## Equity Research

February 20, 2018

Mark Palmer<br>(212) 588-6582 mpalmer@btig.com<br>Giuliano Bologna<br>(212) 588-6583<br>gbologna@btig.com



Source: IDC

## Financials

## Square Inc.

## SO Still Trading in Step with Bitcoin as 4O17 Report Nears; Stiffer Competition for Larger Sellers Looms

Based on a look at the charts of Square Inc. (SQ) and Bitcoin since SQ CEO Jack Dorsey on January 31 disclosed that instant buying and selling of the cryptocurrency was available to most of the company's Cash App customers - it had been available to a small number of the app's users on a trial basis since mid-November - the trajectory of SQ shares appears to have been a muted version of Bitcoin's wild ride during the past few weeks.

- While that connection seems to have worked to SQ's benefit during the latter portion of that ride given that Bitcoin has been rallying, it served as confirmation that SQ's stock has become tethered to the movements of a volatile cryptocurrency - a live-with-it, die-with-it relationship that we do not believe is conducive to the sustenance of a lofty multiple.
- We have been somewhat surprised by the extent to which the relationship between SQ's stock price and its involvement with Bitcoin has developed insofar as we view the contribution from the Cash App/Bitcoin offering to the company's near-to-medium term operating performance as marginal. However irrational this may be, the fact remains that for almost three months the SQ narrative has been conflated with the Bitcoin narrative despite the latter's likely minimal real impact on the former.
- With that said, all of the Bitcoin-driven fluctuations in SQ's stock price have occurred since the company reported its 3 O 17 results on November 8, and the release of its $4 \mathrm{O}_{17}$ report next Thursday likely will refocus investors on its core story.
- Our Sell rating on SQ is based less on the Bitcoin connection and more on our view that, with the stock trading at almost $26 x$ consensus FY20E adjusted EBITDA, its valuation already reflects unimpeded rapid growth when competitive, credit-related and macro factors that could moderate the pace of its expansion remain very much in play.
- Valuation: Our \$30 price target for SQ is based on 20x our FY20E adjusted EBITDA of $\$ 610 \mathrm{~mm}$. We believe the company's current multiple is at risk given competitive, credit- and macro-related factors. The multiple we employ is based on comparable company analysis.


## Estimates

|  | 1Q16 A | 2Q16 A | 3Q16 A | 4Q16 A | FY16 A | 1Q17 A | 2 Q 17 A | 3017 A | 4Q17 | FY17 E | FY18 E |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Sales | 379 | 439 | 439 | 452 | 1,709 | 462 | 552 | 585 | 598 | 2,196 | 2,795 |
| EBITDA (Adj.) | (8) | 13 | 12 | 30 | 46 | 27 | 36 | 34 | 36 | 134 | 234 |

Source: BTIG Estimates and Company Documents (\$ in millions, except per share amount)


