

UBS Evidence Lab: China Infant Formula

3Q18 update: Latest pricing and share trends

Equities

Global
Food

Q3 update: Mix impact pushes overall pricing to positive territory

UBS Evidence Lab has analysed c500,000 records online to track price and SKU trends in China IMF – 1/3 of the global market. Key takeaways: (1) Like-for-like pricing remains weak (despite some sequential improvement in Aug/Sept), but a positive mix impact has pushed overall pricing into positive territory after 6 straight quarters of declines. (2) Imported brands' share of best-selling SKUs has reached 90%, the highest since 2016; but their price premium over domestic ones has fallen to its lowest point. (3) Danone appears to be ceding some ground to A2M. Note that our analysis is based on online B2C data (approx. 15-20% of the market) – trends might be different in other channels.

Regulatory focus shifting to C2C channels; peak import shares look vulnerable

New China e-commerce law passed in September suggests the regulatory focus is shifting from the traditional channels to cross border e-commerce (B2C) and *daigou* (C2C) import channels. While we perceive these changes as a positive for the compliant brands, it might put some pressure on companies that rely on C2C (e.g. Danone, A2M). We also note that imported brands' peak 90% share of best-sellers coincides with a trough pricing premium over the domestic ones (down to just 10% vs 50% in 2016). The impact of rising imported pricing on their market shares remains to be seen.

Bestseller trends: A2M and RB on the rise; Danone down from a high base

We have analysed our companies' share of (1) all SKUs and (2) top-25 bestseller lists (our database is focused on the online B2C channel). A2M (+310bps) had strong gains in top-25 bestseller lists, and Friesland (+180bps) and RB (+170bps) were also up. Danone saw a -600bps decline in the bestseller lists but it continues to dominate, accounting for 45% of the bestselling items. Nestlé (-140bps) was also down.

Stocks: Danone weakness is well-flagged; A2's momentum is encouraging

Our analysis implies weak trends for Danone, but this is already well-flagged: Danone has been guiding for a slowdown in H2 on strong prior year comps (>+50% in China IMF); and consensus forecasts already reflect these trends. A2 trends are encouraging - with share up and m/m pricing improving, we remain comfortable with UBSe and believe the recent sell-off is looking overdone.

Pinar Ergun, CFA

Analyst
pinar.ergun@ubs.com
+44-20-7568 6885

Marcus Curley

Analyst
marcus.curley@ubs.com
+64-9-913 4750

Christine Peng, CFA

Analyst
christine-y.peng@ubs.com
+852-2971 7571

Brad Chen

Analyst
S1460516060001
brad-a.chen@ubssecurities.com
+86-213-866 8985

Ben Gilbert

Analyst
ben.gilbert@ubs.com
+61-2-9324 2782

Figure 1: China infant milk formula (IMF) comp table

Company	UBS rating	Stock Price	UBS PT	Mkt Cap (US\$m)	China IMF (as % sales)	UBSe FY18E EPS	UBSe FY19E EPS	P/E (FY18E)	P/E (FY19E)	EV/EBITDA (FY18E)	EV/EBITDA (FY19E)
Nestlé	Neutral	CHF 79	CHF 84	\$239,565	2%	CHF 3.86	CHF 4.12	20.4x	19.1x	14.5x	13.8x
Danone	Buy	€ 64	€ 73	\$47,760	7%	€ 3.57	€ 3.83	17.9x	16.7x	11.6x	10.6x
Reckitt/(MJN)	Neutral	6460p	6400p	\$60,080	7%	324p	344p	20.0x	18.8x	15.1x	14.2x
Yashili Int'l	Sell	HKD 1.46	HKD 1.54	\$884	72%	Rmb 0.02	Rmb 0.04	52.9x	30.6x	16.1x	10.6x
Yili Industrial	Buy	CNY 25.29	CNY 33.60	\$22,220	11%	CNY 1.11	CNY 1.39	22.8x	18.2x	15.5x	12.3x
The a2 Milk Co	Neutral	NZD 9.89	NZD 11.80	\$4,655	55%	NZD 0.26	NZD 0.37	33.7x	27.0x	23.5x	20.1x
Fonterra	Neutral	NZD 4.55	NZD 5.05	\$4,793	2%	NZD 0.23	NZD 0.25	26.4x	18.4x	9.5x	7.6x

Source: UBS estimates. Note: Priced as of 12 October 2018. FY18 data for a2 Milk and Fonterra are actuals.

Contents

UBS Evidence Lab: 3Q18 key takeaways	3
(1) Imported / premium brands remain dominant.....	3
(2) Mix pushes pricing into positive territory in Q3	4
(3) Bestsellers: Soft trends for Danone; RB & A2 up.....	8
Company sections	10
Nestlé – Neutral, PT CHF 84.....	10
Danone – Buy, PT €73	12
RB – Neutral, PT £64.....	14
Yili – Buy, PT 33.60CNY.....	16
Yashili – Sell, PT 1.54HKD	18
The a2 Milk Company – Neutral, PT 11.80 NZD	20
Fonterra – Neutral, PT 5.05NZD	21
China IMF regulatory outlook	22
UBS Evidence Lab methodology	24

Pinar Ergun, CFA

Analyst
pinar.ergun@ubs.com
+44-20-7568 6885

Marcus Curley

Analyst
marcus.curley@ubs.com
+64-9-913 4750

Christine Peng, CFA

Analyst
christine-y.peng@ubs.com
+852-2971 7571

Brad Chen

Analyst
S1460516060001
brad-a.chen@ubssecurities.com
+86-213-866 8985

Ben Gilbert

Analyst
ben.gilbert@ubs.com
+61-2-9324 2782

Charles Eden, ACA

Analyst
charles.eden@ubs.com
+44-20-7568 9622

Nik Oliver

Analyst
nik.oliver@ubs.com
+44-20-7568 4982

Robert Rampton

Analyst
robert.rampton@ubs.com
+44-20-7568 2014

Robert Krankowski

Associate Analyst
robert.krankowski@ubs.com
+44-20-7568 1152

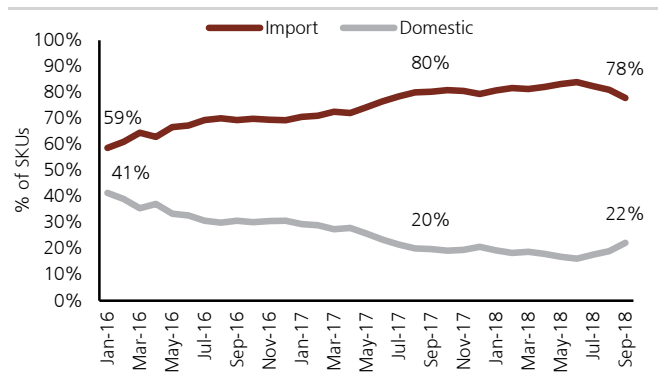
UBS Evidence Lab: 3Q18 key takeaways

- (1) **Mix: Imported and premium brands reach peak best-seller shares**
- (2) **Pricing: LfL pricing is weak but mix is driving positive trends**
- (3) **Bestsellers: Danone losing momentum; RB and A2 doing well**

(1) Imported / premium brands remain dominant

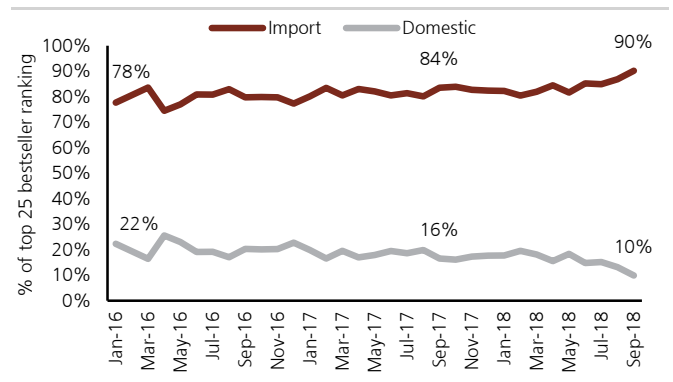
Imported brands continue to dominate the B2C online channel with a 78% share of total online SKUs, albeit down from its peak of 84% in July 2018. Despite this, imported brands capture a staggering 90% share of the top-25 best-selling SKUs, up from 84% a year ago. This coincided with a narrowing pricing premium, as we discuss later in the report.

Figure 2: % of online SKUs: import vs domestic



Source: UBS Evidence Lab Note: This analysis is based on a subset of items, excluding items where the country of production for the SKU is not available in the harvested data

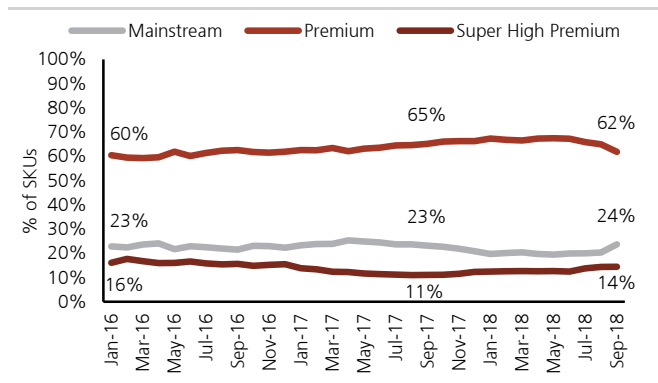
Figure 3: % of Top-25 bestseller SKUs online



Source: UBS Evidence Lab Note: This analysis is based on a subset of items, excluding items where the country of production for the SKU is not available in the harvested data

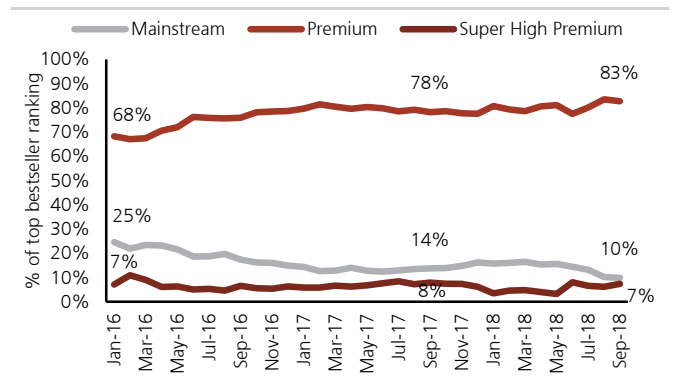
Premium brands have a 62% share of the online SKUs vs 65% a year ago. However, premium brands are enjoying growing in popularity with consumers, capturing an 83% share of the top-25 best-selling SKUs (up from 78% a year ago). This increase came primarily at the expense of mainstream brands, which now represent only 10% of the best-selling SKUs (vs 14% last year). See below.

Figure 4: % of SKUs online by price tier



Source: UBS Evidence Lab Note: UBS defines Super High Premium as >300 RMB per 900g, Premium as 200-300 RMB, Mainstream as 100-200 RMB

Figure 5: % of Top-25 bestseller SKUs online by price tier

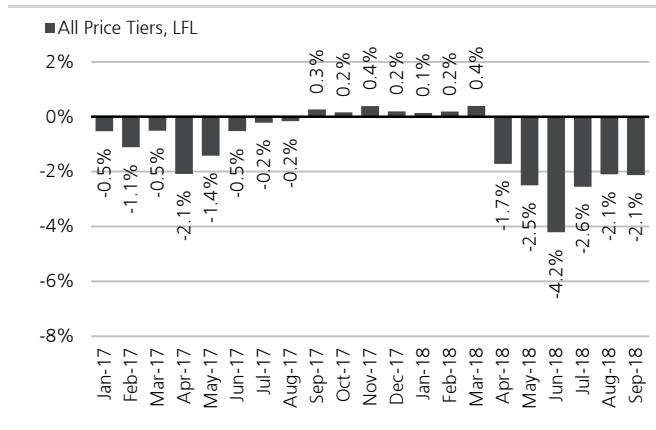


Source: UBS Evidence Lab Note: UBS defines Super High Premium as >300 RMB per 900g, Premium as 200-300 RMB, Mainstream as 100-200 RMB

(2) Mix pushes pricing into positive territory in Q3

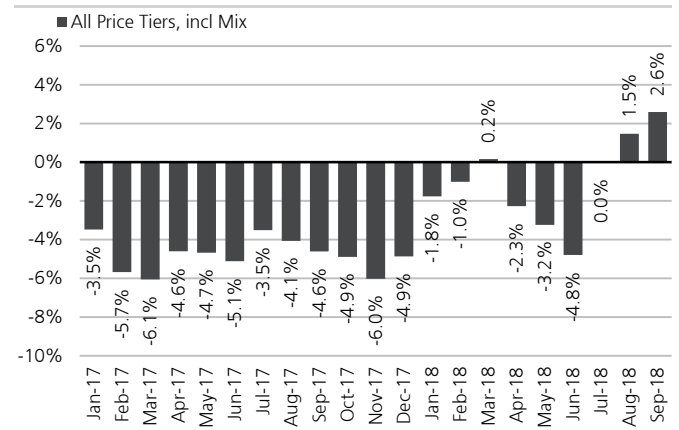
In aggregate, the like-for-like pricing remained negative in Q3, albeit with slightly improving trends in August and September; see Figure 6. However, pricing including the mix impact turned positive after six consecutive quarters of declining trends. This indicates that new products are being launched at higher price points and/or products at a lower price point are being discontinued, driving positive y/y all-in pricing trends in the market.

Figure 6: China IMF online like-for-like prices y/y change (in aggregate)



Source: UBS Evidence Lab

Figure 7: China IMF online prices including mix y/y change (in aggregate)

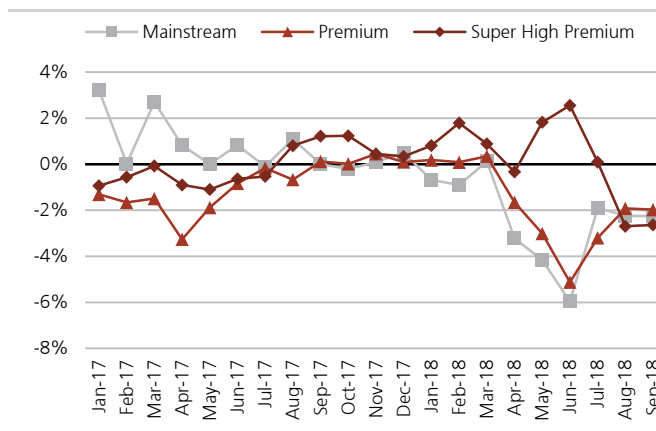


Source: UBS Evidence Lab

In the charts below we also explore the pricing movements by price tier and imports vs domestic brands.

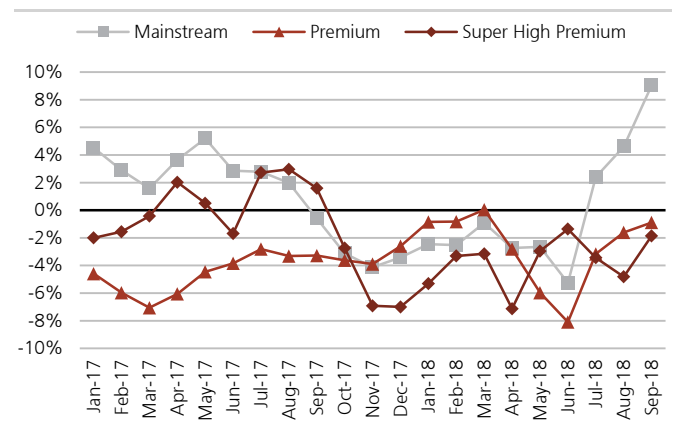
Price segments: All three price segments saw like-for-like price decreases in Q3, with a particularly noteworthy slowdown in super-premium (-3% in Aug/Sept). Premium and Mainstream have also seen price declines (-2%), but this marks a sequential improvement from the mid-single-digit decline in June. Pricing including the mix impact was more favourable for all three price tiers, with particularly large increases in the mainstream tier. Figure 15 in the next section shows a brand-by-brand analysis.

Figure 8: China IMF online like-for-like prices y/y change by price tier



Source: UBS Evidence Lab Note: UBS defines Super High Premium as >300 RMB per 900g, Premium as 200-300 RMB, Mainstream as 100-200 RMB

Figure 9: China IMF online prices including mix y/y change by price tier

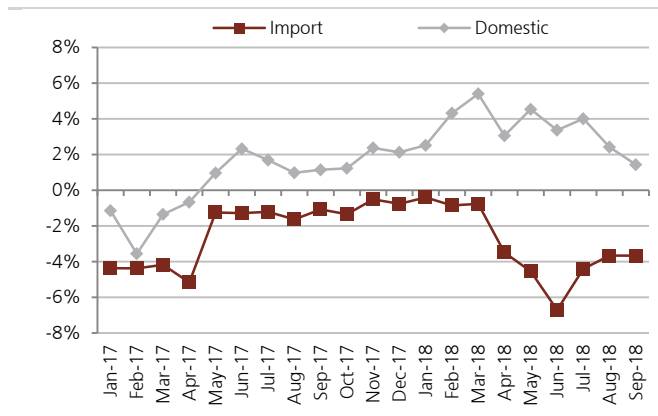


Source: UBS Evidence Lab Note: UBS defines Super High Premium as >300 RMB per 900g, Premium as 200-300 RMB, Mainstream as 100-200 RMB

Import vs domestic: Our data shows declining like-for-like pricing for imported brands in Q3, although it is sequentially better from the lows in June. In contrast, domestic brands' pricing is up slightly but has been moderating in recent months; Figure 10. We think competitive intensity, the success of the compliant domestic brands, and (potentially) discounting by distributors to clear the stock ahead of lower expected volumes in H2 (due to lower birth rates in 2017 vs 2H16) could all be among the explanations for lower imported LfL pricing.

