

# Fingerprint Cards

Telecom Equipment and IT  
Sweden

## KEY DATA

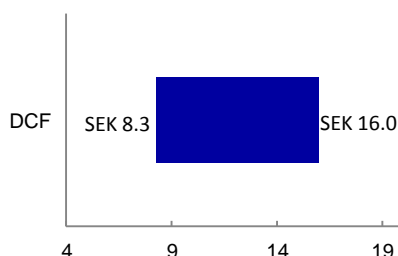
Stock country	Sweden
Bloomberg	FINGB SS
Reuters	FINGb.ST
Share price (close)	SEK 17.80
Free Float	100%
Market cap. (bn)	EUR 0.53/SEK 5.59
Website	www.fingerprints.com
Next report date	15 May 2019

## PERFORMANCE



— Fingerprint Cards Source: Thomson Reuters  
— Sweden OMX Stockholm All-Share (Rebased)

## VALUATION APPROACH



Source: Nordea estimates

## ESTIMATE CHANGES

Year	2019E	2020E	2021E
Sales	-10%	4%	3%
EBIT (adj)	-54%	33%	37%

Source: Nordea estimates

### Nordea Markets - Analysts

Jörgen Wetterberg  
Senior Analyst

Dan Johansson  
Analyst

Henning Zakrisson  
Analyst

## Cost focus buys time for smartcard transition

The smartphone market is in decline and we calculate a fall in Fingerprint's addressable market of 11% for 2019E. We trim sales by 10% for 2019E but raise them by 4%, 3% and 16% for 2020E-22E, respectively, thanks to a potential improvement in the company's smartphone market share and higher smartcard volumes. Successful cost cutting and greater confidence in cost management lead to us lifting our EBIT margin estimates for 2020-22E by 2.2, 3.0 and 2.6 pp, respectively. We also foresee lower financial risks and increase our valuation range to SEK 8.3-16.0 (6.0-11.9).

### Slight revenue beat, but gross and operating margins falter

Revenue of SEK 424m beat our estimates by 2%. Gross margin declined 5.9 pp to 20.8%, missing our estimates by 3.3 pp owing to a delay in the new FPC 1511 and falling margins of older sensors. EBIT was SEK -26m in Q4 2018, SEK -25m less than our estimates. This was mainly due to higher admin costs than we had expected. However, overall opex was down 43% y/y in Q4, which makes us more confident in cost management.

### Cost management has proven efficient, margins to expand

We forecast a gross margin expansion of 5.7 pp to 26.5% for Q1 2019E and 27.5% for 2019E as volumes of the new low-cost FPC1511 sensor picks up. The CEO expects the production costs of FPC1511 to be at least 10% lower. We are more confident in the company's ability to manage costs and cut our opex estimates by 3% a year for 2019E-20E.

### Biometric smartcards reach 135m units 2023E, FPC pole position

Our recent market research spurs us to lift the market size for 2020E-22E by 61% owing to higher ASP and biometric smartcard volumes. We strengthen our view of Fingerprint as an early market leader, raising our segment revenue estimates by 61%, 61% and 84% for 2020-22, respectively.

### Valuation high even with success in smartcards/smartphones

The FPC share has surged 81% since the Q3 report, with a 2020E P/E of 40.2x and 2020E EV/EBIT of 26.7x. Using a WACC of 9.8%, our updated DCF-based fair value range is SEK 8.3-16.0 (6.0-11.9). The top end of this range requires rapid revenue growth, a leading position in the smartcard market, and a stable execution and market environment for smartphone sensors. However, the current share price still exceeds our assumptions.

## SUMMARY TABLE - KEY FIGURES

SEKm	2015	2016	2017	2018	2019E	2020E	2021E
Total revenue	2,901	6,638	2,966	1,535	1,458	1,799	1,917
EBITDA (adj)	939	2,662	234	-756	129	274	324
EBIT (adj)	916	2,613	155	-772	33	178	228
EBIT (adj) margin	31.6%	39.4%	5.2%	-50.3%	2.3%	9.9%	11.9%
EPS (adj)	12.50	6.61	0.38	-2.01	0.04	0.44	0.57
EPS (adj) growth	638.0%	-47.1%	-94.2%	-624.4%	102.2%	898.3%	28.1%
DPS (ord)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EV/Sales	-0.4	2.8	1.5	1.7	3.4	2.6	2.4
EV/EBIT (adj)	n.m.	7.1	29.2	n.m.	150.2	26.7	19.9
P/E (adj)	9.5	9.5	41.3	n.m.	n.m.	40.2	31.4
P/BV	0.0	8.8	2.1	1.8	3.1	2.9	2.7
Dividend yield (ord)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
FCF Yield bef acq & disp	n.m.	5.4%	3.5%	3.5%	2.0%	3.1%	3.8%
Net debt	-1,031	-1,162	-455	-541	-652	-827	-1,038
Net debt/EBITDA	-1.1	-0.4	-1.9	0.7	-5.1	-3.0	-3.2
ROIC after tax	n.m.	n.m.	6.5%	-34.1%	2.1%	11.9%	20.1%

Source: Company data and Nordea estimates

# Company update: Q4 2018 report

Fingerprint's reported Q4 net sales of SEK 424m, 2.2% above our estimates but down 31% y/y. The previously troubled gross margin ended up at 20.8%, higher than the lows of around 15% in H1 2018 but sequentially down by 5.9 pp. The company does not issue guidance for margins but claims that it is set to improve as the new, more profitable low-cost FPC1511 sensor becomes a bigger share of the sensors sold. We expect this to happen gradually in H1 2019. Although the company has completed its cost-cutting programme, it reveals that it is working on trimming costs even further. The last payment from the DeltaID acquisition debt was paid off in the quarter, making the company free of long-term debt.

**FINGERPRINT CARDS: Q4 2018 DEVIATION TABLE**

(SEKm)	Actual		Deviation		Cons.		Deviation		Actual		Actual	
	Q4 18	Q4 18E	vs. actual		Q4 18E	vs. actual	Q3 18	q/q	Q4 17	y/y		
Net sales	424	415	+9	+2.2%	380	44	+12%	431	-2%	615	-31%	
Gross profit	88	100	-12	-12%	101	-13	-13%	115	-23%	130	-113%	
Gross margin	21%	24%	-3.3pp		27%	-5.8pp		27%	-5.9pp	21%	-0.4pp	
EBIT	-26	-1	-25	-2450%	7	-32	-475%	7	-470%	-41	+37%	
Operating margin	-6%	0%	-5.8pp		2%	-7.8pp		2%	-7.6pp	-7%	+0.6pp	
EPS	-0.06	-0.02	-0.04	-200%	0.02	-0.08	-498%	0.01	-700%	-0.05	-20%	

Source: Company data, Infront and Nordea estimates

## Company results

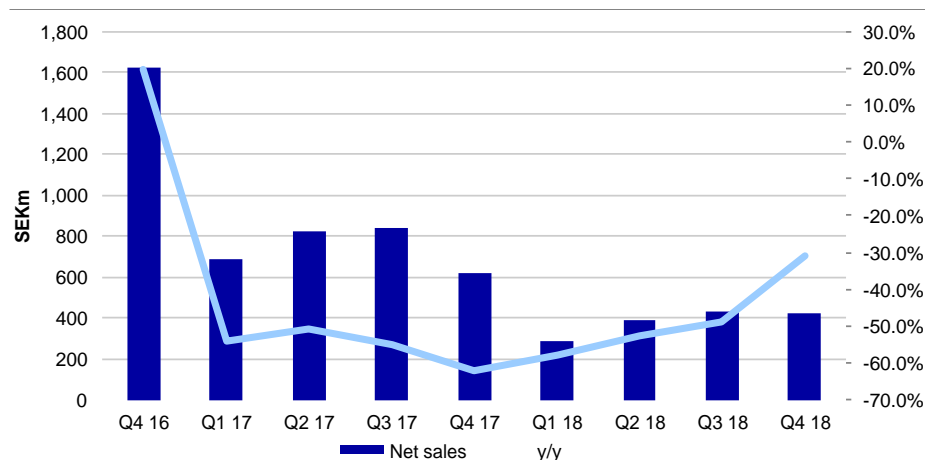
Smartphone market still challenging

Fingerprint's reported net sales of SEK 424m in Q4, were 2.2% above our estimates but a decline of 31% y/y. The competitive market for capacitive fingerprint sensors is still challenging and has led to lower ASPs. We note that various sources claim volumes in the smartphone industry as a whole, have been in decline over the past two years. However, Fingerprint is one of four major fingerprint sensor manufacturers still active on the market and it says that the ASP erosion is starting to subside.

Non-smartphone revenues exceed 10% in Q4 2018

The company has a target that 10% of revenues should stem from other segments than fingerprint sensors for smartphones. It achieved this in Q4 2018, with most of the volumes coming in H2. The largest segment in non-smartphone revenues is fingerprint sensors for door locks, a growing market in China.

**QUARTERLY NET SALES PROGRESSION**

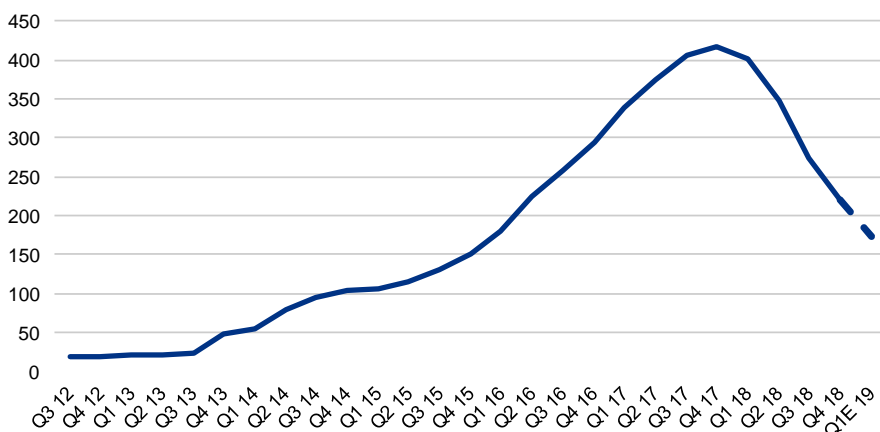


Source: Company data

Gross margin weaker q/q in Q4 2018 due to delayed FPC1511 shipments

The gross margin was 21%, down 5.9 pp q/q after the major improvement in Q3, when it was up around 12 pp after adjusting for one-offs. The company is now further away than it was in Q3 in its target of reaching 30%-plus gross margins in the long term. However, a better product mix, weighted towards the new low-cost sensor FPC1511, is set to help the company move in the right direction again. CEO Christian Fredriksson expects 75-80% of fingerprint sensors for smartphones shipped from Fingerprint will be FPC1511 in H1 2019. When asked about the margin improvement to be expected from the new sensor, he did not want to give any guidance but said that such a new-generation product would be considered to have poor performance if it reduces costs by only 10%.

**NUMBER OF EMPLOYEES**

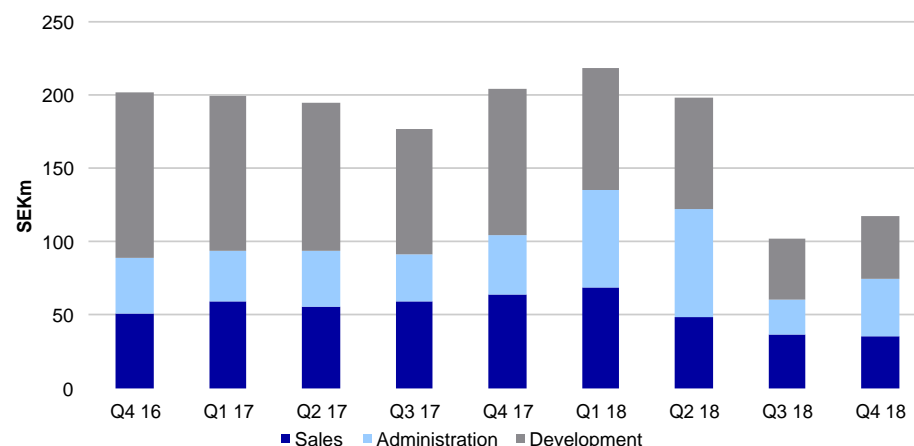


Source: Company data and Nordea estimates

Yearly opex run-rate approaching SEK 400m before the capitalisation of R&D in Q4 2018

2018 opex ended up at SEK 554m before the capitalisation of R&D, SEK 154m above the SEK 400m target for the post-cost reduction programme. However, H2 2018 saw opex reductions of 43% compared with H2 2017, implying that the full effects of the cost-reduction programme are starting to filter through. In addition, it suggests that the targeted reduction is likely to be achieved in the next few quarters.

