futures Market: NYMEX Pricing: US\$/troy ounce **Lot Size:** 50 troy ounces **Deliverability:** Over 15 months including the next 3 calendar months; then a January, April, June and October cycle. **Contracts Traded:** 3,994,072 (2016)

Survey Date Spot Price (Jun. 19): US\$ 856.9	Palladium Forecasts, US\$/Troy Ounce								
	Sep '17	Dec '17	Mar '18	Jun '18	% change from spot	Sep '18	Dec '18	Mar '19	Jun '19
Investec	900.0	900.0	963.0	963.0	12.4%	945.0	945.0	953.0	953.0
Morgan Stanley	805.0	820.6	856.2	894.0	4.3%	934.0	967.8	1003.2	1040.3
ABN Amro	813.0	825.0	838.0	850.0	-0.8%	850.0	850.0	na	na
UBS	820.0	840.0	850.0	850.0	-0.8%	875.0	925.0	925.0	1000.0
Capital Economics	815.0	800.0	815.0	840.0	-2.0%	865.0	890.0	na	na
RBC Capital Markets	790.0	800.0	825.0	825.0	-3.7%	825.0	825.0	875.0	875.0
Societe Generale	770.0	800.0	800.0	825.0	-3.7%	800.0	800.0	825.0	825.0
Standard Chartered	800.0	780.0	820.0	820.0	-4.3%	820.0	na	na	na
Citigroup	760.0	770.0	785.0	800.0	-6.6%	825.0	850.0	830.0	830.0
Scotiabank	750.0	750.0	800.0	800.0	-6.6%	800.0	800.0	850.0	na
Deutsche Bank	750.0	760.0	780.0	760.0	-11.3%	810.0	800.0	850.0	850.0
Liberum Capital	704.5	704.5	738.0	738.0	-13.9%	771.6	771.6	805.1	na
Macquarie	830.0	815.0	750.0	725.0	-15.4%	750.0	775.0	800.0	800.0
ING Bank	740.0	750.0	770.0	720.0	-16.0%	790.0	850.0	790.0	920.0
IHS Markit	774.2	741.5	714.8	684.2	-20.1%	644.8	617.4	589.1	562.9
Consensus (Mean)	788.1	790.4	807.0	806.3	-5.9%	820.4	833.3	841.3	865.6
High	900.0	900.0	963.0	963.0		945.0	967.8	1003.2	1040.3
Low	704.5	704.5	714.8	684.2		644.8	617.4	589.1	562.9
Standard Deviation	46.7	47.8	59.4	72.7		72.9	87.8	103.0	132.7



Prices Reach 16-Year High

- Prices have continued to surge over the past month, rising by 8.1% and reaching a 16-year high in early June. Palladium is up 25.6% in the year to date, making it the top-performing precious metal this year.
- Palladium is benefiting from strong industrial demand, which will likely keep the market in deficit in 2017.
- The automobile sector poses the biggest uncertainty to prices, as it makes up around 75% of total demand for the metal. While the US car market is strong, Chinese demand appears to be weakening.

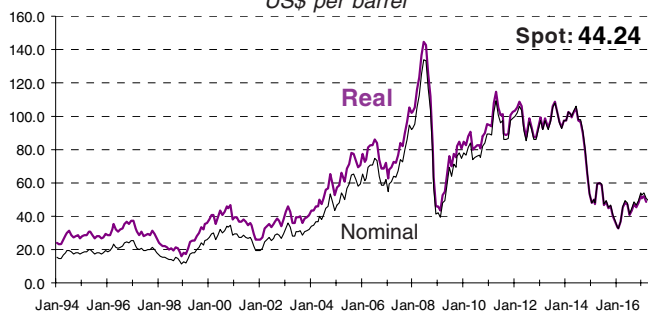
World Palladium Supply and Demand		Total Palladium Supply		Total Palladium Demand	
(in thousands of ounces)					
	2013	2014	2015	2016	
World Supply ¹	8286	8197	8584	8557	
Demand ²	9349	9515	9540	9757	
Balance	-1063	-1318	-956	-1200	

Palladium prices are fixed twice daily by the LPPM to provide a benchmark price in a practice used for other precious metals. Most palladium is used in catalytic converters. **US Futures Market: NYMEX Pricing:** US\$/troy ounce **Lot Size:** 100 troy ounces **Deliverability:** Over 15 months including the next 3 calendar months; then a March, June, September and December cycle. **Contracts Traded:** 1,435,863 (2016).

