



Sky Hong, CFA      Joe Liew, CFA  
Research Analyst      Research Analyst  
(+852) 2203 6131      (+81) 3 5156-6725  
sky.hong@db.com      joe.liew@db.com

## A must read: ballast water convention

### The convention will reinforce multi-year shipping upcycle

The Ballast Water Management Convention, which is scheduled to come into force in September 2017, requires all ships sailing in international waters to install a Ballast Water Management System (BWMS). In light of the high cost and uncertainties associated with BWMS, we expect shipowners to scrap most of their vessels of above 15 years in the coming 2-3 years. We estimate global dry bulk fleets will shrink 1.5% in 2018 and 3.9% in 2019 while VLCC utilization will pick up starting 2018. Buy Pacific Basin and CSD.

### An introduction of this convention

Initiated by the IMO in 2004, the Ballast Water Management Convention was designed to prevent transfers of invasive aquatic species via ships' ballast water. After the accession of Finland, the convention was ratified in Sept. 2016, and will enter into force in Sept. 2017. Thereafter, new vessels will have to install the BWMS on delivery date. For existing vessels, they are required to carry out retro-fit until their next International Oil Pollution Protection (IOPP) renewal survey (conduct every five years). While some vessels could get a grace period of up to five years (assuming the IOPP is renewed just before September this year), there are high levels of uncertainty over this exemption as the IMO is scheduled to further debate this exemption in July.

### Potential impacts on shipping market

The BWMS is expensive (USD2.5m for a VLCC and USD1.5m for a Capesize). This extra cost, along with higher maintenance expense, would substantially lift the breakeven level for 15+ years old vessels. Alongside the freight rate discount (to new ships) and rising demolition prices, our analysis shows that scrapping is the best option for shipowners. Currently, 14% of dry bulkers and 19% of VLCCs are above 15 years old and we expect this proportion of capacity to largely exit in the coming 2-3 years. Coupled with falling newbuild deliveries, we expect dry bulk supply growth to drop to 0.9% in 2017, and decline 1.5% in 2018 and 3.9% in 2019 (vs. 2.3% in 2016). Similarly, we expect VLCC utilization rates to pick up to 85.1% in 2018, in part due to the 2015-16 peak cycle.

### Buy Pacific Basin and CSD, Sell China Cosco

Pacific Basin is the only pure dry bulker in the region; hence, we see scarcity value. Apart from falling supply ahead, dry bulk demand may also positively surprise, thanks to Trump's election (refer to our report "2017 shipping outlook" on 5 Dec. 2016). At 0.6x forward P/B, the stock looks inexpensive as we expect the company to return to a profit this year. Our target price of HKD2.05 is based on 1.0x P/B. We also like CSD, as we expect the tanker cycle to bottom out this year. CSD is likely to raise its payout ratio to 50% for 2016, representing a 6.6% yield. Share buyback is another potential positive catalyst. We maintain Sell on China Cosco. The convention has limited impact on mega vessels and downside risk to demand exists on potential trade conflicts, in our view. Risks: Pacific Basin: softer-than-expected BDI; CSD: a disappointing VLCC rate; China Cosco: stronger-than-expected container rates.

### Top picks

Pacific Basin Shipping Ltd (2343.HK),HKD1.37	Buy
China Shipping Development (1138.HK),HKD4.32	Buy

Source: Deutsche Bank

### Companies Featured

	2015A	2016E	2017E	
China Shipping Development (1138.HK),HKD4.32				Buy
P/E (x)	42.8	5.7	10.3	
EV/EBITDA (x)	15.1	8.0	9.8	
Price/book (x)	0.6	0.6	0.5	
China Cosco Hldgs (1919.HK),HKD2.97				Sell
P/E (x)	-	-	-	
EV/EBITDA (x)	13.6	-	-	
Price/book (x)	1.2	2.0	3.5	
Pacific Basin Shipping Ltd (2343.HK),HKD1.37				Buy
P/E (x)	-	-	-	
EV/EBITDA (x)	10.4	30.5	9.7	
Price/book (x)	0.4	0.7	0.7	

Source: Deutsche Bank



## A quick introduction of this convention

The Ballast Water Management (BWM) Convention was adopted by the International Maritime Organization (IMO) in February 2004. The main purpose of this convention is to prevent transfers of invasive aquatic species in ships' ballast water during international voyages.

In September 2016 after the accession of Finland, the convention was ratified. It is schedule to enter into force on 8 September 2017. Thereafter, all new vessels are required to install the BWMS on delivery while existing ships could have a grace period to carry out retro-fit until their next International Oil Pollution Protection (IOPP) renewal survey.

As the IOPP is usually renewed every five years together with a special survey, a vessel in theory could have a grace period of up to five years if it renews the IOPP just prior to September 2017. However, the risk to this exemption period is high as the IMO will make further debates on this subject in July 2017.

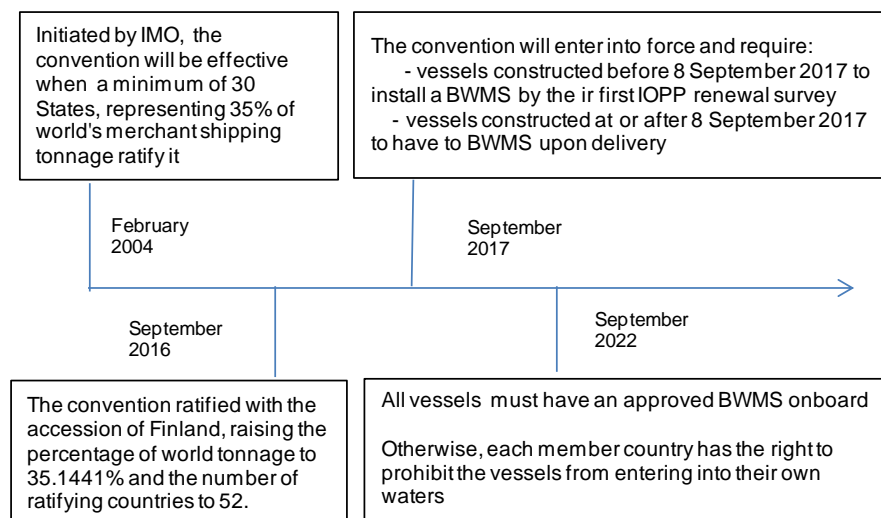
By September 2022, all vessels (including dry bulker, tankers, containers, etc.) must have an approved BWMS on board. Otherwise, each member country has the right to prevent ships from entering into its own waters.

*Ballast water is water that ships fill in their ballast tanks to maintain stability during transit*

*IOPP is usually renewed every 5 years along with a special survey*

*Approved manufacturers of BWMS are listed in the appendix*

Figure 1: Timeline for BWM Convention



Source: Deutsche Bank

## Potential impacts on the shipping market

There are two potential impacts from this convention that are frequently discussed: 1) congestion in shipyard, and 2) scrapping.

### Severe congestion at shipyards looks unlikely

According to our channel checks, the retrofitting could be done during regular drydock intervals and the installation of a BWMS will not take long at shipyards (10-20 days). However, if shipowners choose to install the BWMS during the same period, we would not rule out moderate congestion at shipyards, a likely result of shortages in BWMS equipment supply and shipyard space.

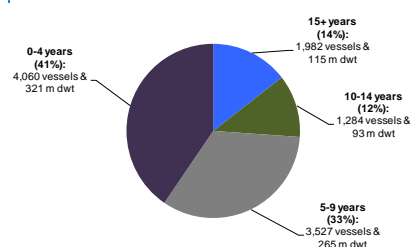


### Scrapping is likely to accelerate

The cost of a BWMS varies widely and rises in line with a ship's size (ranges between USD0.5 and USD5m; USD2.5m for VLCC and USD1.5m for Capesize). Given this large additional cost, many shipowners may choose to scrap their 15 years plus old vessels than to take them through another special survey, which is also costly (USD3m for VLCC and USD1m for Cape). Apart from high operating costs associated with old vessels, the freight rates for old ships are also at a c.20% discount to new vessels'.

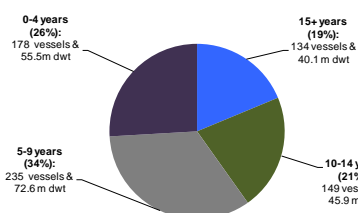
Currently, about 14.4% of dry bulkers and 18.8% of VLCCs are older than 15 years. We expect a large proportion of these to be scrapped in the next few years. For containers, we believe the impact is likely to be smaller as almost all of the mega vessels (12K TEU+) are under 10 years old.

Figure 2: 2016 Bulker age distribution



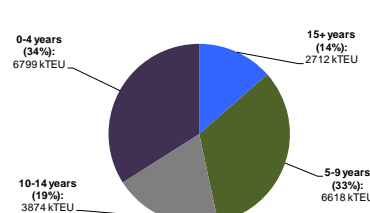
Source: Deutsche Bank, Clarksons

Figure 3: 2016 VLCC age distribution



Source: Deutsche Bank, Clarksons

Figure 4: 2016 Container age distribution



Source: Deutsche Bank, Clarksons

Figure 5 shows our estimate of daily operating cost for 15 years old vessels, assuming shipowners do not scrap them. For VLCC, the cost of a BWMS plus high insurance and maintenance cost would add an extra cost of USD2,000/day, lifting the breakeven cost to USD29k/day. The average VLCC rate since 2010 has been about USD32k/day and if we build in a 20% discount, old VLCCs would fail to achieve breakeven. The same applies to Capesize.