**QUARTERLY OPEX BREAKDOWN**



Source: Company data

Net cash improved to SEK 540.5m with long-term liabilities repaid, reducing financial risk significantly

Operating cash flow was SEK -26.1m, hampered by negative EBIT and restructuring related expenditures. The underlying profitability still has to be turned around in order to improve future cash flows and secure the cash position of Fingerprint.

Q4 cash flow from investing activities of SEK -31.0m was hurt by capitalised development expenditure of SEK 9.3m and the payment for Delta ID of SEK 21m, with another SEK 21m to be paid in Q1 2019E.

Cash flow from financing activities was SEK -151.3m. It consisted of amortisation and the repayment of the remaining portion of the acquisition loan for Delta ID, after which Fingerprint has no interest-bearing liabilities.

Net cash ended Q4 at SEK 540.5m (454.9).

### The smartphone sensor market

Fingerprint's in-display optical sensor to be introduced during 2019 – lagging competitors

In line with our expectations, the main biometric trend in new high-end smartphones launched in Q4 was in-display fingerprint sensors. With Fingerprint's sensor still to be launched, it looks as though the company will enter a more mature market than it and we previously forecast, since other manufacturers of such sensors have already launched their products and started to supply smartphone OEMs.

Fingerprint remarked that it will launch its in-display optical solution during 2019. We believe that better price performance is needed in order for Fingerprint to reach a market share on a par with the more mature capacitive sensor segment.

Samsung is stopping their iris sensors in Galaxy S10

Samsung decided to let go of the iris recognition from its Galaxy S10 model, instead of going for in-display fingerprint. This is a big blow for the market of iris recognition technology, which has had the Samsung flagship series as an important forerunner. However, we believe that iris has a place in the market as a multimodal feature as soon as cameras and sensors move into the displays. We note that Samsung is not a Fingerprint's customer when it comes to handheld devices.

18 new models with Fingerprint's sensors

A total of 18 new smartphone models using Fingerprints sensors were launched in the quarter compared with 12 in Q3.

#### SELECT RECENT HANDSETS LAUNCHED WITH FINGERPRINT SENSORS

Announcement	Launch	Manufacturer	Model	Sensor
10/10/2018	18/10/2018	Google	Pixel 3	FPC1075
10/10/2018	18/10/2018	Google	Pixel 3 XL	FPC1075
24/10/2018	16/10/2018	Huawei	Mate 20	FPC1291
25/10/2018	25/10/2018	Xiaomi	MIX 3	FPC1291
30/10/2018	09/11/2018	Xiaomi	Black Shark Helo	FPC1229
14/01/2019	12/02/2019	Xiaomi	Redmi Note 7	FPC1511
14/01/2019	24/12/2018	Xiaomi	Play	FPC1028

Source: Company data

Iris and face recognition efforts merge

While no comments were made about the potential dismantled development of a 3D face recognition sensor algorithm, CEO Christian Fredriksson announced that the next generations of iris recognition were under development. He commented that the company was working on a combined 2D face and iris-sensor technology that would combine the ease-of-use of face recognition with the high security of iris recognition.

### The smartcard market

Some recent research and remarks made about the future size of the biometric smartcard market prompt us to reconsider our views. Research house Goode Intelligence and smartcard sensor developer Next Biometrics have both released forecast figures for the size of such markets, predicting 579 million and 800 million biometric smartcards, respectively, to be shipped in 2023E. Both are positive about the extensive growth potential of biometric smartcards. Fingerprint's CEO is still more careful in making predictions. However, he did note that half of the payment cards shipped today use the relatively new contactless NFC technology and that this was a positive data point to take into account. Our main issue with these volume forecasts is the price of the sensors compared with the price of a smartcard.

We highlight a few of the newly presented data points and forecasts. We present our view in the segment 'The biometric smartcard market' below.

**FINGERPRINT'S OUT-OF-THE-BOX SMARTCARD ENROLMENT KIT**



Source: Company data

Fingerprint innovates to resolve the enrolment challenges for biometric smartcards

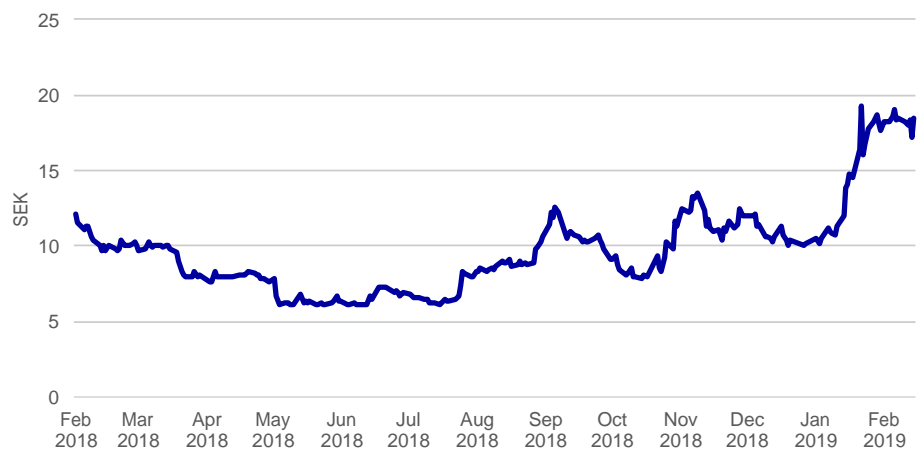
The day before the Q4 report, Fingerprint presented its solution for the previously problematic concept of fingerprint enrolment for smartcards. A few different solutions were presented in a video on the company's website, including a demonstration version of an out-of-the-box enrolment kit. While this does not change our fundamental views on the size of the market, it shows that Fingerprint is aware of potential problems in future products. It also highlights that the company is willing to innovate to overcome these problems and to offer solutions.

Fingerprint's share has had a remarkable run

**The Fingerprint share**

The Fingerprint share has, after a long period of decline, bounced up in the past few months. It is now at a level unseen in 2018. YTD, the stock is up 83%, and the 52-week return is 85%.

**52-WEEK SHARE PRICE TREND**



Source: Thomson Reuters

Share price increase somewhat puzzling

It is not entirely clear what has provided the fuel for the rally in the past few months. There has been no major news from the company and new guidance has not been released. We find the most credible reason to be more interest from institutional investors (eg Legal & General) as a result of index tracking. In addition, retail investors may have updated their views on the upcoming smartcard market and insiders may be buying the stock, improving the sentiment. New research and comments about smartcard volumes have surfaced in the time period, especially connected to Fingerprint's competitors and partners such as IDEX, Next and ZWIPE. We highlight some of these numbers and present our view in the segment 'The biometric smartcard' segment below.

Legal & General ETF has driven share price increase

A new major owner, British biometric index-tracking ETF GO ETF Solutions, owned by Legal and General Group, now owns 5.3% of shares and 4.6% of votes in the company. We suggest that this has had a material effect on the share price. The share went up by 5.9% on the day of the ownership announcement.

#### LARGEST SHAREHOLDERS

Owner	FING A	FING B	Capital	Votes
Johan Carlström with companies	6,000,000	14,000,000	6.4%	20.1%
GO ETF Solutions LLP	-	17,259,748	5.5%	4.7%
Avanza Pension	-	14,754,743	4.7%	4.0%
Ålandsbanken Fonder	-	5,184,220	1.7%	1.4%
Danica Pension	-	3,330,151	1.1%	0.9%
Svenska Handelsbanken AB for PB	-	3,021,500	1.0%	0.8%
Nordnet Pensionsförsäkring	-	2,997,473	1.0%	0.8%
DNB Asset Management SA	-	2,218,035	0.7%	0.6%
Swedbank Försäkring	-	2,165,943	0.7%	0.6%
Dimensional Fund Advisors	-	2,074,616	0.7%	0.6%
Erik Svenonius	-	1,790,000	0.6%	0.5%
SEB Fonder	-	1,747,223	0.6%	0.5%
River and Mercantile	-	1,740,300	0.6%	0.5%
Handelsbanken Liv Försäkring AB	-	1,630,151	0.5%	0.4%
XACT Fonder	-	1,621,008	0.5%	0.4%
Other	-	238,431,889	74.0%	63.2%

Source: Holdings

# Estimate revisions

The Q4 report and newly announced data points on relevant markets prompt us to revise our estimates. We expect the smartphone market to decline further in 2019, affecting capacitive sensor volumes. However, we see heightened potential in the smartcard market for the years beyond 2019, thanks to the emergence of new research and promising comments by competitors recently. We are more confident in Fingerprint's ability to raise margins and manage costs. We present our new estimates below and explain our motivation for the revisions. Our new estimates and scenario analysis lead to a DCF-based valuation range of SEK 8.3-16.0 (6.0-11.9).

The four main assumptions that spur our estimate revisions are:

- The smartphone market will be challenging in 2019, with the third year of declining volumes. We forecast a decline of 11% in Fingerprint's addressable market of smartphone volumes. This will lead to volume reductions, but Fingerprint will likely manage to grab a larger market share. This is because its major customers are not those suffering the most in the market, and we note that the attachment rates of fingerprint sensors are set to increase.
- The price of a smartcard sensor is likely going to be higher than we had thought, even when volumes pick up. We increase our ASP estimates by 60%. We also increase the attachment rates slightly for payment cards after 2020E, and we are still confident in Fingerprint's market position in the segment.
- The margin effect of the new FPC1511 sensor has not yet been seen in numbers, but this will improve underlying margins for the core business starting in H1 2019. This leads us to increase our gross margin assumptions by 0.5 pp and 2.0 pp for 2020-21, respectively. We also revise our opex estimates to take into account the successful cost-cutting programme in H2 2018.
- The company is now debt-free and the immediate risk of financial shortage and default has been lowered significantly. Therefore, we reduce our financial risk estimates in our valuation.

