EQUITY RESEARCH – SPONSORED RESEARCH
Research report prepared by DNB Markets, a division of DNB Bank ASA
Information Technology
Initiating coverage
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9 April 2018

IAR SYSTEMS

Embedded growth story

Solid market fundamentals and a market-leading position have created solid foundations for sales growth in IAR Systems' legacy business, in our view, while the scalability of its business model should allow for further margin gains. Having entered key strategic partnerships in the past year, we believe the company is entering its next phase, setting the scene to reignite the growth story. We initiate coverage with a fair value of SEK240–300.

Attractively positioned to benefit from digitalisation trends. As the world-leading provider of software tools that help developers to program processors that control digital products, we believe IAR Systems is ready to leverage on its position and enter its next phase. We believe this will be when the market stops seeing it as a compiler supplier and instead starts to view it as the go-to tools partner for global players (such as Amazon), as they position themselves ahead of the Internet of Things.

Secure Thingz could mark a paradigm shift. Following the acquisition of Secure Thingz earlier this year, IAR Systems is the frontrunner in secure embedded systems. While it is still early days for this market as there are no real competitors, we believe it could mark a paradigm shift for IAR Systems, if it can leverage on its head-start and capture considerable market share.

Financial targets. IAR Systems has three financial targets: 10–15% annual organic growth, an EBIT margin of >25% over a business cycle (it was 31.1% in 2017), and a 30–50% payout policy. Our organic growth estimates are below the company's target, but our profitability and dividend estimates are above throughout our forecast period.

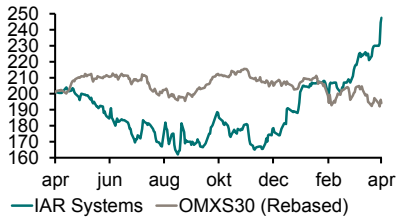
Forecasts. We forecast a 2017–2020 sales CAGR of 9.6% and EBIT CAGR of 14.5% based on a strong market outlook underpinned by: 1) an increase in the number (and complexity) of embedded systems; 2) growing demand for reliable and advanced software tools that offer faster time-to-market and complete development platforms; 3) the automotive opportunity, as cars become mobile computing platforms; and 4) royalties from Renesas Electronics. Moreover, we see additional prospects and untapped potential in security solutions for embedded systems.

Initiating coverage with a SEK240–300 fair value. We find the stock's valuation attractive despite trading at historically elevated levels. As IAR Systems proves its credentials on its growth trajectory, we expect a revaluation up towards its embedded systems peers. Our estimates corresponds to a 2019e P/E of 33.9x, EV/EBIT of 24.7x, and EV/Sales of 8.0x.

Year-end Dec	2014	2015	2016	2017	2018e	2019e	2020e
Revenue (SEKm)	256	312	328	345	377	414	454
EBIT adj (SEKm)	53	83	101	107	121	135	161
PTP (SEKm)	54	83	100	106	120	133	159
EPS rep (SEK)	3.34	5.02	6.18	6.33	6.32	7.32	8.77
EPS adj (SEK)	3.34	5.02	6.18	6.33	6.32	7.32	8.77
DPS (SEK)	0.00	5.00	7.00	5.00	5.00	5.50	6.00
Revenue growth (%)	8.3	21.9	5.4	5.1	9.1	10.0	9.6
EPS growth adj (%)	59.2	50.2	23.0	2.6	-0.2	15.8	19.8
P/E adj (x)	22.4	29.9	33.4	29.8	39.1	33.8	28.2
P/Book (x)	3.27	6.51	9.31	8.22	6.97	6.63	6.17
ROE (%)	14.5	21.9	27.3	28.1	23.5	20.1	22.6
ROCE (%)	18.1	28.5	34.9	36.7	28.8	24.5	27.8
Dividend yield (%)	0.0	3.3	3.4	2.6	2.0	2.2	2.4

Source: Company (historical figures), DNB Markets (estimates)

IARB versus OMXS30 (12m)