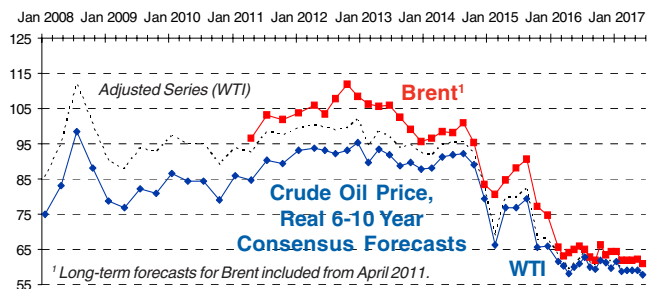
Nominal prices are expressed in fixed money terms in a given year, while real values adjust for inflation over the years. In the **historical data charts** below and on the next page (covering 1994 to 2017), we show monthly commodity price series in both nominal (**black line**) and real terms (**purple**). Nominal values are stated in current 2017 US\$ prices (definitions on individual commodity pages), while the real price series inflates the nominal values using the US CPI index. Real prices are important in the analysis of project feasibility and other long-term investment decisions, as is the choice of deflator. Adjustments based on general purpose price indices may be adequate for exploratory data analysis. To the

right of each historical data chart, we graph **changes in the real long-term consensus price forecasts** (for the 6-10 year rolling aggregate periods; collected on a monthly basis beginning in 2016) back to January 2008. These price forecasts (**blue line**) are based on the US dollar level for the year in which they are made i.e figures from our 2008 survey are inflation-adjusted at 2008 US dollar prices. In order to make the historical long-term price forecasts comparable with those made in subsequent periods – the last six of which are in 2017 US dollar terms – we have adjusted the series using US CPI (**dashed grey line**), in much the same way as we did with the historical data.

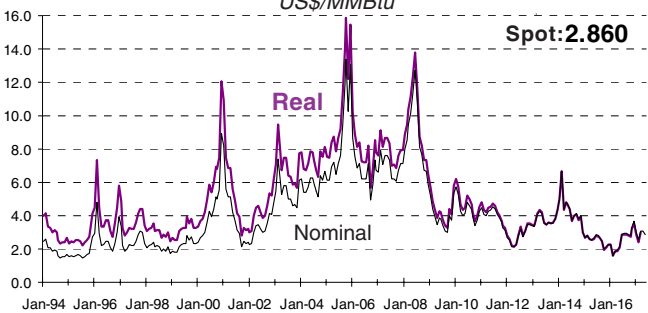
Crude Oil (WTI) Prices – Historical Data
US\$ per barrel



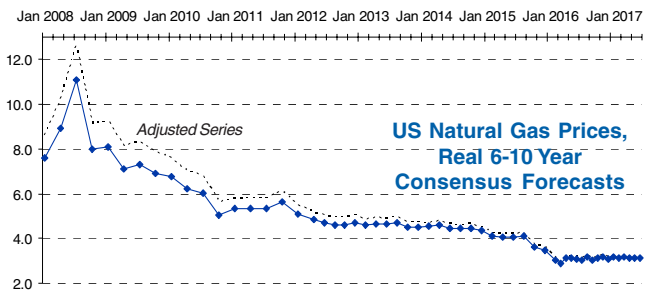
Real Long-Term 6-10 Year Forecasts
Consensus Forecasts from survey of:



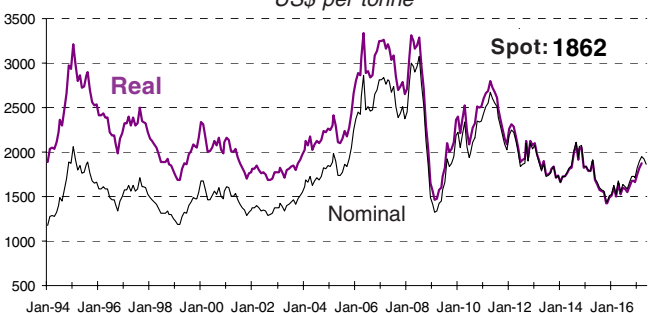
US Natural Gas Prices – Historical Data
US\$/MMBtu