## FINGERPRINT CARDS: EARNINGS REVISIONS

	New Estimates				Old estimates				Diff				% Diff			
	2019E	2020E	2021E	2022E	2019E	2020E	2021E	2022E	2019E	2020E	2021E	2022E	2019E	2020E	2021E	2022E
<b>SEKm</b>																
<b>Net sales</b>	1,458	1,799	1,917	2,316	1,622	1,736	1,858	1,989	-164	+63	+58	+327	-10.1%	+3.7%	+3.1%	+16.4%
<b>Gross profit</b>	401	558	632	741	454	529	576	636	-53	+28	+56	+105	-11.7%	+5.4%	+9.8%	+16.4%
Gross margin	27.5%	31.0%	33.0%	32.0%	28.0%	30.5%	31.0%	32.0%	-0.5pp	+0.5pp	+2.0pp	-	-	-	-	-
<b>Operating expenses</b>																
Sales expenses	131	148	160	185	143	146	149	151	-12	+2	+12	+34	-8%	+1%	+8%	+22%
Administrative expenses	93	88	88	88	94	94	94	94	-1	-6	-6	-6	-1%	-6%	-6%	-6%
Development expenses	144	144	156	160	146	156	167	179	-2	-12	-11	-19	-1%	-8%	-7%	-11%
<b>Total opex</b>	368	380	404	433	382	395	409	424	-14	-16	-5	+9	-4%	-4%	-1%	+2%
<b>Other operating income</b>	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-
<b>EBIT</b>	33	178	228	308	71	134	166	212	-39	+45	+62	+96	-54%	+33%	+37%	+45%
EBIT margin	2.3%	9.9%	11.9%	13.3%	4.4%	7.7%	8.9%	10.7%	-2.1pp	+2.2pp	+3.0pp	+2.6pp	-	-	-	-
<b>EPS</b>	0.04	0.44	0.57	0.76	0.14	0.33	0.41	0.53	-0.10	+0.11	+0.15	+0.24	-68%	+33%	+37%	+45%
<b>Units shipped (m)</b>																
Capacitive	216	231	238	242	235	233	246	252	-19	-1	-8	-10	-8%	-1%	-3%	-4%
In-display	1	8	19	34	1	11	27	45	-0	-3	-8	-11	-32%	-30%	-30%	-25%
Iris	20	43	59	64	56	89	116	119	-36	-45	-57	-55	-64%	-51%	-49%	-46%
Smartcards	-	7	14	43	1	7	12	32	-1	+0	+2	+11	-100%	+0%	+15%	+34%
<b>ASP (USD)</b>																
Capacitive	0.69	0.59	0.50	0.42	0.67	0.57	0.48	0.41	+0.02	+0.02	+0.02	+0.01	+4%	+4%	+4%	+4%
In-display	2.9	2.0	1.5	1.1	2.9	2.0	1.5	1.1	-	-	-	-	-	-	-	-
Iris	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	-	-	-	-	-	-	-	-
Smartcards	6.4	4.5	3.1	2.2	4.0	2.8	2.0	1.4	+2.4	+1.7	+1.2	+0.8	+60%	+60%	+60%	+60%

Source: Nordea estimates

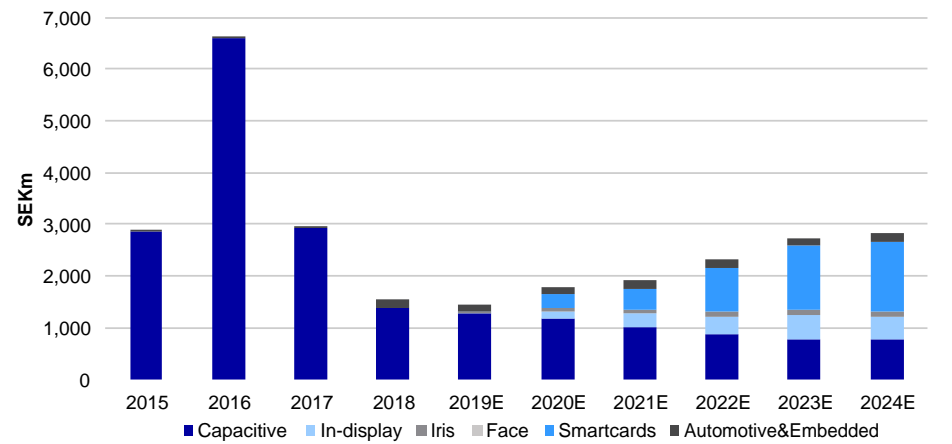
Smartphone volumes set to decline

### Smartphone segment

New reports on the number of smartphones shipped during 2018 reveal a decline in volumes for the second year in a row. Profit warnings issued by Apple and Samsung, among others, and industry analyst reports from IDC and Credit Suisse also do not bode well for 2019. Some in the market have even claimed that volumes will decline to levels not seen since 2013, burdened primarily by weakened consumer demand in China.

Smartcards to account for more than a third of revenues from 2022E

### FINGERPRINT'S REVENUES

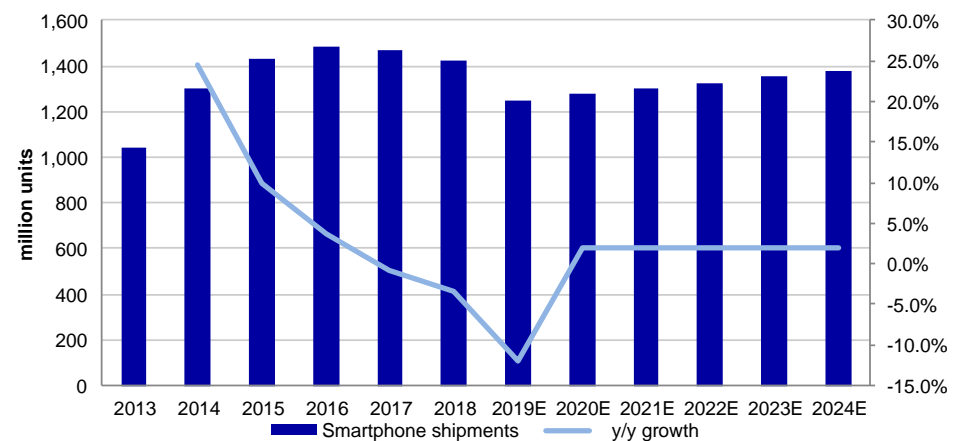


Source: Company data and Nordea estimates

Smartphone market in decline, Fingerprint's position stable

While Fingerprint claims that its major customers have not issued profit warnings recently, we still believe that the smartphone market will decline in 2019, taking its toll on Fingerprint's performance. We thus lower our total smartphone shipment volumes for 2019. We now see an 11% decline in volumes y/y, which leads to a decrease in Fingerprint's addressable market for capacitive sensors. We keep our volume growth forecasts for 2020-22. The effect is mitigated by the fact that the major Fingerprint customers have not announced the same volume issues. In addition, Fingerprint is now one of only four major players in the capacitive sensor market for smartphones. This encourages us to increase the company's market share slightly in our forecasts, mitigating the lower sensor volume in 2020E-22E.

### GLOBAL SMARTPHONE SHIPMENTS



Source: IDC, Credit Suisse, Statista, ABI Research and Nordea estimates

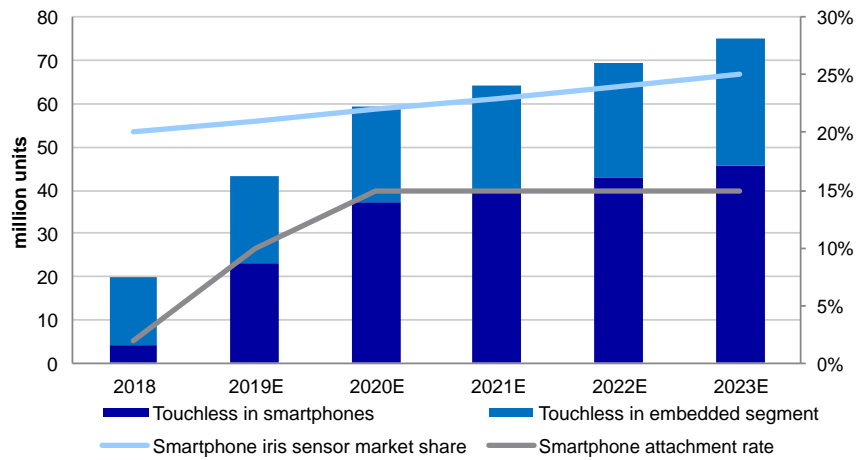
We also believe that our previous assumptions on sensor ASP have been a little low and now reduce our assumed price erosion in 2019, leading to 4% higher sensor ASP.

Iris recognition not catching much interest in smartphones

It is clear that iris recognition in smartphones has not caught the interest that Fingerprint had hoped for when acquiring Delta ID, nor has it been as high as we had forecast in our previous reports. The fact that Samsung decided to ditch iris recognition in the flagship model Galaxy S10 is a negative data point, in our view, and it calls for negative attachment rate revisions. We lower our touchless sensor shipment estimate

by 64% for 2019. However, since the numbers were low to begin with, this does not have a material impact on our revenue estimates.

**FINGERPRINT'S TOUCHLESS SENSOR SHIPMENTS**



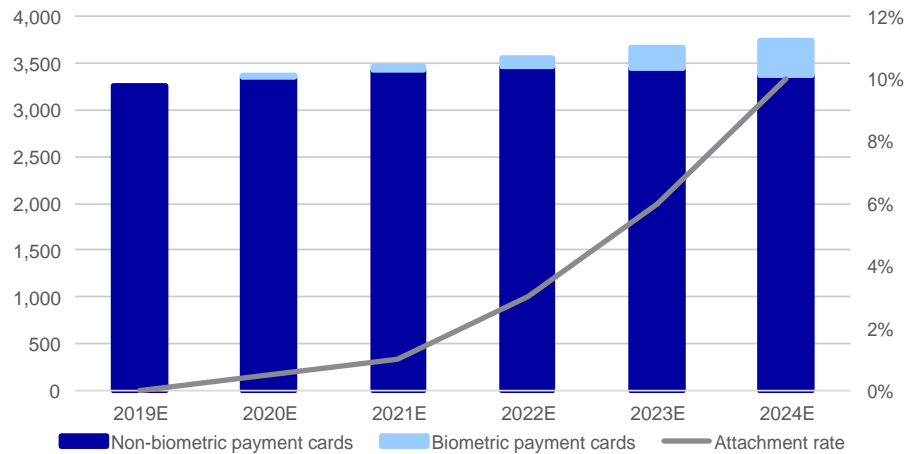
Source: Nordea estimates

ASP for smartcard likely higher than we expected

**Smartcards**

As discussed in the segment 'The biometric smartcard market', new data on sensor costs and card volumes have been published recently, which has led us to revise our view on the market size slightly. We increase the sensor ASP in the segment by 60%, due to comments made by Fingerprint's competitors. The higher ASP also reflects the fact that Fingerprint is likely to ship sensors and complete T-shape modules for smartcards, thus earning a bigger share of the card cost.

**GLOBAL PAYMENT CARD SHIPMENTS**



Source: Nordea estimates

Smartcards are set to grow rapidly

Even though the main problem with attachment rates in smartcards is the price of the sensors, we expect the market to grow slightly faster than before in light of the recent research. We remove all shipment forecasts from 2019 and now expect the first million in volumes to roll out in 2020, with increased volume estimates for 2021-22.

We detail our view on the size of the biometric smartcard market in the segment 'The biometric smartcard market'.

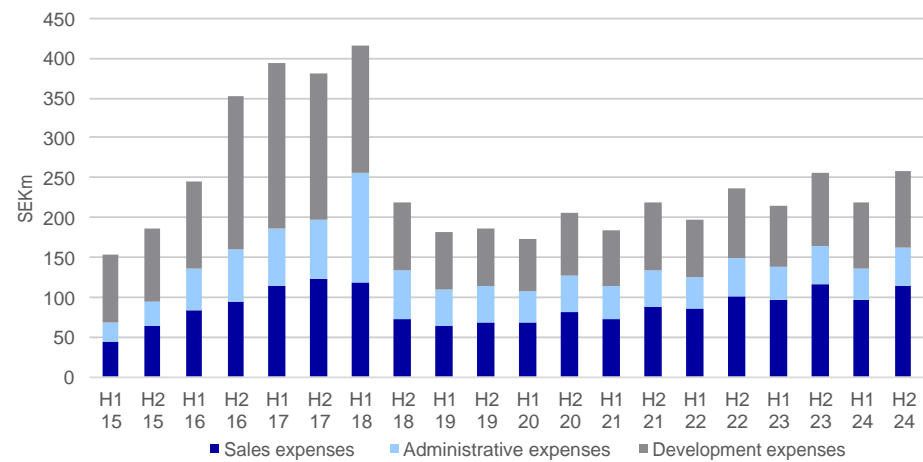
**Cost management**

More faith in company's cost-cutting abilities

Thanks to the sweeping cost reductions the company has achieved in the last two quarters, we are now more confident in its ability to make further cuts and keep costs down. Based on the opex target of under SEK 400m before the capitalisation of R&D, we reduce our opex estimates for the coming years, mainly in 2019. While the administrative costs saw a rise in Q4, both H2 and Q4 2018 opex saw y/y declines of

43%. This is the reason why we expect the opex reductions to be sustainable. We believe administrative costs will be lower in H1 2019E as a result of the cancelled leases and other cost-cutting measures.