Figure 5: 15 year plus old vessels may fail to achieve breakeven due to rising operating costs

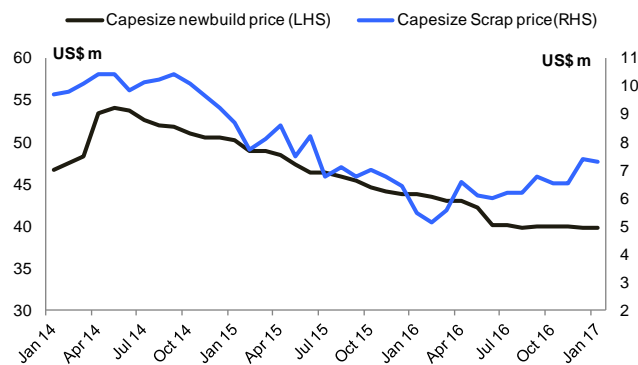
USD/day	VLCC	Capesize	Note
BWMS	1,370	822	BWMS costs USD2.5m for a VLCC and USD1.5m for a Cape
Maintenance cost	11	11	Annual maintenance cost about USD2,000, filter replacing cost USD10,000 every 5 years
<b>Total BWMS related cost</b>	<b>1,381</b>	<b>833</b>	
Special Survey cost	1,644	548	USD3m for a VLCC above 15 years old and USD1m for a Cape
Crew cost	4,725	3,139	Crew wages, provisions and crew other
Store cost	1,470	1,095	Lubricants and stores other
Insurance	1,155	730	P&I and H&M
Repair & maintenance	1,580	949	Spares and other repairs & maintenance
Other administration cost	1,570	1,387	other daily cost
Fuel cost	10,411	5,205	250 operating days p.a; VLCC consumes 40 tons/day, Cape 20 tons/day; bunker price at USD380/ton
Drydock cost	4,384	2,740	The annual drydock cost for VLCC is USD1.6m, Cape USD1m,
<b>Total operating cost</b>	<b>28,739</b>	<b>17,026</b>	
<b>Freight rates</b>	<b>26,080</b>	<b>13,440</b>	Avg rates since 2010; VLCC: USD32.6k/day, Cape: USD16.8k/day; 20% discount for 15 years old vessel

Source: Deutsche Bank, Clarksons

Rather, as scrapping prices have picked up and newbuild prices continue to fall (Figures 6 and 7), our analysis shows that shipowners would achieve decent IRRs if they were to scrap old ships and order new ones (Figure 8).

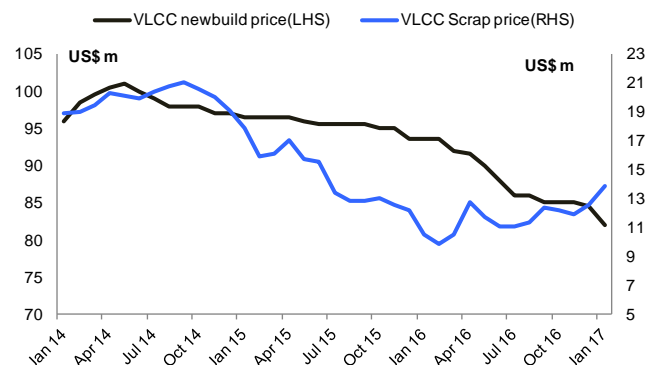


Figure 6: Capesize newbuild vs. scrap price



Source: Deutsche Bank, Clarksons

Figure 7: VLCC newbuild vs. scrap price



Source: Deutsche Bank, Clarksons

Figure 8: Scrap old VLCCs and order new ones; Projected IRR calculation

USD m	Construction period										Loan repayment period																	
Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Total debt			72	71	69	68	66	64	62	60	58	56	53	51	48	46	43	40	37	33	30	26	22	18	14	10	5	0
Yearly amortization				5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Debt portion				2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	4	4	4	4	4	5	5
Finance cost				4	4	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	1	1	1	1	1	0	0
<b>Cash flow</b>																												
TCE				11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Operating cost				4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Debt and interest				5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Equity outflow		8	5																									
<b>Total FCF-project</b>	<b>13</b>	<b>-45</b>	<b>-40</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	
<b>Total FCF-Equity</b>	<b>0</b>	<b>-8</b>	<b>-5</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	
<b>Project IRR</b>	<b>8.3%</b>																											
<b>Equity IRR</b>	<b>14.0%</b>																											

Source: Deutsche Bank; Note: 1.VLCC newbuild price USD85m and Scrap priceUSD13m;2.USD72m debt financing at 5%; 3.VLCC USD30k/day TCE and USD10k/day Opcost; 4. 25 years straightline depreciation

Our scrapping forecasts

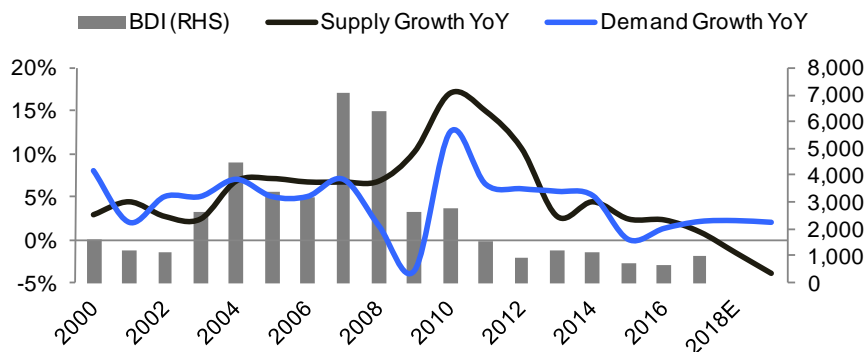
Dry Bulker:

- **Assumptions:** 80% of large-size vessels (i.e. Cape, Pana) above 15 years, 20% of large-size vessels between 10-14 years, and 50% of small-size vessels over 15 years to be scrapped in next five years
- **Impacts:** global dry bulk fleets to grow 0.9% in 2017 and then shrink 1.5% in 2018 and 3.9% in 2019.

*This convention applies to IMO member countries, which cover most global bulk trade (figure 21 in appendix); we therefore assume that 80% large-size ships would be scrapped; small size vessels are mostly used in coastal/ inland water, less affected by the BWM convention and, hence we assume a 50% scrapping ratio*



Figure 9: Dry Bulker S/D vs. BDI



Source: Deutsche Bank, Clarksons

Figure 10: DB's dry bulk SD table

S/D table (m tons)	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017E	2018E	2019E
Scheduled deliveries						100.1	71.1	75.6	69.3	55.5	19.4	7.5
Slippage/ cancelled						-37.2	-22.9	-26.3	-22.1	-16.7	-4.9	-1.5
Actual deliveries						62.9	48.2	49.3	47.2	38.9	14.6	6.0
Scrapping						-23.7	-16.4	-30.7	-29.1	-31.0	-25.7	-36.0
Net addition(+)/removal (-)						-0.1	0.0	-0.4	-0.6	-0.6	-0.6	-0.6
Total Bulk Fleet	419.6	462.5	541.1	621.7	687.5	726.7	758.4	776.5	794.0	801.2	789.5	759.0
y/y growth	6.8%	10.2%	17.0%	14.9%	10.6%	5.7%	4.4%	2.4%	2.3%	0.9%	-1.5%	-3.9%
Demand growth	1.9%	-3.6%	12.5%	6.4%	5.9%	5.6%	5.1%	0.0%	1.3%	2.1%	2.2%	2.0%
<b>S/D balance</b>	<b>4.8%</b>	<b>13.8%</b>	<b>4.5%</b>	<b>8.5%</b>	<b>4.7%</b>	<b>0.1%</b>	<b>-0.7%</b>	<b>2.4%</b>	<b>0.9%</b>	<b>-1.2%</b>	<b>-3.6%</b>	<b>-5.9%</b>

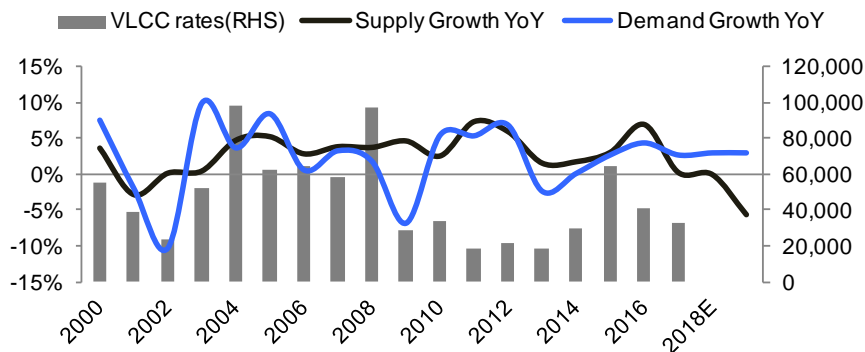
Source: Deutsche Bank, Clarksons; Note: we assume 30% slippage ratio for 2017, 25% for 2018 and 20% for 2019

**Tanker:**

- **Assumptions:** 80% of large-size vessels (i.e. VLCC, Suez) above 15 years, 20% of large-size vessels between 10 and 14 years, and 50% of small-size vessels over 15 years to be scrapped in the next five years
- **Impacts:** VLCC utilization rates will slightly drop to 82.7% in 2017E (from 83.4% in 2016), then rise to 85.1% in 2018E and 90.1% in 2019E.