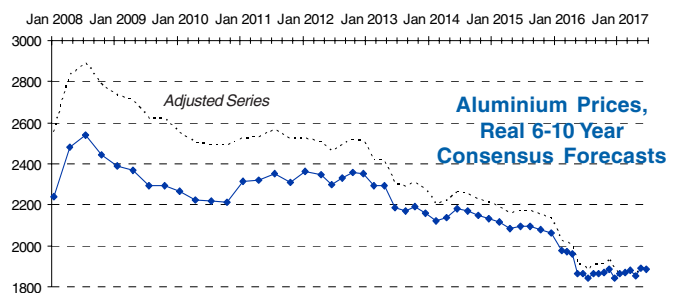
Real Long-Term 6-10 Year Forecasts
Consensus Forecasts from survey of:



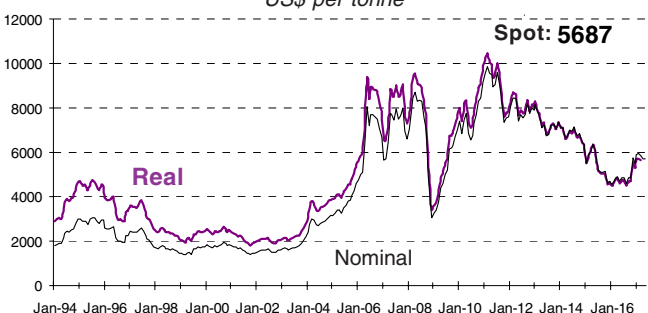
Aluminium Prices – Historical Data
US\$ per tonne



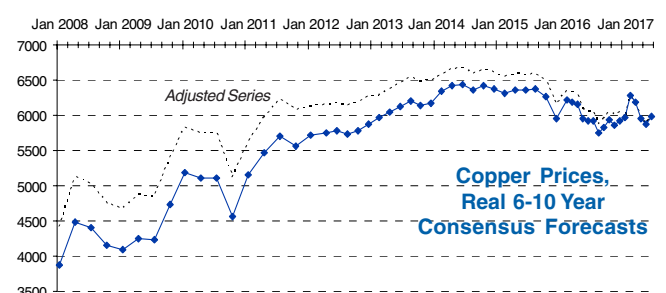
Real Long-Term 6-10 Year Forecasts
Consensus Forecasts from survey of:



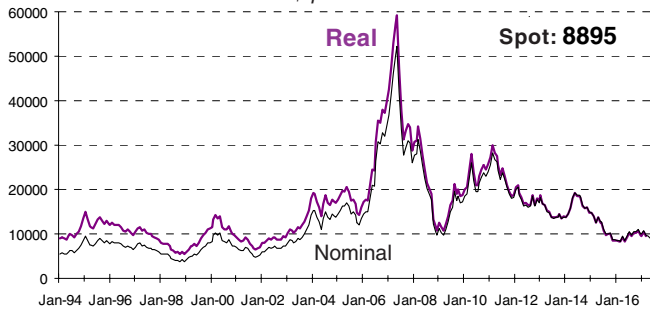
Copper Prices – Historical Data
US\$ per tonne



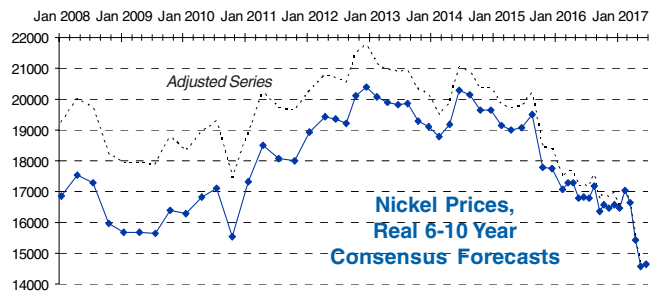
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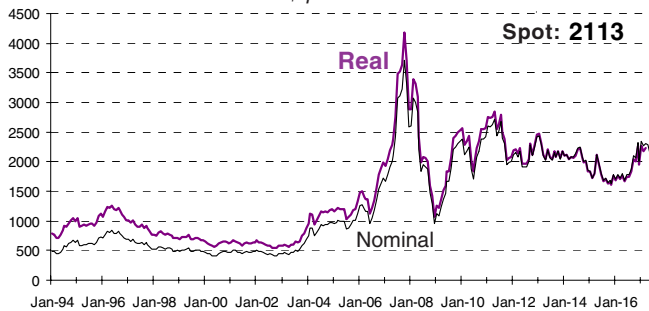
Nickel Prices – Historical Data
US\$ per tonne