**OPEX FORECASTS**



Source: Company data and Nordea estimates

The only cost that we do not reduce for 2019E-22E is sales expenses, which we believe will increase as revenue rises owing to sales provisions and the like.

Gross margin to improve during 2019E

While the gross margin came in lower than we expected, this seems to be due to the effect of the low-cost sensor FPC1511 reaching meaningful volumes later than we thought. We decrease our margin assumptions slightly for H1 2019 but increase them for H2, when we assume the ~12% cheaper sensor will start to gain volume shares. This also affects 2020E-21E margins. In 2021, we believe the volumes in the new smartcard segment will start to increase, improving the overall gross margins with its higher product margins.

Other segment will account for roughly 10% of revenues in 2019E

**Embedded solutions**

That more than 10% of Fingerprint's 2018 revenue came from segments other than smartphones is a testament to the mounting interest in implementing biometric sensors in other solutions such as security, border control, and identification for everyday IoT items. The market for biometric door locks, especially in China, is growing at promising rates, in our view. Fingerprints claimed to have an attractive position in this market in 2018, with a total of 10 million sensors shipped in China. It forecasts 15 million sensors for China alone for 2019. Therefore, we increase our sensor shipment volumes in the embedded segments for the next few years, leading to higher revenues from the segment.

# Detailed estimates

## FINGERPRINT: VOLUMES AND ASP

	Q3 18	Q4 18	Q1 19E	Q2 19E	Q3 19E	2017	2018	2019E	2020E	2021E	2022E	2023E
<b>USD/SEK</b>	<b>8.95</b>	<b>9.05</b>	<b>9.25</b>	<b>9.25</b>	<b>9.25</b>	<b>8.54</b>	<b>8.70</b>	<b>9.25</b>	<b>9.25</b>	<b>9.25</b>	<b>9.25</b>	<b>9.25</b>
<b>Revenues (SEKm)</b>	431	424	349	364	395	2,966	1,535	1,458	1,799	1,917	2,316	2,737
Change y/y	-49%	-31%	21%	-7%	-8%	-55%	-48%	-5%	23%	7%	21%	18%
<b>Smartphone related units (m)</b>												
<b>Capacitive</b>	52	57	46	49	55	245	193	200	215	217	220	221
ASP (USD)	0.84	0.74	0.72	0.71	0.68	1.41	0.83	0.69	0.59	0.50	0.42	0.38
Change y/y	-39%	-43%	-20%	-17%	-19%	-38%	-41%	-17%	-15%	-15%	-15%	-10%
<b>In-display</b>	0	0	0	0	0	0	0	1	8	19	34	60
ASP (USD)	-	-	-	-	-	-	4.2	2.9	2.0	1.5	1.1	0.8
Change y/y	-	-	-	-	-	-	-	-30%	-30%	-27%	-25%	-25%
<b>Iris</b>	-	-	-	-	-	-	-	4	23	37	40	43
ASP (USD)	-	-	-	-	-	-	0.38	0.34	0.31	0.28	0.25	0.23
Change y/y	-	-	-	-	-	-	-	-10%	-10%	-10%	-10%	-10%
<b>Smartcard related units (m)</b>												
<b>Capacitive</b>	0	0	0	0	0	0	0	0	7	14	43	88
ASP (USD)	8.00	8.00	6.40	6.40	6.40	-	8	6	4	3	2	2
Change y/y	0.0%	0.0%	-20.0%	-20.0%	-20.0%	0	0	0	0	0	0	0
<b>Automotive &amp; Embedded-related units (m)</b>												
<b>Capacitive</b>	3.50	4.30	4.00	4.00	4.00	4	13	16	16	21	23	27
<b>Touchless</b>	4.00	4.00	3.61	4.00	4.00	10.0	16.0	15.6	20.0	22.0	24.2	26.6

Source: Company data and Nordea estimates

## FINGERPRINT: P&L

	Q3 18	Q4 18	Q1 19E	Q2 19E	Q3 19E	2017	2018	2019E	2020E	2021E	2022E	2023E
<b>Net sales</b>	431	424	349	364	395	2,966	1,535	1,458	1,799	1,917	2,316	2,737
Change y/y	-49%	-31%	21%	-7%	-8%	-55%	-48%	-5%	23%	7%	21%	18%
Cost of goods sold	-316	-336	-257	-264	-285	-1,977	-1,533	-1,057	-1,242	-1,284	-1,575	-1,883
Gross profit	115	88	92	100	110	989	2	401	558	632	741	854
Gross margin	27%	21%	26%	27%	28%	33%	0%	28%	31%	33%	32%	31%
Sales expenses	-37	-35	-31	-33	-36	-237	-189	-131	-148	-160	-185	-213
Administrative expenses	-24	-39	-23	-23	-23	-146	-202	-93	-88	-88	-88	-88
Development expenses	-41	-43	-36	-36	-36	-391	-244	-144	-144	-156	-160	-170
<b>Total opex</b>	-102	-117	-91	-92	-95	-774	-635	-368	-380	-404	-433	-471
Change y/y	-42%	-43%	-58%	-54%	-7%	29%	-18%	-42%	3%	6%	7%	9%
Opex/sales	24%	28%	26%	25%	24%	26%	41%	25%	21%	21%	19%	17%
Other operating incomes/expenses	-7	3	0	0	0	-61	-139	0	0	0	0	0
<b>Operating profit</b>	7	-26	2	8	15	155	-772	33	178	228	308	382
Margin	2%	-6%	1%	2%	4%	5%	-50%	2%	10%	12%	13%	14%
Net financial items	-4	2	-4	-4	-4	-13	-25	-15	0	0	0	0
<b>Pre-tax profit</b>	3	-24	-2	4	12	142	-797	18	178	228	308	382
Tax	0	6	0	-1	-3	-22	166	-4	-39	-50	-68	-84
Tax rate	7%	26%	22%	22%	22%	15%	21%	22%	22%	22%	22%	22%
Net profit	3	-18	-2	3	9	120	-631	14	139	178	240	298
<b>EPS</b>	0.01	-0.06	0.00	0.01	0.03	0.38	-2.01	0.04	0.44	0.57	0.76	0.95

Source: Company data and Nordea estimates

# The biometric smartcard market

Fingerprint's revenues in the last years have almost entirely stemmed from capacitive sensors for smartphones, a market that is in clear decline. As a result, the company is venturing into new markets. One of the main bets as of today is that of biometric smartcards. These are payment and security cards that implement a fingerprint scanner to mitigate the security issues of PIN codes and contactless payments. There are many views on the size of this market, and the uncertainty is one of the key reasons for the volatility and differing views on the value of the Fingerprint's stock. We therefore want to shed some light on the subject and present our views below.

Fingerprint was founded to create fingerprint sensors for payment cards

When Fingerprint Cards was founded in 1997, the company's objective was to develop fingerprint sensors for payment cards. In 2005, founder Lennart Carlson wanted to dismantle all operations due to the slower-than-expected developing market for biometric solutions. The company was saved and it entered a golden age when fingerprint sensors became popular in smartphones. It is now returning to its roots thanks to the potentially burgeoning market for biometric smartcards. The world might have not been ready in 1997, but the question is if it is ready now.

Year-to-date, Fingerprint's stock is up 83%. While the news flow contains a few product launches in smartphones using Fingerprint's sensors, we believe the main cause of the movements is changing views on the size of the biometric smartcard market.

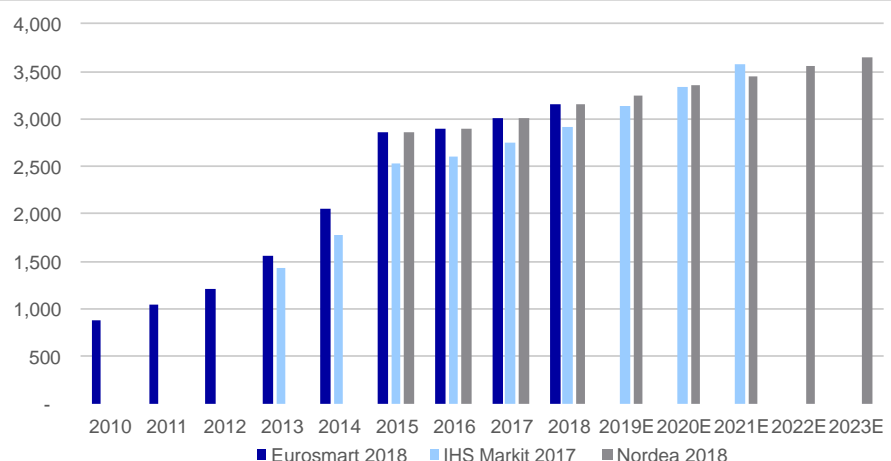
In the coming sections, we present a number of different views on the relevant factors affecting the future revenue streams of Fingerprint's smartcard sensor business line – mainly being the size of the card market, the attachment rate of fingerprint sensors, the price of a sensor and the market share of Fingerprint.

The size of the market is uncertain

## The size of the payment card market

With new payment methods on the rise globally, and with the huge Chinese market historically favouring smartphone over card payments, the number of payment cards shipped in the coming years is not a straight-forward thing to forecast. Even historical numbers contain differences depending on sources and definitions.

**FORECASTS OF PAYMENT CARD SHIPMENTS GLOBALLY**



Source: Eurosmart, IHS Markit and Nordea estimates

We base our estimates on a number of research houses

Our estimates from 2018 are based on research from IHS, Eurosmart and statements made by ABI Research, Fingerprint Cards, peers and competitors.

Biometric sensors are convenient and secure

### The attachment rate of biometric sensors

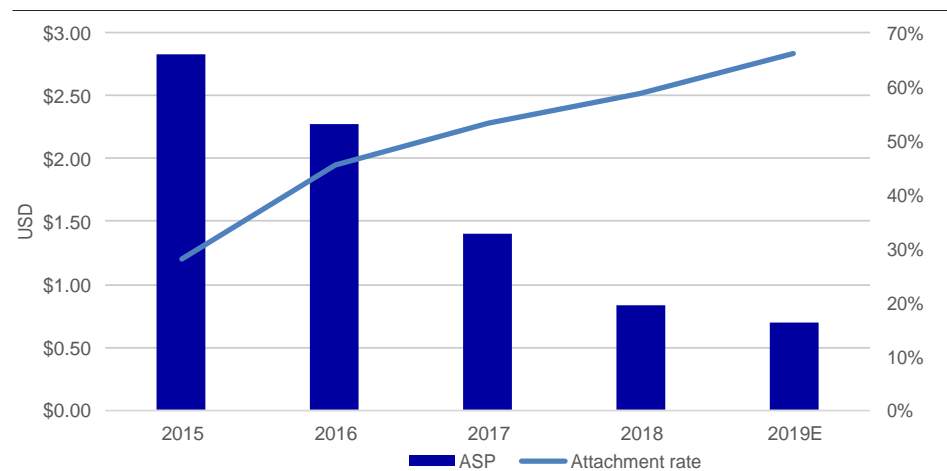
No matter the size of the payment card market in the future, Fingerprint can only address the portion of the cards that will implement biometrics. It is probable that fingerprints will become the standard biometric solution for biometric payment cards, even though similar concepts such as vein patterns have been discussed, simply because it is user friendly, familiar and secure.