- With larger sellers representing about 48\% of SQ's GPV during 3O17, the stakes are rising around the company's efforts to win in this space. What has been particularly impressive in recent quarters has been SQ's push "upmarket" to serve sellers with more than $\$ 125 \mathrm{~K}$ in annual gross payment volume (GPV) without any compression in transaction margin.
- Management explained that SQ's ability to drive transaction-based profit of $1.05 \%$ in $3 \mathrm{Q}_{17}$, up from 1.01\% in the prior-year period, was based on the pricing pressure from custom pricing for larger sellers being offset by the contribution of higher-yielding products such as Virtual Terminal and Invoices.
- As seen in the chart above, SQ's recent growth rate among the micromerchants which have been its core niche historically is slower than the growth it has seen among larger sellers. As such, we believe the company's overall growth trajectory will hinge in large part on its ability to sustain growth among such larger firms, a group that has traditionally been served by merchant acquirers and other payment processors.
- As SQ pushes upmarket, one competitor we believe it is likely to encounter again and again is First Data (FDC, Buy, $\$ 23$ PT) which has occupied the space for some time but had struggled to gain traction until recently. FDC's Clover and Clover Go are the company's answers to SQ's offerings, and FDC CEO Frank Bisignano during a meeting
with sell-side analysts following the release of its $4 \mathrm{O}_{17}$ report last Monday stated that "we are maniacally focused on beating" SQ.
- Just as SQ's strategy involves cross-selling ancillary products to its core payment processing customers and thereby generating incremental revenues while reducing churn, FDC has been busy in recent months integrating two of the acquisitions that it made during 2017 - CardConnect and BluePay - including combining them with Clover as a fully integrated offering. Bisignano noted during FDC's 4O17 conference call that excluding Clover Go - its mobile credit-card reader - the company had shipped over 400,000 Clover units, and including Clover Go it had shipped over 750,000 units.
- Expert reviews of SQ's point-of-sale offerings versus those of FDC/Clover are inconclusive with pros and cons offered for each, and SQ's ancillary products have positioned the company to maintain rapid revenue growth and transaction-based profit during its push upstream. We do not believe FDC has to beat SQ all of the time or even most of the time for it to have an impact on the trajectory of SQ's growth among larger sellers for which the firms compete.
- One way that SQ likely will seek to keep or attract larger sellers amidst a more competitive environment is through Square Capital, which provides loans to merchants who use the company's payment processing services. While SQ holds only a small portion of the loans it originates, we believe that as the company becomes increasingly dependent on credit as a means of driving its growth that it will also become increasingly vulnerable to credit-market volatility.
- In this regard, we believe Square Capital's business model is akin to that of LendingClub Corporation (LC, Buy, \$7 PT) which, during the markets' volatile start to 2016, demonstrated that a non-bank lender that sells the loans it originates can see its valuation hit just as hard by bumpiness in the credit market as those that retain loans on their balance sheets.
- Of course, SQ is seeking to transition from being a non-bank lender to the holder of an industrial loan charter (ILC) as early last September it submitted an application to Utah's banking regulator. We see the outcome of the application process as something of a lose-lose proposition for SQ. If the company is granted an ILC, that would make credit a more central part of its story, which we believe could impair its credit-risk profile and ultimately result in multiple contraction. However, if SQ is rejected in its effort to gain an ILC, investors who cheered the announcement of a potential driver of the expansion of Square Capital are likely to be disappointed.
- Even as the company's overall revenue growth accelerated to 45\% during $3 \mathrm{O}_{17}$ thanks in part to improved take rates, Square Capital's growth declined sequentially for the first time ever, a drop that management attributed to seasonality and the impact of Hurricanes Harney and Irma during the quarter. As such, we believe investors will be looking for a reacceleration from the unit when the company
reports its $4 \mathrm{O}_{17}$ results. We believe they should be careful what they wish for.
- SQ is scheduled to report its 4 O 17 results on Tuesday, February 27 after the market close with a conference call slated for 5 pm ET.