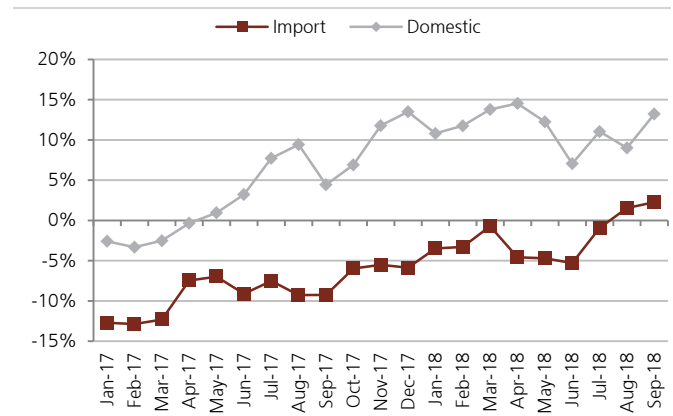
In contrast, pricing including the mix impact was positive for both imported and domestic brands. After >1.5 years of declining y/y pricing, imported pricing has turned slightly positive in August; and domestic pricing has stayed solid.

Figure 10: Online average like-for-like prices y/y change



Source: UBS Evidence Lab. Note: Analysis is based on a subset of items, excluding items where the country of production for the SKU is not available in the data

Figure 11: Online average prices y/y change including mix



Source: UBS Evidence Lab. Note: Analysis is based on a subset of items, excluding items where the country of production for the SKU is not available in the data

Despite more favourable overall pricing in Q3 (incl. mix) the average price premium of imported over domestic remains at its trough. It has stabilised at around 10% in 2Q18 (down from 50% in 2016) and remains around that level; see below.

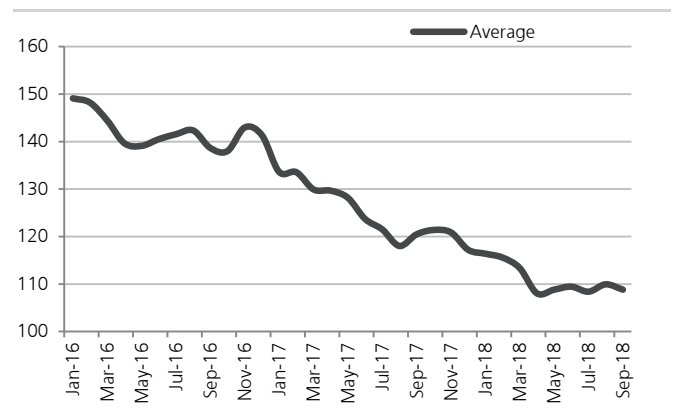
Please note that our imported vs domestic analysis is based on a subset of items, excluding items where the country of production for the SKU is not available in the harvested data. As such, the charts may not fully reconcile to others in the report.

Figure 12: Online average prices of domestic and imported brands, including mix



Source: UBS Evidence Lab. Note: Analysis is based on a subset of items, excluding items where the country of production for the SKU is not available in the data

Figure 13: Online average price premium of imported over domestic, including mix (domestic = 100)



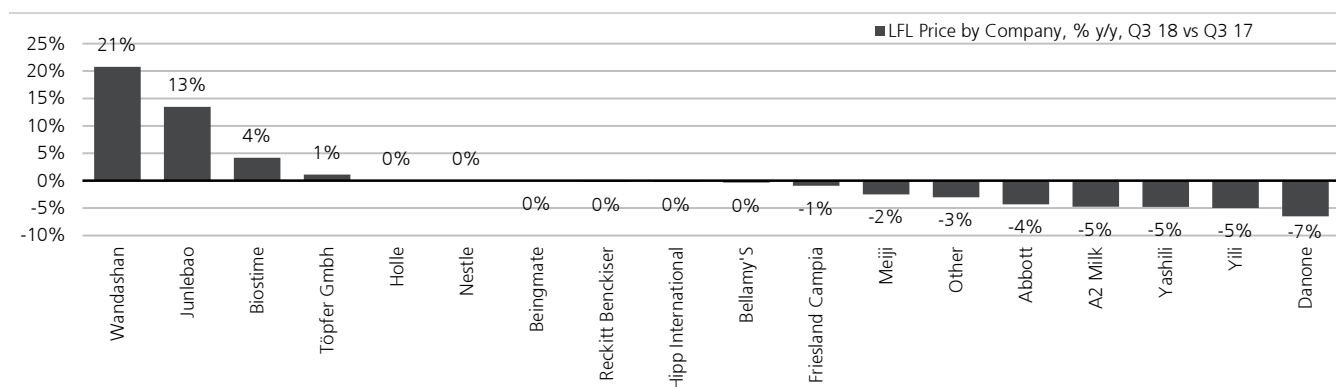
Source: UBS Evidence Lab. Note: Analysis is based on a subset of items, excluding items where the country of production for the SKU is not available in the data

Pricing: company-level analysis

We have aggregated brand data at the company level to track online prices by company. We analyse the pricing changes both on a like-for-like basis (which tracks the pricing of the same SKUs over time) and on an all-in basis (which includes the mix changes from new and removed SKUs). In summary:

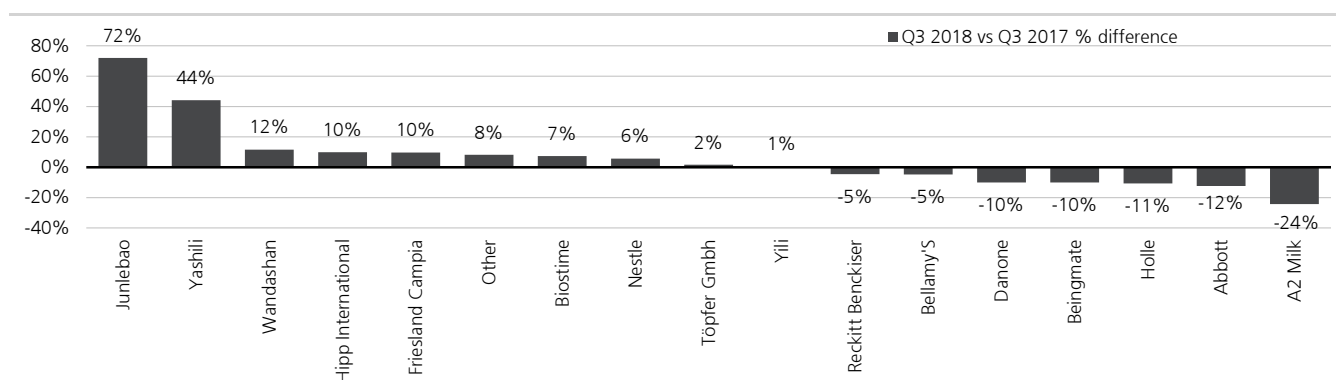
- **Among the multinationals**, the like-for-like pricing was the weakest for Danone (-7%) and Abbott (-4%), whilst Nestlé and Reckitt Benckiser were broadly flat. Including the mix impact, pricing fared worse with Abbott -12%, Danone -10% and RB -5%. However, Nestlé stood out with +6% median price increases after including the mix effects.
- **Among the local companies**, Yashili and Yili both saw LfL price decreases of -5%, although Yashili saw dramatic mix benefits, with median pricing up +44% y/y. For Yili, y/y median pricing growth was up +1%. Other locals, such as Wandashan and Junlebao, delivered significant y/y price increases.
- **Australasian companies:** A2 Milk saw a -5% LfL price decline, continuing the trend from 2Q (-5% in 2Q18) in our dataset since Jan 2016. Pleasingly however sequential trends did improve, with m/m median pricing up c5% in September. We would expect to see LfL trends to begin turning positive through Q2 FY19.

Figure 14: Year-on-year like-for-like online price changes in 3Q18 at the company level



Source: UBS Evidence Lab

Figure 15: Year-on-year median online price changes in 3Q18 at the company level (includes mix changes from new and removed SKUs)



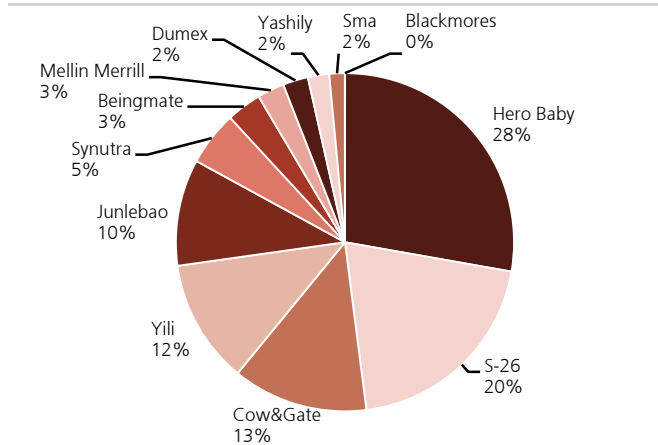
Source: UBS Evidence Lab

Pricing: brand-level analysis by price-tier

Below we analyse the key brands by price-tier in more detail (recall that mainstream is 24% of SKUs, premium 62% and super premium 14%). Overall, we find significant dispersion among brands irrespective of the price-tier considered.

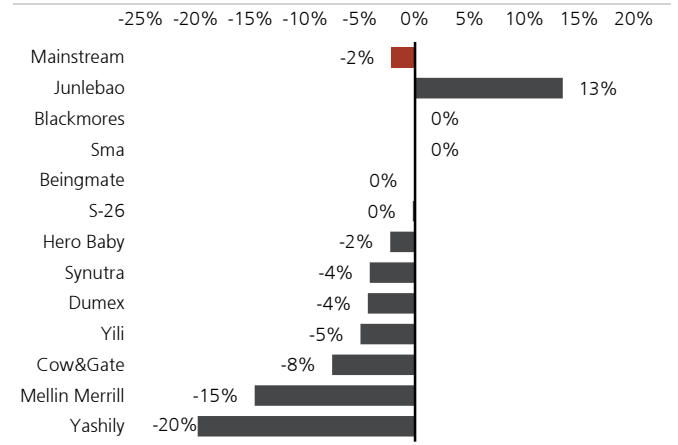
Mainstream: In the mainstream tier, the top-3 brands in terms of SKU count are Hero Baby (28%), S-26 (20%) and Cow & Gate (13%). In Q3, Junlebao saw the largest like-for-like price hike y/y among these brands. Nestlé's S-26 was flat, while Yashily was down -20%.

Figure 16: % of Mainstream SKU count online* in 3Q18



Source: UBS Evidence Lab *in UBS Evidence Lab's database

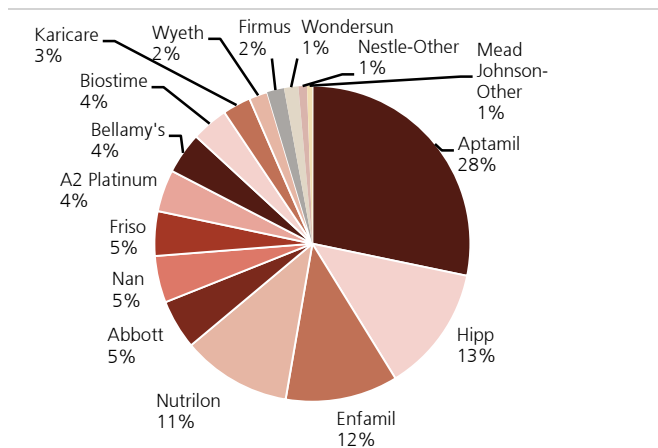
Figure 17: 3Q18 LfL price change y/y in Mainstream tier



Source: UBS Evidence Lab

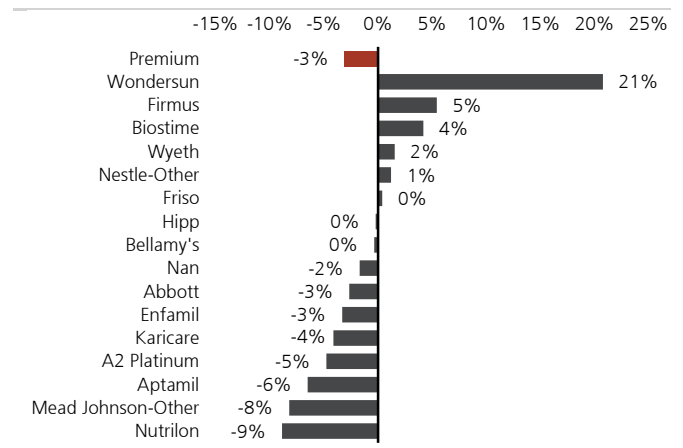
Premium: In the premium tier, the top-3 brands in terms of SKU count are Aptamil (28%), Hipp (13%) and Enfamil (12%). Like-for-like pricing in Danone's Aptamil and Nutrilon brands were among the weakest (-6%/-9% respectively). A2 Platinum (-5%) and RB's Enfamil (-4%) also declined. The LfL pricing in Nestlé's key brands was mixed, with increases in Wyeth (+2%) but declines in Nan (-2%). Some domestic brands, like Wondersun, showed stronger pricing trends.

Figure 18: % of Premium SKU count online* in 3Q18



Source: UBS Evidence Lab *in UBS Evidence Lab's database

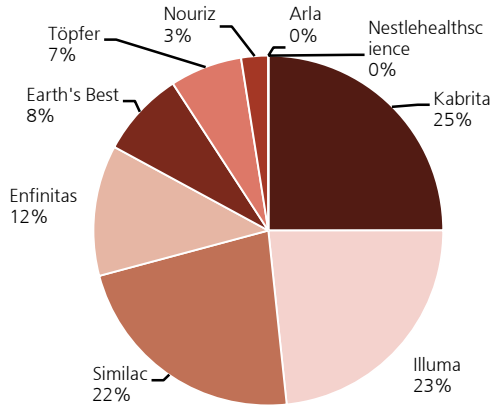
Figure 19: 3Q18 LfL price change y/y in Premium tier



Source: UBS Evidence Lab

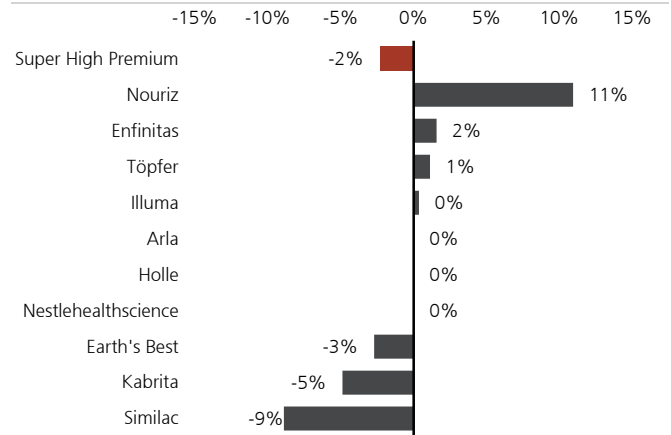
Super High Premium: Kabrita (goat's milk) has the largest share (25%) of online SKU count, followed by Nestlé's Illuma brand (23%), Abbott's Similac (22%) and RB's Enfinitas (12%). In Q3, y/y online pricing was flat for Illuma and slightly up for Enfinitas (+2%). Nouriz (+11%) took the largest price increases.

Figure 20: % of Super High Premium SKUs online*, 3Q18



Source: UBS Evidence Lab *in UBS Evidence Lab's database

Figure 21: 3Q18 LfL price change y/y in Super Premium



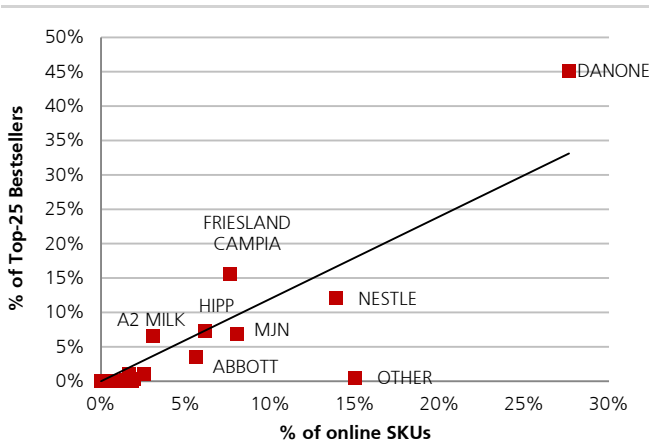
Source: UBS Evidence Lab

(3) Bestsellers: Soft trends for Danone; RB & A2 up

We have analysed the brand shares in our database across (1) all online SKUs; and (2) Top-25 bestseller lists; and aggregated them at the company level.