Figure 11: VLCC S/D vs. VLCC rates



Source: Deutsche Bank, Clarksons

Figure 12: DB's VLCC SD table

m dwt	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017E	2018E	2019E
Begin fleet	147.7	151.0	160.5	164.7	176.9	187.5	190.5	193.9	200.0	214.1	214.8	214.8
Deliveries less	12.8	16.4	16.6	19.1	15.3	9.5	7.6	6.2	14.3	9.0	12.4	4.4
-Slippage										2.4	2.1	0.1
-Cancelled										4.8	4.1	0.2
Demolition	0.8	2.4	3.5	3.3	2.7	5.0	2.4	0.5	0.6	8.3	12.4	16.5
Mis. addition (+)/removal (-)	-8.7	-4.5	-8.9	-3.7	-2.0	-1.5	-1.8	0.3	0.3	0.0	0.0	0.0
Net addition	3.3	9.6	4.2	12.2	10.6	3.0	3.5	6.0	14.1	0.7	0.0	-12.1
End fleet	153.3	160.5	164.7	176.9	187.5	190.5	193.9	200.0	214.1	214.8	214.8	202.7
Supply growth	3.8%	4.7%	2.6%	7.4%	6.0%	1.6%	1.8%	3.1%	7.0%	0.3%	0.0%	-5.6%
VLCC demand (m dwt)	146.3	138.5	146.3	153.8	165	161	161.2	165.5	172.7	177.4	182.7	188.2
Demand growth	0.2%	5.3%	5.6%	5.1%	7.3%	-2.4%	0.1%	2.7%	4.4%	2.7%	3.0%	3.0%
<b>Tanker cap utilization</b>	<b>97.4%</b>	<b>88.5%</b>	<b>90.0%</b>	<b>90.0%</b>	<b>90.6%</b>	<b>85.2%</b>	<b>83.9%</b>	<b>84.0%</b>	<b>83.4%</b>	<b>82.7%</b>	<b>85.1%</b>	<b>90.1%</b>

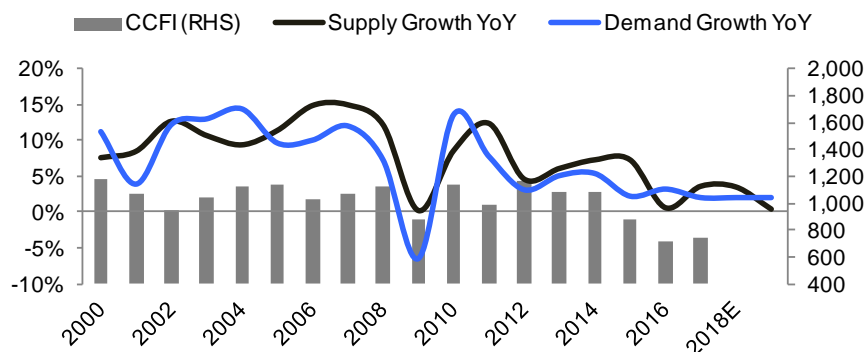
Source: Deutsche Bank, Clarksons; Note: we assume 35% slippage ratio and 15% cancellation ratio for 2017E-2019E

**Container:**

- **Assumptions:** 80% of large-size capacity over 15 years, 20% of large-size capacity between 10 and 14 years; 50% of small-size capacity over 15 years
- **Impacts:** global effective supply to grow 3.6% in 2017E and 3.5% in 2018E, and then narrow to 0.4% in 2019E.



Figure 13: Container SD vs. CCFI



Source: Deutsche Bank, Clarksons

Figure 14: DB's container SD table

S&D table	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017E	2018E	2019E
Nominal supply growth	13.2%	9.2%	7.9%	8.8%	6.9%	5.7%	6.0%	7.3%	4.5%	2.8%	3.0%	0.4%
Less: cancellations & slippage	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.5%	0.0%
Capable supply growth	13.2%	9.2%	7.9%	8.8%	6.9%	5.7%	6.0%	7.3%	4.5%	2.4%	2.5%	0.4%
Adjusted for: idle capacity	-1.0%	-9.0%	4.7%	3.6%	-2.3%	0.4%	1.3%	0.0%	-3.9%	1.2%	1.0%	0.0%
Adjusted for: Slow steaming			-4.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Effective supply growth	12.2%	0.2%	8.6%	12.4%	4.6%	6.1%	7.3%	7.3%	0.6%	3.6%	3.5%	0.4%
Demand growth	7.3%	-6.6%	13.7%	7.8%	3.1%	5.1%	5.4%	2.2%	3.2%	2.0%	2.0%	2.0%
<b>S/D balance (capable capacity)</b>	<b>5.9%</b>	<b>15.8%</b>	<b>-5.9%</b>	<b>1.0%</b>	<b>3.8%</b>	<b>0.6%</b>	<b>0.6%</b>	<b>5.1%</b>	<b>1.3%</b>	<b>0.4%</b>	<b>0.5%</b>	<b>-1.6%</b>
<b>S/D balance (effective capacity)</b>	<b>4.9%</b>	<b>6.8%</b>	<b>-5.2%</b>	<b>4.6%</b>	<b>1.5%</b>	<b>1.0%</b>	<b>1.9%</b>	<b>5.1%</b>	<b>-2.6%</b>	<b>1.6%</b>	<b>1.5%</b>	<b>-1.6%</b>

Source: Deutsche Bank estimates

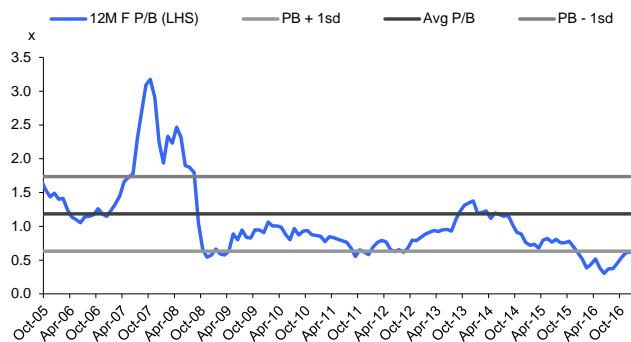
## Company review

### Pacific Basin (2343.HK, Buy, target price HKD2.05)

Currently, Pacific Basin is the only pure dry bulk player we cover regionally after the restructuring of Chinese shipping groups. We believe it will benefit from a scarcity premium, should investors want to play a dry bulk recovery. We saw rate increases in 2016, and we have a more positive stance on rates in the following years. At 0.6x forward P/B, the stock looks inexpensive as we expect the company to return to a profit this year. We believe the company should be able to cover its cost of equity and we are comfortable with 1.0x 2017E P/B and target price of HKD2.05. Key risk relates to the uncertain demand outlook for the dry bulk shipping sector. Demand this year has been difficult to predict and a negative surprise would hurt rates, earnings and stock prices.

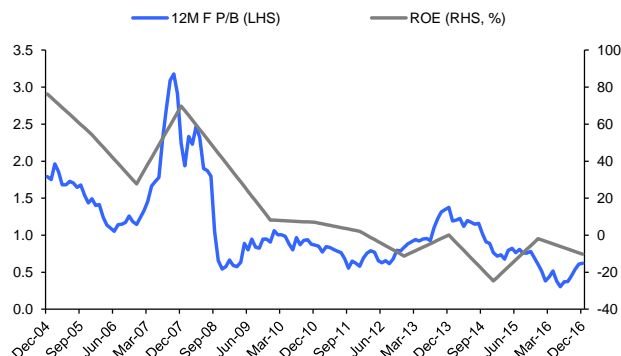


Figure 15: Pacific Basin 12m forward P/B



Source: Deutsche Bank, company data

Figure 16: Pacific Basin 12m forward P/B vs. ROE

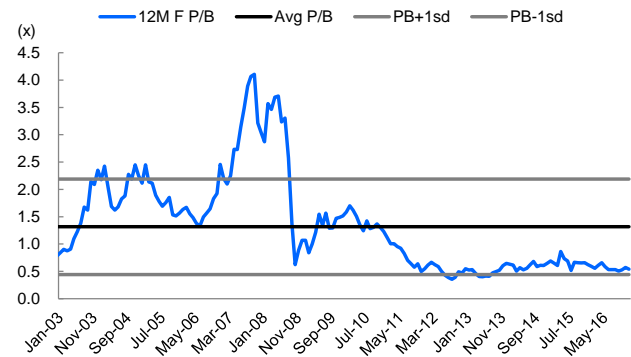


Source: Deutsche Bank, company data

**CSD (1138.HK, Buy, target price HKD6.60)**

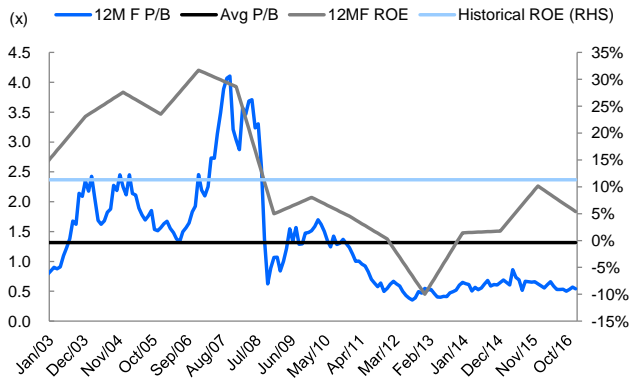
We believe CSD may raise its dividend payout ratio for 2016 considering the substantial cash in its books. The company is likely to raise the payout ratio to 50% for 2016, representing a 6.6% yield. Moreover, as CSD parent holds a 38.56% stake in the listco, CSD parent may initiate a share buyback plan after receiving likely higher dividends. Our target price is based on 0.8x P/B and we think this is fair as we expect the company to make RMB 1.5bn in net profit, or 5.4% in 2017. Weaker-than-expected China growth is a key macro risk. Lower-than-expected VLCC rate is a company specific risk.

Figure 17: CSD 12m forward P/B



Source: Deutsche Bank, company data

Figure 18: CSD 12m forward P/B vs. ROE



Source: Deutsche Bank, company data

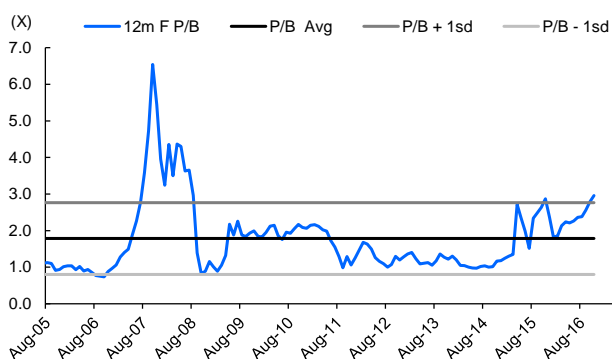
**China Cosco (1919.HK, Sell, target price HKD1.0)**

Our target price of HKD1.0 is based on 0.6x P/B. We think this is fair considering the disappointing 2016 results and that losses are highly likely to continue in 2017-2018E. We estimate its shareholder's equity will shrink to RMB15bn by the end of 2016 (vs. RMB25bn at the end of 2015). ROE in 2016E will be negative 50.2%. Along with the continued downturn in container shipping, we believe the risk of de-listing cannot be ruled out. Key macro risk is stronger-than-expected global trade. Company-specific risk is stronger-than-expected merger synergies.