Source: Factset

SUMMARY

Share price (SEK)	248
Tickers	IARB SS, IARb.ST

CAPITAL STRUCTURE

No. of shares fully dil. (m)	13.6
NIBD adj end-2018e (SEKm)	-31

SHARE PRICE PERFORMANCE

Abs. 1/3/12m (%)	15/23/23
Rel. 1/3/12m (%)	18/29/26
High/Low 12m (SEK)	248/162

Source: Company , DNB Markets (estimates)

NEXT EVENT

Q1 2018	25/04/2018

This report has been commissioned and paid for by the company, and is deemed to constitute an acceptable minor non-monetary benefit as defined in MiFID II

DNB Markets acted as Sole Lead Manager and Bookrunner in the recent directed issue in IAR Systems Group AB

ANALYSTS
Joachim Gunell

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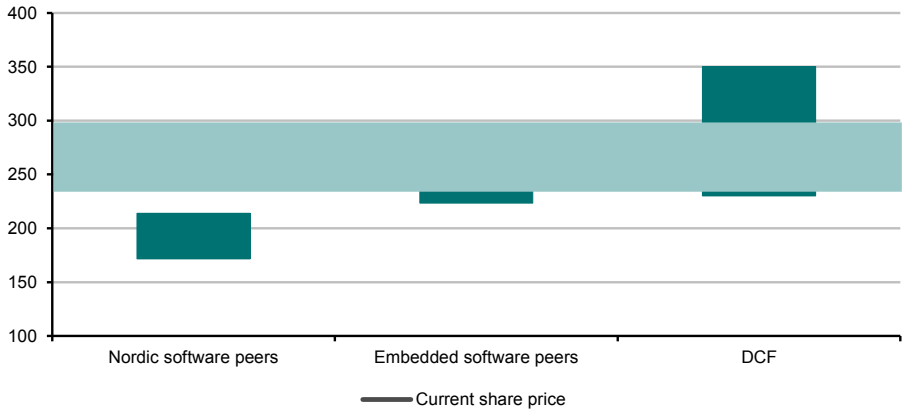
Overview

Valuation (SEK)



Source: DNB Markets

Valuation methodology

- Blending our total peer group of Nordic software and embedded software peers with DCF suggests a fair value of SEK240–300.
- Using just our embedded systems peers implies a fair value of SEK230–280. We believe these peers (rather than Nordic software peers) better reflect IAR Systems' operating environment, business model, and growth prospects.
- Our estimates corresponds to a 2019e P/E of 33.9x, EV/EBIT of 24.7x, and EV/Sales of 8.0x.

Source: DNB Markets

Downside risks to our fair value

- Failure to resurrect the growth story. If investors lose trust in its ability to reinstate growth it could trigger a devaluation of the shares, as in 2017.
- Disappointing disclosures regarding key strategic partnerships in terms of when they will materialise and fee structure. For instance, the Renesas Synergy agreement has yet to show itself in IAR Systems' sales.
- IAR Systems is considerably sensitive to a strengthening of the SEK (particularly against the USD, EUR and JPY).

Source: DNB Markets

DNB Markets estimates

- We believe IAR 3.0 will be when the market stops seeing IAR Systems as a compiler supplier and instead starts to view it as the go-to tools partner for global players such as Amazon and Renesas Electronics as they position their embedded systems ahead of the Internet of Things.
- Consensus has yet to emerge on IAR Systems' investment case; however, we particularly like the company's market opportunity, operating profile, financial outlook and valuation.