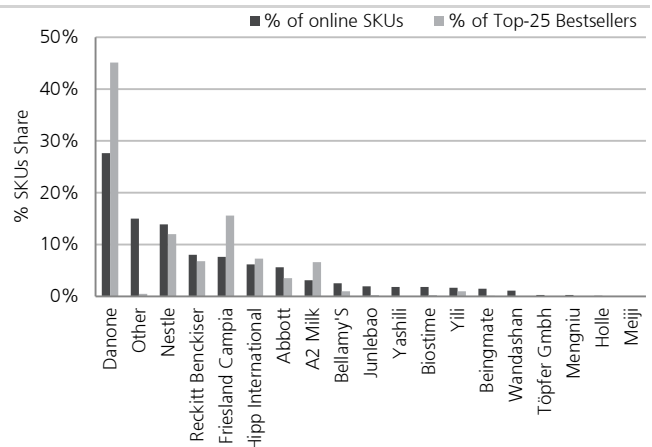
One key observation is the positive correlation between a company's share of all SKUs and its share of top-25 bestsellers. Perhaps more interesting is the variance in the conversion rates (i.e. how much of a company's SKU share translates into its top-25 share). For most, the relationship is close to 1-1: for example, Nestlé's brands represent 14% of all SKUs and 12% of the top-25 bestsellers. However, Danone stands out, with a 28% share of SKUs but a much higher 45% share of the top-25 best-sellers online.

Figure 22: % share of SKUs vs Top-25 bestsellers



Source: UBS Evidence Lab

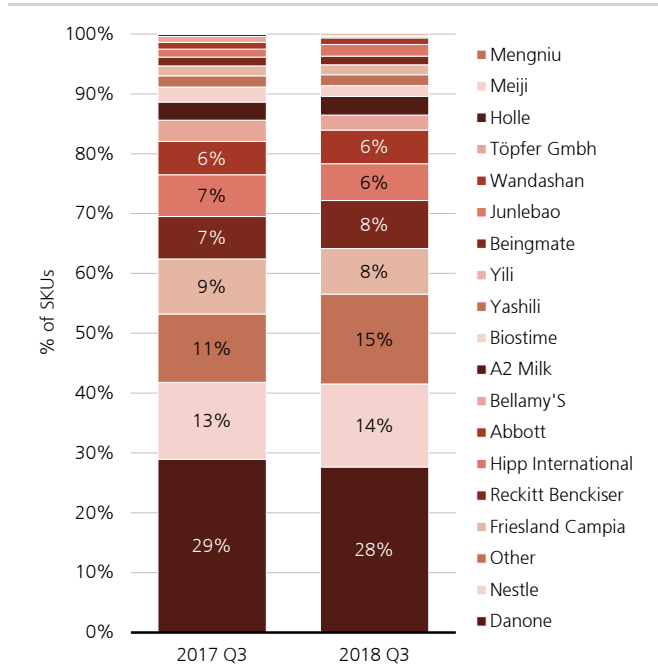
Figure 23: % share of SKUs vs Top-25 bestsellers



Source: UBS Evidence Lab

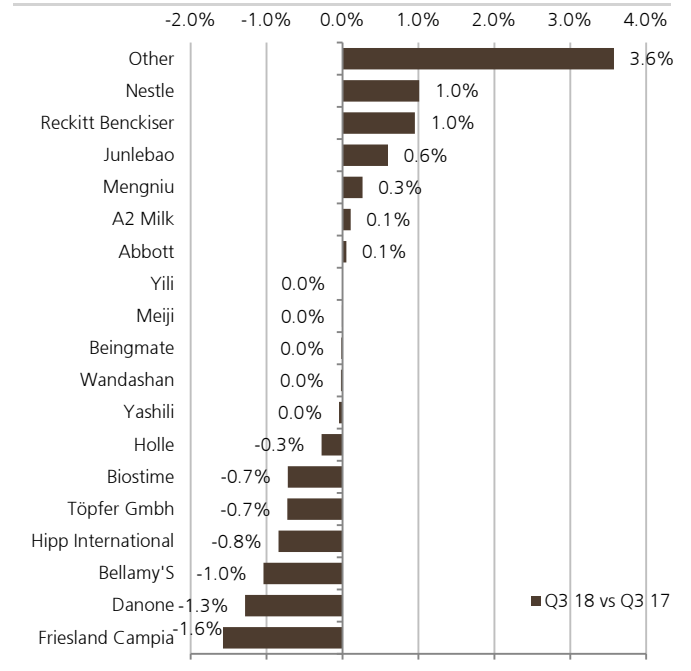
In Q3, Danone's share of online SKUs fell by -1% point y/y with its share of top-25 bestsellers down by -6% points to 45%. Despite this decline, Danone's brands are still by far the most popular products. RB and Nestlé have slightly increased their presence, with a +1% point uplift in their SKU shares. RB's bestseller share was up by +2% points but Nestlé's was down by -1% point. While A2 Milk share of SKUs was broadly flat, its share of the bestseller lists is up strongly, by +3% points. Note that domestic players are increasing/holding their share of bestselling items despite mixed trends on their SKU shares.

Figure 24: % of online SKUs: 3Q17 vs 3Q18



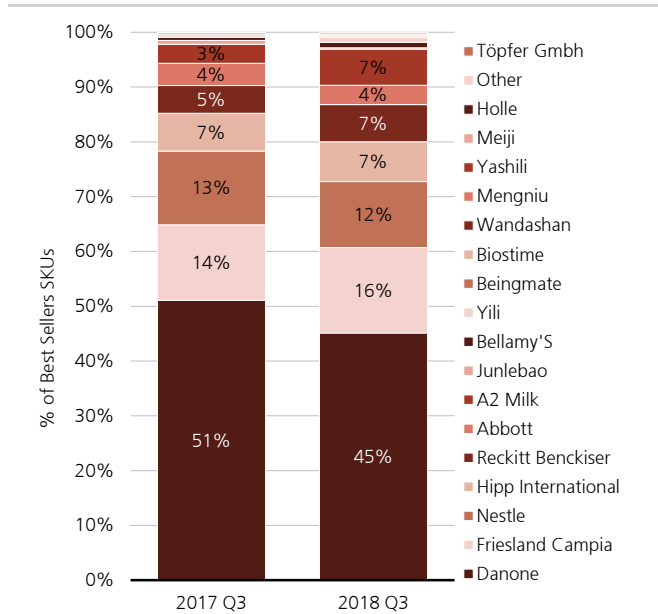
Source: UBS Evidence Lab

Figure 25: YoY change in % of online SKUs



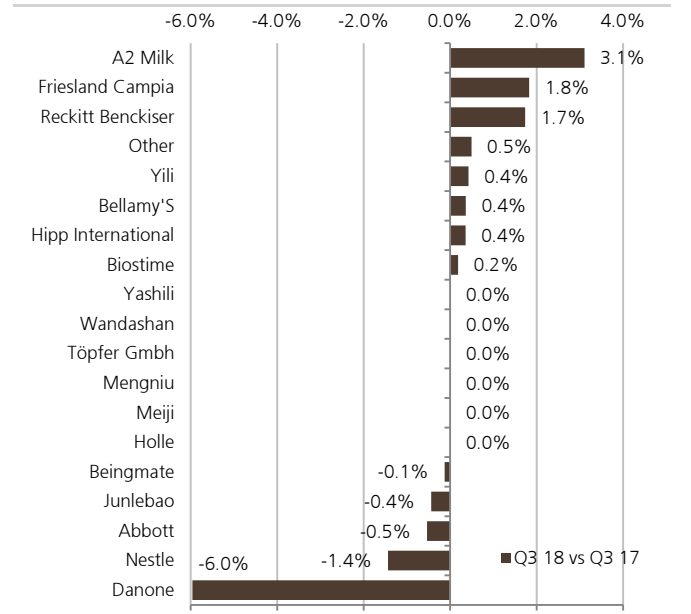
Source: UBS Evidence Lab

Figure 26: % of Top-25 bestsellers: 3Q17 vs 3Q18



Source: UBS Evidence Lab

Figure 27: YoY change in % of Top-25 bestsellers



Source: UBS Evidence Lab

Company sections

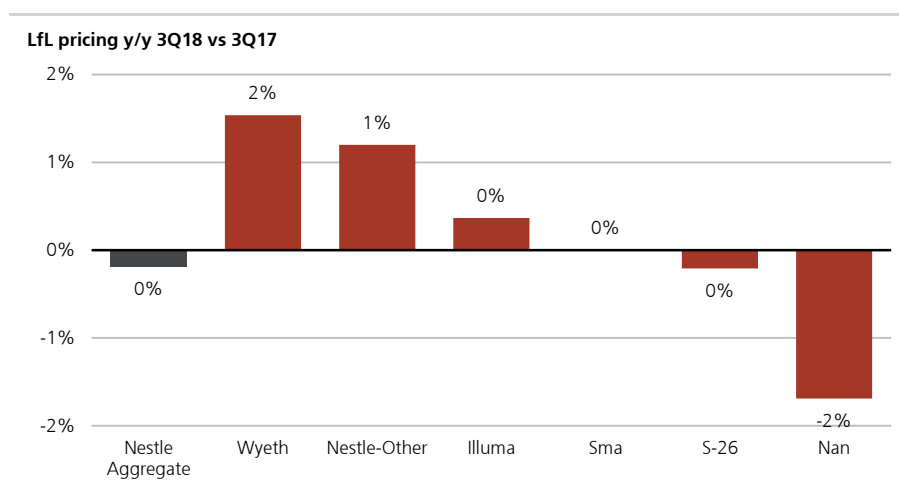
Nestlé – Neutral, PT CHF 84

UBS view: In the near term, we expect a gradual recovery in Nestlé's OSG, driven by improving pricing and execution. However, we expect the company's 2018 growth to be around just +3%. In the longer term, we still think Nestlé offers attractive upside optionality from portfolio management. At 19x 2019E PE, Nestlé trades at a 6% premium to EU Staples. We rate Nestlé Neutral.

We estimate China IMF is around 2% of Nestlé group sales

Pricing: UBS Evidence Lab data suggests Nestlé's overall China IMF pricing online was broadly flat in 3Q18. Nan was negative, but Wyeth was positive. Pricing in the super-premium brand Illuma (>CHF1bn in sales) was broadly flat.

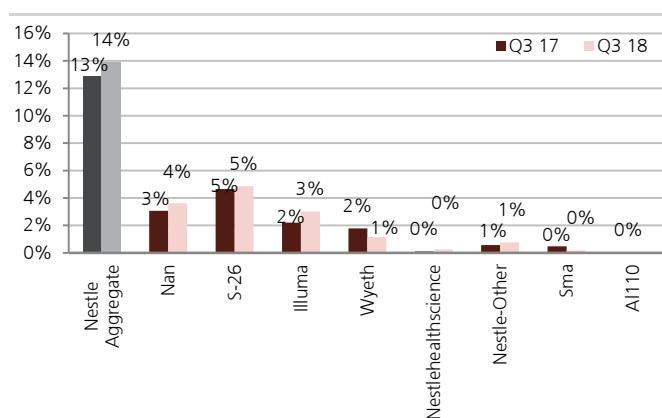
Figure 28: Nestlé pricing y/y growth: 3Q18 vs 3Q17



Source: UBS Evidence Lab

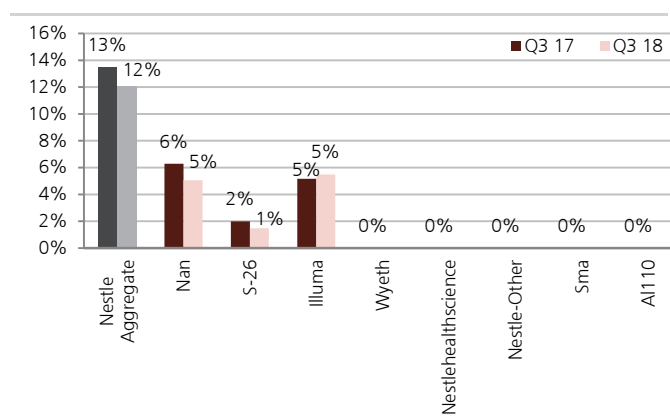
SKU shares: Nestlé's share of total online SKUs increased slightly, but its share of the top-25 bestselling SKUs declined (due to Nan and S-26). Illuma's popularity increased y/y in Q3 (as measured by its share of top-25 bestsellers), and its SKU share was up – this coincides with flattish pricing in the brand.

Figure 29: Nestlé brands' share of online SKUs



Source: UBS Evidence Lab; brands may not sum up to the Group numbers due to smaller brands not covered in this chart

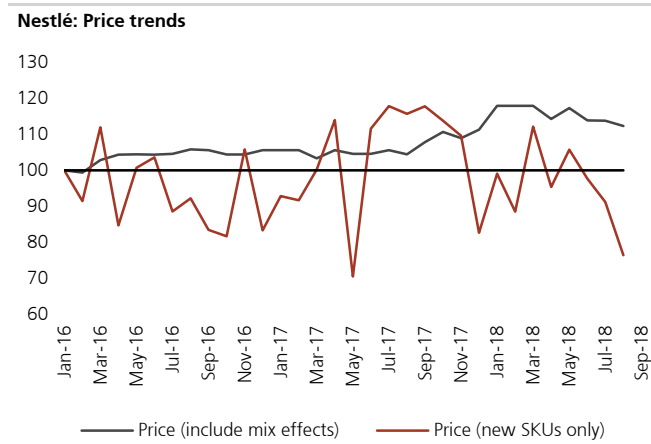
Figure 30: Nestlé brands' share of Top-25 bestsellers



Source: UBS Evidence Lab; brands may not sum up to the Group numbers due to smaller brands not covered in this chart

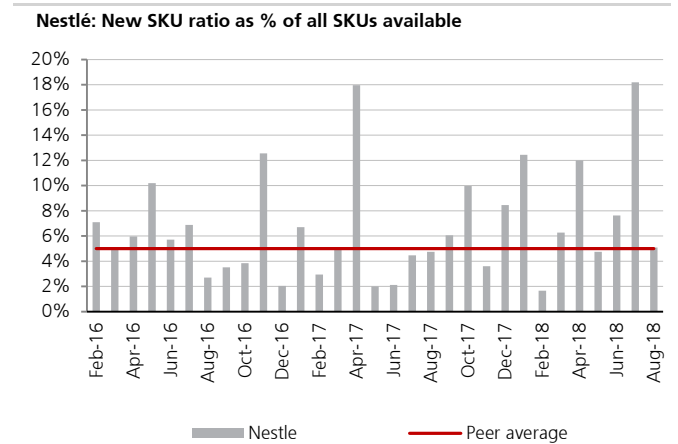
Mix effects/new SKUs: We compared the pricing of Nestlé's new SKUs to its overall median pricing (including the mix effects). We are somewhat surprised to see that the new SKUs have been introduced at lower prices recently; and we wonder whether this might be driven by distributor activity, rather than being a deliberate pricing decision by the company. However, it is encouraging to see that the all-in pricing has been holding up well, which implies that Nestlé is able to push through some LfL price increases (in existing SKUs). These trends could also be explained by introductory promotions – we notice a one-month lag between the launch of new SKUs and price movements.