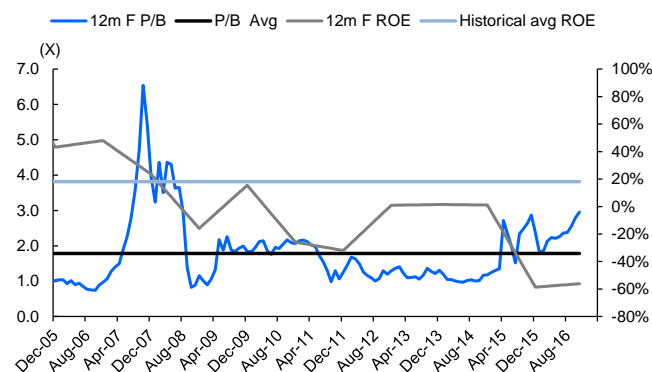


Figure 19: China Cosco 12m forward P/B



Source: Deutsche Bank, company data

Figure 20: China Cosco 12m forward P/B vs. ROE



Source: Deutsche Bank

## Appendix

This convention would not affect vessels if they are deployed in coastal or inland waters. However, in addition to these party countries like Japan, Brazil and Canada, countries like Australia and China have decided to comply with the convention to protect the environment. About 60%-90% of global exports and imports are covered by these countries.

Figure 21: BWM Convention influenced large parts of global trade

countries influenced by the BWM Convention

Dry bulk	Brazil	Canada	Sweden	Indonesia	Australia	US	Total impact	Total trade	Proportion
Iron ore export (m t)	374.7	39.2	18.0	-	805.2	-	1,237.1	1,426.0	87%
Coking coal export(m t)	-	27.1	-	-	153.8	29.7	210.6	241.0	87%
Grain export (m t)	-	-	-	344.9	224.6	19.2	588.7	882.0	67%
Tanker	Brazil	EU	Japan	Korea	China	US	Total impact	Total trade	Proportion
Crude oil import (m bpd)	0.2	4.4	3.3	2.9	7.0	4.6	22.4	38.8	58%

Source: Deutsche Bank, Clarksons

Currently there are 69 IMO-approved BWMSs available, but only five of them are approved under the more stringent regime of the US (the US not being a Party to the BWM Convention). Moreover, a more stringent approval regime regarding the BWMS will be adopted by the IMO in 2020.



Figure 22: List of approved manufacturers

Name	Country	Parent company	Ticker
Alfa Laval	Sweden	na	ALFA.ST
OceanSaver AS	Norway	na	unlisted
Optimarin	Norway	na	unlisted
Degussa GmbH	Germany	na	unlisted
Techcross Ltd.; Korea Ocean Research and Development Institute	S. Korea	na	unlisted
Japan Association of Marine Safety	Japan	na	unlisted
RWO GmbH	Germany	na	VIE.PA
NK Company Ltd.	Korea	na	unlisted
Hitachi. Ltd.	Japan	na	6501.T
Resource Ballast Technologies Ltd.	na	na	na
Panasia CO. Ltd	Korea	na	unlisted
The Toagosei Group	Japan	na	4545.T
Greenship Ltd.	na	na	na
Ecochlor, Inc	USA	na	unlisted
Cosco(Weihai) Shipbuilding Marine Technology Co., Ltd	China	COSCO group	unlisted
Hyundai Heavy Industries Co., Ltd.	S. Korea	na	009540.ks
Aquaworx ATC GmbH	Germany	Aligna AG.	unlisted
Siemens Water Technologies	UK	na	unlisted
Qingdao Sunrui Corrosion and Fouling Control Company	China	na	unlisted
DESMI Ocean Guard A/S	na	na	na
21st Century Shipbuilding CO., Ltd.	S. Korea	na	unlisted
Kwang San CO., Ltd	na	na	na
Qingdao Headway Technology CO., Ltd	China	na	unlisted
Severn Trent De Nora, LLC	USA	na	unlisted
Techwin Eco Co., Ltd	na	na	na
AQUA Eng. CO., Ltd.	S. Korea	na	unlisted
Kuraray Co., Ltd	Japan	na	3405.T
ERMA FIRST ESK ENGINEERING SOLUTIONS S.A.	na	na	na
Envirotech and Consultancy Pte. Ltd.	USA	na	unlisted
Katayama Chemical, Inc.	Japan	na	unlisted
JFE Engineering Corporation	Japan	JFT Holdings, Inc	5411.T
GEA Westfalia Separator Systems GmbH	Germany	na	unlisted
Samsung Heavy Industries Co., Ltd.	S. Korea	na	010140.KS
STX Metal Co/. Ltd.	S. Korea	STX Engine Co., Ltd	077970.KS
Dalian Maritime University	China	na	unlisted
Hanla IMS CO., Ltd.	S. Korea	na	092460.KQ
Korea Top Marine Co., Ltd.	S. Korea	na	unlisted
Hamworthy Water Systems Ltd.	na	na	na
Jiujiang Precision Measuring Technology Research Institute	China	na	unlisted
HWASEUNG R&A Co., Ltd.	S. Korea	na	013520.KS
Van Oord B.V.	Netherlands	Merwe Oord	unlisted
REDOX Maritime Technologies AS	na	na	na
SUNBO Industries Co. Ltd.; DSEC Co. Ltd.; The Korean Institute of Machinery & Material	S. Korea	na	unlisted
Azienda Chimica Genovese	Italy	na	unlisted
Panasonic Environmental Systems & Engineering Co. Ltd.	Japan	Panasonic Corp	6752.T
Ecomarine Technology Research Association	na	na	na
Kurita Water Industries Ltd	Japan	na	6370.T

Source: Deutsche Bank



Model updated: 05 December 2016

Running the numbers

Asia  
 Hong Kong  
 Marine

Pacific Basin Shipping Ltd

Reuters: 2343.HK Bloomberg: 2343 HK

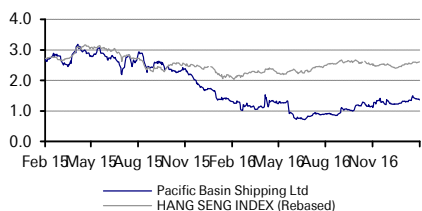
Buy

Price (8 Feb 17) HKD 1.37  
 Target Price HKD 2.05  
 52 Week range HKD 0.72 - 1.53  
 Market Cap (m) HKDm 5,288  
 USDm 682

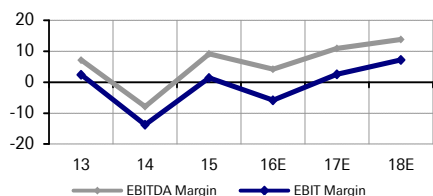
Company Profile

Pacific Basin Shipping Limited is an investment holding company. The Company, through its subsidiaries is engaged in the provision of dry bulk shipping services through the operation of a fleet of vessels.

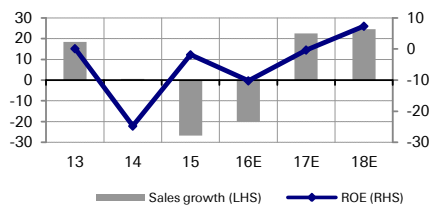
Price Performance



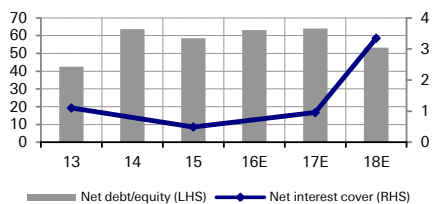
Margin Trends



Growth & Profitability



Solvency



Fiscal year end 31-Dec

Financial Summary

	2013	2014	2015	2016E	2017E	2018E
DB EPS (USD)	0.01	-0.15	-0.01	-0.04	0.00	0.02
Reported EPS (USD)	0.00	-0.15	-0.01	-0.04	0.00	0.02
DPS (USD)	0.01	0.01	0.00	0.00	0.00	0.00
BVPS (USD)	0.7	0.5	0.5	0.3	0.3	0.3
Weighted average shares (m)	1,904	1,909	1,913	2,810	3,860	3,860
Average market cap (USDm)	1,177	1,104	638	682	682	682
Enterprise value (USDm)	1,696	1,737	1,204	1,298	1,304	1,216

Valuation Metrics

P/E (DB) (x)	119.4	nm	nm	nm	nm	9.0
P/E (Reported) (x)	772.5	nm	nm	nm	nm	9.0
P/BV (x)	1.06	0.77	0.43	0.67	0.67	0.65
FCF Yield (%)	nm	nm	14.5	nm	3.9	23.5
Dividend Yield (%)	1.0	1.1	0.0	0.0	0.0	0.0
EV/Sales (x)	1.0	1.0	1.0	1.3	1.1	0.8
EV/EBITDA (x)	13.9	nm	10.4	30.5	9.7	5.7
EV/EBIT (x)	41.0	nm	68.9	nm	41.1	11.0

Income Statement (USDm)

Sales revenue	1,709	1,718	1,260	1,006	1,233	1,536
Gross profit	136	61	94	53	146	224
EBITDA	122	-135	116	42	135	213
Depreciation	81	100	98	101	103	102
Amortisation	0	0	0	0	0	0
EBIT	41	-236	17	-59	32	111
Net interest income/(expense)	-37	-33	-35	-41	-33	-33
Associates/affiliates	7	-10	0	0	0	0
Exceptionals/extraordinaries	-8	-6	0	0	0	0
Other pre-tax income/(expense)	1	0	0	0	0	0
Profit before tax	3	-284	-17	-100	-1	78
Income tax expense	1	1	1	2	2	2
Minorities	0	0	0	0	0	0
Other post-tax income/(expense)	0	0	0	0	0	0
Net profit	2	-285	-18	-102	-3	76
DB adjustments (including dilution)	8	6	0	0	0	0
DB Net profit	10	-280	-19	-102	-3	76