However, they cost more than the card themselves

The main problem with implementing a fingerprint sensor to a payment card is not the customer usefulness or the card manufacturer demand. In recent years, the popularity of the contactless Near Field Communication (NFC) solution has increased, with some sources citing attachment rates of around 50% in certain regions. In addition, the cards have been praised by customers and vendors for their user-friendliness and speed. Besides aligning one's thumb to the sensor, a biometric smartcard requires almost the same action from a user but does not come with a payment cap that a contactless card does today. Based on this, we reason that biometric smartcards will be as popular with users as contactless cards are. We therefore assume that there will not be any material issues in customer demand.

The problem rather is the price of a fingerprint sensor. While different producers and researchers claim different present prices of fingerprint sensors for smartcards, consensus is that attaching a sensor to a card today will increase the cost of the card dramatically. This is the balancing act of the market size – the higher the price, the lower the attachment rates and vice versa.

**SMARTPHONE FINGERPRINT SENSOR ATTACHMENT RATE AND ASP**



Source: Company data and Nordea estimates

Attachment rates in smartphones went up rapidly after the iPhone 5S

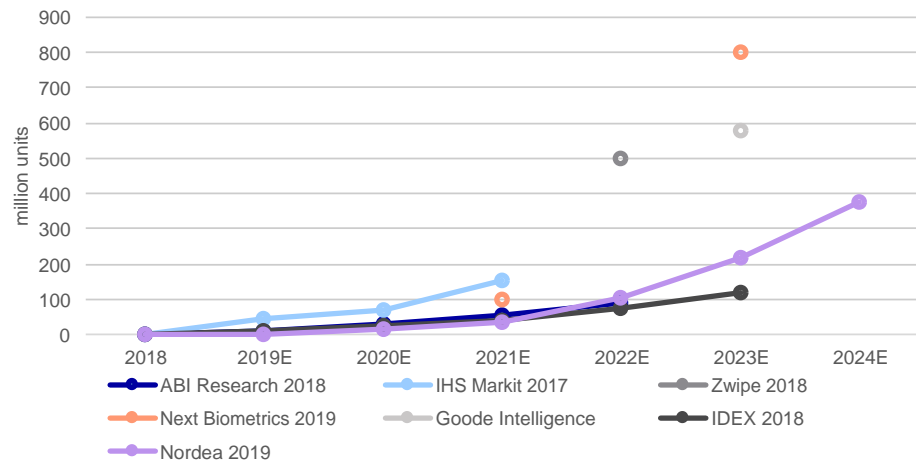
There are two historical cases of interest. First is the obvious other mass market for fingerprint sensors – the smartphone industry – where attachment rates quickly went to above 50% after the launch of the pioneering iPhone 5S. The important thing to keep in mind here is that the ASP of a fingerprint sensor is less than 1% of the complete production cost for many models. In contrast, a fingerprint sensor for a smartcard is likely around 400% of the cost of a contactless payment card today, assuming a sensor price of USD 8 and a card price of around USD 2.

Contactless payment cards have become very popular

The other interesting case is that of contactless payment cards. The novelty was launched by major card payment schemes in 2005 and has grown significantly since then, with some reports claiming that more than half of the cards shipped today come with contactless technology. At a Nordea Tech Seminar in November 2018, Fingerprint's CEO, Christian Fredriksson, commented that it took eight years for contactless cards to surpass a billion in volumes. We see no reason why biometric sensors in smartcards should follow a faster volume trend than this.

It should be noted that this fast attachment rate increase has occurred even though a contactless payment card costs more than double a standard chip card (roughly USD 2.0 versus USD 1.0). However, since a biometric payment card today likely costs around USD 5-10, the read-across is not as straight forward.

**BIOMETRIC SMARTCARD SHIPMENT FORECASTS**



Source: ABI Research, IHS Markit, Goode Intelligence, Next Biometrics, Dagens Industri, IDEX and Nordea estimates

The various sources cite very differing forecasts of the number of biometric smartcards to be shipped in the coming five years, with Goode Intelligence, Next Biometrics and recently listed Norwegian smartcard manufacturer Zwipe being the two extremes, forecasting over half a billion biometric smart cards in three years' time. While this might sound like a very high number, it should be noted that it still represents an attachment rate of less than 15%.

IDEX has given very differing views on the size of the market

The CEO of Norwegian fingerprint sensor company IDEX stated during the company's Q3 2018 call that he believes the 579 million cards in the market in 2023, as forecasted by Goode Intelligence, may be too low a number. However, roughly two months earlier, the company uploaded a commissioned whitepaper from ABI Research, where that same amount was forecast at 117 million cards. In the same results call, the CEO estimates that the company will produce tens of millions of units in 2019.

In a January 2019 business update, fingerprint sensor manufacturer Next Biometrics said that it and "the market" expected the number of biometric smartcards to be shipped to reach 200 million in 2021 and around 800 million in 2023.

Fingerprints has revised its views on when volumes will start to grow strongly

Fingerprint does not provide clear guidance on smartcard volumes and tend to exercise caution in making these kinds of estimates. During the Q2 2017 earnings call, CEO Christian Fredriksson said, "small volumes this year, tens of millions next year and hundreds of millions in 2019". We do not believe Fingerprint will reach millions of units in 2019, and while the company does not provide any volume guidance, the message is clear – volumes will come but it will take time.

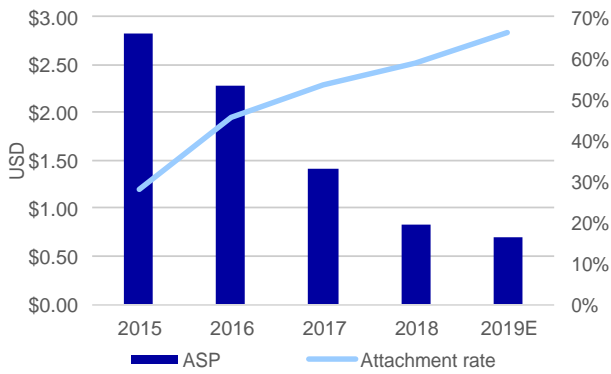
Our estimates are based on ABI Research and IHS Markit numbers combined with company remarks and comments. Since all our market forecasts are higher than those of IDEX, a listed company whose future revenues are set to stem solely from smartcard sensors, we do not believe that we are overly conservative about volumes even though we end up way below the numbers mentioned by Goode Intelligence, Next and Zwipe. We increase our estimates slightly from the last report and add further growth for 2024. In our forecasts, the attachment rate of the sensors goes from 0.5% to 10% in 2020-24.

**The price of a fingerprint sensor for smartcards**

Sensors likely too expensive to reach significant volumes today

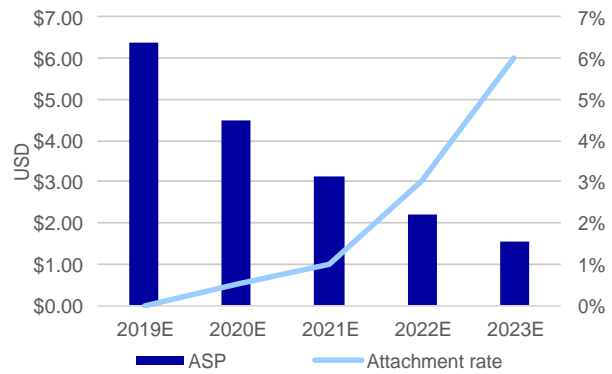
The next data point needed for a simple estimation of the market size for biometric smartcards is the price of a sensor. There is sufficient data on the price of the commoditised capacitive sensors used in smartphones today, but the price for the ones to be used in smartcards is a bit more unclear. There are different prices being quoted from various sources, and while some give estimates of the price of the very card, others are for sensors only.

**CAPACITIVE FINGERPRINT SENSORS IN SMARTPHONES**



Source: Nordea estimates

**CAPACITIVE FINGERPRINT SENSORS IN SMARTCARDS**



Source: Nordea estimates

The sensors cost more than the cards

In an interview with the chairman of the board of biometric smartcard producer Zwipe and previous Fingerprint's CEO Jörgen Lantto in January 2019, said that he believed the price of such a card will be USD 5-10. In the same interview, he also forecast that the number of biometric smartcards in the market will reach half a billion three to four years from now. ABI Research estimates, in a 2018 report, that the price today is somewhere in the range of USD 13-19, while sensor manufacturer IDEX claims it is above USD 20. Most sources put the price of a regular chip card at less than USD 1 and a contactless one at roughly USD 2. ABI Research means that the manufacturers needs to aim for the USD 5 per card mark in order to reach any significant volumes.

In a 2017 capital markets day presentation, IDEX said that it expected the ASP for its sensor to end up in the range of USD 3-5 to gain volumes in the business. In the company's earnings call in Q3 2018, when asked if this range was still relevant, the company's response that the price would be higher than that.

In NEXT Biometrics' market predictions from 2017, the ASP for a biometric smartcard sensor seems to lie around USD 4. It also stated that the sensor and the inlay of the card will cost around USD 8-10. The company also believes that the total card cost has to move below USD 10 for banks to start ramping up volumes. In a January 2019 business update, the company stated that cards should cost around USD 4-5 for the market to start gaining volumes, which it predicted would happen in 2021-23. However, the company also stated a range of USD 5-7 for the same time period in the presentation.

Based on the information above, we revise our ASPs for the sensors and modules for the next few years, increasing them for the initial launch years. Our estimate for the ASP is now around USD 4.5 for 2020E, when we believe volumes will start to ramp up. We expect an annual price erosion of around 30% over our forecast period, similar to what was seen in the smartphone market. This is also a key reason for volumes ramping up.

**Fingerprint's market share**

Fingerprints seemingly on the frontier of development

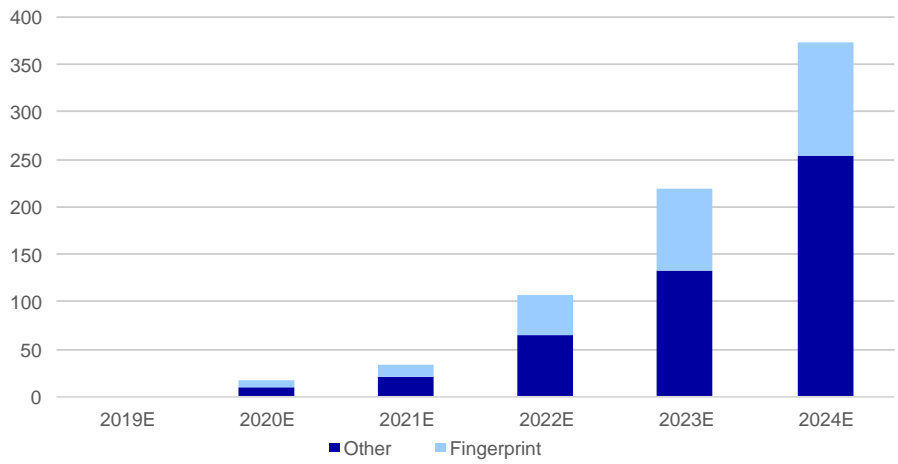
There are two main competitors in producing fingerprint sensors for smartcards – IDEX and Next biometrics, both listed on the Oslo Stock Exchange. While both of these companies have indicated that smartcards are their future focus market, Fingerprint has been clearly dominant in global market trials. This lead might, however, be at threat, with IDEX now testing cards in collaboration with an unnamed Asian bank.

We believe that the competition will put pressure on ASP as well as increase the competition among card issuers in their collaborations with biometric companies to produce cards as advanced as their peers. Our view is that Fingerprint is in a good position to get a large market share initially, and we believe the three producers will be able to maintain a major part of the market together for at least a number of years.

The payment card industry is centred in Europe

While there are emerging competitors in China and other parts of Asia, we believe the Europe-centric card-manufacturing market and the extensive certification processes of payment cards will be barriers of entry. This will create a more sustainable market share outlook for Fingerprint compared with the decline in the smartphone business. According to Fingerprint, 80% of payment card production today takes place in Europe.