Figure 31: Nestlé: Indexed median price trends (including mix effects) vs price trends of new SKUs



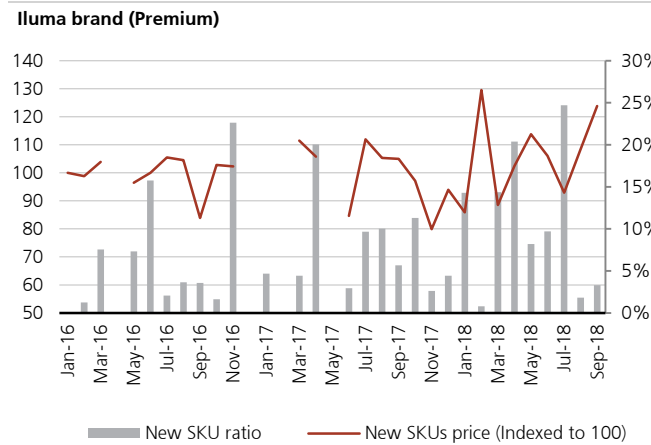
Source: UBS Evidence Lab. Note: Median pricing; price trends indexed to 100 in Jan 2016; New item price indexed to all item price (base 100)

Figure 32: Nestlé: New SKU ratio vs peer average



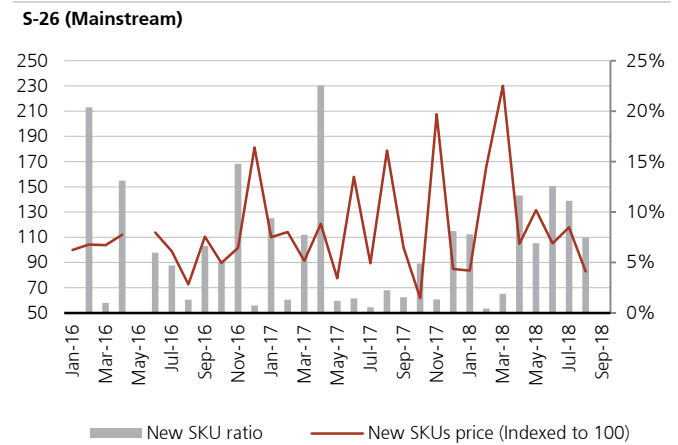
Source: UBS Evidence Lab

Figure 33: ILLUMA: Indexed median price trends of new SKUs vs new SKU ratio



Source: UBS Evidence Lab. Note: Median pricing.

Figure 34: S-26: Indexed median price trends of new SKUs vs new SKU ratio



Source: UBS Evidence Lab

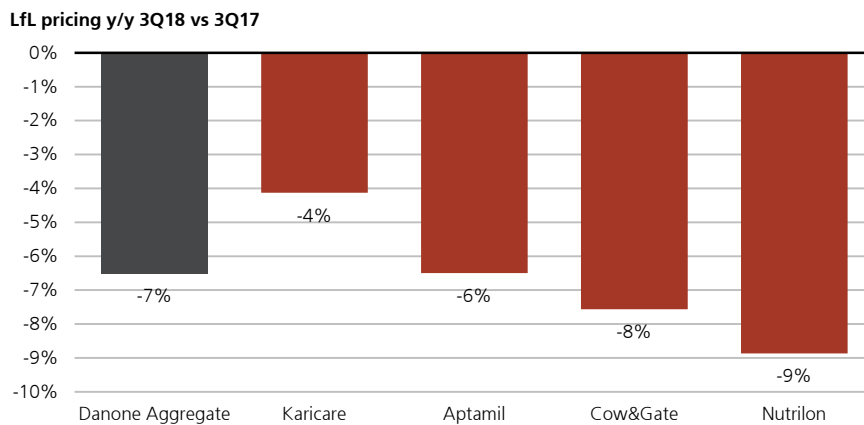
Danone – Buy, PT €73

UBS view: We rate Danone Buy, as we expect to see a gradual improvement in its WhiteWave and Dairy businesses in 2H18, offsetting the potential slowdown in Chinese infant formula (c7% of Group sales) on tougher comps. At 17x 2019E, the stock enjoys good valuation support in our view. We expect Danone to close its valuation gap to peers over the next 12 months.

We estimate China IMF is around 7% of Danone's group sales

Pricing: UBS Evidence Lab data suggests Danone's China IMF pricing was down by high single digits in 3Q18. Its Nutrilon brand was the main drag – we suspect there is an element of distributor activity behind these price reductions (rather than outright price cuts implemented by the company).

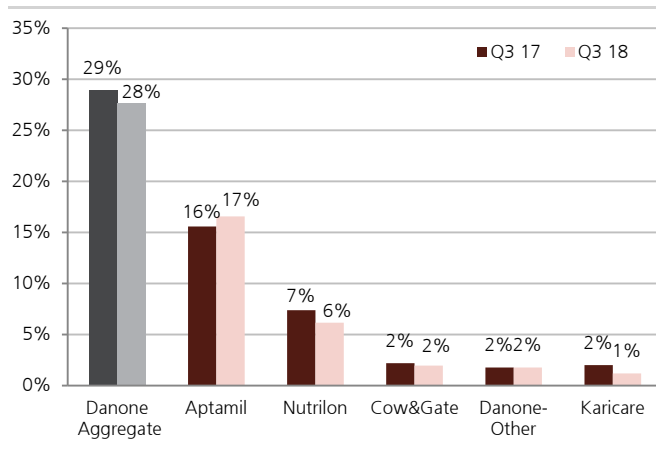
Figure 35: Danone like-for-like pricing y/y growth: 3Q18 vs 3Q17



Source: UBS Evidence Lab

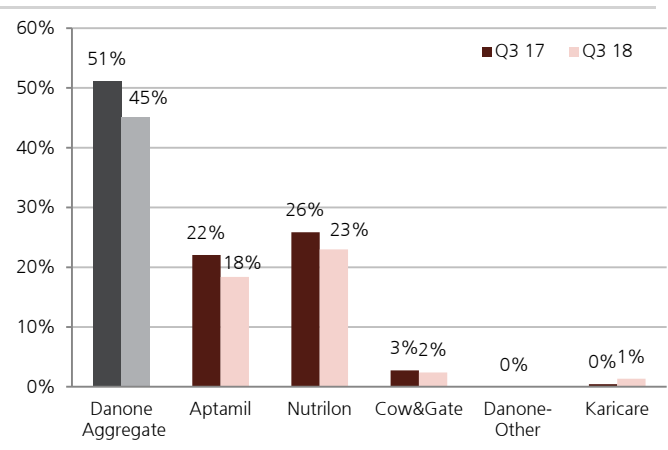
SKU shares: As discussed earlier, Danone saw declines in its share of total SKUs and bestsellers. Despite that, Danone continues to be popular with 45% share in the bestseller lists. We have factored in this decline to our H2 forecasts.

Figure 36: Danone brands' share of online SKUs



Source: UBS Evidence Lab; brands may not sum up to the Group numbers due to smaller brands not covered in this chart

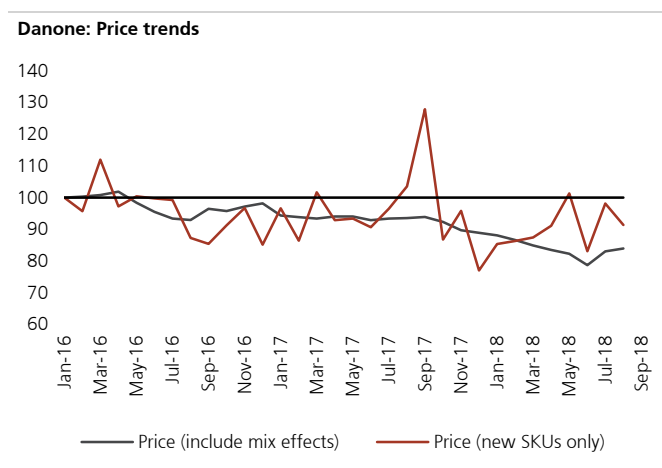
Figure 37: Danone brands' share of Top-25 bestsellers



Source: UBS Evidence Lab; brands may not sum up to the Group numbers due to smaller brands not covered in this chart

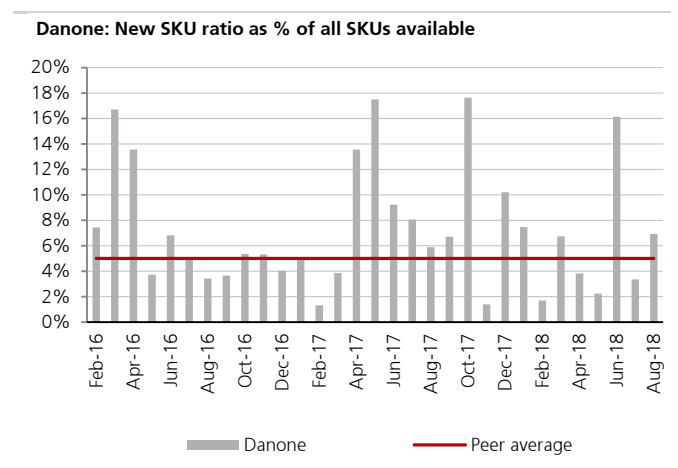
Mix effects/new SKUs: In contrast to Nestlé, Danone has been introducing new SKUs at a higher price point vs the overall median pricing across its China IMF portfolio (including mix effects). It also appears to be introducing new SKUs more frequently vs Nestlé (7% vs 6% of SKUs). However, it is somewhat concerning that Danone's overall median pricing (all-in) has been trending down, particularly since September 2017 – although the last few months look better. We think this has initially had a positive impact on its market shares (per our earlier reports and Danone's quarterly results) but today's SKU share data does not encourage. We are relatively cautious about Danone's Chinese IMF performance in 2H18: we expect weaker volumes and slower pricing trends.

Figure 38: Danone: Indexed median price trends (including mix effects) vs price trends of new SKUs



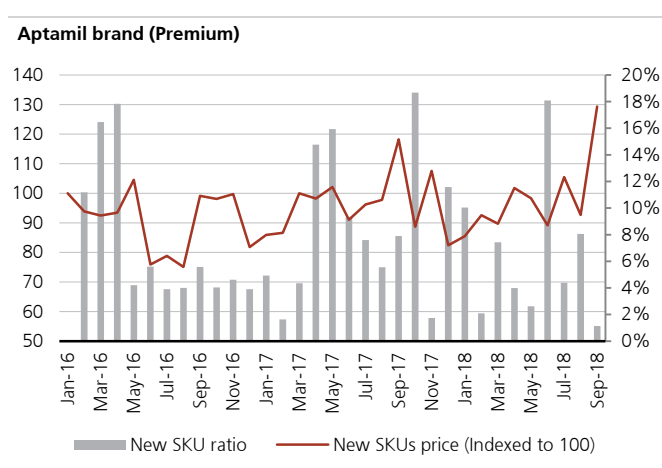
Source: UBS Evidence Lab. Note: Median pricing; price trends indexed to 100 in Jan 2016; New item price indexed to all item price (base 100)

Figure 39: Danone: New SKU ratio vs peer average



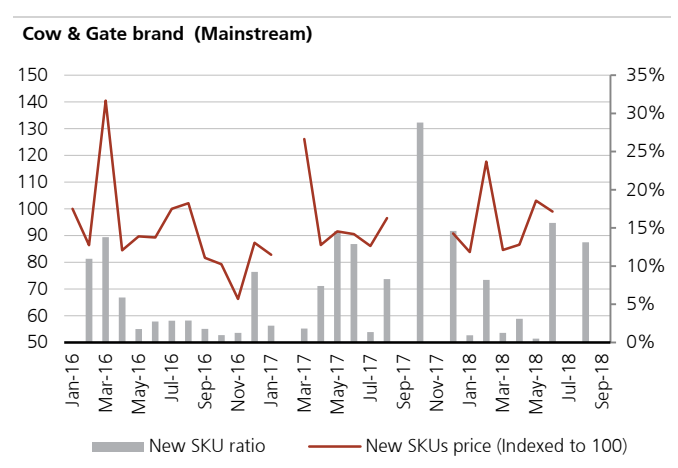
Source: UBS Evidence Lab

Figure 40: Aptamil: Indexed median price trends of new SKUs vs new SKU ratio



Source: UBS Evidence Lab. Note: Median pricing.

Figure 41: Cow & Gate: Indexed median price trends of new SKUs vs new SKU ratio



Source: UBS Evidence Lab

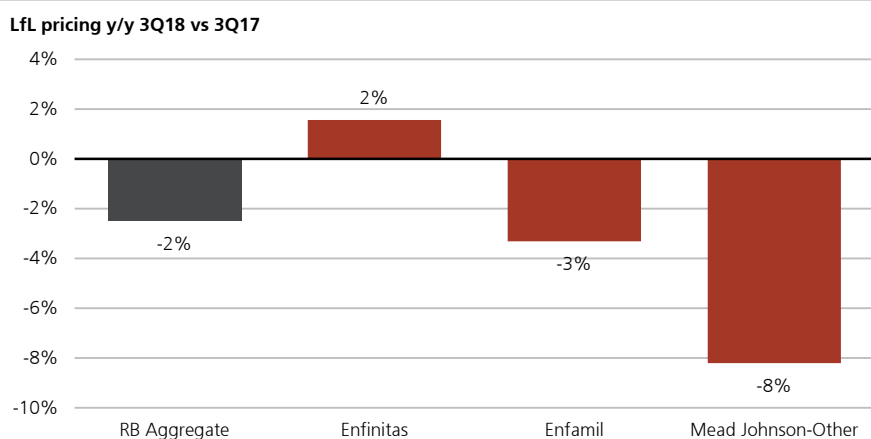
RB – Neutral, PT £64

UBS view: Following RB's acquisition of Mead Johnson (MJN) in 1H17, China infant formula now represents c7% of RB's Group sales. Organic sales growth in MJN turned positive in 3Q17 (+1%) and continued its momentum in 4Q17 (+3%), 1Q18 (+6%) and 2Q18 (+9%) driven by double digit growth in Asia. Some of this strength was driven by inventory loading in both China and the US. We rate RB Neutral – there are still a number of fundamental uncertainties, particularly on long-term margins. The stock is trading at 19x 19E PE, a 4% premium to EU Staples.

Pricing: UBS Evidence Lab data suggests RB's overall China IMF pricing online fell slightly (-2% y/y) in 3Q18. Its super-high premium brand Enfinitas was up but Enfamil and the other brands under the Enfa family were drags (the "Other" bucket captures brands such as Enfapro, Enfagrow, Enfakid, etc.)

We estimate China IMF is 7% of RB's group sales

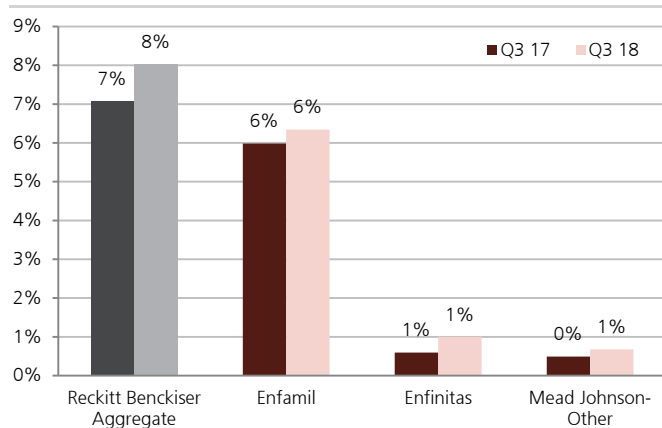
Figure 42: RB like-for-like pricing y/y growth: 3Q18 vs 3Q17



Source: UBS Evidence Lab

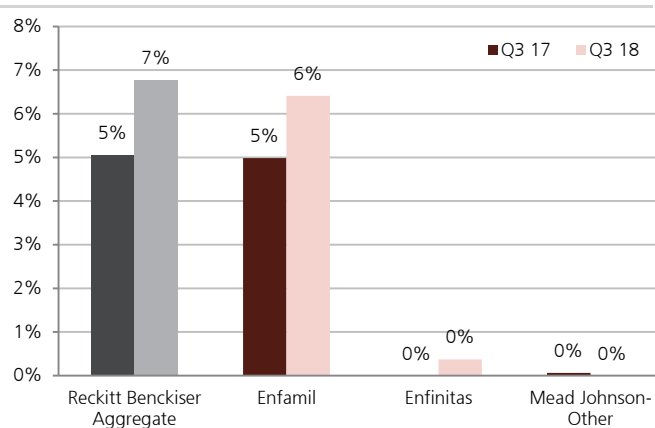
SKU shares: RB's share of total online SKUs now stands at 8%, slightly up from 7% in 3Q17. More importantly, RB saw a +170bps increase y/y in its share of the top-25 bestselling SKUs, driven primarily by Enfamil. Despite this increase, RB's share of the bestsellers (7%) is still slightly under-indexed in comparison to its share of overall SKUs.