Cash Flow (USDm)

Cash flow from operations	98	94	99	39	130	210
Net Capex	-455	-118	-6	-171	-103	-50
Free cash flow	-357	-24	93	-132	27	160
Equity raised/(bought back)	-7	-3	-1	151	0	0
Dividends paid	-12	-12	-12	0	0	-38
Net inc/(dec) in borrowings	228	-37	-74	-24	0	1
Other investing/financing cash flows	-51	-23	-29	-41	-33	-33
Net cash flow	-199	-100	-24	-47	-6	90
Change in working capital	-28	13	10	-2	-3	0

Balance Sheet (USDm)

Cash and other liquid assets	483	362	358	258	252	342
Tangible fixed assets	1,631	1,588	1,613	1,683	1,683	1,631
Goodwill/intangible assets	25	25	25	25	25	25
Associates/investments	34	5	2	28	28	27
Other assets	364	328	147	129	145	166
Total assets	2,537	2,308	2,146	2,124	2,133	2,191
Interest bearing debt	1,037	1,000	926	902	902	903
Other liabilities	196	306	249	202	214	235
Total liabilities	1,233	1,306	1,175	1,104	1,116	1,138
Shareholders' equity	1,304	1,002	971	1,020	1,017	1,055
Minorities	0	0	0	0	0	0
Total shareholders' equity	1,304	1,002	971	1,020	1,017	1,055
Net debt	554	638	568	644	650	567

Key Company Metrics

Sales growth (%)	18.4	0.6	-26.7	-20.2	22.5	24.6
DB EPS growth (%)	-80.8	na	93.4	-273.1	97.7	na
EBITDA Margin (%)	7.2	-7.9	9.2	4.2	10.9	13.8
EBIT Margin (%)	2.4	-13.7	1.4	-5.8	2.6	7.2
Payout ratio (%)	806.6	nm	nm	nm	nm	0.0
ROE (%)	0.1	-24.7	-1.9	-10.2	-0.3	7.3
Capex/sales (%)	26.8	11.3	11.6	17.0	8.4	3.3
Capex/depreciation (x)	5.7	1.9	1.5	1.7	1.0	0.5
Net debt/equity (%)	42.5	63.7	58.5	63.2	64.0	53.2
Net interest cover (x)	1.1	nm	0.5	nm	1.0	3.3

Source: Company data, Deutsche Bank estimates



Model updated: 05 December 2016

Running the numbers

Asia
China
Marine

China Shipping Development

Reuters: 1138.HK Bloomberg: 1138.HK

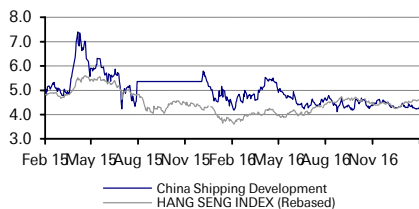
Buy

Price (8 Feb 17)	HKD 4.32
Target Price	HKD 6.60
52 Week range	HKD 4.12 - 5.53
Market Cap (m)	HKDm 14,708
	USDm 1,896

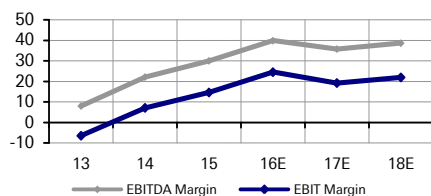
Company Profile

The company is the dominating player in China's coastal energy shipping market. It also participates in the international oil and LNG markets.

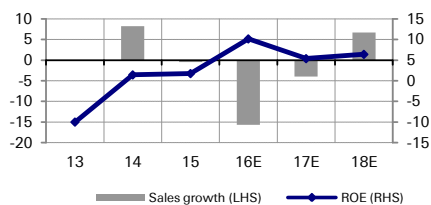
Price Performance



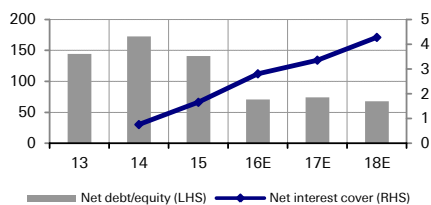
Margin Trends



Growth & Profitability



Solvency



Fiscal year end 31-Dec

Financial Summary

	2013	2014	2015	2016E	2017E	2018E
DB EPS (CNY)	-0.66	0.09	0.10	0.67	0.37	0.46
Reported EPS (CNY)	-0.66	0.09	0.10	0.67	0.37	0.46
DPS (CNY)	0.00	0.03	0.10	0.22	0.12	0.15
BVPS (CNY)	6.2	6.3	6.4	6.8	7.1	7.4
Weighted average shares (m)	3,405	3,481	4,032	4,032	4,032	4,032
Average market cap (CNYm)	10,770	13,293	17,829	13,047	13,047	13,047
Enterprise value (CNYm)	42,806	52,337	55,249	32,812	34,684	33,742

Valuation Metrics

P/E (DB) (x)	nm	43.1	42.8	5.7	10.3	8.3
P/E (Reported) (x)	nm	43.1	42.8	5.7	10.3	8.3
P/BV (x)	0.74	0.65	0.64	0.56	0.54	0.52
FCF Yield (%)	nm	nm	20.3	121.6	nm	17.7
Dividend Yield (%)	0.0	0.8	2.3	5.8	3.2	4.0
EV/Sales (x)	3.8	4.3	4.5	3.2	3.5	3.2
EV/EBITDA (x)	46.7	19.2	15.1	8.0	9.8	8.3
EV/EBIT (x)	nm	59.5	30.9	13.0	18.2	14.6

Income Statement (CNYm)

Sales revenue	11,344	12,273	12,213	10,298	9,886	10,549
Gross profit	1,461	3,230	4,226	4,697	4,138	4,700
EBITDA	916	2,723	3,670	4,105	3,539	4,076
Depreciation	1,642	1,843	1,880	1,577	1,636	1,757
Amortisation	0	0	0	0	0	0
EBIT	-726	880	1,790	2,528	1,903	2,319
Net interest income/(expense)	-920	-1,159	-1,079	-900	-567	-542
Associates/affiliates	112	297	288	450	550	640
Exceptionals/extraordinary	-695	303	-407	260	0	0
Other pre-tax income/(expense)	0	0	0	0	0	0
Profit before tax	-2,230	321	592	2,338	1,886	2,417
Income tax expense	-12	-80	102	351	283	362
Minorities	17	92	73	47	98	187
Other post-tax income/(expense)	0	0	0	761	0	0
Net profit	-2,234	309	417	2,701	1,505	1,867
DB adjustments (including dilution)	0	0	0	0	0	0
DB Net profit	-2,234	309	417	2,701	1,505	1,867

Cash Flow (CNYm)

Cash flow from operations	1,429	3,157	5,085	6,557	3,731	4,202
Net Capex	-3,619	-6,362	-1,467	12,239	-3,990	-1,462
Free cash flow	-2,190	-3,205	3,618	18,796	-259	2,741
Equity raised/(bought back)	0	0	0	0	0	0
Dividends paid	0	0	-104	-891	-497	-616
Net inc/(dec) in borrowings	2,069	7,626	-1,343	-4,883	-8,500	-800
Other investing/financing cash flows	-1,228	-3,905	-2,638	-603	-1,117	-1,182
Net cash flow	-1,348	517	-468	12,419	-10,372	143
Change in working capital	451	-2,218	166	1,333	-74	-151

Balance Sheet (CNYm)

Cash and other liquid assets	1,919	2,449	2,086	14,505	4,132	4,275
Tangible fixed assets	47,468	50,531	51,745	40,159	42,514	42,219
Goodwill/intangible assets	0	0	0	0	0	0
Associates/investments	5,635	7,570	7,567	5,337	5,887	6,527
Other assets	3,821	5,201	6,981	4,424	4,525	4,694
Total assets	58,842	65,750	68,379	64,425	57,058	57,714
Interest bearing debt	33,955	41,493	39,506	34,269	25,769	24,969
Other liabilities	2,675	1,610	2,350	2,184	2,211	2,229
Total liabilities	36,631	43,103	41,856	36,453	27,980	27,198
Shareholders' equity	21,227	21,829	25,697	27,507	28,515	29,766
Minorities	985	819	826	465	563	750
Total shareholders' equity	22,212	22,648	26,523	27,972	29,078	30,516
Net debt	32,036	39,044	37,420	19,764	21,637	20,694

Key Company Metrics

Sales growth (%)	nm	8.2	-0.5	-15.7	-4.0	6.7
DB EPS growth (%)	na	na	16.7	547.6	-44.3	24.1
EBITDA Margin (%)	8.1	22.2	30.0	39.9	35.8	38.6
EBIT Margin (%)	-6.4	7.2	14.7	24.5	19.3	22.0
Payout ratio (%)	nm	33.8	96.7	33.0	33.0	33.0
ROE (%)	-10.0	1.4	1.8	10.2	5.4	6.4
Capex/sales (%)	34.0	54.9	15.7	180.7	50.5	23.3
Capex/depreciation (x)	2.4	3.7	1.0	11.8	3.1	1.4
Net debt/equity (%)	144.2	172.4	141.1	70.7	74.4	67.8
Net interest cover (x)	nm	0.8	1.7	2.8	3.4	4.3

Source: Company data, Deutsche Bank estimates



Model updated:05 December 2016

Running the numbers

Asia
China
Marine

China Cosco Hldgs

Reuters: 1919.HK Bloomberg: 1919 HK

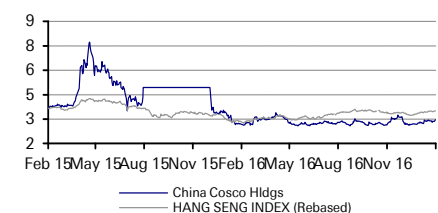
Sell

Price (8 Feb 17)	HKD 2.97
Target Price	HKD 1.00
52 Week range	HKD 2.58 - 3.39
Market Cap (m)	HKDm 30,342 USDm 3,910

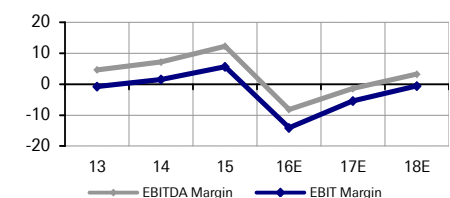
Company Profile

China COSCO Holdings Co. Ltd is the second-largest integrated shipping company in the world. The company, together with its subsidiaries, provides a wide range of container shipping, terminal, container leasing and logistics services across the container shipping value chain for both international and domestic customers.