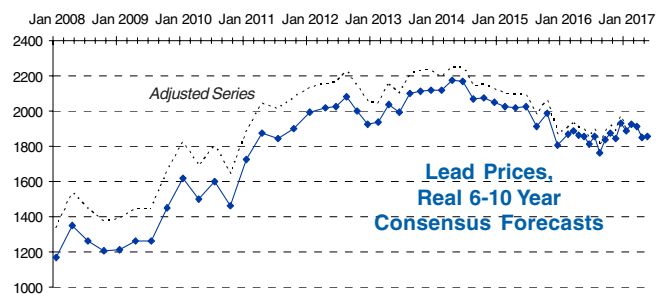
Real Long-Term 6-10 Year Forecasts
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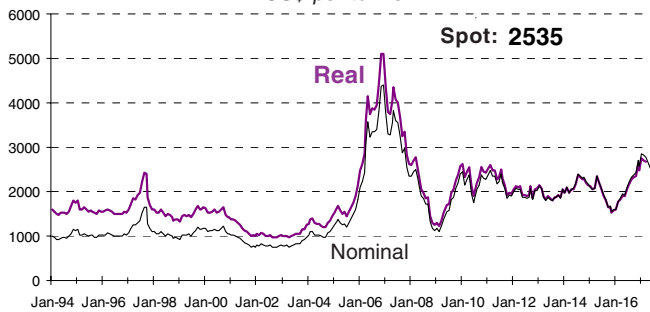
Lead Prices – Historical Data
US\$ per tonne



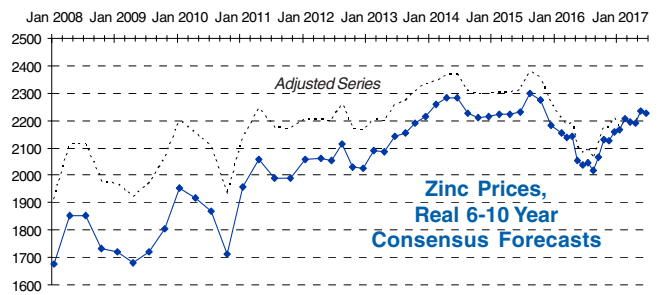
Real Long-Term 6-10 Year Forecasts
Consensus Forecasts from survey of:



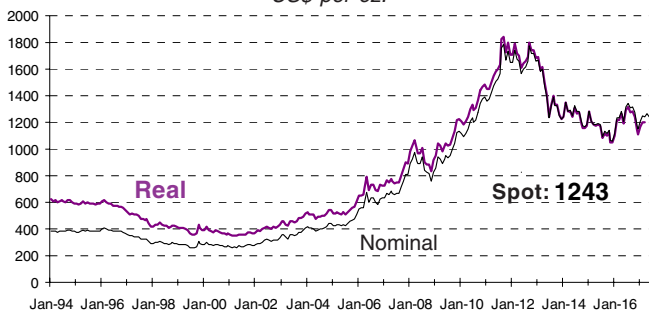
Zinc Prices – Historical Data
US\$ per tonne



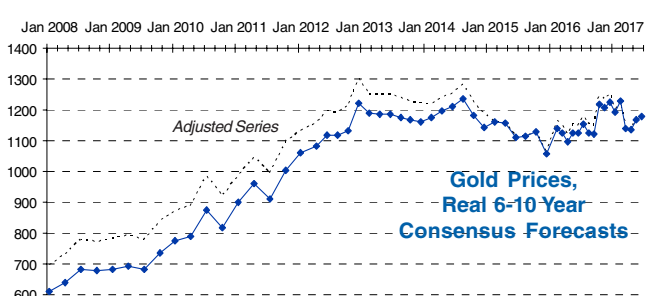
Real Long-Term 6-10 Year Forecasts
Consensus Forecasts from survey of:



Gold Prices – Historical Data
US\$ per oz.