**GLOBAL BIOMETRIC SMARTCARD SHIPMENTS**



Source: Nordea estimates

Our market share estimates are set at 40% for the initial volume years, and then down to 32% when competition ramps up in 2024E.

# Factors to consider when investing in Fingerprint Cards

Fingerprint Cards has a chequered past, to say the least. Its journey as a listed company was rather uneventful at the outset – it experienced slow adoption of capacitive fingerprint sensors only because its technology was ahead of its time. When the technology started gaining momentum, Fingerprint enjoyed a head start and growth was immense, providing its shareholders significant returns. However, competition finally caught up, and the company's decline came equally fast. The company now faces great challenges, but is not down for the count just yet. With the introduction of new biometric modalities (eg in-display fingerprint sensors and iris recognition) and growth in emerging segments, we see the possibility of a new dawn for Fingerprint Cards. In combination with more streamlined operations, the business could once again return to earnings growth and close the current margin gap to its peers. However, expanding from one to three or more industrial segments, and from essentially one product line to four, is a balancing act when cash is scarce – it carries high risk and potentially high rewards.

There are four main factors to consider

We consider the following factors critical when evaluating an investment in Fingerprint Cards:

- Its potential to become a next-generation technology leader,
- Adjacent biometric market opportunities and an increased attachment rate for new applications that increase earnings diversification,
- Streamlined operations and a new product offering set to improve margins, and
- Its potential as a takeover target.

The most important risks are mainly related to future revenue streams

The main risks to consider are the following:

- Fingerprint's competitive position could be threatened by new smartphone biometric sensor standards,
- Uncertainty regarding the future size and growth of new market opportunities within smartcards, automotive and embedded solutions,
- Challenging market conditions with immense competition, declining volumes and pressure on price,
- The potential need to turn to capital markets in the future due to the pressure on the company's financial position, and
- High concentration of existing and potential customers, with the ten largest customers accounting for 98.8% of revenues.

We believe that in-display fingerprint sensors will become the future norm in smartphones

## The future is multimodality

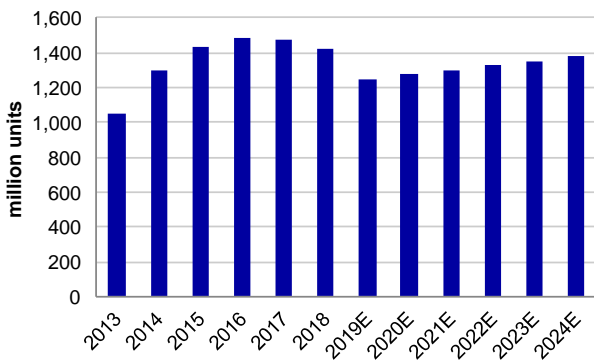
Following the success of fingerprint sensors in smartphones, in-display fingerprint sensors and touchless biometric modalities have become attractive to customers and manufacturers in the smartphone market. We have seen an increasing number of phones with multimodal biometric sensors, such as fingerprint sensors combined with face or iris recognition. The 2018 Google Pixel 3 launch was criticised for not featuring face recognition on top of its fingerprint sensor. One likely reason for Google's exclusion of touchless modalities is its willingness to keep screen bezel size down, another is that some reviews claim the non-Apple face recognition technology is unsatisfactory from convenience and security perspectives – a view that is adhered to by Fingerprint's CEO. Apple's FaceID solution is a major R&D investment and the competition has not yet

caught up, but this is just a matter of time. Advanced face recognition technology also requires that components are not obscured by display pixels, thus increasing the bezel or notch size requirements in the phones. We thus believe that in-display as a standalone sensor will be the norm in high-end smartphones until touchless sensors are good enough to be offered as a multimodality outside of Apple iPhones – which is likely to happen in 2019.

Technology leadership position still up for grabs

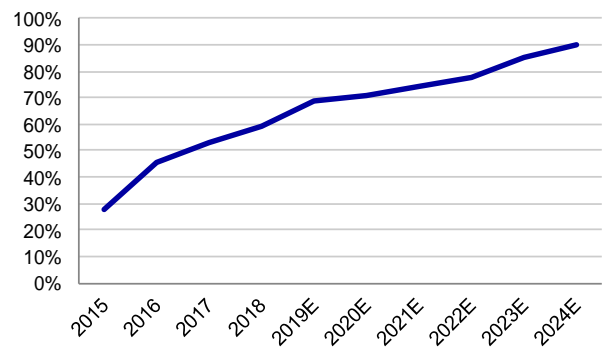
This spring, we witnessed the launch of a handful of devices sporting huge displays with fingerprint sensors built into the actual screen of the device. Despite receiving praise for the design, the sensors are reportedly slow, and there is room for improvement by moving from “hot zone” detection, where only a very small part of the display is able to detect the fingerprint, to full-display detection.

**GLOBAL SMARTPHONE SHIPMENTS**



Source: IDC, Credit Suisse and Nordea estimates

**FINGERPRINT SENSOR ATTACHMENT RATE**

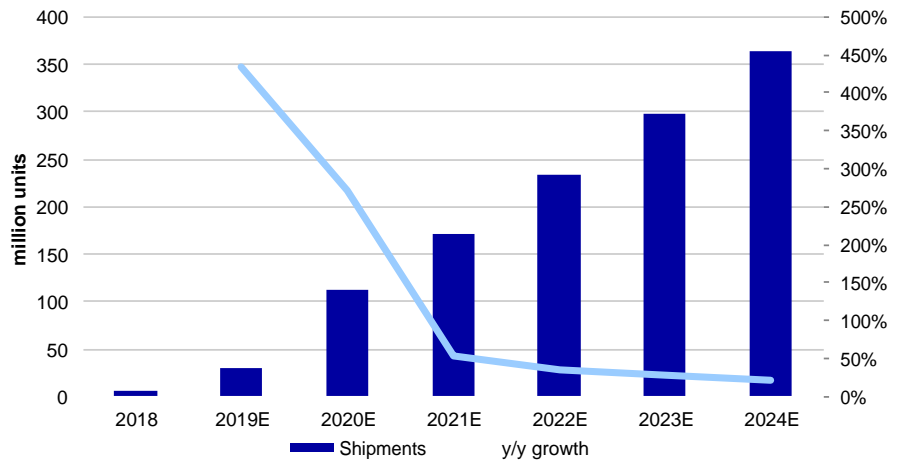


Source: Nordea estimates

Opportunity for Fingerprint to take a leadership position in in-display sensors for next generation high-end smartphones

So far, Fingerprint and Egistec are the only biometric sensor companies to announce the development of full-display sensors, although we believe other competitors are working on similar solutions. Egistec’s full-display sensor is based on optical detection while Fingerprint’s uses ultrasound technology to create a fast and reliable sensor that can detect a fingerprint anywhere on the display. Qualcomm has a finished and ready-to-ship in-display ultrasound sensor, but it is hot-zone-based and has not gained traction in the consumer market yet. Fingerprint, assuming its product is released ahead of the competition, could enjoy first-mover advantage in full-display sensors and once again grab a large share of the high-end smartphone market for biometric sensors. However, the issue is R&D capability: Fingerprint is a smaller company than most of its competitors. Considering the recent cost and personnel reductions, as well as its diversified R&D focus, we are not surprised that Fingerprint did not release the sensor in H2 2018. The risk of bringing the sensor to market too late, or that the product will simply be too expensive, cannot be ignored. As of today, the launch date for the ultrasound in-display fingerprint sensor has not been announced and the company will instead offer an optical solution starting in 2019. According to the company, the solution is almost finished, being demoed for customers at the moment and the next step is basically a design win for the product.

**GLOBAL IN-DISPLAY SENSOR SHIPMENTS EXCLUDING APPLE**



Source: Nordea estimates

**The opportunities of future product markets**

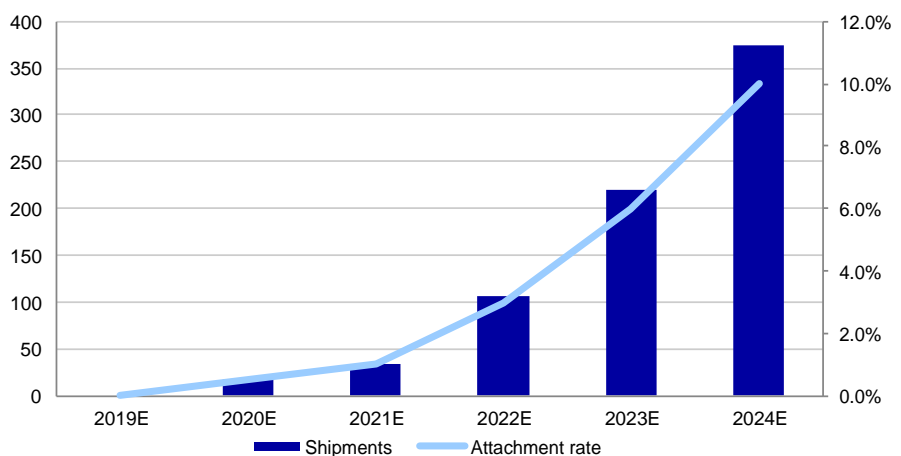
Capacitive sensors likely to be around for the foreseeable future

Capacitive fingerprint sensors in smartphones have become commonplace, but they are likely to be replaced by ultrasound and optical solutions in the coming years. This is because ultrasound and optical detection, contrary to capacitive sensors, work through smartphone displays. However, capacitive sensors are still easy to implement, cheap to produce and offer high degrees of security and convenience. Despite the heavy competition, Fingerprint is still a market leader in this area and one of roughly four companies to make it through the heavy competition in the latest years; as such, when the company ventures into new markets, it brings considerable experience to the table.

New segments like smartcards could add earnings diversification

According to the company, smartcards are the single-largest future opportunity for Fingerprints. With more than three billion payment cards shipped annually around the world, the addressable market is huge. Using its newly launched T-shape module and sensor series, the company has already started testing sensor-equipped cards. It is one of only a few players openly planning to enter the maturing market with an actual product. Combined with the increasing implementation of fingerprint sensors in other segments (home security, automotive and the Internet of Things), this should diversify Fingerprint's offering and make the company less vulnerable to volatility in smartphone volumes. The Q3 standard approval of the FPC1021AP sensor for automotive implementation came with the statement that the product is ready for mass-market production in 2019. This gives us a positive view that this segment, while small, is set to grow.