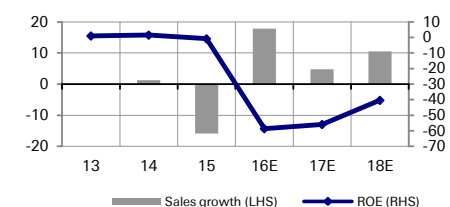
Price Performance



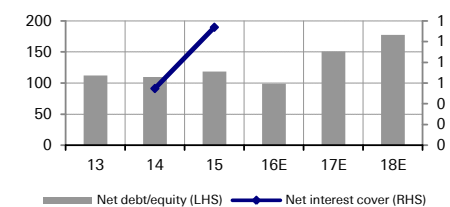
Margin Trends



Growth & Profitability



Solvency



Fiscal year end 31-Dec

Financial Summary

	2013	2014	2015	2016E	2017E	2018E
DB EPS (CNY)	0.02	0.04	-0.02	-1.09	-0.58	-0.25
Reported EPS (CNY)	0.02	0.04	-0.02	-1.09	-0.58	-0.25
DPS (CNY)	0.00	0.00	0.00	0.00	0.00	0.00
BVPS (CNY)	2.4	2.4	2.4	1.3	0.7	0.5
Weighted average shares (m)	10,216	10,216	10,216	10,216	10,216	10,216
Average market cap (CNYm)	30,112	27,312	39,274	26,917	26,917	26,917
Enterprise value (CNYm)	84,181	80,504	96,283	66,840	78,096	82,597

Valuation Metrics

P/E (DB) (x)	127.9	75.4	nm	nm	nm	nm
P/E (Reported) (x)	127.9	75.4	nm	nm	nm	nm
P/BV (x)	1.26	1.28	1.18	2.00	3.55	5.34
FCF Yield (%)	nm	nm	nm	nm	nm	nm
Dividend Yield (%)	0.0	0.0	0.0	0.0	0.0	0.0
EV/Sales (x)	1.2	1.2	1.7	1.0	1.1	1.1
EV/EBITDA (x)	26.8	16.5	13.6	nm	nm	32.8
EV/EBIT (x)	nm	77.2	29.7	nm	nm	nm

Income Statement (CNYm)

Sales revenue	67,384	68,254	57,404	67,634	70,871	78,298
Gross profit	3,553	7,863	5,987	2,635	4,658	8,755
EBITDA	3,142	4,882	7,063	-5,516	-1,008	2,522
Depreciation	3,655	3,840	3,826	4,032	2,831	2,989
Amortisation	0	0	0	0	0	0
EBIT	-513	1,042	3,237	-9,548	-3,839	-467
Net interest income/(expense)	-2,103	-1,901	-2,842	-3,410	-2,989	-2,489
Associates/affiliates	1,102	1,366	1,361	0	0	0
Exceptionals/extraordinaries	0	0	0	0	0	0
Other pre-tax income/(expense)	4,692	0	0	0	0	0
Profit before tax	3,179	507	1,756	-12,958	-6,828	-2,957
Income tax expense	299	-1,044	457	-3,240	-1,707	-739
Minorities	2,644	1,188	1,508	1,458	768	333
Other post-tax income/(expense)	0	0	0	0	0	0
Net profit	235	362	-210	-11,177	-5,889	-2,550
DB adjustments (including dilution)	0	0	0	0	0	0
DB Net profit	235	362	-210	-11,177	-5,889	-2,550

Cash Flow (CNYm)

Cash flow from operations	-2,317	6,037	6,717	-368	-4,488	1,832
Net Capex	-10,629	-6,958	-6,775	-6,000	-6,000	-6,000
Free cash flow	-12,946	-921	-58	-6,368	-10,488	-4,168
Equity raised/(bought back)	0	0	0	0	0	0
Dividends paid	0	0	0	0	0	0
Net inc/(dec) in borrowings	8,241	-10,111	-4,754	-23,177	5,000	5,000
Other investing/financing cash flows	6,575	2,531	-2,203	24,912	0	0
Net cash flow	1,870	-8,501	-7,015	-4,632	-5,488	832
Change in working capital	-3,276	-693	-67	4,179	-3,395	-197

Balance Sheet (CNYm)

Cash and other liquid assets	49,057	39,706	32,691	28,058	22,570	23,402
Tangible fixed assets	81,404	80,097	84,649	50,476	52,448	54,202
Goodwill/intangible assets	114	107	157	157	157	157
Associates/investments	11,161	12,624	16,628	16,628	16,628	16,628
Other assets	20,126	16,254	14,069	24,967	25,416	26,445
Total assets	161,862	148,788	148,193	120,286	117,219	120,834
Interest bearing debt	96,395	86,943	86,045	62,868	67,868	72,868
Other liabilities	23,353	18,887	17,211	22,200	19,253	20,086
Total liabilities	119,748	105,830	103,256	85,068	87,121	92,954
Shareholders' equity	24,223	24,379	24,653	13,477	7,587	5,037
Minorities	17,891	18,579	20,284	21,742	22,510	22,843
Total shareholders' equity	42,114	42,958	44,938	35,219	30,098	27,880
Net debt	47,338	47,238	53,354	34,810	45,298	49,466

Key Company Metrics

Sales growth (%)	nm	1.3	-15.9	17.8	4.8	10.5
DB EPS growth (%)	na	53.8	na	-5,227.7	47.3	56.7
EBITDA Margin (%)	4.7	7.2	12.3	-8.2	-1.4	3.2
EBIT Margin (%)	-0.8	1.5	5.6	-14.1	-5.4	-0.6
Payout ratio (%)	0.0	0.0	nm	nm	nm	nm
ROE (%)	1.0	1.5	-0.9	-58.6	-55.9	-40.4
Capex/sales (%)	15.8	10.2	12.6	8.9	8.5	7.7
Capex/depreciation (x)	2.9	1.8	1.9	1.5	2.1	2.0
Net debt/equity (%)	112.4	110.0	118.7	98.8	150.5	177.4
Net interest cover (x)	nm	0.5	1.1	nm	nm	nm

Source: Company data, Deutsche Bank estimates



# Appendix 1

## Important Disclosures

\*Other information available upon request

### Disclosure checklist

Company	Ticker	Recent price*	Disclosure
China Shipping Development	1138.HK	4.32 (HKD) 8 Feb 17	NA
China Cosco Hldgs	1919.HK	2.97 (HKD) 8 Feb 17	NA
Pacific Basin Shipping Ltd	2343.HK	1.37 (HKD) 8 Feb 17	14,15

Prices are current as of the end of the previous trading session unless otherwise indicated and are sourced from local exchanges via Reuters, Bloomberg and other vendors. Other information is sourced from Deutsche Bank, subject companies, and other sources. For disclosures pertaining to recommendations or estimates made on securities other than the primary subject of this research, please see the most recently published company report or visit our global disclosure look-up page on our website at <http://gm.db.com/ger/disclosure/DisclosureDirectory.eqsr>. Aside from within this report, important conflict disclosures can also be found at <https://gm.db.com/equities> under the "Disclosures Lookup" and "Legal" tabs. Investors are strongly encouraged to review this information before investing.

## Important Disclosures Required by U.S. Regulators

Disclosures marked with an asterisk may also be required by at least one jurisdiction in addition to the United States. See Important Disclosures Required by Non-US Regulators and Explanatory Notes.

14. Deutsche Bank and/or its affiliate(s) has received non-investment banking related compensation from this company within the past year.
15. This company has been a client of Deutsche Bank Securities Inc. within the past year, during which time it received non-investment banking securities-related services.