Income Statement

| Square Inc. - Operating Model | Dec-12 | Dec-13 | Dec-14 | Dec-15 | Dec-16 | Mar-17 | Jun-17 | Sep-17 | Dec-17 | Dec-17 | Mar-18 | Jun-18 | Sep-18 | Dec-18 | Dec-18 | Dec-19 | Dec-20 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| \$ millions | 2012A | 2013A | 2014A | 2015A | 2016 A | 10.17 A | 2017A | 3017 A | 4017 E | 2017E | 1018 E | 2018E | 3018 E | 4 CO 18 E | 2018E | 2019E | 2020E |
| Transaction-based revenue | 193.98 | 433.74 | 707.80 | 1,050.45 | 1,456.16 | 403.48 | 482.07 | 510.02 | 512.22 | 1,907.79 | 504.25 | 610.79 | 643.24 | 645.74 | 2,404.01 | 2,991.67 | 3,625.60 |
| Starbucks transaction-based revenue | 9.47 | 114.46 | 123.02 | 142.28 | 78.90 |  |  |  |  |  |  |  |  |  |  |  |  |
| Subscription and services-based revenue |  |  | 12.05 | 58.01 | 129.35 | 49.06 | 59.15 | 65.05 | 73.62 | 246.89 | 70.93 | 83.36 | 87.85 | 99.34 | 341.47 | 453.36 | 601.47 |
| Hardware revenue |  | 4.24 | 7.32 | 16.38 | 44.31 | 9.02 | 10.29 | 10.09 | 12.28 | 41.68 | 10.82 | 12.35 | 12.11 | 14.74 | 50.01 | 57.51 | 63.26 |
| Total net revenue | 203.45 | 552.43 | 850.19 | 1,267.12 | 1,708.72 | 461.55 | 551.51 | 585.16 | 598.13 | 2,196.35 | 585.99 | 706.49 | 743.19 | 759.82 | 2,795.50 | 3,502.54 | 4,290.33 |
| Transaction costs | 126.35 | 277.83 | 450.86 | 672.67 | 943.20 | 257.78 | 311.09 | 04 | . 60 | 1,232.51 | . 94 | 401.55 | 423.62 | 426.01 | 1582.13 | 1,987.80 | 2,432.28 |
| Starbucks transaction costs | 12.55 | 139.80 | 150.96 | 165.44 | 69.76 |  |  |  |  |  |  |  |  |  |  |  |  |
| Software and data products cost |  |  | 2.97 | 22.47 | 43.13 | 15.88 | 17.12 | 18.17 | 23.38 | 74.54 | 21.46 | 25.2 | 26.5 | 30.06 | 103.3 | 130.39 | 166.97 |
| Hardware cost |  | 6.01 | 18.33 | 30.87 | 68.56 | 12.66 | 14.17 | 18.78 | 14.49 | 60.10 | 12.55 | 14.32 | 14.04 | 16.95 | 57.86 | 66.14 | 69.59 |
| Amortization of acquired technology |  |  | 1.00 | 5.64 | 8.03 | 1.81 | 1.70 | 1.56 | 1.63 | 6.69 | 1.72 | 1.80 | 1.89 | 1.99 | 7.39 | 8.99 | 10.92 |
| Total cost of revenue | 138.90 | 423.65 | 624.12 | 897.09 | 1,132.68 | 288.12 | 344.08 | 366.54 | 375.10 | 1,373.85 | 366.67 | 442.90 | 466.14 | 475.00 | 1,750.72 | 2,193.32 | 2,679.76 |
| Gross profit (loss) | 4.55 | 128.79 | 26.07 | 370.03 | 76.04 | 73.43 | 07.43 | 18.62 | 223.03 | 822.50 | 219.33 | 263.5 | 277.0 | 284.82 | 1,044.78 | 1,309.22 | 1,610.57 |
| Product development | 46.57 | 82.86 | 144.64 | 199.64 | 268.54 | 68.58 | 78.13 | 82.55 | 84.23 | 313.48 | 81.05 | 95.95 | 99.08 | 99.40 | 375.49 | 435.48 | 490.59 |
| Sales and marketing | 56.65 | 64.16 | 112.58 | 145.62 | 173.88 | 49.90 | 59.92 | 66.53 | 68.01 | 244.36 | 65.46 | 77.50 | 80.04 | 80.31 | 303.31 | 352.05 | 396.96 |
| General and administrative | 36.18 | 68.94 | 94.22 | 143.47 | 251.99 | 56.94 | 62.99 | 64.31 | 66.24 | 250.48 | 66.90 | 67.57 | 68.25 | 68.93 | 271.66 | 279.19 | 284.81 |