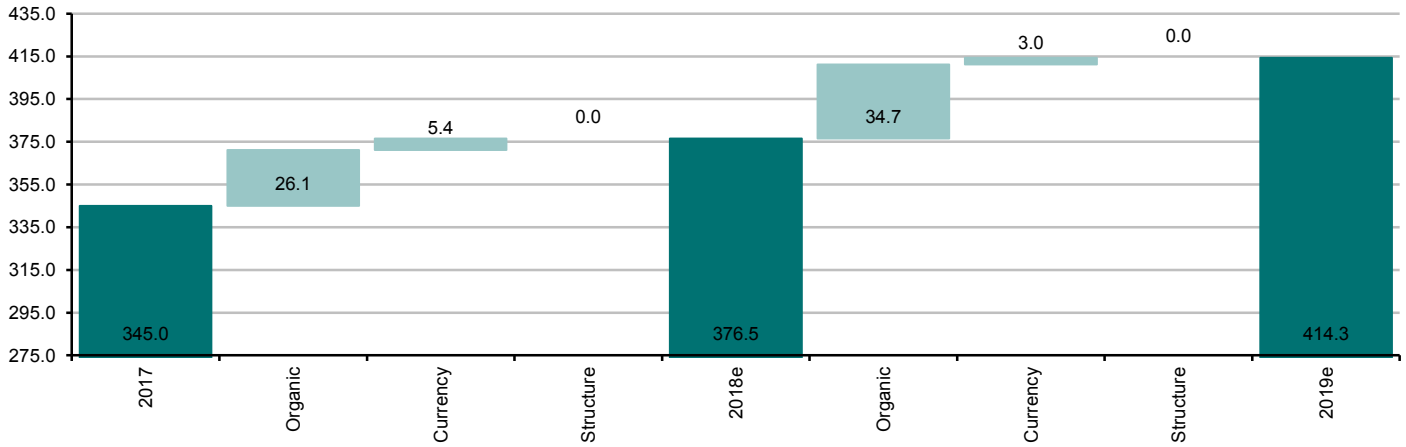
Source: DNB Markets

Upside risks to our fair value

- The company over-delivering on its financial targets (particularly in terms of organic growth of 10–15%)
- IAR Systems' new security offering gaining faster penetration than we assume by leveraging on its head-start.
- Value-enhancing acquisitions to be integrated in its product offering or new strategic partnerships.
- Faster than expected revaluation of the stock towards embedded software peer valuations.

Source: DNB Markets

Sales bridge 2017–2019e (SEKm)



Source: DNB Markets (forecasts), company (historical data)

Contents

Summary of positives

World-leading provider of software development tools and services

Its software tools and services enable the development of digital products…

…in end-markets underpinned by growing demand for digital technology

Sweden-based IAR Systems is a world-leading provider of software tools and services for embedded systems (a chip containing embedded software) that enable the development of digital products for 46,000+ customers in end-markets underpinned by growing demand for digital technology. We believe IAR Systems has a resilient business model selling flexible right-to-use licences to access its wholly owned software tool-chain (the IAR Embedded Workbench), which enables close customer relationships, high customer retention, and consistent revenue streams complemented by a royalty-based agreement with world-leading processor vendor Renesas Electronics. The March 2018 acquisition of Secure Thingz (the leading provider of advanced security solutions that help customers to take control of digital products from day one) has made IAR Systems the frontrunner ahead of the paradigm shift associated with security solutions for embedded systems in the Internet of Things (IoT).

Embedded resilience in a sticky business

IAR Systems owns the market for software development tools with c50% global market share

Key competitive strengths:
1) unique and complete tool-chain
2) independence
3) high-quality products
4) frontrunner in security solutions
5) management's ability to achieve its long-term potential

We consider IAR Systems' key competitive advantage to be its proprietary technology platform, the IAR Embedded Workbench, which holds a ~50% global market share, as: 1) it is a unique line-up of a complete tool-chain for product developers; 2) being independent, IAR Systems supports a wide range of design architecture, meaning customers can choose the programming environment and tools according to their own needs, regardless of processor or project, which avoids locking customers in to one technical platform; 3) superior quality as its commercial customers cannot compromise on tools' code performance, reliability, user-friendliness, or time-to-market using inferior technologies such as open-source alternatives; 4) it is now a leading player in embedded systems security, and should be able to leverage its head-start and unique technology to maximise the market potential; and 5) a scaled-up management team with the ability to execute the growth potential in the business, in our view.

IAR 3.0

Setting the scene for the growth story

IAR Systems has gone through various phases since 2010, having: 1) streamlined itself towards proprietary software, creating a more specialised company; and 2) shifted its project-based business model to scalable licence sales, which has substantially improved margins. In our view, it is now heading into its third phase: the growth story. We believe that IAR 3.0 (our interpretation of IAR Systems' next phase) marks the shift from being a supplier of a compiler to become the go-to software tool partner for global players such as Amazon and Renesas Electronics as they position their embedded systems ahead of the Internet of Things (IoT).