**GLOBAL BIOMETRIC SMARTCARD SHIPMENTS**



Source: Nordea estimates

Cost reduction programme to drive opex below SEK 400m before capitalisation of R&D	<p><b>Returning to cost leadership</b></p> <p>To ensure future competitiveness and a return to earnings growth, Fingerprint has implemented a number of measures to improve its margins. The company has already finished one cost-cutting programme and has started rolling out another one, from which it should reap benefits during the latter part of this year. The latest programme aims to adapt to the ongoing challenging market conditions for capacitive sensors and is expected to reduce headcount by an additional 150 employees. The target is still set at total annual operational expenses before capitalisation of R&amp;D below SEK 400m, which was the level back in 2015. We believe this is feasible in 2019E.</p>
Product innovation should adapt to demand for smaller and cheaper sensors	<p>The Q2 announcement of the FPC1511 sensor, which the company claims to be its most cost-efficient sensor so far, is yet another driver to adapt to the latest shift in demand favouring smaller and cheaper fingerprint sensors. While the pricing of the sensor is not public, it is said to be the most cost-optimised sensor released by Fingerprint so far. If the new cost-cutting programme is executed properly and the FPC1511 gains order momentum in early 2019, we believe the company should be able to close the margin gap to its peers and defend its leading position in the market for capacitive fingerprint sensors.</p>
Broken industry, not a broken company	<p><b>Challenging market could trigger industry consolidation</b></p> <p>With sensor prices in freefall, plummeting 30% annually in the last years, the capacitive sensor is being commoditised at a more rapid pace than likely anyone could have foreseen. On top of this, new industry standards are starting to emerge, creating the need for additional investments in R&amp;D at the worst possible time. Industry experts such as ABI still rank Fingerprint as the market leader in a competitive assessment based on innovation and implementation, so its product and patent portfolio still holds value. Its experience in capacitive sensors should also offer first-mover advantages in new verticals and product categories.</p>
Inevitable margin scenario is playing out	<p>The flipside of the brutal price erosion seen in the past few quarters would be that it amplifies the normalisation of a more realistic margin scenario than seen in 2016. Maintaining an EBIT margin of almost 40% for a commodity product is unrealistic in the long term. However, the rapid margin decline likely increases the probability that we are nearing a point where price pressure will start to subside.</p>
The current market situation is tough, which could incite consolidation	<p>With the market leader on the ropes, smaller competitors are also likely to struggle, which could start a wave of consolidation. Against that backdrop, we do not rule out that Fingerprint itself could be a target for companies such as Qualcomm/NXP, ST Electronics, Samsung, etc. Benchmarking its margins against its peers, we see scope for margin normalisation due to the recent underperformance, although margins likely will not return to previous highs. This has also been acknowledged by Fingerprint's management along with the announced plans to streamline the organisation. A new owner could likely fast-track this development, although it would eventually require consent from the chairman of the board, Johan Carlström, who is also the largest owner.</p>

# Risk factors

Below, we list the key risk factors for Fingerprint Cards. The purpose of this is not to provide a comprehensive picture of all risks that the company may face, but instead to highlight those that we find most relevant. The main risks we see relate to new industry standards, development speed, uncertainty of the potential in new market segments and the current financial position.

The biometric sensor market is going through a paradigm shift

## Technology risk and new industry standards

While fingerprint sensors are now used in above 60 % of all smartphones produced, the capacitive fingerprint sensor technology used by Fingerprint has been commoditised and the ASP has plummeted. The industry is also increasingly moving towards new standards, such as touchless recognition or in-display fingerprint sensors, and while Fingerprint has new technologies under development, the company has yet to implement them in a finished product. If Fingerprint does not meet its planned product roadmap, it risks losing market shares to competitors, such as Goodix and Synaptics, which have already successfully implemented and adapted versions of the new technology. Recent statements from the CEO as well as remarks made during the Q2 report indicate that Fingerprint has discontinued, or at least shifted focus from, its development of a 3D face recognition technology. The Q2 report also contained substantial writedowns in capitalised R&D, from one long-term and one more recent product development. While the company does not state it explicitly, we suggest that one of these probably refers to face recognition technology. While this might have been a necessary move to complete the cost-cutting programme, it also puts the company at risk of missing the target market if face recognition becomes the norm in future smartphones. That said, we suggest that this risk is lowered by the Q4 announcement that the company is working on improving its iris solution by adding 2D face recognition.

A few major OEMs account for the majority of Fingerprint's addressable markets, leading to volatility in revenues and development costs

## Customer concentration

In 2017, 98.8% of Fingerprint's revenue stemmed from its ten largest customers, and three out of the five largest smartphone manufacturers are Fingerprint's customers. This is primarily because almost all of the company's large OEM customers are in the highly concentrated smartphone market. If Fingerprint fails to compete on product offerings and prices for now and for future generations of sensors, it could lose customers to its competitors, and revenue is likely to take a considerable beating with every lost customer. The company recently reached its target to achieve 10% of revenues from segments other than smartphones. This alleviates the risks in the company, and we suggest that risks will diminish even further as the company improves its customer mix.

Some of Fingerprint's competitors have a more convincing history of innovation

## Development speed

The technology used for in-display fingerprint detection is not based on the same technology (capacitance-based fingerprint detection) that launched Fingerprint in the first place. The company does not have a legacy of revolutionising innovations in other areas. The development of in-display sensors presented during the November 2017 Technology Update promises cutting-edge technology in terms of ultrasound fingerprint detection and 3D face recognition. The first would, if presented soon, provide a sensor more advanced than anything currently found in the consumer market, but its development has been delayed. While Fingerprint spends a significant amount on R&D and has a large number of PhDs in its development force, the company is up against competitors with superior R&D muscle. The cost cuts and upcoming reductions in personnel could also slow the ongoing innovation process down and hamper the progress of future innovations. The risk is therefore that Fingerprint's end products will not be competitive enough to maintain the company's market share in high-end smartphones.

Since we expect a large portion of future revenues to come from smartcards, this risk is becoming less relevant. This is because the players that are openly competing with Fingerprint on that front are smaller companies with less R&D power and experience in the biometric mass markets. Fingerprint is likely going to be the technology leader in biometric smartcards when and if that market opens up and starts gaining volumes.

There is no consensus on how big the future biometric markets will become

**Size and growth of biometric sensor market**

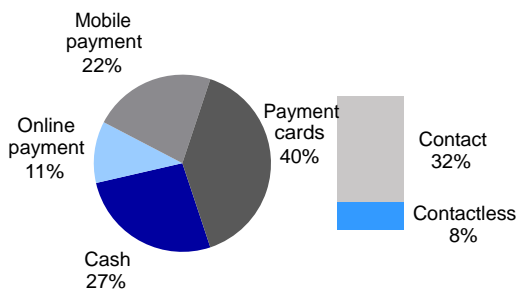
In an interview with, the newly elected chairman of the board, Johan Carlström, in 2018 claimed that Fingerprint Cards is the market leader in fingerprint detection and that smartcards and IoT will be a new, important market for the company's detectors. While the current technology that Fingerprint offers would likely be well suited for many products, and the T-shape module for smartcard fingerprint sensors is promising, there is no guarantee that the company will enjoy a strong, long-lasting first-mover advantage in these markets. As these are new markets, price discovery is still ongoing, and the initial ASPs and the rate of future price decreases are still uncertain. The addressable market size is based on sensitive assumptions relating to the attachment rate, and these ultimately depend on the payment industry's dynamics and the strategic choices of the major card producers.

There is a risk that the future payment norm will be mobile phone payments

**Future payment methods**

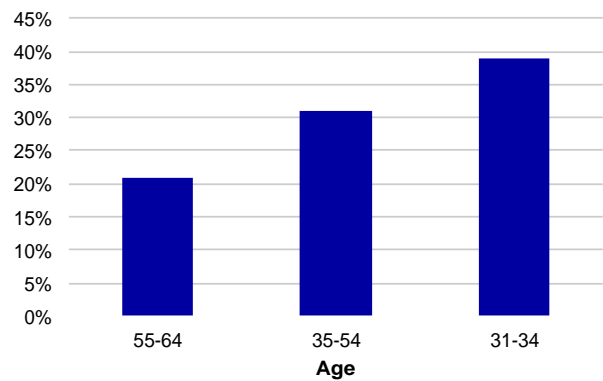
While using biometric identification as a security measure in payments would benefit consumers and be convenient to use, it is unclear that the future lies in smartcards. In China, mobile payments on smartphones are increasing in popularity, using services such as WeChat Pay and Alipay. Cards as a payment solution have been around for decades, but now that mobile devices are so prevalent, questions are raised regarding the benefits of smartcards as a payment medium compared with smartphones. There is a substantial risk that the smartcard business levels off before it catches on, and these risks should not be ignored.

**PAYMENT METHOD USAGE, 2017**



Source: Company data

**% WHO USED MOBILE PAYMENT IN THE LAST MONTH, 2017**



Source: GlobalWebIndex

The barriers to entry in biometric sensors are not as high as previously thought

**Loss of customers and further pressure on ASP**

Innovation, product mix and an increasing number of fingerprint sensor producers for smartphone implementation have burdened ASPs and proven that the barriers to entry in the biometric market are quite low. Prices could continue to decrease and customers could turn to other competitors in the current market. This customer churn will likely occur even if the company develops new innovations. Dual-sourcing is common in the smartphone industry, with OEMs diversifying their supplier portfolio for components.

# Reported numbers and forecasts

## INCOME STATEMENT

SEKm	2011	2012	2013	2014	2015	2016	2017	2018	2019E	2020E	2021E
<b>Net revenue</b>	<b>69</b>	<b>10</b>	<b>95</b>	<b>234</b>	<b>2,901</b>	<b>6,638</b>	<b>2,966</b>	<b>1,535</b>	<b>1,458</b>	<b>1,799</b>	<b>1,917</b>
Revenue growth	12.6%	-85.0%	828.4%	144.9%	n.m.	128.9%	-55.3%	-48.2%	-5.0%	23.4%	6.5%
of which organic	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
of which FX	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
EBITDA	8	-28	-21	-72	939	2,662	234	-756	129	274	324
Depreciation and impairments PPE	-1	-1	-2	0	-6	-8	-14	-16	-16	-16	-16
EBITA	7	-29	-23	-72	933	2,654	221	-772	113	258	308
Amortisation and impairments	-4	-9	-11	-74	-17	-41	-66	0	-80	-80	-80
EBIT	3	-39	-34	-145	916	2,613	155	-772	33	178	228
of which associates	0	0	0	0	0	0	0	0	0	0	0
Associates excluded from EBIT	0	0	0	0	0	0	0	0	0	0	0
Net financials	1	1	1	2	0	35	-13	-25	-15	0	0
Changes in value, net	0	0	0	0	0	0	0	0	0	0	0
<b>Pre-tax profit</b>	<b>3</b>	<b>-38</b>	<b>-33</b>	<b>-144</b>	<b>915</b>	<b>2,648</b>	<b>142</b>	<b>-797</b>	<b>18</b>	<b>178</b>	<b>228</b>
Reported taxes	0	0	0	-1	-112	-579	-22	166	-4	-39	-50
Net profit from continued operations	3	-38	-33	-144	804	2,069	120	-631	14	139	178
Discontinued operations	0	0	0	0	0	0	0	0	0	0	0
Minority interests	0	0	0	0	0	0	0	0	0	0	0
Net profit to equity	3	-38	-33	-144	804	2,069	120	-631	14	139	178
<b>EPS</b>	<b>0.08</b>	<b>-0.83</b>	<b>-0.59</b>	<b>-2.32</b>	<b>12.50</b>	<b>6.61</b>	<b>0.38</b>	<b>-2.01</b>	<b>0.04</b>	<b>0.44</b>	<b>0.57</b>
DPS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
of which ordinary	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
of which extraordinary	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

## Profit margin in percent

EBITDA	11.1%	-271.4%	-22.1%	-30.7%	32.4%	40.1%	7.9%	-49.2%	8.8%	15.2%	16.9%
EBITA	9.8%	-284.4%	-24.2%	-30.7%	32.1%	40.0%	7.4%	-50.3%	7.7%	14.4%	16.1%
<b>EBIT</b>	<b>3.9%</b>	<b>-376.6%</b>	<b>-35.3%</b>	<b>-62.2%</b>	<b>31.6%</b>	<b>39.4%</b>	<b>5.2%</b>	<b>-50.3%</b>	<b>2.3%</b>	<b>9.9%</b>	<b>11.9%</b>

## Adjusted earnings

EBITDA (adj)	8	-28	-21	-72	939	2,662	234	-756	129	274	324
EBITA (adj)	7	-29	-23	-72	933	2,654	221	-772	113	258	308
EBIT (adj)	3	-39	-34	-145	916	2,613	155	-772	33	178	228
<b>EPS (adj)</b>	<b>0.08</b>	<b>-0.83</b>	<b>-0.59</b>	<b>-2.32</b>	<b>12.50</b>	<b>6.61</b>	<b>0.38</b>	<b>-2.01</b>	<b>0.04</b>	<b>0.44</b>	<b>0.57</b>