| Transaction and advance losses | 10.51 | 15.33 | 24.08 | 54.01 | 51.24 | 11.89 | 18.40 | 19.89 | 20.19 | 70.38 | 18.17 | 22.05 | 23.26 | 23.39 | 86.87 | 108.86 | 132.86 |
| Amortization of acquired customer assets |  | - | 1.05 | 1.76 | 0.85 | 0.21 | 0.22 | 0.22 | - | 0.65 | - | . |  | - | - |  |  |
| Impairment of intangible assets |  | 2.43 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Total operating expenses | 149.91 | 233.73 | 376.57 | 544.49 | 746.49 | 187.51 | 219.65 | 233.51 | 238.67 | 879.34 | 231.58 | 263.08 | 270.63 | 272.03 | 1,037.33 | 1,175.58 | 1,305.22 |
| Operating income (loss) | (85.36) | (104.94) | (150.49) | (174.46) | (170.45) | (14.08) | (12.22) | (14.89) | (15.64) | (56.84) | (12.26) | 0.51 | 6.42 | 12.78 | 7.45 | 133.64 | 305.35 |
| EBITDA | (81.78) | (96.67) | (131.91) | (146.83) | (132.71) | (4.64) | (3.10) | (5.81) | (3.68) | (17.23) | (0.54) | 14.64 | 21.28 | 27.98 | 63.36 | 203.69 | 391.1 |
| Adjusted EBITDA | (70.58) | (51.53) | (67.74) | (41.12) | 45.74 | 27.03 | 36.50 | 34.30 | 35.76 | 133.58 | 35.17 | 57.69 | 66.57 | 74.28 | 233.72 | 399.62 | 609.70 |
| Interest (income) and expense | 0.01 | (0.01) | 1.06 | 1.16 | (0.24) | 0.50 | 3.27 | 1.85 | 0.50 | 6.12 | 0.50 | 0.50 | 0.50 | 0.50 | 2.00 | 2.00 | 2.00 |
| Other (income) and expense | $(0.17)$ <br> 85.20$)$ | (0.95) | 1.10 | 0.45 | (0.54) | (14.58) |  | (1674) | (16, ${ }^{-14)}$ |  |  |  | 5 |  |  |  |  |
| Provision for income taxes | (85.20) | (103.98) | (152.64) | (176.07) | (1.92 | ${ }_{0.51}$ | ${ }_{0} 0.47$ | ${ }_{(0.65)}$ | (16.14) |  | (12.7) | 0.01 | 5.92 | 12.28 | 5.45 | 131.64 | 303.35 |
| Net income (loss) | (85.20) | (104.49) | (154.09) | (179.82) | (171.59) | (15.09) | (15.96) | (16.10) | (16.14) | (63.29) | (12.76) | 0.01 | 5.92 | 12.28 | 5.45 | 131.64 | 303.35 |
| Adjusted EPS - Diluted |  |  |  | .39) | 0.04 | 0.05 | 0.08 | 0.08 | 0.06 | 0.28 | 0.06 | 0.11 | 0.13 | 0.14 | 0.4 | 0.75 | 1.10 |
| Shares outstanding - diluted |  |  |  | 170.50 | 362.58 | 366.74 | 376.36 | 383.95 | 391.63 | 379.67 | 399.46 | 407.45 | 415.60 | 423.91 | 411.61 | 445.54 | 482.26 |
| Total net revenue | 203.45 | 552.43 | 850.19 | 1,267.12 | 1,708.72 | 461.55 | 551.51 | 585.16 | 598.13 | 2,196.35 | 585.99 | 706.49 | 743.19 | 759.82 | 2,795.50 | 3,502.54 | 4,290.33 |
| Starbucks transaction revenue | 9.47 | 114.46 | 123.02 | 142.28 | 78.90 | - |  |  | - | - | - | - | - | - | - |  |  |
| Transaction costs | 126.35 | 277.83 | 450.86 | 672.67 | 943.20 | 7.78 | 311.09 | 328.04 | 335.60 | 1,232.51 | 330.94 | 401.55 | 423.62 | 426.01 | 1,582.13 | 1,987.80 | 2,432.28 |
| Adjusted revenue | 67.63 | 160.14 | 276.31 | 452.17 | 686.62 | 203.78 | 240.41 | 257.12 | 262.54 | 963.84 | 255.05 | 304.93 | 319.57 | 333.81 | 1,213.37 | 1,514.74 | 1,858.05 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Net income (loss) | (85.20) | (104.49) | (154.09) | (179.82) | (171.59) | (15.09) | (15.96) | (16.10) | (16.14) | (63.29) | (12.76) | 0.01 | 5.92 | 12.28 | 5.45 | 131.64 | 3.3 |