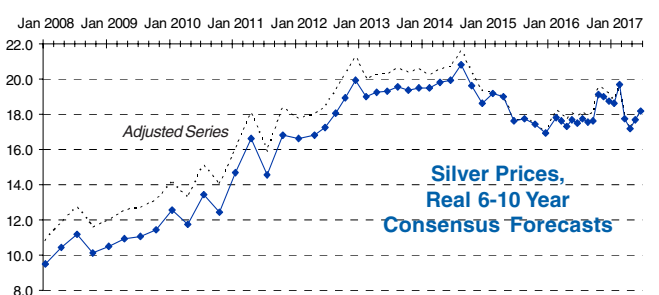
Real Long-Term 6-10 Year Forecasts
Consensus Forecasts from survey of:



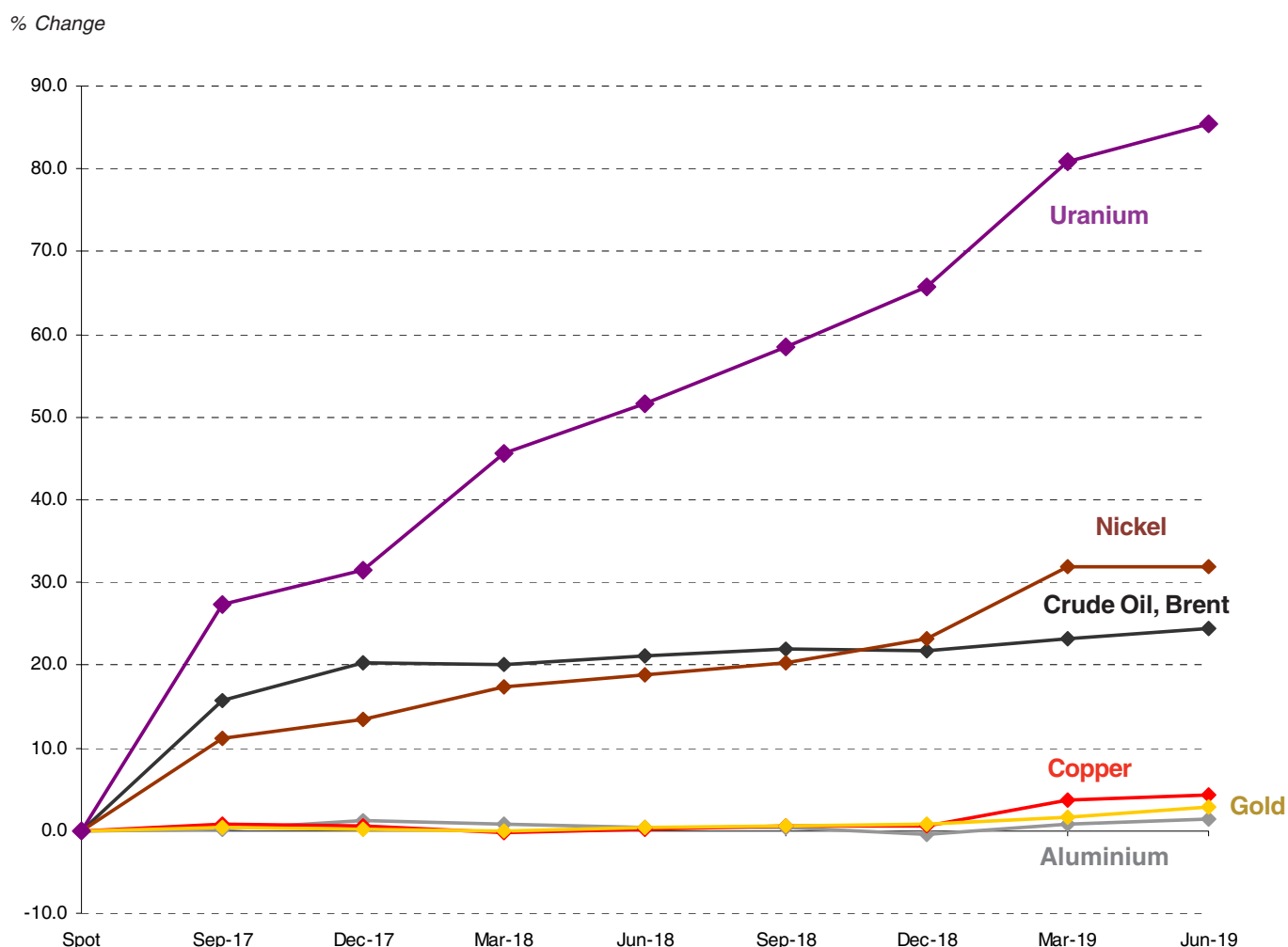
Silver Prices – Historical Data
US\$ per oz.



Real Long-Term 6-10 Year Forecasts
Consensus Forecasts from survey of:



Consensus Forecasts Percentage Changes From Spot Price During the Next Eight Quarters



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