Growing addressable market with the spread of digital technology

Numerous market drivers indicate a continuation of the solid industry growth

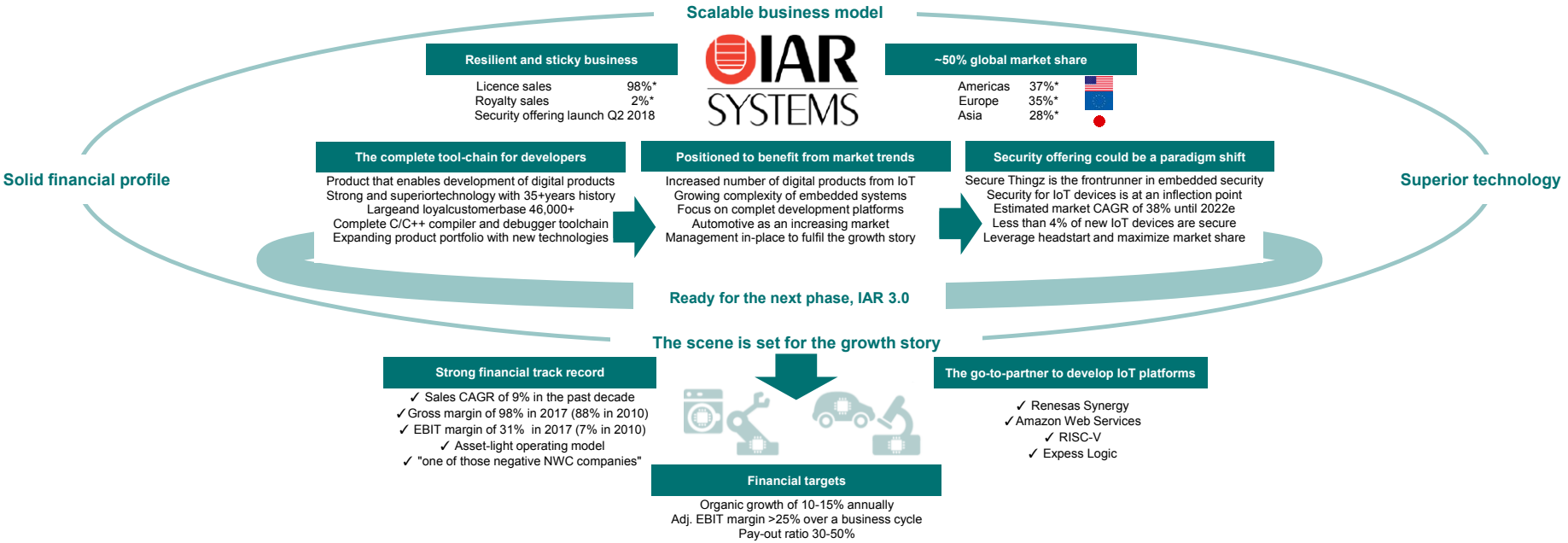
The spread of digital technology is driving the market for embedded systems. Thus, the market has numerous underlying drivers that all indicate a continuation of the solid industry growth of the past decade. Global Market Insights estimates a market CAGR of 7% until 2023e, and we believe the factors that should affect growth for IAR Systems are likely to be: 1) continued increase in the number (and complexity) of embedded systems driven by IoT; 2) demand for reliable and advanced software tools that offer faster time-to-market and a complete development platform; 3) the automotive opportunity as cars become mobile computing platforms; 4) market consolidation and players becoming too dominant; and 5) untapped potential in security solutions for embedded systems.

Security for embedded systems could mark a paradigm shift for IAR Systems

Untapped potential in security offering

Following the acquisition of Secure Thingz, IAR Systems is now the frontrunner in offering secure embedded systems. We believe IAR Systems identified Secure Thingz as a takeover candidate before the market had valued its demand growth opportunity. The security market for embedded systems is in its inception phase but we expect it to grow rapidly through 2022e as the share of secure new embedded products is set to grow from 4% today to almost 20% by 2022e, according to ABI Research. There are no real competitors in this market yet, and if IAR Systems were to capture considerable market share, we believe it could be a paradigm shift for the company. However, to be prudent, we have included minimal sales from its security offering in our estimates, preferring to see sales materialise.