For disclosures pertaining to recommendations or estimates made on securities other than the primary subject of this research, please see the most recently published company report or visit our global disclosure look-up page on our website at <http://gm.db.com/ger/disclosure/DisclosureDirectory.eqsr>

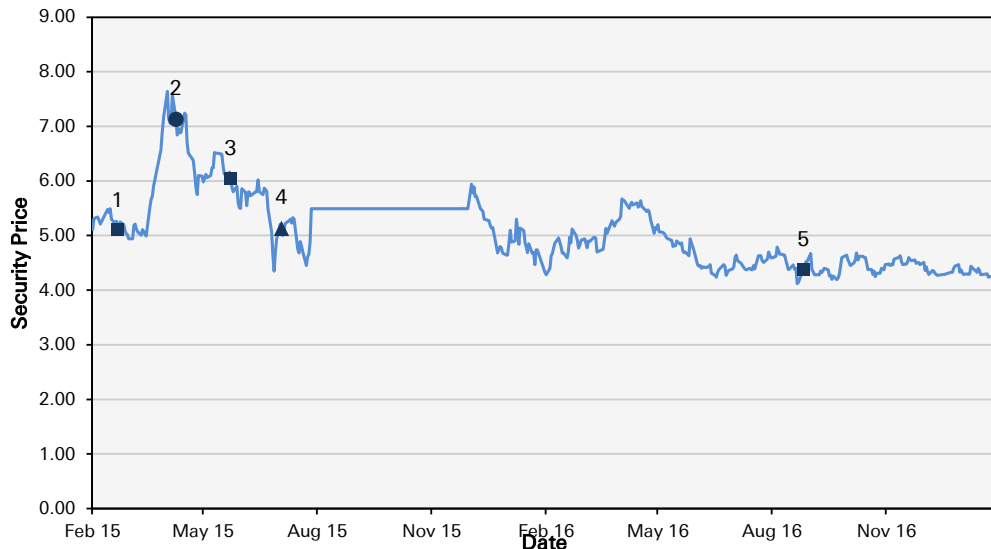
## Analyst Certification

The views expressed in this report accurately reflect the personal views of the undersigned lead analyst about the subject issuers and the securities of those issuers. In addition, the undersigned lead analyst has not and will not receive any compensation for providing a specific recommendation or view in this report. Sky Hong



Historical recommendations and target price: China Shipping Development (1138.HK)

(as of 2/8/2017)



Previous Recommendations

- Strong Buy
- Buy
- Market Perform
- Underperform
- Not Rated
- Suspended Rating

Current Recommendations

- Buy
- Hold
- Sell
- Not Rated
- Suspended Rating

\*New Recommendation Structure as of September 9,2002

\*\*Analyst is no longer at Deutsche Bank

1. 04/03/2015:	Buy, Target Price Change HKD8.00 Sky Hong, CFA	4. 14/07/2015:	Upgrade to Buy, HKD6.90 Sky Hong, CFA
2. 20/04/2015:	Downgrade to Hold, Target Price Change HKD7.40 Sky Hong, CFA	5. 06/09/2016:	Buy, Target Price Change HKD6.60 Sky Hong, CFA
3. 03/06/2015:	Hold, Target Price Change HKD6.90 Sky Hong, CFA		

Historical recommendations and target price: China Cosco Hldgs (1919.HK)

(as of 2/8/2017)



Previous Recommendations

- Strong Buy
- Buy
- Market Perform
- Underperform
- Not Rated
- Suspended Rating

Current Recommendations

- Buy
- Hold
- Sell
- Not Rated
- Suspended Rating

\*New Recommendation Structure as of September 9,2002

\*\*Analyst is no longer at Deutsche Bank

1. 04/03/2015:	Upgrade to Buy, Target Price Change HKD4.50 Sky Hong, CFA	4. 14/07/2015:	Upgrade to Hold, Target Price Change HKD4.10 Sky Hong, CFA
2. 20/04/2015:	Downgrade to Sell, Target Price Change HKD4.20 Sky Hong, CFA	5. 15/02/2016:	Downgrade to Sell, Target Price Change HKD1.10 Sky Hong, CFA
3. 03/06/2015:	Sell, Target Price Change HKD3.30 Sky Hong, CFA	6. 05/12/2016:	Sell, Target Price Change HKD1.00 Sky Hong, CFA



Historical recommendations and target price: Pacific Basin Shipping Ltd (2343.HK)

(as of 2/8/2017)



Previous Recommendations

- Strong Buy
- Buy
- Market Perform
- Underperform
- Not Rated
- Suspended Rating

Current Recommendations

- Buy
- Hold
- Sell
- Not Rated
- Suspended Rating

\*New Recommendation Structure as of September 9, 2002

\*\*Analyst is no longer at Deutsche Bank

1. 03/06/2015:	Downgrade to Hold, Target Price Change HKD3.05 Sky Hong, CFA	4. 22/06/2016:	Buy, Target Price Change HKD1.00 Joe Liew, CFA
2. 06/11/2015:	Upgrade to Buy, Target Price Change HKD2.80 Joe Liew, CFA	5. 29/09/2016:	Buy, Target Price Change HKD1.42 Joe Liew, CFA
3. 28/04/2016:	Buy, Target Price Change HKD1.75 Joe Liew, CFA	6. 05/12/2016:	Buy, Target Price Change HKD2.05 Sky Hong, CFA

Equity rating key

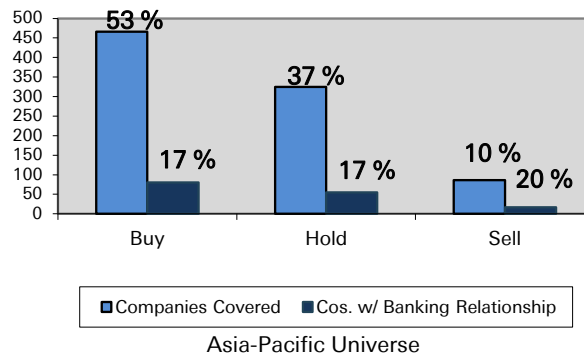
Buy: Based on a current 12-month view of total share-holder return (TSR = percentage change in share price from current price to projected target price plus projected dividend yield), we recommend that investors buy the stock.

Sell: Based on a current 12-month view of total share-holder return, we recommend that investors sell the stock

Hold: We take a neutral view on the stock 12-months out and, based on this time horizon, do not recommend either a Buy or Sell.

Newly issued research recommendations and target prices supersede previously published research.

Equity rating dispersion and banking relationships







## Additional Information

The information and opinions in this report were prepared by Deutsche Bank AG or one of its affiliates (collectively "Deutsche Bank"). Though the information herein is believed to be reliable and has been obtained from public sources believed to be reliable, Deutsche Bank makes no representation as to its accuracy or completeness.

If you use the services of Deutsche Bank in connection with a purchase or sale of a security that is discussed in this report, or is included or discussed in another communication (oral or written) from a Deutsche Bank analyst, Deutsche Bank may act as principal for its own account or as agent for another person.

Deutsche Bank may consider this report in deciding to trade as principal. It may also engage in transactions, for its own account or with customers, in a manner inconsistent with the views taken in this research report. Others within Deutsche Bank, including strategists, sales staff and other analysts, may take views that are inconsistent with those taken in this research report. Deutsche Bank issues a variety of research products, including fundamental analysis, equity-linked analysis, quantitative analysis and trade ideas. Recommendations contained in one type of communication may differ from recommendations contained in others, whether as a result of differing time horizons, methodologies or otherwise. Deutsche Bank and/or its affiliates may also be holding debt or equity securities of the issuers it writes on. Analysts are paid in part based on the profitability of Deutsche Bank AG and its affiliates, which includes investment banking, trading and principal trading revenues.

Opinions, estimates and projections constitute the current judgment of the author as of the date of this report. They do not necessarily reflect the opinions of Deutsche Bank and are subject to change without notice. Deutsche Bank provides liquidity for buyers and sellers of securities issued by the companies it covers. Deutsche Bank research analysts sometimes have shorter-term trade ideas that are consistent or inconsistent with Deutsche Bank's existing longer term ratings. Trade ideas for equities can be found at the SOLAR link at <http://gm.db.com>. A SOLAR idea represents a high conviction belief by an analyst that a stock will outperform or underperform the market and/or sector delineated over a time frame of no less than two weeks. In addition to SOLAR ideas, the analysts named in this report may from time to time discuss with our clients, Deutsche Bank salespersons and Deutsche Bank traders, trading strategies or ideas that reference catalysts or events that may have a near-term or medium-term impact on the market price of the securities discussed in this report, which impact may be directionally counter to the analysts' current 12-month view of total return or investment return as described herein. Deutsche Bank has no obligation to update, modify or amend this report or to otherwise notify a recipient thereof if any opinion, forecast or estimate contained herein changes or subsequently becomes inaccurate. Coverage and the frequency of changes in market conditions and in both general and company specific economic prospects make it difficult to update research at defined intervals. Updates are at the sole discretion of the coverage analyst concerned or of the Research Department Management and as such the majority of reports are published at irregular intervals. This report is provided for informational purposes only and does not take into account the particular investment objectives, financial situations, or needs of individual clients. It is not an offer or a solicitation of an offer to buy or sell any financial instruments or to participate in any particular trading strategy. Target prices are inherently imprecise and a product of the analyst's judgment. The financial instruments discussed in this report may not be suitable for all investors and investors must make their own informed investment decisions. Prices and availability of financial instruments are subject to change without notice and investment transactions can lead to losses as a result of price fluctuations and other factors. If a financial instrument is denominated in a currency other than an investor's currency, a change in exchange rates may adversely affect the investment. Past performance is not necessarily indicative of future results. Unless otherwise indicated, prices are current as of the end of the previous trading session, and are sourced from local exchanges via Reuters, Bloomberg and other vendors. Data is sourced from Deutsche Bank, subject companies, and in some cases, other parties.

The Deutsche Bank Research Department is independent of other business areas divisions of the Bank. Details regarding our organizational arrangements and information barriers we have to prevent and avoid conflicts of interest with respect to our research is available on our website under Disclaimer found on the Legal tab.

Macroeconomic fluctuations often account for most of the risks associated with exposures to instruments that promise to pay fixed or variable interest rates. For an investor who is long fixed rate instruments (thus receiving these cash



flows), increases in interest rates naturally lift the discount factors applied to the expected cash flows and thus cause a loss. The longer the maturity of a certain cash flow and the higher the move in the discount factor, the higher will be the loss. Upside surprises in inflation, fiscal funding needs, and FX depreciation rates are among the most common adverse macroeconomic shocks to receivers. But counterparty exposure, issuer creditworthiness, client segmentation, regulation (including changes in assets holding limits for different types of investors), changes in tax policies, currency convertibility (which may constrain currency conversion, repatriation of profits and/or the liquidation of positions), and settlement issues related to local clearing houses are also important risk factors to be considered. The sensitivity of fixed income instruments to macroeconomic shocks may be mitigated by indexing the contracted cash flows to inflation, to FX depreciation, or to specified interest rates – these are common in emerging markets. It is important to note that the index fixings may – by construction – lag or mis-measure the actual move in the underlying variables they are intended to track. The choice of the proper fixing (or metric) is particularly important in swaps markets, where floating coupon rates (i.e., coupons indexed to a typically short-dated interest rate reference index) are exchanged for fixed coupons. It is also important to acknowledge that funding in a currency that differs from the currency in which coupons are denominated carries FX risk. Naturally, options on swaps (swaptions) also bear the risks typical to options in addition to the risks related to rates movements.