| Starbucks transaction revenue | (9.47) | (114.46) | (123.02) | (142.28) | (78.90) |  |  |  |  |  |  |  |  |  |  |  |  |
| Starbucks transaction costs | 12.55 | 139.80 | 150.96 | 165.44 | 69.76 | - | - | - | - | - | - | - | - | - | - |  | - |
| Share-based compensation expense | 8.11 | 14.66 | 36.12 | 82.29 | 138.79 | 31.67 | 39.59 | 40.05 | 39.44 | 150.75 | 35.71 | 43.05 | 45.29 | 46.30 | 170.36 | 195.93 | 218.55 |
| Depreciation and amortization | 3.58 | 8.27 | 18.59 | 27.63 | 37.75 | 9.44 | 9.13 | 9.09 | 11.96 | 39.61 | 11.72 | 14.13 | 14.86 | 15.20 | 55.91 | 70.05 | 85.81 |
| Interest (income) expense | 0.01 | (0.01) | 1.06 | 1.16 | (0.24) | 0.50 | 3.27 | 1.85 | 0.50 | 6.12 | 0.50 | 0.50 | 0.50 | 0.50 | 2.00 | 2.00 | 2.00 |
| Other (income) expense | (0.17) | (0.95) | 1.10 | 0.45 | 48.32 |  |  |  |  |  |  |  |  |  |  |  |  |
| Provision (benefit) for income taxes | - | 0.51 | 1.44 | 3.75 | 1.92 | 0.51 | 0.47 | (0.65) | - | 0.33 | - | - | - | - | - |  | - |
| Loss on sale of property plant and equipment | 0.01 | 2.71 | 0.11 | 0.27 | ${ }^{(0.05)}$ |  | 0.00 | 0.06 | - | 0.06 |  |  |  |  | - |  | - |
| Impairment of intangible assets | 28) | 2.43 | - 67 | 112 | - 74 | 27 | ${ }^{-}$ | - 34 | 3576 | ${ }^{-1335}$ | 3517 | 57. | 66.57 | 7428 | ${ }^{233} 7$ | ${ }^{-1}$ | 60970 |
| Adjusted EBITDA | (70.58) | (51.53) | (67.74) | (41.12) | 45.74 | 27.03 | 36.50 | 34.30 | 35.76 | 133.58 | 35.17 | 57.69 | 66.57 | 74.28 | 233.72 | 399.62 | 609.70 |
| Tax rate |  | -0.5\% | -0.9\% | -2.1\% | -1.1\% | ${ }^{-3.5 \%}$ | -3.0\% | 3.9\% | 0.0\% | -0.5\% | 0.0\% | 0.0\% | 0.0\% | 0.0\% | 0.0\% | 0.0\% | 0.0\% |
| Adjusted revenue growth | - | 136.8\% | 72.5\% | 63.6\% | 51.9\% | 39.4\% | 40.7\% | 44.6\% | 36.8\% | 40.4\% | 25.2\% | 26.8\% | 24.3\% | 27.1\% | 25.9\% | 24.8\% | 22.7\% |
| Transaction revenue growth |  | 123.6\% | 63.2\% | 48.4\% | 38.6\% | 34.3\% | 32.1\% | 31.3\% | 27.3\% | 31.0\% | 25.0\% | 26.7\% | 26.1\% | 26.1\% | 26.0\% | 24.4\% | 21.2\% |
| Software and data product growth |  |  |  | 381.6\% | 123.0\% | 106.2\% | 99.0\% | 84.2\% | 81.7\% | 90.9\% | 44.6\% | 40.9\% | 35.0\% | 34.9\% | 38.3\% | 32.8\% | 32.7\% |
| Hardware revenue growth |  |  | 72.7\% | 123.6\% | 170.5\% | -44.3\% | -7.2\% | 23.5\% | 38.5\% | -5.9\% | 20.0\% | 20.0\% | 20.0\% | 20.0\% | 20.0\% | 15.0\% | 10.0\% |
| Adjusted EBITDA growth | - | -27.0\% | 31.5\% | -39.3\% | 211.3\% | -428.5\% | 190.7\% | 195.1\% | 20.0\% | 192.0\% | 30.1\% | 58.1\% | 94.1\% | 107.7\% | 75.0\% | 71.0\% | 52.6\% |
| Adjusted EBITDA margin | -104.4\% | -32.2\% | -24.5\% | -9.1\% | 6.7\% | 13.3\% | 15.2\% | 13.3\% | 13.6\% | 13.9\% | 13.8\% | 18.9\% | 20.8\% | 22.3\% | 19.3\% | 26.4\% | 32.8\% |