Figure 1: IAR Systems' in one picture



Source: Company (underlying data), DNB Markets (compilation)
Note: * Percentage of sales 2017

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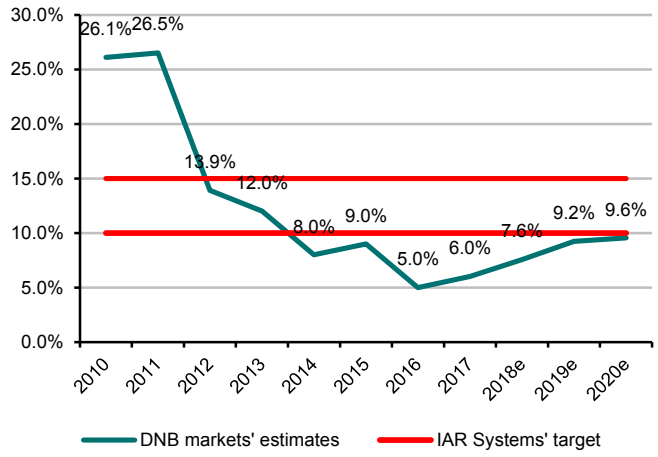
We forecast 2017–2020e sales and EBIT CAGRs of 9.6% and 14.5%

We forecast a 2017–2020e sales CAGR of 8.9%, driven by an organic sales CAGR of 6.5% for its legacy licensing business (98% of 2017 sales) as the aforementioned market drivers should translate into more processors and lines of code, driving demand for software development tools and possibly programmers (user keys) for IAR Systems, as well as a full user-friendly total solution enabling customers to re-use large amounts of code. In addition, increased penetration from existing and new technologies in the IAR Embedded Workbench should drive add-on sales. We estimate that revenues stemming from the royalty-based agreement with Renesas Electronics (2%) should contribute to organic sales CAGR of 2.7% for IAR Systems until 2020e. However, as the dynamics of this agreement have not been disclosed, we take a conservative approach for estimating the revenue impact.

Market drivers should create more processors and lines of code, driving demand for software development tools, and a user-friendly total solution enabling customers to re-use code

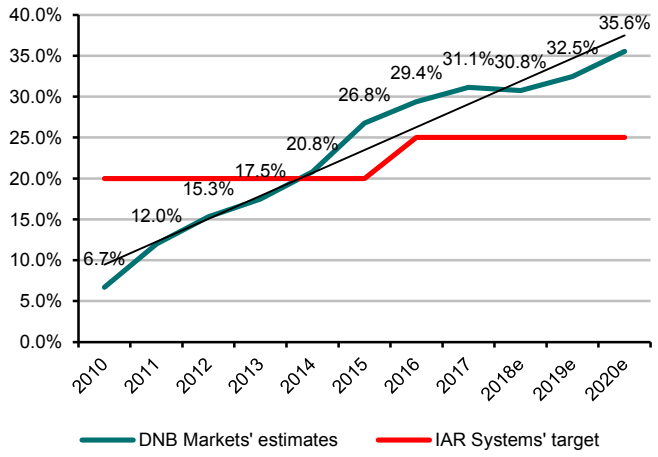
We forecast a 2017–2020 EBIT CAGR of 14.2%, implying a margin gain from 31.1% in 2017 to 35.6% in 2020e, driven by: 1) solid organic volume growth; and 2) operational leverage averaging 70% (hurt in 2018 by the integration of Secure Thingz) in 2019–2020e as we believe IAR Systems should continue to benefit from economies of scale due to its large fixed cost base.

Figure 2: Organic sales growth (2010-2020e)



Source: DNB Markets (forecasts), company (historical data)

Figure 3: Adj. EBIT margin



Source: DNB Markets (forecasts), company (historical data)

Financial targets

IAR Systems has three financial targets: 1) average organic growth of 10–15% annually; 2) an adj. EBIT margin in excess of 25% over a business cycle; and 3) a dividend payout of 30–50% of annual net income. Our estimates for organic growth remain below the target, but on profitability and the dividend policy we are above IAR Systems throughout our forecast period.