Figure 43: RB brands' share of online SKUs



Source: UBS Evidence Lab; brands do not sum up to the Group numbers, this is due to various brands under the Enfa family not being covered in this chart

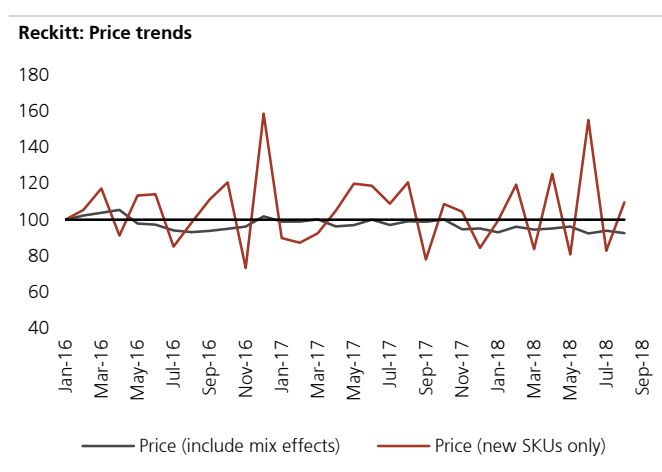
Figure 44: RB brands' share of Top-25 bestsellers



Source: UBS Evidence Lab; brands do not sum up to the Group numbers, this is due to various brands under the Enfa family not being covered in this chart

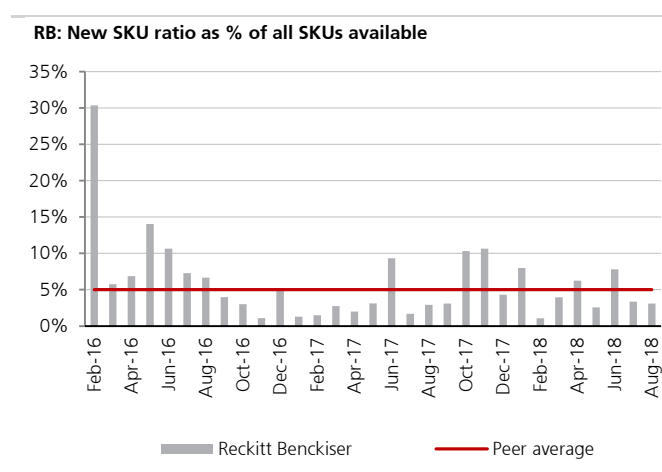
Mix effects/new SKUs: RB's price of new SKUs has generally been in line with overall median pricing including mix effects. Introducing more innovative products could allow the company to list its SKUs at a higher price point in the future, which could be an opportunity. Indeed, the share of new SKUs within RB's Chinese IMF portfolio averages just 5% of SKUs - a lower percentage vs Danone (7%) and Nestlé (6%). More than a year on from RB's acquisition of Mead Johnson, we would have expected to see increasing innovation rates and introduction of new SKUs. This does not yet appear to be the case – if anything, the YTD average of 5% is lower than what Mead Johnson achieved in 2016 (9%, and as high as 30% in Feb 2016).

Figure 45: RB: Indexed median price trends (including mix effects) vs price trends of new SKUs



Source: UBS Evidence Lab. Note: Median pricing; price trends indexed to 100 in Jan 2016; New item price indexed to all item price (base 100)

Figure 46: RB: New SKU ratio vs peer average



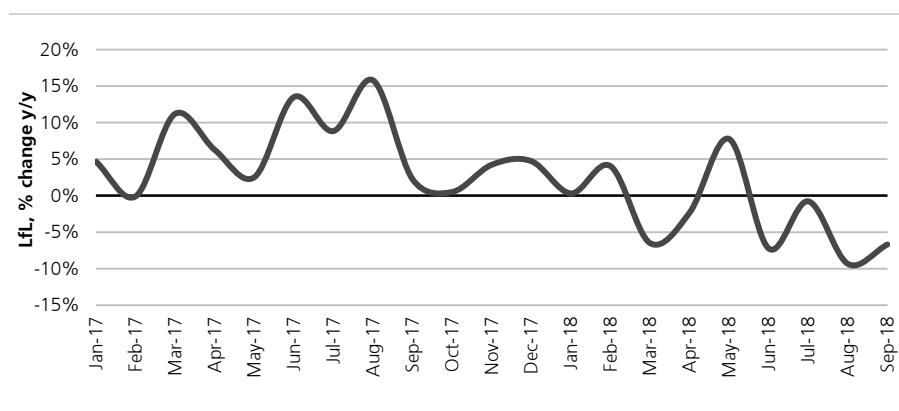
Source: UBS Evidence Lab

Yili – Buy, PT 33.60CNY

UBS view: We believe Yili is well positioned for the structural changes in IMF given its greater exposure to lower-tier cities, improving brand image and higher mix upgrade potential. However, after the value growth acceleration of both the industry (+17% y/y) and Yili (+27% y/y) in H118, its management flagged intensifying market competition and rising channel inventory, in line with the downward trend of online pricings since Q218. Therefore, we expect its IMF revenue growth to moderate from H218. In the meantime, we remain optimistic about Yili's liquid milk growth as the industry leader amid continuing rebalance of supply/demand dynamic, with limited competition from regional brands. We think investors could be overly concerned about the short-term increase in S&D ratio due to its major peer's aggressive marketing initiatives and expect its S&D ratio to start to fall from Q318.

Pricing: UBS Evidence Lab data suggests Yili's overall pricing was down 5% y/y in 3Q18. Specifically, due to the fluctuation in bases, Yili's overall LFL pricing fell 0.8% y/y, 9.3% y/y and 6.7% y/y in July, August and September, respectively. But, including mix effect, Yili's median online price was up 1% y/y in 3Q18.

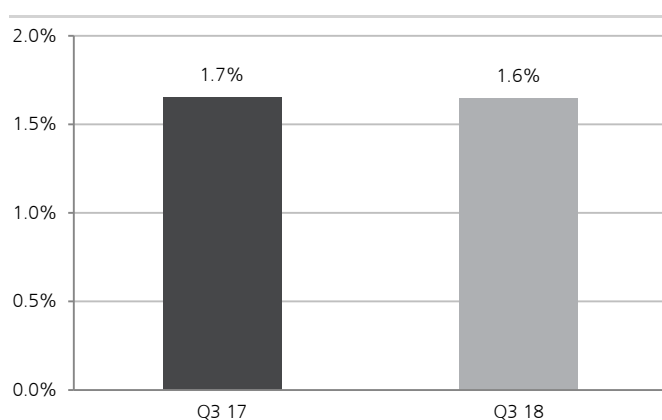
Figure 47: Yili like-for-like pricing y/y growth-



Source: UBS Evidence Lab

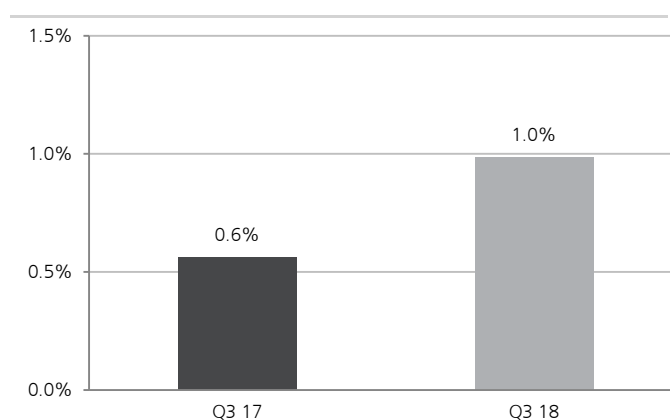
SKU shares: Yili's efforts in product streamlining/upgrading and brand building under its share-driven strategy seem to be bearing fruit. Although Yili's share of total online SKUs decreased 10bps y/y in 3Q18 to 1.6%, its share of top-25 bestsellers was up 40bps YoY to 1.0%. This is in-line with the steady share-gaining trend in the off-line channel, according to our channel checks with distributors.

Figure 48: Yili brands' share of online SKUs



Source: UBS Evidence Lab

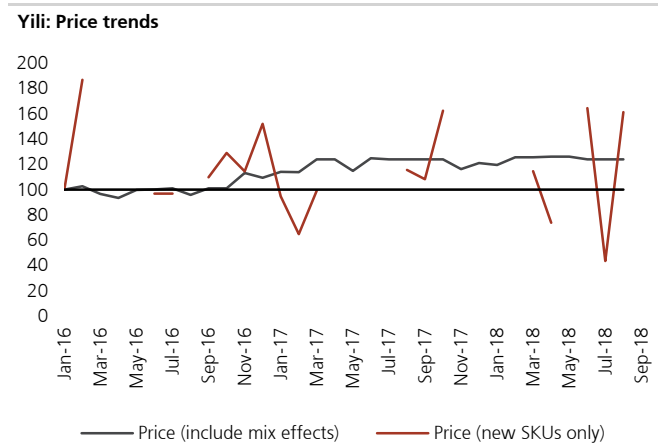
Figure 49: Yili brands' share of Top-25 bestsellers



Source: UBS Evidence Lab

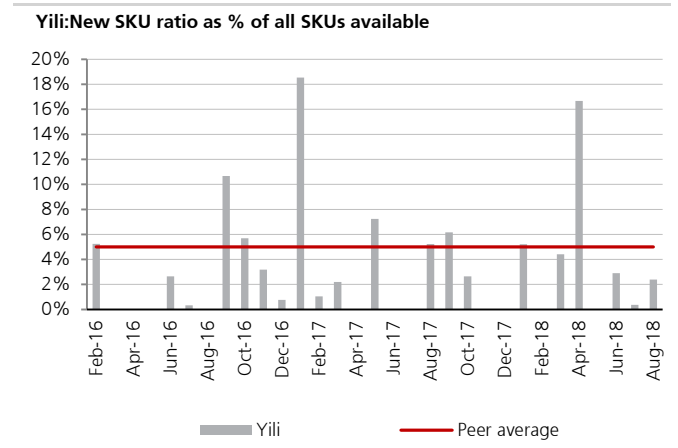
Mix effects/new SKUs: Yili's price of new SKUs has generally been higher than overall median pricing including mix effects and there is an average gap of 3-6 months between the launch of new SKUs. Notably, April saw a large increase in the new SKU ratio while those new SKUs were priced lower than Yili's median. These findings may imply that Yili upgraded the package of its low-price SKUs.

Figure 50: Yili: Indexed median price trends (including mix effects) vs price trends of new SKUs



Source: UBS Evidence Lab. Note: Median pricing; price trends indexed to 100 in Jan 2016; New item price indexed to all item price (base 100)

Figure 51: Yili: New SKU ratio



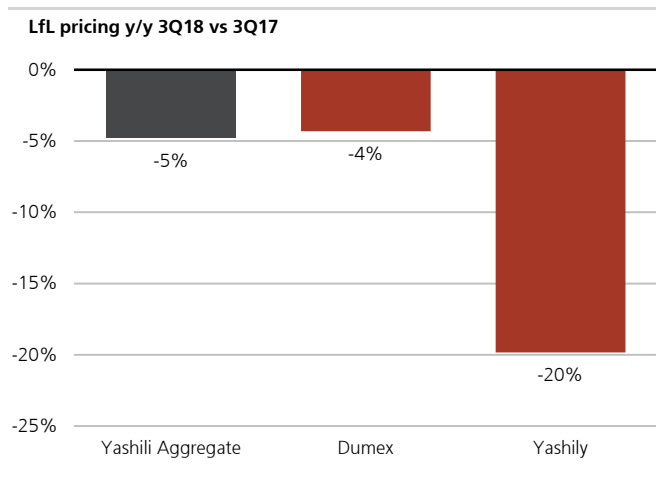
Source: UBS Evidence Lab

Yashili – Sell, PT 1.54HKD

UBS view: Yashili's LFL pricing trend continued to weaken in 3Q18, down -5% y/y in the quarter (Dumex brand -4%, Yashily brand -20%), the first y/y decline since Q217. Mix improvement largely attributable to new Arla SKU launches, however, drove a +44% y/y growth in overall median price. Yashili continued to lose online SKU market share YoY in 3Q18 (mainly driven by weakness in the Dumex brand), though market shares rebounded q/q at both the company level and in the Dumex and Arla brands. We believe Yashili is unlikely to be a significant earnings contributor to Mengniu in the near-term.

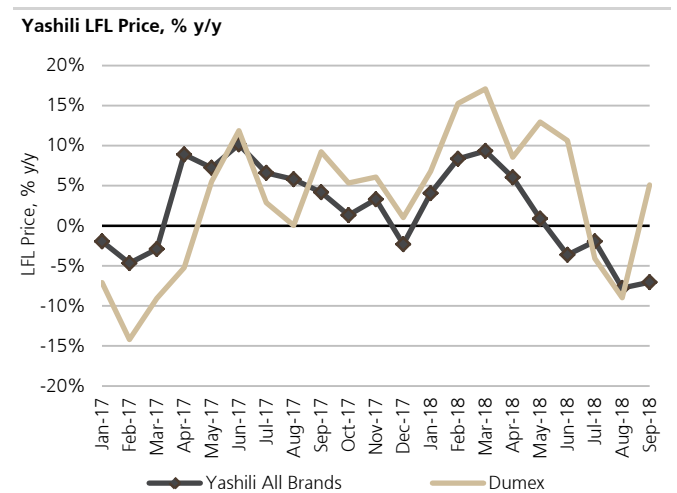
Pricing: UBS Evidence Lab data suggests Yashili's LFL pricing was down -5% y/y in 3Q18, led by the Yashily brand (-20% y/y), with the Dumex brand also down -4% y/y. Including mix effect, Yashili's pricing was up +44% y/y in 3Q18, indicating mix improvement largely driven by the Arla brand.

Figure 52: Yashili pricing y/y growth: 3Q18 vs 3Q17



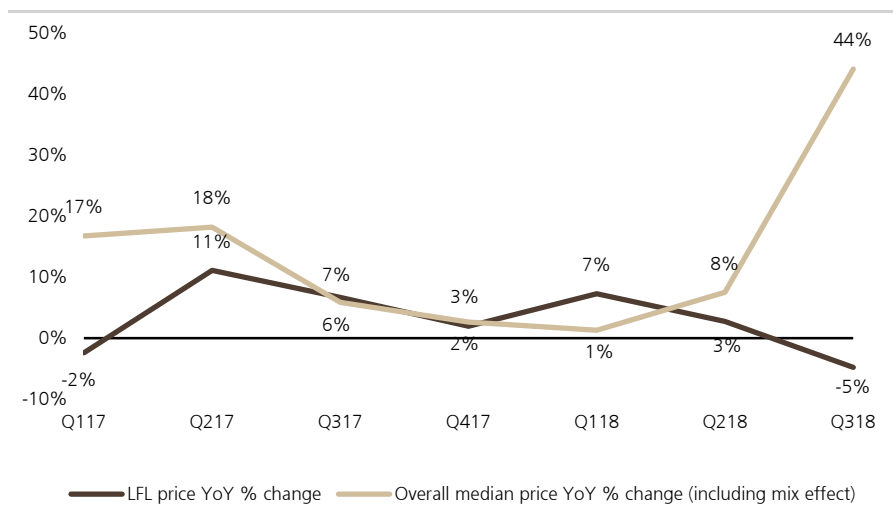
Source: UBS Evidence Lab

Figure 53: Yashili pricing y/y growth: monthly



Source: UBS Evidence Lab

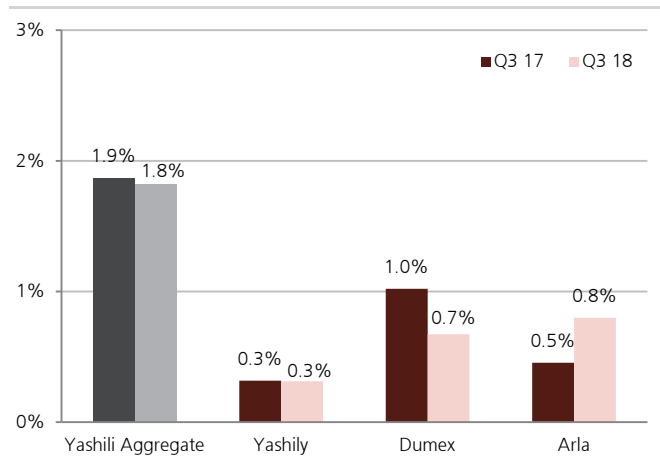
Figure 54: Yashili pricing y/y growth: LFL vs. overall median (including mix)



Source: UBS Evidence Lab

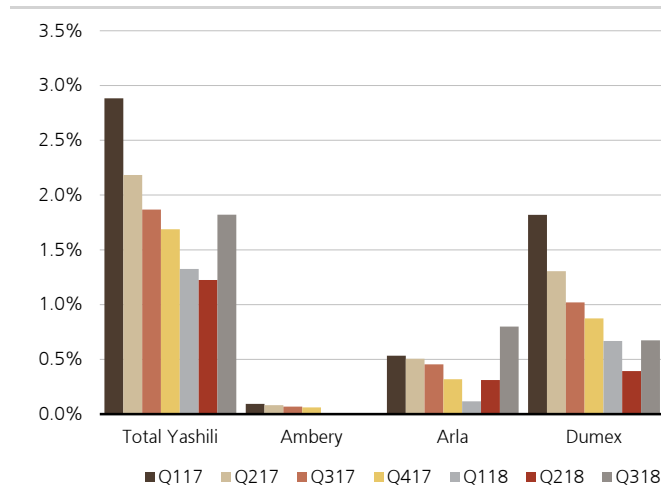
SKU shares: Yashili's share of total online SKUs declined -10bps y/y in 3Q18, mainly driven by weakness in the Dumex brand (-30bps y/y) which more than offset the increase in the Arla brand (+30bps y/y). On a q/q basis, market shares rebounded in 3Q18 at both the company level and in the Dumex and Arla brands. Yashili's share of top-25 bestsellers was negligible.