BTIG Covered Companies Mentioned in this Report
SQUARE INC. (SQ, Sell, \$30.00 PT; Current Price: \$44.11; Analyst: Mark.Palmer)
FIRST DATA CORPORATION (FDC, Buy, $\$ 23.00$ PT; Current Price: $\$ 15.66$; Analyst: Mark.Palmer)

## Appendix: Analyst Certification and Other Important Disclosures

## Analyst Certification

I, Mark Palmer, hereby certify that the views about the companies and securities discussed in this report are accurately expressed and that I have not received and will not receive direct or indirect compensation in exchange for expressing specific recommendations or views in this report.
I, Giuliano Bologna, hereby certify that the views about the companies and securities discussed in this report are accurately expressed and that I have not received and will not receive direct or indirect compensation in exchange for expressing specific recommendations or views in this report.

## Regulatory Disclosures

## Ratings Definitions

## BTIG LLC's ("BTIG") ratings, effective June 12, 2017, are defined as follows:

BUY - A security which is expected to produce a positive total return of $15 \%$ or greater over the 12 months following the recommendation. The BUY rating may be maintained as long as it is deemed appropriate, notwithstanding price fluctuations that would cause the target to fall outside of the $15 \%$ return.
SELL - A security which is expected to produce a negative total return of $15 \%$ or greater over the next 12 months following the recommendation. The SELL rating may be maintained as long as it is deemed appropriate, notwithstanding price fluctuations that would cause the target to fall outside of the $15 \%$ return.
NEUTRAL - A security which is not expected to appreciate or depreciate meaningfully over the next 12 months.
NOT RATED - A security which is not rated or covered by BTIG.
UNDER REVIEW - Effective immediately, coverage of the following securities is Under Review. Ratings, price targets, disclosures, and estimates for the companies listed below are suspended and should no longer be relied upon.

## Distribution of Ratings and Investment Banking Clients

BTIG must disclose in each research report the percentage of all securities rated by the member to which the member would assign a "buy", "neutral" or "sell" rating. The said ratings are updated on a quarterly basis. BTIG must also disclose the percentage of subject companies within each of these three categories for whom the member has provided investment banking services within the previous twelve months. Stocks under coverage as of the end of the most recent calendar quarter (December 31, 2017): 278

Distribution of BTIG's Research Recommendations (as of December 31, 2017):
BUY: 59.0\%; NEUTRAL: 37.0\%; SELL: 4.0\%
Distribution of BTIG's Investment Banking Services (as of December 31, 2017):
BUY: 20.1\%; NEUTRAL: 6.8\%; SELL: 0.0\%

For purposes of FINRA ratings distribution rules, BTIG's stock ratings of Buy, Neutral and Sell fall into Buy, Hold and Sell categories, respectively.

## Company Valuation and Risk Disclosures

## Square Inc. (SQ, Sell, \$30.00 PT)

Valuation: Our $\$ 30$ price target for SQ is based on $20 x$ our FY20E adjusted EBITDA of $\$ 610 \mathrm{~mm}$. We believe the company's current multiple is at risk given competitive, credit- and macro-related factors. The multiple we employ is based on comparable company analysis.
Risks: The primary Upside risks include, better than anticipated performance by the company, rapid growth, continued multiple expansion, Square's ability to launch new lines of business, the company's ability to expand into additional countries to continue their rapid growth and an acquisition of the company.

Square Inc. (SQ)


Note: Closing Price and Target Price have been aajusted for corporate actions.

| Date | Closing Price (\$) | Target Price (\$) | Analyst | Rating |
| :---: | :---: | :---: | :---: | :---: |
| 02-Dec-15 | 11.92 | 15 | Mark Palmer | Buy |
| $31-$ Mar-16 | 14.22 | NA | Mark Palmer |  |
| $23-$ May-16 | 10.14 | 12 | Neutral |  |
| $29-$ Mug-16 | 12.07 | NA | Mark Palmer | Buy |
| $22-$ Feb-17 | 17.15 | 20 | Mark Palmer | Neutral |
| $17-$ May-17 | 19.68 | NA | Mark Palmer | Buy |
| $27-\mathrm{Nov-17}$ | 42.55 | 30 | Mark Palmer | Neutral |

## Other Disclosures

Additional Information Available Upon Request

## General Disclosures

Research reports produced by BTIG LLC ("BTIG") are published for and intended to be distributed solely to BTIG institutional and corporate clients. Recipients of BTIG reports will not be considered clients of BTIG solely because they may have received such BTIG report.