Figure 4: IAR Systems's financial targets – reported and DNB Markets' estimates

	Reported fiscal years						DNB Markets' estimates		
	2013	2014	2015	2016	2017	IAR target	2018e	2019e	2020e
Organic growth	12.0%	8.0%	9.0%	5.0%	6.0%	10-15%	7.6%	9.2%	9.6%
EBIT margin	15.8%	20.8%	26.8%	30.6%	31.1%	>25%	30.8%	32.5%	35.6%
Pay-out ratio	88.0%	149.3%	99.7%	113.3%	79.0%	30-50%	75%	75%	68%

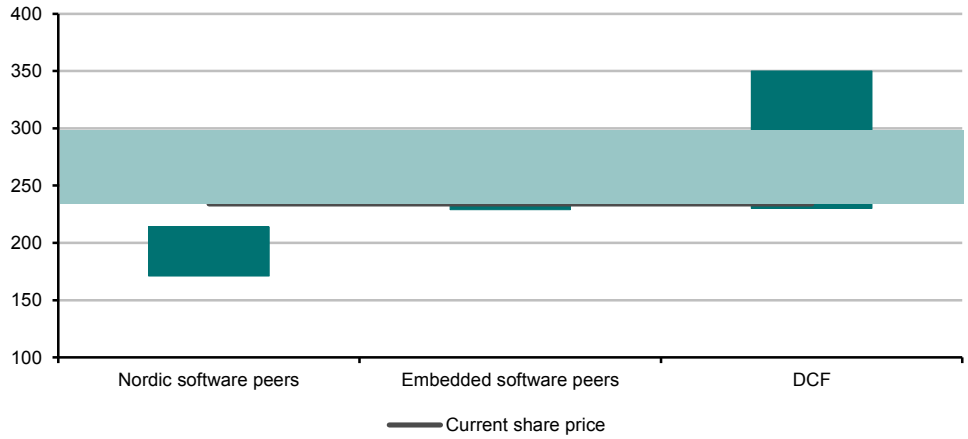
Source: DNB Markets (forecasts), company (historical data and targets)

We calculate a fair value of SEK240–300

Based on our group of Nordic software peers (7), embedded software peers (5), as well as our DCF model, we calculate a fair value of SEK240–300. We believe the market is valuing IAR Systems relative to Nordic Software peers, whereas embedded software peers better reflect its operating environment, business model, and growth prospects. On current share price, our estimates suggest a 2019e P/E of 33.9x, EV/EBIT of 24.7x, and EV/Sales of 8.0x, while our fair value suggests share price potential of-3% to 22%.

Fair value of SEK240–300 suggests potential of -3% to 22%

Figure 5: Valuation summary (SEK/share)



Source: DNB Markets

Summary of negatives

The key risks that could affect our fair value are: 1) IAR Systems' inability to resurrect the growth story, e.g. if it failed to capture the underlying market growth, or if there was prolonged market consolidation (causing market uncertainty) or delays in key strategic initiatives; 2) market entry from large and well-resourced players that until now have overlooked the potential in software tools for embedded systems; and 3) FX headwinds, as the company is rather sensitive to currency fluctuations to the SEK as it does not hedge its currency flows (with >98% of sales from markets outside Sweden but 58% of its cost base in SEK).