Figure 55: Yashili brands' share of online SKUs



Source: UBS Evidence Lab; brands may not sum up to the Group numbers due to smaller brands not covered in this chart

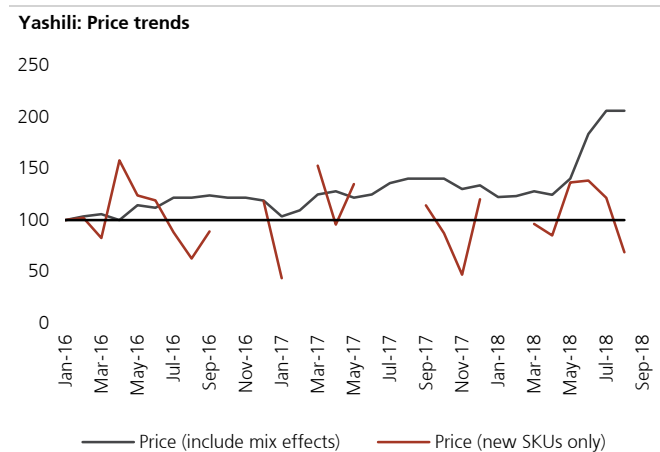
Figure 56: Yashili brands' share of online SKUs since Q117



Source: UBS Evidence Lab; brands may not sum up to the Group numbers due to smaller brands not covered in this chart

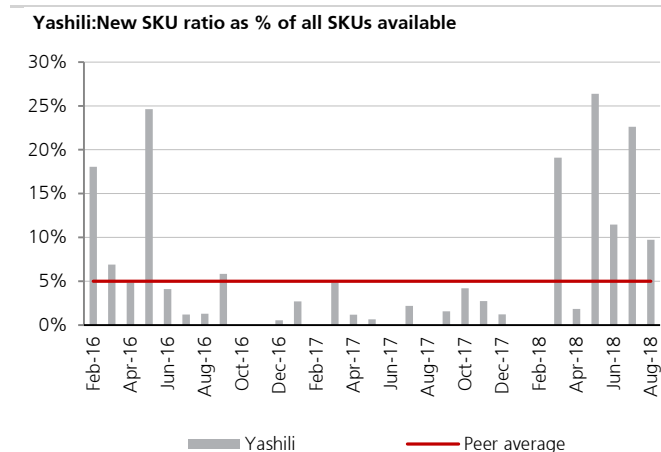
Mix effects/new SKUs: Yashili's price of new SKUs has generally been mixed, whilst price including mixed effects has been gaining momentum YTD. UBS Evidence Lab data also suggests that there has been a significant pickup of new SKUs since March 2018 (except in April).

Figure 57: Yashili: Indexed median price trends (including mix effects) vs price trends of new SKUs



Source: UBS Evidence Lab. Note: Median pricing; price trends indexed to 100 in Jan 2016; New item price indexed to all item price (base 100)

Figure 58: Yashili: New SKU ratio



Source: UBS Evidence Lab

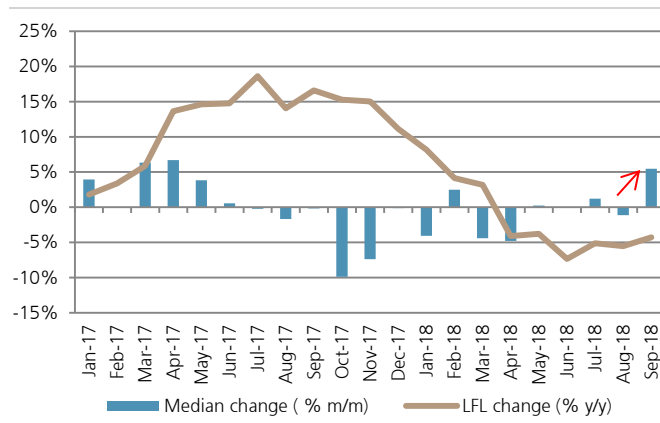
The a2 Milk Company – Neutral, PT 11.80 NZD

A2 Milk's performance in China remains the primary near-medium term share price driver with China IMF (including grey channel) making up c70% of FY18 sales. We have a Neutral rating. We continue to believe the medium term outlook for A2M remains robust, with our recent visit to China re-affirming this.

The results over Q1 FY19; were mixed via:

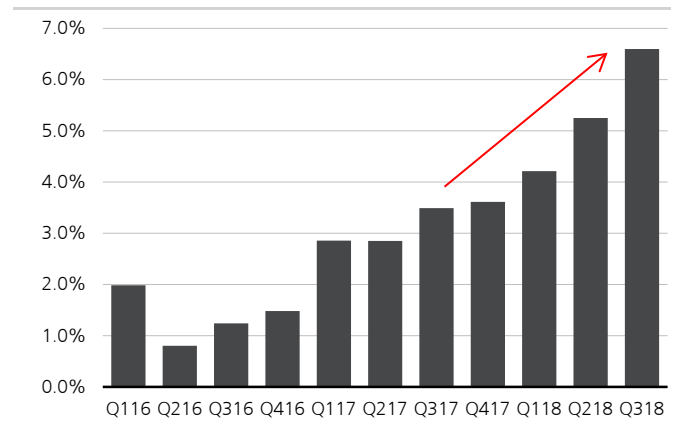
- **Ranking strong:** a2 Platinum is ranked #7 as a company in online share of top-25 bestsellers (up 1.4ppts to 6.6% in 3Q18). In terms of total SKU's A2M is ranked #9 (c3% in 3Q18).
- **Pricing mixed:** Median prices began to recover over Q3, with September median pricing up c5% y/y, reflecting the new label product and waning stock of old label product. LFL pricing however remained subdued, down c5% over the quarter and the decline only easing modestly in September. We would be concerned if pricing did not begin to turn positive in the December quarter.

Figure 59: a2 Platinum online m/m median price trends



Source: UBS Evidence Lab

Figure 60: a2 Platinum share of Top-25 bestsellers



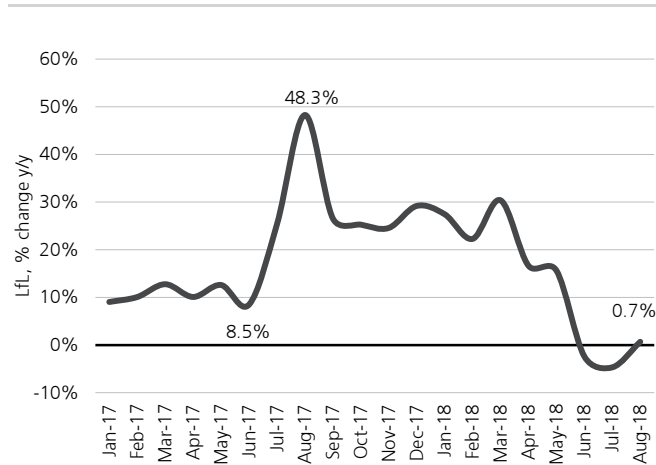
Source: UBS Evidence Lab

Fonterra – Neutral, PT 5.05NZZ

We estimate China IMF (including ingredients sales and equity-accounted contribution from Beingmate) only account for around 5% of FY17 gross profit.

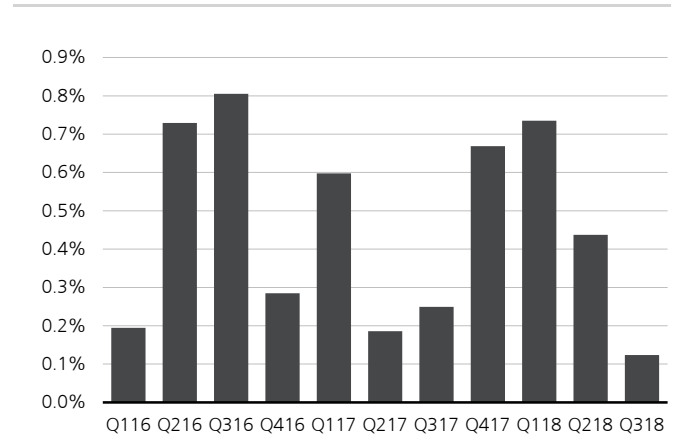
UBS Evidence Lab data points to a disappointing 3Q18 for Beingmate. In particular, Beingmate giving up all of its price gains achieved in CY17 with median online prices down -10% y/y but stable on q/q. Moreover, following recent sharp declines, online pricing of major grey market premium import brands, like Aptamil (RMB193/can in September) and A2 (RMB232/can in September) is becoming an issue for Beingmate (RMB164/can in September). Beingmate's share of online best-sellers share remains low, and the company's focus remains on the offline channel in China.

Figure 61: Beingmate online like-for-like prices y/y change



Source: UBS Evidence Lab

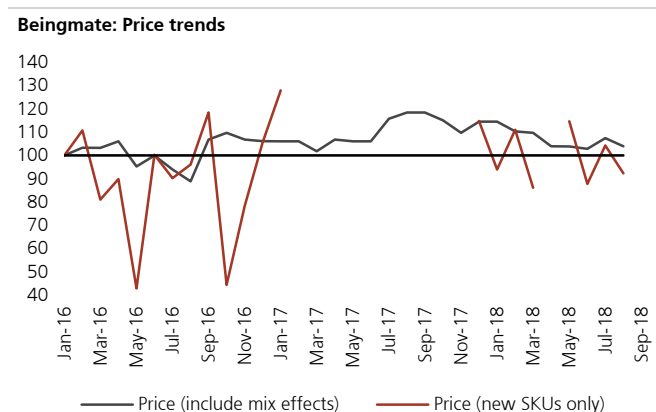
Figure 62: Beingmate share of Top-25 bestsellers



Source: UBS Evidence Lab

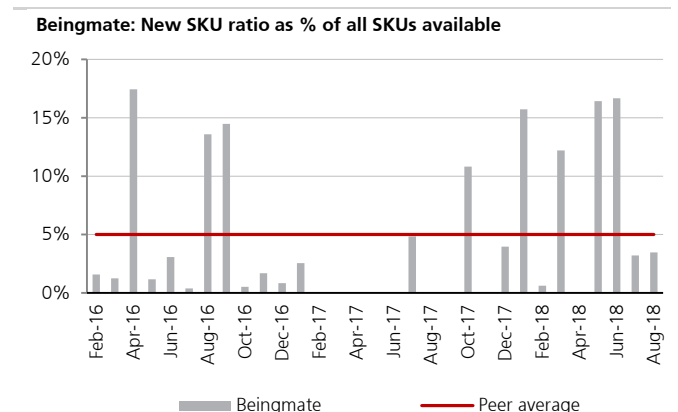
Mix effects/new SKUs: Pricing of new SKUs has generally been lower than those including mixed effects. The level of new SKUs moderated in 3Q18 after a pick-up in 2Q18.

Figure 63: Beingmate online like-for-like prices y/y change



Source: UBS Evidence Lab. Note: Median pricing; price trends indexed to 100 in Jan 2016; New item price indexed to all item price (base 100)

Figure 64: Beingmate share of Top-25 bestsellers



Source: UBS Evidence Lab

China IMF regulatory outlook

Focus shifting from traditional to grey market channels

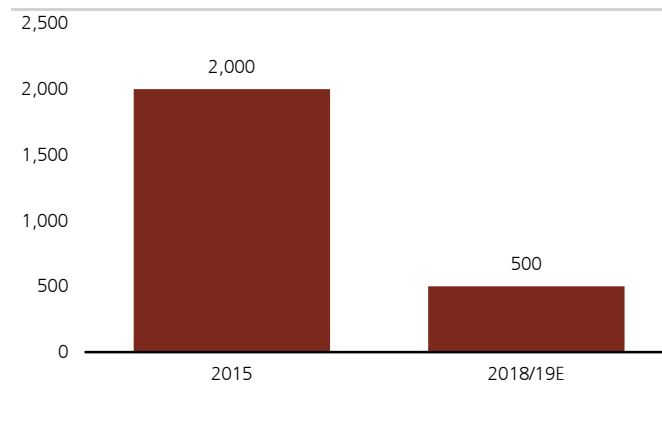
Regulation of IMF in China continues to evolve. The regulatory programme started back in 2014 with registration of IMF factories, followed with registration of brands and associated products in 2016/7 sold through traditional channels. The focus now looks to be shifting to remaining channels, being cross border e-commerce via free trade zones (B2C) and *daigou* (C2C) channels.

Figure 65: China's IMF industry regulatory changes

2016: Cross-border Regulation - Value-added Tax
2016: CIQ Product Testing Requirements
2016: Infant Formula Registration Regulation (announced June 8th)
2018: Cross-border Regulation: Product Compliance for Bonded Warehouses (enforcement likely to be at the end of 2018)
2018: E-commerce Regulation (enforcement likely to be at the end of 2019)
2019: Food Safety Regulation (enforcement likely to be at the end of 2019)

Source: UBS research

Figure 66: Number of China IMF brands



Source: UBS estimates and analysis

Key Elements of China IMF Regulation

Below we summarise seven key points around the Chinese IMF regulation, including an update on the new rules passed in September 2018.

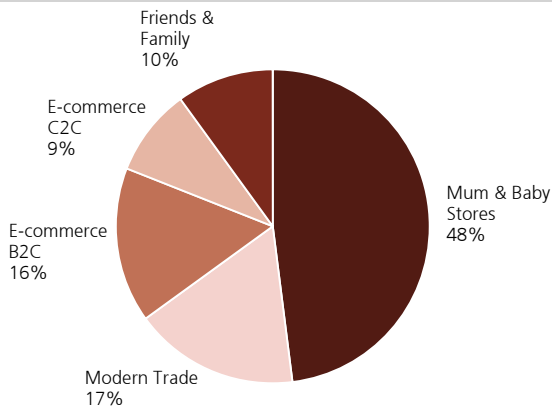
- 1) Infant Formula Factor Registration:** Announced in 2013 and phased in across 2014. All producers of infant formula sold in China must be registered with CNCA. The registration system issued 176 factory licenses, including 103 in China and 73 in overseas countries.
- 2) Cross Border Regulatory Value Added Tax (VAT):** Announced in April 2016, all IMF product shipments valued at less than 2,000 RMB are now subject to an 11.9% VAT (from 0%). This tax creates a more even tax system for imported products across direct B2C and traditional retail channels.
- 3) CIQ Product Testing policy (aka "One Brand, One Formulation"):** Announced in June 2016, the Chinese Food & Drug Administration (CFDA) implemented formal product standards and testing requirements for imported IMF brands entering China. This measure requires IMF companies to sell products with unique formulations (≥ 6 different nutrients). Differentiated formulation requirements will help eliminate generic brands mainly sold through the CBEC channel. Large multinational IMF companies with superior R&D resources are best positioned to benefit from CFDA reform in our view.

- 4) Infant Formula Brand and Product Registration:** Announced in June 2016 and phased-in across 2016 and 2017. Key features: 1) all licenced factories, domestic & foreign, need to register each brand and associated product formulations; 2) limited to 3 brands and 9 product formulations per licensed factory; 3) needs raw materials and finished product testing; 4) detailed labelling and product description instructions to improve ease of customer use; and 5) excludes CBEC. The deadline for registration was 1 Jan 2018. We believe local brands with limited manufacturing capability and smaller foreign brands will be negatively impacted, yet large players will benefit. We believe around 500 brands are likely to be eventually registered.
- 5) Cross Border (via Bonded Warehouse) Regulation:** All imported products, including IMF, sold into China via e-commerce platforms and bonded warehouses will need to be registered with customs. Products also require safety testing by CFDA and must meet local product standards. There will also be a new custom clearance process, including inspection, quarantine and certification. While this government measure was announced in 2016, there was an 18-month grace (or transitional) period for non-compliant products to exit the marketplace. In March 2017, China's Ministry of Commerce had announced that cross-border e-commerce imports will be temporarily treated as "personal goods". This regulation is now expected to come into force at the end of 2018.
- 6) China e-Commerce Regulation:** Passed in **September 2018**, all e-commerce operators (sellers) must obtain a relevant license and registration plus meet tax obligations. E-commerce platforms, including WeChat, must ensure operators meet requirements. Operators engaged in cross border e-commerce shall abide by state laws and import/export regulations. Law also establishes customer dispute mechanisms plus legal liabilities and penalties. For IMF this potentially means products need to come from registered factories and registered brands with proper Chinese labels. Draft implementation regulations for IMF should be issued by SAMR (State Administration for Market Regulations) by the end of 2018.
- 7) Food Safety Regulation:** New Chinese food safety laws were passed in April 2015. The implementation rules were issued in draft form in December 2015 and revised in October 2016 and again in September 2017. These impose new rules for licensing, information systems, transportation, labelling, product testing, and penalties mainly for food producers, and to a lesser degree, importers. Explicit requirements around the CBEC channel have been removed in the latest draft. It is looking increasingly likely that this regulation will come into force in 2019

China IMF channels & global milk powder prices

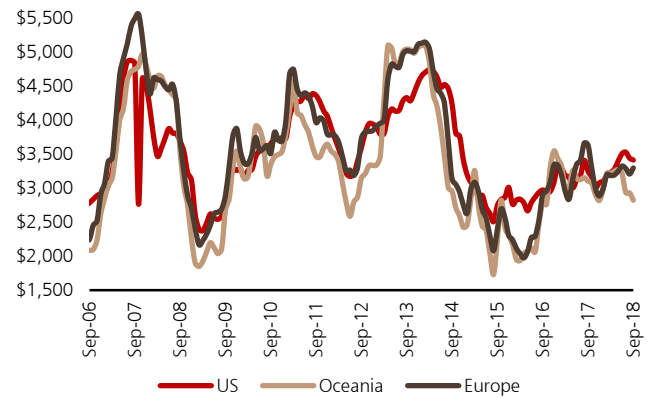
- According to Danone, mum & baby stores are now almost half of the Chinese IMF market. E-commerce is 25% (of which 16% is B2C and 9% is C2C).
- Whole milk powder prices in US, Oceania and Europe at c\$3,000 have been edging up, but they are still significantly below the highs in 2013.