Derivative transactions involve numerous risks including, among others, market, counterparty default and illiquidity risk. The appropriateness or otherwise of these products for use by investors is dependent on the investors' own circumstances including their tax position, their regulatory environment and the nature of their other assets and liabilities, and as such, investors should take expert legal and financial advice before entering into any transaction similar to or inspired by the contents of this publication. The risk of loss in futures trading and options, foreign or domestic, can be substantial. As a result of the high degree of leverage obtainable in futures and options trading, losses may be incurred that are greater than the amount of funds initially deposited. Trading in options involves risk and is not suitable for all investors. Prior to buying or selling an option investors must review the "Characteristics and Risks of Standardized Options", at <http://www.optionsclearing.com/about/publications/character-risks.jsp>. If you are unable to access the website please contact your Deutsche Bank representative for a copy of this important document.

Participants in foreign exchange transactions may incur risks arising from several factors, including the following: ( i) exchange rates can be volatile and are subject to large fluctuations; ( ii) the value of currencies may be affected by numerous market factors, including world and national economic, political and regulatory events, events in equity and debt markets and changes in interest rates; and (iii) currencies may be subject to devaluation or government imposed exchange controls which could affect the value of the currency. Investors in securities such as ADRs, whose values are affected by the currency of an underlying security, effectively assume currency risk.

Unless governing law provides otherwise, all transactions should be executed through the Deutsche Bank entity in the investor's home jurisdiction. Aside from within this report, important conflict disclosures can also be found at <https://gm.db.com/equities> under the "Disclosures Lookup" and "Legal" tabs. Investors are strongly encouraged to review this information before investing.

**United States:** Approved and/or distributed by Deutsche Bank Securities Incorporated, a member of FINRA, NFA and SIPC. Analysts located outside of the United States are employed by non-US affiliates that are not subject to FINRA regulations.

**Germany:** Approved and/or distributed by Deutsche Bank AG, a joint stock corporation with limited liability incorporated in the Federal Republic of Germany with its principal office in Frankfurt am Main. Deutsche Bank AG is authorized under German Banking Law and is subject to supervision by the European Central Bank and by BaFin, Germany's Federal Financial Supervisory Authority.

**United Kingdom:** Approved and/or distributed by Deutsche Bank AG acting through its London Branch at Winchester House, 1 Great Winchester Street, London EC2N 2DB. Deutsche Bank AG in the United Kingdom is authorised by the Prudential Regulation Authority and is subject to limited regulation by the Prudential Regulation Authority and Financial Conduct Authority. Details about the extent of our authorisation and regulation are available on request.

**Hong Kong:** Distributed by Deutsche Bank AG, Hong Kong Branch.



**India:** Prepared by Deutsche Equities India Pvt Ltd, which is registered by the Securities and Exchange Board of India (SEBI) as a stock broker. Research Analyst SEBI Registration Number is INH000001741. DEIPL may have received administrative warnings from the SEBI for breaches of Indian regulations.

**Japan:** Approved and/or distributed by Deutsche Securities Inc.(DSI). Registration number - Registered as a financial instruments dealer by the Head of the Kanto Local Finance Bureau (Kinsho) No. 117. Member of associations: JSDA, Type II Financial Instruments Firms Association and The Financial Futures Association of Japan. Commissions and risks involved in stock transactions - for stock transactions, we charge stock commissions and consumption tax by multiplying the transaction amount by the commission rate agreed with each customer. Stock transactions can lead to losses as a result of share price fluctuations and other factors. Transactions in foreign stocks can lead to additional losses stemming from foreign exchange fluctuations. We may also charge commissions and fees for certain categories of investment advice, products and services. Recommended investment strategies, products and services carry the risk of losses to principal and other losses as a result of changes in market and/or economic trends, and/or fluctuations in market value. Before deciding on the purchase of financial products and/or services, customers should carefully read the relevant disclosures, prospectuses and other documentation. "Moody's", "Standard & Poor's", and "Fitch" mentioned in this report are not registered credit rating agencies in Japan unless Japan or "Nippon" is specifically designated in the name of the entity. Reports on Japanese listed companies not written by analysts of DSI are written by Deutsche Bank Group's analysts with the coverage companies specified by DSI. Some of the foreign securities stated on this report are not disclosed according to the Financial Instruments and Exchange Law of Japan. Target prices set by Deutsche Bank's equity analysts are based on a 12-month forecast period.

**Korea:** Distributed by Deutsche Securities Korea Co.

**South Africa:** Deutsche Bank AG Johannesburg is incorporated in the Federal Republic of Germany (Branch Register Number in South Africa: 1998/003298/10).

**Singapore:** by Deutsche Bank AG, Singapore Branch or Deutsche Securities Asia Limited, Singapore Branch (One Raffles Quay #18-00 South Tower Singapore 048583, +65 6423 8001), which may be contacted in respect of any matters arising from, or in connection with, this report. Where this report is issued or promulgated in Singapore to a person who is not an accredited investor, expert investor or institutional investor (as defined in the applicable Singapore laws and regulations), they accept legal responsibility to such person for its contents.

**Taiwan:** Information on securities/investments that trade in Taiwan is for your reference only. Readers should independently evaluate investment risks and are solely responsible for their investment decisions. Deutsche Bank research may not be distributed to the Taiwan public media or quoted or used by the Taiwan public media without written consent. Information on securities/instruments that do not trade in Taiwan is for informational purposes only and is not to be construed as a recommendation to trade in such securities/instruments. Deutsche Securities Asia Limited, Taipei Branch may not execute transactions for clients in these securities/instruments.

**Qatar:** Deutsche Bank AG in the Qatar Financial Centre (registered no. 00032) is regulated by the Qatar Financial Centre Regulatory Authority. Deutsche Bank AG - QFC Branch may only undertake the financial services activities that fall within the scope of its existing QFCRA license. Principal place of business in the QFC: Qatar Financial Centre, Tower, West Bay, Level 5, PO Box 14928, Doha, Qatar. This information has been distributed by Deutsche Bank AG. Related financial products or services are only available to Business Customers, as defined by the Qatar Financial Centre Regulatory Authority.

**Russia:** This information, interpretation and opinions submitted herein are not in the context of, and do not constitute, any appraisal or evaluation activity requiring a license in the Russian Federation.

**Kingdom of Saudi Arabia:** Deutsche Securities Saudi Arabia LLC Company, (registered no. 07073-37) is regulated by the Capital Market Authority. Deutsche Securities Saudi Arabia may only undertake the financial services activities that fall within the scope of its existing CMA license. Principal place of business in Saudi Arabia: King Fahad Road, Al Olaya District, P.O. Box 301809, Faisaliah Tower - 17th Floor, 11372 Riyadh, Saudi Arabia.

**United Arab Emirates:** Deutsche Bank AG in the Dubai International Financial Centre (registered no. 00045) is regulated



by the Dubai Financial Services Authority. Deutsche Bank AG - DIFC Branch may only undertake the financial services activities that fall within the scope of its existing DFSA license. Principal place of business in the DIFC: Dubai International Financial Centre, The Gate Village, Building 5, PO Box 504902, Dubai, U.A.E. This information has been distributed by Deutsche Bank AG. Related financial products or services are only available to Professional Clients, as defined by the Dubai Financial Services Authority.

**Australia:** Retail clients should obtain a copy of a Product Disclosure Statement (PDS) relating to any financial product referred to in this report and consider the PDS before making any decision about whether to acquire the product. Please refer to Australian specific research disclosures and related information at <https://australia.db.com/australia/content/research-information.html>

**Australia and New Zealand:** This research is intended only for "wholesale clients" within the meaning of the Australian Corporations Act and New Zealand Financial Advisors Act respectively.

Additional information relative to securities, other financial products or issuers discussed in this report is available upon request. This report may not be reproduced, distributed or published without Deutsche Bank's prior written consent. Copyright © 2017 Deutsche Bank AG



---

## David Folkerts-Landau

Group Chief Economist and Global Head of Research

Raj Hindocha  
Global Chief Operating Officer  
Research

Michael Spencer  
Head of APAC Research  
Global Head of Economics

Steve Pollard  
Head of Americas Research  
Global Head of Equity Research

Anthony Klarman  
Global Head of  
Debt Research

Paul Reynolds  
Head of EMEA  
Equity Research

Dave Clark  
Head of APAC  
Equity Research

Pam Finelli  
Global Head of  
Equity Derivatives Research

Andreas Neubauer  
Head of Research - Germany

Stuart Kirk  
Head of Thematic Research

---

### International locations

#### Deutsche Bank AG

Deutsche Bank Place  
Level 16  
Corner of Hunter & Phillip Streets  
Sydney, NSW 2000  
Australia  
Tel: (61) 2 8258 1234

#### Deutsche Bank AG

Große Gallusstraße 10-14  
60272 Frankfurt am Main  
Germany  
Tel: (49) 69 910 00

#### Deutsche Bank AG

Filiale Hongkong  
International Commerce Centre,  
1 Austin Road West, Kowloon,  
Hong Kong  
Tel: (852) 2203 8888

#### Deutsche Securities Inc.

2-11-1 Nagatacho  
Sanno Park Tower  
Chiyoda-ku, Tokyo 100-6171  
Japan  
Tel: (81) 3 5156 6770

#### Deutsche Bank AG London

1 Great Winchester Street  
London EC2N 2EQ  
United Kingdom  
Tel: (44) 20 7545 8000

#### Deutsche Bank Securities Inc.

60 Wall Street  
New York, NY 10005  
United States of America  
Tel: (1) 212 250 2500

---