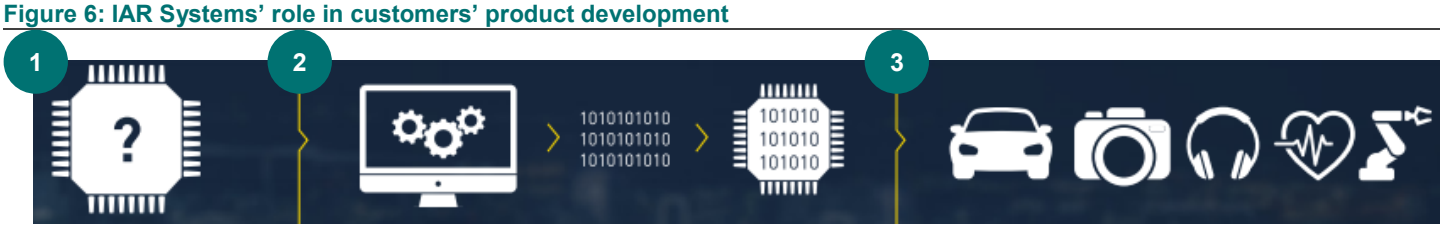
- **Failure to resurrect the growth story.** Having reported average local currency growth of 20% in 2010–2013, 9% in 2014–2015 and 6% in 2016–2017, we believe the key risk to the valuation is a failure to resurrect the organic growth story. While we have identified numerous market drivers that should fuel organic growth in our forecast period, an inability to capture these trends, delays in when the factors materialise, or disappointing disclosures regarding the new strategic alliances in terms of royalty fees, licensing structures etc. could raise questions about the operations and thus the valuation.
- **FX headwinds.** With >98% of sales from markets outside Sweden, while the vast majority of the fixed cost base is denominated in SEK (we estimate ~58%), IAR Systems is rather sensitive to currency fluctuations to the SEK. If the SEK were to strengthen by 10% against its most important currencies (USD, EUR, JPY) as well as GBP and KRW in 2018, we estimate a ~10% FX headwind on sales and a ~30% headwind on 2018 EBIT.
- **Intensified competitive landscape.** While the company holds leading positions across most processor types, it still faces a highly competitive environment, particularly from the independent supplier Green Hills Software and Arm's development tool Kiel. If the competitiveness was to intensify or market growth rates were to abate, there could be pressure on the pricing of software licences (from those not giving it away free) in efforts to recapture growth or gain market share. While we believe that the commercial viability of open source players is a limited risk for IAR Systems' offering today, any success of these alternatives could result in reduced licensing revenues for IAR Systems.
- **Continued market consolidation.** The ongoing consolidation trend among processor vendors could last than IAR Systems expects. If this continues to create market uncertainty and disrupt IAR Systems' partner network, it could hamper its growth prospects. Moreover, if the acquisitions of embedded software players continue it could cap IAR Systems' ability to integrate new technologies to its product offering. If it fails to acquire new technologies or create strategic alliances to integrate into IAR Systems' offering could impede its ability to address new market trends that should contribute to growth.
- **Large player entering the market.** While we believe the barriers to entry are considerable, we believe the attractiveness of this market has been somewhat overlooked by industry giants as they have often acquired development tools companies and given away the products 'free' to reduce costs. As many players in the semiconductor industry (particularly processor vendors) but especially global giants such as Google and Amazon are well resourced, it could pose a threat if they were to consider increasing their presence in software development tools.
- **Limited supply of qualified personnel.** In an industry characterised by rapid technological development, it is vital for IAR Systems to continually improve its product offering via innovation. A need for its technology and products to be market leading means it has to constantly retain qualified employees, particularly in the technological aspects of product development. Failure to respond quickly to technological developments via qualified personnel could negatively affect its operations.
- **Worsening economic conditions.** A deteriorating global economy would likely cause a downturn in the cyclical semiconductor industry and customers' end-markets, which could affect the number of new microprocessors, and consequently demand for software development tools that program the chips.

Business overview

Dating back to 1983, IAR Systems is an independent provider of software for the programming of microprocessors in embedded systems (the control function in digital products). Its leading software – the IAR Embedded Workbench – facilitates, quality-assures, and improves the time-to-market of programming instructions in processors so they can fulfil their function in the embedded system for developers of smart products. The customer base of 150,000+ programmers (users) is found mainly in end-markets underpinned by growing demand for digital technology and embedded systems, such as industrial automation, medical technology, telecommunication, consumer electronics, and the automotive industry.

World-leading provider of software for programming processors in embedded systems, which enable the development of digital products

Figure 6: IAR Systems' role in customers' product development



Before a processor can be used in a product, it needs to be programmed

Product developers use IAR Embedded Workbench to give the processor the correct instructions to control the finished product

Once the processor has been programmed and installed in the finished product, its ready to go to market