Figure 67: China infant formula market by channel



Source: Danone company presentation

Figure 68: Whole milk powder prices



Source: U.S. Dairy Export Council

UBS Evidence Lab methodology

Caveats to consider:

UBS Evidence Lab is collecting China Infant Formula prices from a sample of websites. The sample of websites includes large multi-category eCommerce, large physical retail chains with an online presence, and specialty baby websites. The website prices are likely a good reflection of overall eCommerce prices, but eCommerce prices may not reflect the broader market for Infant Formula in China.

For the price segment analysis, UBS defines super high premium as +300 Rmb per 900g, premium as 200-300 Rmb per 900g, Mainstream as 100-200 Rmb per 900g.

For the import vs domestic analysis, we only compare items where the production company is directly stated on the retailer's website.

The latest available China Infant Formula prices data in this report is until end of June, but there were data gaps in the weeks ending 2nd and 9th June.

Metric definitions:

- **Like-for-like price changes:** We identify identical items found in the current and year ago period to calculate the price change, removing mix effects from new and removed items.
- **Share of top 25:** A measure of popularity calculated as the number of SKUs showing up in top 25 bestsellers on the retailer webpage, by category divided by the total number of top 25 positions. We track this over time to see shifts in popularity amongst product cohorts such as super high premium or Imports.

- **% of SKUs: % of SKUs:** The total number of SKUs offered by a brand, Parent Company or product cohort divided by the total number of available SKUs offered across all websites for a given week.

Please note: Our Chinese Infant Formula database excludes data points from the following periods. UBS Evidence Lab rigorous data quality process resulted in the decision to remove these records. Trends within these missing weeks could have altered the aggregated trend shown in the relevant period, but we believe the takeaways are directionally correct.

w/c 23-Sept-17

w/c 30-Dec-17

w/c 06-Jan-18

w/c 02 Jun-18

w/c 09-Jun-18

**UBS Evidence Lab provides our research analysts with rigorous primary research. The team conducts representative surveys of key sector decision-makers, mines the Internet, systematically collects observable data, and pulls information from other innovative sources. They apply a variety of advanced analytic techniques to derive insights from the data collected. This valuable resource supplies UBS analysts with differentiated information to support their forecasts and recommendations—in turn enhancing our ability to serve the needs of our clients.*

For this report, UBS Evidence Lab used advanced web mining techniques to collect infant formula milk product offers in China from five leading eCommerce sites. For each product, we collected weekly information about assortment, price, popularity, ratings and country of production. Our China Infant Milk Formula database began in late December 2015 and now has nearly 500,000 records covering more than 10,000 unique SKU identifiers.

Valuation Method and Risk Statement

We set our price targets using a combination of (1) DCF, to drive our absolute valuations, and (2) our views on where the stocks should trade relative to each other and the sector.

Sector-specific risks include: (1) consumer expenditure levels and the economic and political stability in the countries of operation; (2) shifts in consumer trends between categories; (3) increasing competition & fragmentation; (4) the impact on returns from increased A&P, capital investment and M&A activities; (5) exchange rate movements, particularly in USD and emerging market currencies; and (6) variability of input costs, such as raw materials and packaging materials.

Required Disclosures

This report has been prepared by UBS Limited, an affiliate of UBS AG. UBS AG, its subsidiaries, branches and affiliates are referred to herein as UBS.

For information on the ways in which UBS manages conflicts and maintains independence of its research product; historical performance information; and certain additional disclosures concerning UBS research recommendations, please visit www.ubs.com/disclosures. The figures contained in performance charts refer to the past; past performance is not a reliable indicator of future results. Additional information will be made available upon request. UBS Securities Co. Limited is licensed to conduct securities investment consultancy businesses by the China Securities Regulatory Commission. UBS acts or may act as principal in the debt securities (or in related derivatives) that may be the subject of this report. This recommendation was finalized on: 16 October 2018 07:04 AM GMT. UBS has designated certain Research department members as Derivatives Research Analysts where those department members publish research principally on the analysis of the price or market for a derivative, and provide information reasonably sufficient upon which to base a decision to enter into a derivatives transaction. Where Derivatives Research Analysts co-author research reports with Equity Research Analysts or Economists, the Derivatives Research Analyst is responsible for the derivatives investment views, forecasts, and/or recommendations.

Analyst Certification: Each research analyst primarily responsible for the content of this research report, in whole or in part, certifies that with respect to each security or issuer that the analyst covered in this report: (1) all of the views expressed accurately reflect his or her personal views about those securities or issuers and were prepared in an independent manner, including with respect to UBS, and (2) no part of his or her compensation was, is, or will be, directly or indirectly, related to the specific recommendations or views expressed by that research analyst in the research report.

UBS Investment Research: Global Equity Rating Definitions

12-Month Rating	Definition	Coverage ¹	IB Services ²
Buy	FSR is > 6% above the MRA.	48%	24%
Neutral	FSR is between -6% and 6% of the MRA.	37%	21%
Sell	FSR is > 6% below the MRA.	15%	12%
Short-Term Rating	Definition	Coverage ³	IB Services ⁴
Buy	Stock price expected to rise within three months from the time the rating was assigned because of a specific catalyst or event.	<1%	<1%
Sell	Stock price expected to fall within three months from the time the rating was assigned because of a specific catalyst or event.	<1%	<1%

Source: UBS. Rating allocations are as of 30 September 2018.

1: Percentage of companies under coverage globally within the 12-month rating category.

2: Percentage of companies within the 12-month rating category for which investment banking (IB) services were provided within the past 12 months.

3: Percentage of companies under coverage globally within the Short-Term rating category.

4: Percentage of companies within the Short-Term rating category for which investment banking (IB) services were provided within the past 12 months.

KEY DEFINITIONS: **Forecast Stock Return (FSR)** is defined as expected percentage price appreciation plus gross dividend yield over the next 12 months. In some cases, this yield may be based on accrued dividends. **Market Return Assumption (MRA)** is defined as the one-year local market interest rate plus 5% (a proxy for, and not a forecast of, the equity risk premium). **Under Review (UR)** Stocks may be flagged as UR by the analyst, indicating that the stock's price target and/or rating are subject to possible change in the near term, usually in response to an event that may affect the investment case or valuation. **Short-Term Ratings** reflect the expected near-term (up to three months) performance of the stock and do not reflect any change in the fundamental view or investment case. **Equity Price Targets** have an investment horizon of 12 months.

EXCEPTIONS AND SPECIAL CASES:UK and European Investment Fund ratings and definitions are: **Buy:** Positive on factors such as structure, management, performance record, discount; **Neutral:** Neutral on factors such as structure, management, performance record, discount; **Sell:** Negative on factors such as structure, management, performance record, discount. **Core Banding Exceptions (CBE):** Exceptions to the standard +/-6% bands may be granted by the Investment Review Committee (IRC). Factors considered by the IRC include the stock's volatility and the credit spread of the respective company's debt. As a result, stocks deemed to be very high or low risk may be subject to higher or lower bands as they relate to the rating. When such exceptions apply, they will be identified in the Company Disclosures table in the relevant research piece.

Research analysts contributing to this report who are employed by any non-US affiliate of UBS Securities LLC are not registered/qualified as research analysts with FINRA. Such analysts may not be associated persons of UBS Securities LLC and therefore are not subject to the FINRA restrictions on communications with a subject company, public appearances, and trading securities held by a research analyst account. The name of each affiliate and analyst employed by that affiliate contributing to this report, if any, follows.

UBS Limited: Pinar Ergun, CFA; Charles Eden, ACA; Nik Oliver; Robert Rampton. **UBS New Zealand Holdings Ltd:** Marcus Curley. **UBS AG Hong Kong Branch:** Christine Peng, CFA. **UBS Securities Co. Limited:** Brad Chen. **UBS Securities Australia Ltd:** Ben Gilbert. **UBS Service Centre (Poland) Sp. z o.o.:** Robert Krankowski.

Company Disclosures

Company Name	Reuters	12-month rating	Short-term rating	Price	Price date
Danone	DANO.PA	Buy	N/A	€64.38	15 Oct 2018
Fonterra Shareholders' Fund	FSF.NZ	Neutral	N/A	NZ\$4.56	15 Oct 2018
Inner Mongolia Yili Industrial	600887.SS	Buy	N/A	Rmb25.14	15 Oct 2018
Nestlé ^{1, 2, 4, 5, 6a, 6b, 7, 22}	NESN.S	Neutral	N/A	CHF78.90	15 Oct 2018
Reckitt Benckiser	RB.L	Neutral	N/A	6,540p	15 Oct 2018
The a2 Milk Company Limited ¹³	ATM.NZ	Neutral	N/A	NZ\$9.78	15 Oct 2018
Yashili International	1230.HK	Sell	N/A	HK\$1.45	15 Oct 2018

Source: UBS. All prices as of local market close.

Ratings in this table are the most current published ratings prior to this report. They may be more recent than the stock pricing date

1. UBS Securities LLC is acting as manager/co-manager, underwriter, placement or sales agent in regard to an offering of securities of this company/entity or one of its affiliates.
2. UBS AG, its affiliates or subsidiaries has acted as manager/co-manager in the underwriting or placement of securities of this company/entity or one of its affiliates within the past 12 months.
4. Within the past 12 months, UBS AG, its affiliates or subsidiaries has received compensation for investment banking services from this company/entity or one of its affiliates.
5. UBS AG, its affiliates or subsidiaries expect to receive or intend to seek compensation for investment banking services from this company/entity within the next three months.
- 6a. This company/entity is, or within the past 12 months has been, a client of UBS Securities LLC, and non-investment banking securities-related services are being, or have been, provided.
- 6b. This company/entity is, or within the past 12 months has been, a client of UBS Securities LLC, and non-securities services are being, or have been, provided.
7. Within the past 12 months, UBS Securities LLC and/or its affiliates have received compensation for products and services other than investment banking services from this company/entity.
13. UBS AG, its affiliates or subsidiaries beneficially owned 1% or more of a class of this company's common equity securities as of last month's end (or the prior month's end if this report is dated less than 10 days after the most recent month's end).
22. UBS AG, its affiliates or subsidiaries held other significant financial interests in this company/entity as of last month's end (or the prior month's end if this report is dated less than 10 working days after the most recent month's end).

Unless otherwise indicated, please refer to the Valuation and Risk sections within the body of this report. For a complete set of disclosure statements associated with the companies discussed in this report, including information on valuation and risk, please contact UBS Securities LLC, 1285 Avenue of Americas, New York, NY 10019, USA, Attention: Investment Research.

Global Disclaimer

This document has been prepared by UBS Limited, an affiliate of UBS AG. UBS AG, its subsidiaries, branches and affiliates are referred to herein as UBS.

Global Research is provided to our clients through UBS Neo, and in certain instances, UBS.com and any other system or distribution method specifically identified in one or more communications distributed through UBS Neo or UBS.com (each a system) as an approved means for distributing Global Research. It may also be made available through third party vendors and distributed by UBS and/or third parties via e-mail or alternative electronic means. The level and types of services provided by Global Research to a client may vary depending upon various factors such as a client's individual preferences as to the frequency and manner of receiving communications, a client's risk profile and investment focus and perspective (e.g., market wide, sector specific, long-term, short-term, etc.), the size and scope of the overall client relationship with UBS and legal and regulatory constraints.

All Global Research is available on UBS Neo. Please contact your UBS sales representative if you wish to discuss your access to UBS Neo.

When you receive Global Research through a System, your access and/or use of such Global Research is subject to this Global Research Disclaimer and to the terms of use governing the applicable System.

When you receive Global Research via a third party vendor, e-mail or other electronic means, you agree that use shall be subject to this Global Research Disclaimer, where applicable the UBS Investment Bank terms of business (<https://www.ubs.com/global/en/investment-bank/regulatory.html>) and to UBS's Terms of Use/Disclaimer (<http://www.ubs.com/global/en/legalinfo2/disclaimer.html>). In addition, you consent to UBS processing your personal data and using cookies in accordance with our Privacy Statement (<http://www.ubs.com/global/en/legalinfo2/privacy.html>) and cookie notice (<http://www.ubs.com/global/en/homepage/cookies/cookie-management.html>).

If you receive Global Research, whether through a System or by any other means, you agree that you shall not copy, revise, amend, create a derivative work, provide to any third party, or in any way commercially exploit any UBS research provided via Global Research or otherwise, and that you shall not extract data from any research or estimates provided to you via Global Research or otherwise, without the prior written consent of UBS.

This document is for distribution only as may be permitted by law. It is not directed to, or intended for distribution to or use by, any person or entity who is a citizen or resident of or located in any locality, state, country or other jurisdiction where such distribution, publication, availability or use would be contrary to law or regulation or would subject UBS to any registration or licensing requirement within such jurisdiction.

This document is a general communication and is educational in nature; it is not an advertisement nor is it a solicitation or an offer to buy or sell any financial instruments or to participate in any particular trading strategy. Nothing in this document constitutes a representation that any investment strategy or recommendation is suitable or appropriate to an investor's individual circumstances or otherwise constitutes a personal recommendation. By providing this document, none of UBS or its representatives has any responsibility or authority to provide or have provided investment advice in a fiduciary capacity or otherwise. Investments involve risks, and investors should exercise prudence and their own judgment in making their investment decisions. None of UBS or its representatives is suggesting that the recipient or any other person take a specific course of action or any action at all. By receiving this document, the recipient acknowledges and agrees with the intended purpose described above and further disclaims any expectation or belief that the information constitutes investment advice to the recipient or otherwise purports to meet the investment objectives of the recipient. The financial instruments described in the document may not be eligible for sale in all jurisdictions or to certain categories of investors.

Options, structured derivative products and futures (including OTC derivatives) are not suitable for all investors. Trading in these instruments is considered risky and may be appropriate only for sophisticated investors. Prior to buying or selling an option, and for the complete risks relating to options, you must receive a copy of "The Characteristics and Risks of Standardized Options." You may read the document at <http://www.theocc.com/publications/risks/riskchap1.jsp> or ask your salesperson for a copy. Various theoretical explanations of the risks associated with these instruments have been published. Supporting documentation for any claims, comparisons, recommendations, statistics or other technical data will be supplied upon request. Past performance is not necessarily indicative of future results. Transaction costs may be significant in option strategies calling for multiple purchases and sales of options, such as spreads and straddles. Because of the importance of tax considerations to many options transactions, the investor considering options should consult with his/her tax advisor as to how taxes affect the outcome of contemplated options transactions.

Mortgage and asset-backed securities may involve a high degree of risk and may be highly volatile in response to fluctuations in interest rates or other market conditions. Foreign currency rates of exchange may adversely affect the value, price or income of any security or related instrument referred to in the document. For investment advice, trade execution or other enquiries, clients should contact their local sales representative.

The value of any investment or income may go down as well as up, and investors may not get back the full (or any) amount invested. Past performance is not necessarily a guide to future performance. Neither UBS nor any of its directors, employees or agents accepts any liability for any loss (including investment loss) or damage arising out of the use of all or any of the Information.

Prior to making any investment or financial decisions, any recipient of this document or the information should seek individualized advice from his or her personal financial, legal, tax and other professional advisors that takes into account all the particular facts and circumstances of his or her investment objectives.

Any prices stated in this document are for information purposes only and do not represent valuations for individual securities or other financial instruments. There is no representation that any transaction can or could have been effected at those prices, and any prices do not necessarily reflect UBS's internal books and records or theoretical model-based valuations and may be based on certain assumptions. Different assumptions by UBS or any other source may yield substantially different results.