The research analyst(s) responsible for the preparation of this report receives compensation based upon a variety of factors, including the quality and accuracy of research, internal/client feedback, and overall Firm revenues.

BTIG reports are based on public information and BTIG considers the same to be reliable, comprehensive information, but makes no representation or warranty that the reports are accurate or complete. BTIG opinions and information provided in this report are as of the date of the report and may change without notice. An issuer may be classified as "Under Review" or "Research Restricted". In these cases, investors should consider any previous investment recommendation and/or rating to a subject company/issuer to no longer be current and should not be relied upon nor considered a solicitation.

This research report is not an offer to buy or sell or solicitation of an offer to buy or sell any security in any jurisdiction where such an offer or solicitation would be illegal. This research report was not drafted specifically for any particular individual or entity and is not a personal recommendation to participate in any particular trading strategy or transaction. Any recipient of this research report should obtain independent advice specific to their
personal circumstances before undertaking any investment activity and must make their own independent evaluation of any securities or financial instruments.

Facts, views or opinions presented in this report have not been reviewed by, and may not reflect information known to, employees or other professionals in the "BTIG Group" (BTIG Group includes, but is not limited to, BTIG and its parents, subsidiaries and/or affiliates). BTIG Group employees, including Sales Representatives and Traders, may provide oral or written commentary or advice that may be inconsistent with the opinions and/or views expressed in this research report. BTIG Group employees and/or its affiliates not involved in the preparation of this research report may have investments in securities or derivatives of securities of companies mentioned in this report that are inconsistent with the views discussed in this report.

Investors in securities products bear certain risks in conjunction with those investments. The value of, and income from, any investments may vary because of changes in interest rates or foreign exchange rates, securities prices or market indexes, operational or financial conditions of companies or other factors within or beyond the companies control. Recipient of the research reports should be aware that investments in securities may pose significant risks due to the inherent uncertainty associated with relying on forecasts of various factors that can affect the earnings, cash flow and overall valuation of a company. Any investment in securities should be undertaken only upon consideration of issues relating to the recipient's overall investment portfolio and objectives (such as diversification by asset class, industry or company) as well as time horizon and liquidity needs. Further, past performance should not be taken as an indication or guarantee of future performance, and no representation or warranty, express or implied, is made regarding future performance. There may be time limitations on the exercise of options or other rights in any securities transactions.

Investing in foreign markets and securities, including ADRs, is subject to additional risks such as currency fluctuation, limited information, political instability, economic risk, and the potential for illiquid markets. Investing in emerging markets may accentuate these risks. Non-U.S. reporting issuers of foreign securities, however, may not make regular or complete public disclosure relating to their financial condition or the securities that they issue.

The trademarks and service marks contained herein are the property of their respective owners. Third-party data providers make no warranties or representations of any kind relating to the accuracy, completeness, or timeliness of the data they provide and shall not have liability of any damages of any kind relating to such data. The report or any portion hereof may not be reprinted, sold or redistributed without the written consent of BTIG. This report is intended only for use by the recipient. The recipient acknowledges that all research and analysis in this report are the property of BTIG and agrees to limit the use of all publications received from BTIG within his, or her or its, own company or organization. No rights are given for passing on, transmitting, re transmitting or reselling the information provided.

## Jurisdiction and Dissemination

BTIG is a U.S. broker-dealer and member of FINRA and SIPC.

BTIG Australia Limited ACN 128554 601, member of ASIC and ASX; BTIG Hong Kong Limited, an Exchange Participant of SEHK and licensed and regulated by the SFC; BTIG Ltd, member of the LSE, authorized and regulated by the FSA; and BTIG Singapore Pte Ltd, registered and licensed with MAS; are all separate but affiliated entities of BTIG. Unless governing law permits otherwise, you must contact a BTIG entity in your home jurisdiction for further information, or if you want to use our services in effecting a transaction.

Issues and approved for distribution in the UK and EEA by BTIG Ltd. to eligible counterparties and professional clients only. Issued and distributed in Australia to "wholesale clients" only by BTIG Australia Limited. In Singapore and Hong Kong, further information may be obtained from BTIG Singapore Pte Ltd and BTIG Hong Kong Limited, respectively.