## Adjusted profit margins in percent

EBITDA (adj)	11.1%	-271.4%	-22.1%	-30.7%	32.4%	40.1%	7.9%	-49.2%	8.8%	15.2%	16.9%
EBITA (adj)	9.8%	-284.4%	-24.2%	-30.7%	32.1%	40.0%	7.4%	-50.3%	7.7%	14.4%	16.1%
EBIT (adj)	3.9%	-376.6%	-35.3%	-62.2%	31.6%	39.4%	5.2%	-50.3%	2.3%	9.9%	11.9%

## Performance metrics

CAGR last 5 years											
Net revenue	44.0%	-13.1%	28.3%	43.4%	116.5%	149.5%	210.5%	74.3%	44.2%	-9.1%	-22.0%
EBITDA	n.m.	n.m.	n.m.	n.m.	159.4%	222.4%	n.m.	n.m.	n.m.	-21.8%	-34.4%
EBIT	n.m.	n.m.	n.m.	n.m.	256.0%	295.5%	n.m.	n.m.	n.m.	-27.9%	-38.6%
EPS	n.m.	n.m.	n.m.	n.m.	204.7%	143.9%	n.m.	n.m.	n.m.	-48.7%	-38.8%
DPS	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.
Average last 5 years											
Average EBIT margin	-36.9%	-40.4%	-33.9%	-45.5%	21.2%	33.5%	27.3%	19.4%	19.0%	15.3%	-1.8%
Average EBITDA margin	-24.2%	-23.1%	-17.5%	-22.4%	24.9%	35.2%	29.2%	21.1%	20.7%	17.7%	2.1%

## VALUATION RATIOS - ADJUSTED EARNINGS

SEKm	2011	2012	2013	2014	2015	2016	2017	2018	2019E	2020E	2021E
P/E (adj)	24.3	n.m.	n.m.	n.m.	9.5	9.5	41.3	n.m.	n.m.	40.2	31.4
EV/EBITDA (adj)	n.m.	2.2	10.0	1.4	n.m.	7.0	19.2	n.m.	38.3	17.4	14.0
EV/EBITA (adj)	n.m.	2.1	9.2	1.4	n.m.	7.0	20.4	n.m.	43.7	18.4	14.8
EV/EBIT (adj)	n.m.	1.6	6.3	0.7	n.m.	7.1	29.2	n.m.	150.2	26.7	19.9

## VALUATION RATIOS - REPORTED EARNINGS

SEKm	2011	2012	2013	2014	2015	2016	2017	2018	2019E	2020E	2021E
P/E	24.3	n.m.	n.m.	n.m.	9.5	9.5	41.3	n.m.	n.m.	40.2	31.4
EV/Sales	-0.34	-5.90	-2.22	-0.44	-0.36	2.79	1.52	1.72	3.39	2.65	2.37
EV/EBITDA	n.m.	2.2	10.0	1.4	n.m.	7.0	19.2	n.m.	38.3	17.4	14.0
EV/EBITA	n.m.	2.1	9.2	1.4	n.m.	7.0	20.4	n.m.	43.7	18.4	14.8
EV/EBIT	n.m.	1.6	6.3	0.7	n.m.	7.1	29.2	n.m.	150.2	26.7	19.9
Dividend yield (ord.)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
FCF yield	n.m.	n.m.	n.m.	n.m.	n.m.	5.4%	3.5%	3.5%	2.0%	3.1%	3.8%
Payout ratio	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Source: Company data and Nordea estimates

**BALANCE SHEET**

SEKm	2011	2012	2013	2014	2015	2016	2017	2018	2019E	2020E	2021E
Intangible assets	28	29	54	70	50	71	1,188	1,103	1,063	1,023	983
of which R&D	0	0	0	0	0	0	0	0	0	0	0
of which other intangibles	28	29	54	70	50	71	1,188	1,103	1,063	1,023	983
of which goodwill	0	0	0	0	0	0	0	0	0	0	0
Tangible assets	4	5	5	19	21	29	35	30	30	30	30
Shares associates	0	0	0	0	0	0	0	0	0	0	0
Interest bearing assets	0	0	0	0	0	0	0	0	0	0	0
Deferred tax assets	0	0	0	0	0	0	0	0	0	0	0
Other non-IB non-current assets	0	0	0	0	0	0	0	0	0	0	0
Other non-current assets	1	0	0	n.a.	1	0	0	28	0	0	0
Total non-current assets	33	34	60	89	71	101	1,223	1,161	1,093	1,053	1,013
Inventory	4	11	20	99	153	673	646	348	306	360	383
Accounts receivable	53	6	31	116	618	1,132	438	233	221	273	291
Other current assets	3	3	8	20	37	435	313	38	36	44	47
Cash and bank	23	61	212	102	1,031	1,162	920	541	652	827	1,038
Total current assets	83	81	271	336	1,839	3,402	2,317	1,159	1,215	1,504	1,759
Assets held for sale	0	0	0	0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
<b>Total assets</b>	<b>117</b>	<b>115</b>	<b>330</b>	<b>425</b>	<b>1,910</b>	<b>3,503</b>	<b>3,540</b>	<b>2,319</b>	<b>2,308</b>	<b>2,556</b>	<b>2,772</b>
Shareholders equity	106	102	288	301	1,147	2,226	2,331	1,776	1,789	1,928	2,107
Of which preferred stocks	0	0	0	0	0	0	0	0	0	0	0
Of which equity part of hybrid debt	0	0	0	0	0	0	0	0	0	0	0
Minority interest	0	0	0	0	0	0	0	0	0	0	0
Total Equity	106	102	288	301	1,147	2,226	2,331	1,776	1,789	1,928	2,107
Deferred tax	0	0	0	0	0	136	190	52	52	52	52
Long term interest bearing debt	0	0	0	0	0	0	222	0	0	0	0
Pension provisions	0	0	0	0	0	0	0	0	0	0	0
Other long-term provisions	1	0	0	0	0	0	0	0	0	0	0
Other long-term liabilities	0	1	0	0	0	0	0	0	0	0	0
Convertible debt	0	0	0	0	0	0	0	0	0	0	0
Shareholder debt	0	0	0	0	0	0	0	0	0	0	0
Hybrid debt	0	0	0	0	0	0	0	0	0	0	0
Total non-current liabilities	1	1	0	0	0	136	412	52	52	52	52
Short-term provisions	0	0	15	22	101	258	190	1	1	1	1
Accounts payable	3	5	26	66	549	822	268	256	243	300	320
Other current liabilities	6	8	2	36	114	61	108	234	222	275	293
Short term interest bearing debt	0	0	0	0	0	0	243	0	0	0	0
Total current liabilities	9	13	42	123	763	1,141	809	492	467	576	614
Liabilities for assets held for sale	0	0	0	0	0	0	0	0	0	0	0
<b>Total liabilities and equity</b>	<b>117</b>	<b>115</b>	<b>330</b>	<b>425</b>	<b>1,910</b>	<b>3,503</b>	<b>3,552</b>	<b>2,319</b>	<b>2,308</b>	<b>2,556</b>	<b>2,772</b>
<b>Balance sheet and debt metrics</b>											
Net debt	-23	-61	-212	-102	-1,031	-1,162	-455	-541	-652	-827	-1,038
Working capital	51	8	32	132	145	1,358	1,021	128	97	102	109
Invested capital	84	42	91	221	217	1,458	2,244	1,288	1,190	1,155	1,122
Capital employed	107	103	288	301	1,147	2,362	2,731	1,828	1,841	1,980	2,159
ROE	3.6%	-36.7%	-16.7%	-49.0%	n.m.	n.m.	5.3%	-30.7%	0.8%	7.5%	8.8%
ROIC	3.2%	-47.8%	-39.4%	-72.6%	n.m.	n.m.	6.5%	-34.1%	2.1%	11.9%	20.1%
ROCE	2.5%	-37.7%	-11.7%	-48.2%	79.8%	n.m.	5.7%	-42.2%	1.8%	9.0%	10.6%
Net debt/EBITDA	-3.0	2.2	10.0	1.4	-1.1	-0.4	-1.9	0.7	-5.1	-3.0	-3.2
Interest coverage	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.
Equity ratio	91.0%	88.4%	87.0%	70.9%	60.0%	63.5%	65.6%	76.6%	77.5%	75.4%	76.0%
Net gearing	-21.6%	-59.5%	-73.7%	-33.8%	-89.9%	-52.2%	-19.5%	-30.4%	-36.4%	-42.9%	-49.3%

Source: Company data and Nordea estimates

**CASH FLOW STATEMENT**

SEKm	2011	2012	2013	2014	2015	2016	2017	2018	2019E	2020E	2021E
<b>EBITDA (adj) for associates</b>	<b>8</b>	<b>-28</b>	<b>-21</b>	<b>-72</b>	<b>939</b>	<b>2,662</b>	<b>234</b>	<b>-756</b>	<b>129</b>	<b>274</b>	<b>324</b>
Paid taxes	0	0	0	0	-2	-498	-345	232	-4	-39	-50
Net financials	1	1	1	0	0	0	0	-25	-15	0	0
Change in provisions	1	-1	15	6	80	157	-68	-189	0	0	0
Change in other LT non-IB	-1	2	0	0	-1	1	0	-28	28	0	0
Cash flow to/from associates	0	0	0	0	0	0	0	0	0	0	0
Dividends paid to minorities	0	0	0	0	0	0	0	0	0	0	0
Other adj to reconcile to cash flow	1	-2	-15	-20	-64	-192	112	796	0	0	0
<b>Funds from operations (FFO)</b>	<b>9</b>	<b>-29</b>	<b>-20</b>	<b>-86</b>	<b>951</b>	<b>2,130</b>	<b>-68</b>	<b>30</b>	<b>138</b>	<b>235</b>	<b>274</b>
Change in NWC	-31	43	-11	-88	-43	-1,000	444	244	30	-5	-7
<b>Cash flow from operations (CFO)</b>	<b>-21</b>	<b>14</b>	<b>-31</b>	<b>-174</b>	<b>908</b>	<b>1,130</b>	<b>377</b>	<b>275</b>	<b>168</b>	<b>230</b>	<b>268</b>
Capital expenditure	-11	-12	-38	-76	-17	-63	-204	-163	-56	-56	-56
<b>Free cash flow before A&amp;D</b>	<b>-32</b>	<b>2</b>	<b>-69</b>	<b>-250</b>	<b>891</b>	<b>1,067</b>	<b>173</b>	<b>112</b>	<b>112</b>	<b>174</b>	<b>212</b>
Proceeds from sale of assets	0	0	0	0	0	0	0	0	0	0	0
Acquisitions	0	0	0	-15	0	0	0	0	0	0	0
Free cash flow	-32	2	-69	-265	891	1,067	173	112	112	174	212
Dividends paid	0	0	0	0	0	0	0	0	0	0	0
Equity issues / buybacks	25	34	221	155	48	-1,000	0	0	0	0	0
Net change in debt	0	1	0	0	0	0	0	-508	0	0	0
Other financing adjustments	-2	1	0	0	0	0	0	0	-1	0	0
Other non-cash adjustments	1	0	0	0	-9	64	-415	16	0	0	0
Change in cash	-8	38	151	-110	929	131	-242	-380	112	174	212

**Cash flow metrics**

Capex/D&A	n.m.	n.m.	n.m.	n.m.	74.5%	n.m.	n.m.	n.m.	58.3%	58.3%	n.m.
Capex/Sales	-15.6%	n.m.	-40.2%	-32.3%	-0.6%	-0.9%	-6.9%	-10.6%	-3.8%	-3.1%	-2.9%

**Key information**

Share price year end (/current)	2	2	11	7	118	63	16	10	18	18	18
Market cap.	0	0	0	0	0	19,678	4,964	3,179	5,589	5,589	5,589
Enterprise value	-23	-61	-212	-102	-1,031	18,516	4,509	2,639	4,936	4,762	4,550
Diluted no. of shares, year-end (m)	0.0	0.0	0.0	0.0	0.0	313.1	314.0	314.0	314.0	314.0	314.0

Source: Company data and Nordea estimates

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