No representation or warranty, either expressed or implied, is provided in relation to the accuracy, completeness or reliability of the information contained in any materials to which this document relates (the "Information"), except with respect to Information concerning UBS. The Information is not intended to be a complete statement or summary of the securities, markets or developments referred to in the document. UBS does not undertake to update or keep current the Information. Any opinions expressed in this document may change without notice and may differ or be contrary to opinions expressed by other business areas or groups, personnel or other representative of UBS. Any statements contained in this report attributed to a third party represent UBS's interpretation of the data, information and/or opinions provided by that third party either publicly or through a subscription service, and such use and interpretation have not been reviewed by the third party. In no circumstances may this document or any of the Information (including any forecast, value, index or other calculated amount ("Values")) be used for any of the following purposes:

- (i) valuation or accounting purposes;
- (ii) to determine the amounts due or payable, the price or the value of any financial instrument or financial contract; or
- (iii) to measure the performance of any financial instrument including, without limitation, for the purpose of tracking the return or performance of any Value or of defining the asset allocation of portfolio or of computing performance fees.

By receiving this document and the Information you will be deemed to represent and warrant to UBS that you will not use this document or any of the Information for any of the above purposes or otherwise rely upon this document or any of the Information.

UBS has policies and procedures, which include, without limitation, independence policies and permanent information barriers, that are intended, and upon which UBS relies, to manage potential conflicts of interest and control the flow of information within divisions of UBS and among its subsidiaries, branches and affiliates. For further information on the ways in which UBS manages conflicts and maintains independence of its research products, historical performance information and certain additional disclosures concerning UBS research recommendations, please visit www.ubs.com/disclosures.

Research will initiate, update and cease coverage solely at the discretion of UBS Research Management, which will also have sole discretion on the timing and frequency of any published research product. The analysis contained in this document is based on numerous assumptions. All material information in relation to published research reports, such as valuation methodology, risk statements, underlying assumptions (including sensitivity analysis of those assumptions), ratings history etc. as required by the Market Abuse Regulation, can be found on UBS Neo. Different assumptions could result in materially different results.

The analyst(s) responsible for the preparation of this document may interact with trading desk personnel, sales personnel and other parties for the purpose of gathering, applying and interpreting market information. UBS relies on information barriers to control the flow of information contained in one or more areas within UBS into other areas, units, groups or affiliates of UBS. The compensation of the analyst who prepared this document is determined exclusively by research management and senior management (not including investment banking). Analyst compensation is not based on investment banking revenues; however, compensation may relate to the revenues of UBS and/or its divisions as a whole, of which investment banking, sales and trading are a part, and UBS's subsidiaries, branches and affiliates as a whole.

For financial instruments admitted to trading on an EU regulated market: UBS AG, its affiliates or subsidiaries (excluding UBS Securities LLC) acts as a market maker or liquidity provider (in accordance with the interpretation of these terms in the UK) in the financial instruments of the issuer save that where the activity of liquidity provider is carried out in accordance with the definition given to it by the laws and regulations of any other EU jurisdictions, such information is separately disclosed in this document. For financial instruments admitted to trading on a non-EU regulated market: UBS may act as a market maker save that where this activity is carried out in the US in accordance with the definition given to it by the relevant laws and regulations, such activity will be specifically disclosed in this document. UBS may have issued a warrant the value of which is based on one or more of the financial instruments referred to in the document. UBS and its affiliates and employees may have long or short positions, trade as principal and buy and sell in instruments or derivatives identified herein; such transactions or positions may be inconsistent with the opinions expressed in this document.

Within the past 12 months UBS AG, its affiliates or subsidiaries may have received or provided investment services and activities or ancillary services as per MiFID II which may have given rise to a payment or promise of a payment in relation to these services from or to this company.

United Kingdom and the rest of Europe: Except as otherwise specified herein, this material is distributed by UBS Limited to persons who are eligible counterparties or professional clients. UBS Limited is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority. **France:** Prepared by UBS Limited and distributed by UBS Limited and UBS Securities France S.A. UBS Securities France S.A. is regulated by the ACPR (Autorité de Contrôle Prudentiel et de Résolution) and the Autorité des Marchés Financiers (AMF). Where an analyst of UBS Securities France S.A. has contributed to this document, the document is also deemed to have been prepared by UBS Securities France S.A. **Germany:** Prepared by UBS Limited and distributed by UBS Limited and UBS Europe SE. UBS Europe SE is regulated by the Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin). **Spain:** Prepared by UBS Limited and distributed by UBS Limited and UBS Securities España SV, SA. UBS Securities España SV, SA is regulated by the Comisión Nacional del Mercado de Valores (CNMV). **Turkey:** Distributed by UBS Limited. No information in this document is provided for the purpose of offering, marketing and sale by any means of any capital market instruments and services in the Republic of Turkey. Therefore, this document may not be considered as an offer made or to be made to residents of the Republic of Turkey. UBS Limited is not licensed by the Turkish Capital Market Board under the provisions of the Capital Market Law (Law No. 6362). Accordingly, neither this document nor any other offering material related to the instruments/services may be utilized in connection with providing any capital market services to persons within the Republic of Turkey without the prior approval of the Capital Market Board. However, according to article 15 (d) (ii) of the Decree No. 32, there is no restriction on the purchase or sale of the securities abroad by residents of the Republic of Turkey. **Poland:** Distributed by UBS Limited (spółka z ograniczoną odpowiedzialnością) Oddział w Polsce regulated by the Polish Financial Supervision Authority. Where an analyst of UBS Limited (spółka z ograniczoną odpowiedzialnością) Oddział w Polsce has contributed to this document, the document is also deemed to have been prepared by UBS Limited (spółka z ograniczoną odpowiedzialnością) Oddział w Polsce. **Russia:** Prepared and distributed by UBS Bank (OOO). **Switzerland:** Distributed by UBS AG to persons who are institutional investors only. UBS AG is regulated by the Swiss Financial Market Supervisory Authority (FINMA). **Italy:** Prepared by UBS Limited and distributed by UBS Limited and UBS Limited, Italy Branch. Where an analyst of UBS Limited, Italy Branch has contributed to this document, the document is also deemed to have been prepared by UBS Limited, Italy Branch. **South Africa:** Distributed by UBS South Africa (Pty) Limited (Registration No. 1995/011140/07), an authorised user of the JSE and an authorised Financial Services Provider (FSP 7328). **Israel:** This material is distributed by UBS Limited. UBS Limited is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority. UBS Securities Israel Ltd is a licensed Investment Marketer that is supervised by the Israel Securities Authority (ISA). UBS Limited and its affiliates incorporated outside Israel are not licensed under the Israeli Advisory Law. UBS Limited is not covered by insurance as required from a licensee under the Israeli Advisory Law. UBS may engage among others in issuance of Financial Assets or in distribution of Financial Assets of other issuers for fees or other benefits. UBS Limited and its affiliates may prefer various Financial Assets to which they have or may have Affiliation (as such term is defined under the Israeli Advisory Law). Nothing in this Material should be considered as investment advice under the Israeli Advisory Law. This Material is being issued only to and/or is directed only at persons who are Eligible Clients within the meaning of the Israeli Advisory Law, and this material must not be relied on or acted upon by any other persons. **Saudi Arabia:** This document has been issued by UBS AG (and/or any of its subsidiaries, branches or affiliates), a public company limited by shares, incorporated in Switzerland with its registered offices at Aeschenvorstadt 1, CH-4051 Basel and Bahnhofstrasse 45, CH-8001 Zurich. This publication has been approved by UBS Saudi Arabia (a subsidiary of UBS AG), a Saudi closed joint stock company incorporated in the Kingdom of Saudi Arabia under commercial register number 1010257812 having its registered office at Tatweer Towers, P.O. Box 75724, Riyadh 11588, Kingdom of Saudi Arabia. UBS Saudi Arabia is authorized and regulated by the Capital Market Authority to conduct securities business under license number 08113-37. **UAE / Dubai:** The information distributed by UBS AG Dubai Branch is only intended for Professional Clients and/or Market Counterparties, as classified under the DFSA rulebook. No other person should act upon this material/communication. The information is not for further distribution within the United Arab Emirates. UBS AG Dubai Branch is regulated by the DFSA in the DIFC. UBS is not licensed to provide banking services in the UAE by the Central Bank of the UAE, nor is it licensed by the UAE Securities and Commodities Authority. **United States:** Distributed to US persons by either UBS Securities LLC or by UBS Financial Services Inc., subsidiaries of UBS AG; or by a group, subsidiary or affiliate of UBS AG that is not registered as a US broker-dealer (a 'non-US affiliate') to major US institutional investors only. UBS Securities LLC or UBS Financial Services Inc. accepts responsibility for the content of a document prepared by another non-US affiliate when distributed to US persons by UBS Securities LLC or UBS Financial Services Inc. All transactions by a US person in the securities mentioned in this document must be effected through UBS Securities LLC or UBS Financial Services Inc., and not through a non-US affiliate. UBS Securities LLC is not acting as a municipal advisor to any municipal entity or obligated person within the meaning of Section 15B of the Securities Exchange Act (the "Municipal Advisor Rule"), and the opinions or views contained herein are not intended to be, and do not constitute, advice within the meaning of the Municipal Advisor Rule. **Canada:** Distributed by UBS Securities Canada Inc., a registered investment dealer in Canada and a Member-Canadian Investor Protection Fund, or by another affiliate of UBS AG that is registered to conduct business in Canada or is otherwise exempt from registration. **Mexico:** This report has been distributed and prepared by UBS Casa de Bolsa, S.A. de C.V., UBS Grupo Financiero, an entity that is part of UBS Grupo Financiero, S.A. de C.V. and is a subsidiary of UBS AG. This document is intended for distribution to institutional or sophisticated investors only. Research reports only reflect the views of the analysts responsible for the reports. Analysts do not receive any compensation from persons or entities different from UBS Casa de Bolsa, S.A. de C.V., UBS Grupo Financiero, or different from entities belonging to the same financial group or business group of such. For Spanish translations of applicable disclosures, please go to www.ubs.com/disclosures. **Brazil:** Except as otherwise specified herein, this material is prepared by UBS Brasil CCTVM S.A. to persons who are eligible investors residing in Brazil, which are considered to be Investidores Profissionais, as designated by the applicable regulation, mainly the CVM Instruction No. 539 from the 13th of November 2013 (determines the duty to verify the suitability of products, services and transactions with regards to the client's profile). **Hong Kong:** Distributed by UBS Securities Asia Limited and/or UBS AG, Hong Kong Branch. Please contact local licensed/registered representatives of UBS Securities Asia Limited and/or UBS AG, Hong Kong Branch in respect of any matters arising from, or in connection with, the analysis or document. **Singapore:** Distributed by UBS Securities Pte. Ltd. [MCI (P) 008/09/2017 and Co. Reg. No.: 198500648C] or UBS AG, Singapore Branch. Please contact UBS Securities Pte. Ltd., an exempt financial adviser under the Singapore Financial Advisers Act (Cap. 110); or UBS AG, Singapore Branch, an exempt financial adviser under the Singapore Financial Advisers Act (Cap. 110) and a wholesale bank licensed under the Singapore Banking Act (Cap. 19) regulated by the Monetary Authority of Singapore, in respect of any matters arising from, or in connection with, the analysis or document. The recipients of this document represent and warrant that they are accredited and institutional investors as defined in the Securities and Futures Act (Cap. 289). **Japan:** Distributed by UBS Securities Japan Co., Ltd. to professional investors (except as otherwise permitted). Where this document has been prepared by UBS Securities Japan Co., Ltd., UBS Securities Japan Co., Ltd. is the author, publisher and distributor of the document. Distributed by UBS AG, Tokyo Branch to Professional Investors (except as otherwise permitted) in relation to foreign exchange and other banking businesses when relevant. **Australia:** Clients of UBS AG: Distributed by UBS AG (ABN 47 088 129 613 and holder of Australian Financial Services License No. 231087). Clients of UBS Securities Australia Ltd: Distributed by UBS Securities Australia Ltd (ABN 62 008 586 481 and holder of Australian Financial Services License No. 231098). This Document contains general information and/or general advice only and does not constitute personal financial product advice. As such, the Information in this document has been prepared without taking into account any investor's objectives, financial situation or needs, and investors should, before acting on the Information, consider the appropriateness of the Information, having regard to their objectives, financial situation and needs. If the Information contained in this document relates to the acquisition, or potential acquisition of a particular financial product by a 'Retail' client as defined by section 761G of the Corporations Act 2001 where a Product Disclosure Statement would be required, the retail client should obtain and consider the Product Disclosure Statement relating to the product before making any decision about whether to acquire the product. The UBS Securities Australia Limited Financial Services Guide is available at: www.ubs.com/ecs-research-fsg. **New Zealand:** Distributed by UBS New Zealand Ltd. UBS New Zealand Ltd is not a registered bank in New Zealand. You are being provided with this UBS publication or material because you have indicated to UBS that you are a "wholesale client" within the meaning of section 5C of the Financial Advisers Act 2008 of New Zealand (Permitted Client). This publication or material is not intended for clients who are not Permitted Clients (non-permitted Clients). If you are a non-permitted Client you must not rely on this publication or material. If despite this warning you nevertheless rely on this publication or material, you hereby (i) acknowledge that you may not rely on the content of this publication or material and that any recommendations or opinions in such this publication or material are not made or provided to you, and (ii) to the maximum extent permitted by law (a) indemnify UBS and its associates or related entities (and their respective Directors, officers, agents and Advisors) (each a 'Relevant Person') for any loss, damage, liability or claim any of them may incur or suffer as a result of, or in connection with, your unauthorised reliance on this publication or material and (b) waive any rights or remedies you may have against any Relevant Person for (or in respect of) any loss, damage, liability or claim you may incur or suffer as a result of, or in connection with, your unauthorised reliance on this publication or material. **Korea:** Distributed in Korea by UBS Securities Pte. Ltd., Seoul Branch. This document may have been edited or contributed to from time to time by affiliates of UBS Securities Pte. Ltd., Seoul Branch. This material is intended for professional/institutional clients only and not for distribution to any retail clients. **Malaysia:** This material is authorized to be distributed in Malaysia by UBS Securities Malaysia Sdn. Bhd (Capital Markets Services License No.: CMSL/A0063/2007). This material is intended for professional/institutional clients only and not for distribution

to any retail clients. **India:** Distributed by UBS Securities India Private Ltd. (Corporate Identity Number U67120MH1996PTC097299) 2/F, 2 North Avenue, Maker Maxity, Bandra Kurla Complex, Bandra (East), Mumbai (India) 400051. Phone: +912261556000. It provides brokerage services bearing SEBI Registration Numbers: NSE (Capital Market Segment): INB230951431, NSE (F&O Segment) INF230951431, NSE (Currency Derivatives Segment) INE230951431, BSE (Capital Market Segment) INB010951437; merchant banking services bearing SEBI Registration Number: INM000010809 and Research Analyst services bearing SEBI Registration Number: INH000001204. UBS AG, its affiliates or subsidiaries may have debt holdings or positions in the subject Indian company/companies. Within the past 12 months, UBS AG, its affiliates or subsidiaries may have received compensation for non-investment banking securities-related services and/or non-securities services from the subject Indian company/companies. The subject company/companies may have been a client/clients of UBS AG, its affiliates or subsidiaries during the 12 months preceding the date of distribution of the research report with respect to investment banking and/or non-investment banking securities-related services and/or non-securities services. With regard to information on associates, please refer to the Annual Report at: http://www.ubs.com/global/en/about_ubs/investor_relations/annualreporting.html**Taiwan:** Distributed by UBS Securities Pte. Ltd., Taipei Branch which is regulated by the Taiwan Securities and Futures Bureau. **Indonesia:** This report is being distributed by PT UBS Sekuritas Indonesia and is delivered by its licensed employee(s), including marketing/sales person, to its client. PT UBS Sekuritas Indonesia, having its registered office at Wisma GKBI, 22nd floor, Jl. Jend. Sudirman, kav.28, Jakarta 10210, Indonesia, is a subsidiary company of UBS AG and licensed under Capital Market Law no. 8 year 1995, a holder of broker-dealer and underwriter licenses issued by the Capital Market and Financial Institution Supervisory Agency (now Otoritas Jasa Keuangan/OJK). PT UBS Sekuritas Indonesia is also a member of Indonesia Stock Exchange and supervised by Otoritas Jasa Keuangan (OJK). Neither this report nor any copy hereof may be distributed in Indonesia or to any Indonesian citizens except in compliance with applicable Indonesian capital market laws and regulations. This report is not an offer of securities in Indonesia and may not be distributed within the territory of the Republic of Indonesia or to Indonesian citizens in circumstance which constitutes an offering within the meaning of Indonesian capital market laws and regulations.

The disclosures contained in research documents produced by UBS Limited shall be governed by and construed in accordance with English law.

UBS specifically prohibits the redistribution of this document in whole or in part without the written permission of UBS and in any event UBS accepts no liability whatsoever for any redistribution of this document or its contents or the actions of third parties in this respect. Images may depict objects or elements that are protected by third party copyright, trademarks and other intellectual property rights. © UBS 2018. The key symbol and UBS are among the registered and unregistered trademarks of UBS. All rights reserved.