Source: Company

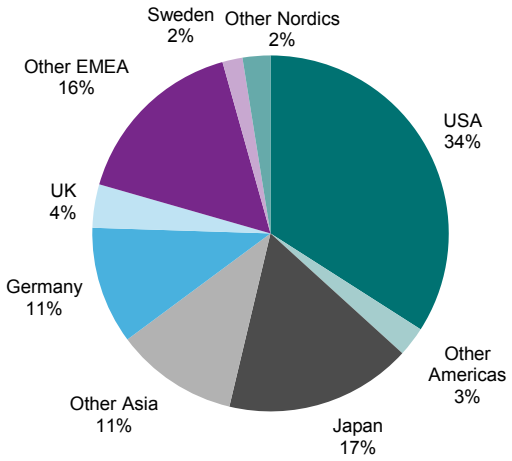
Headquartered in Uppsala (Sweden), the company holds a leading global market share of~50% with 95%+ of sales stemming from markets outside the Nordics and a market presence in 50+ countries and headcount of 163. With a history of adapting to meet customer demand, IAR Systems' business model is primarily licence-based, where customers pay for a flexible right-to-use licence to access the IAR Embedded Workbench®, giving it attractive and steady revenue streams (~30% recurring revenues). Also, to position itself more towards the Internet of Things (IoT), the company complemented its licence-based model in 2016 with an exclusive royalty-based agreement with world-leading process vendor Renesas Electronics.

- **Licenced-based revenue (98% of 2017 sales)** based entirely on the number of licence users (perpetual software keys) of the IAR Embedded Workbench sold when a developer programs a product. The licence cost is ~SEK30,000 (upfront) while the customer can add a support and update agreement for an annual cost of 20% of the licence price.
- **Royalty-based revenue (2%)** based on the number of microprocessors produced in Renesas Synergy series. Unlike the licence-based model, IAR Systems receives revenue throughout the entire production period.

50% global market share with 98% licence-based revenues, which are flexible for customers and leverage the number of programmers using its licence…

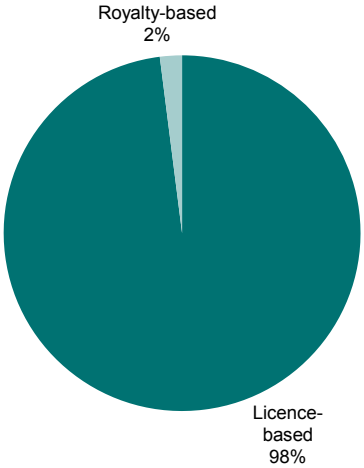
…complemented by royalty-based revenue that leverages the number of chips used in customers' production, which falls straight through to EBIT

Figure 7: Geographical sales split (2017)



Source: Company

Figure 8: Sales by business model (2017)



Source: Company

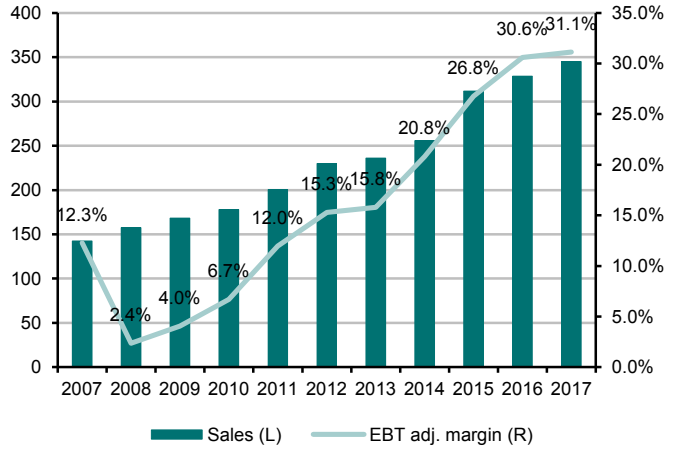
IAR Systems was acquired by IT conglomerate Nocom in 2005. However, by 2010 Nocom (known as Intoi by then) wanted to focus more on proprietary software and create a more specialised company, so it kept only IAR Systems and took on that name.

From an IT conglomerate to a streamlined proprietary software provider….

With 2017 net sales of SEK345m, IAR Systems is 2.7x larger than the company acquired in 2005. While experiencing a sales CAGR of 9.2% over the past 10 years, it has been able to significantly boost its underlying profitability from an adj. EBIT margin of 12.3% in 2007 to 31.1% in 2017, which we attribute to: 1) the scalability of its high gross-margin standardised software; 2) more focus on proprietary products; and 3) increased cost efficiency (given the large fixed cost base where personnel costs comprise 46% of sales).

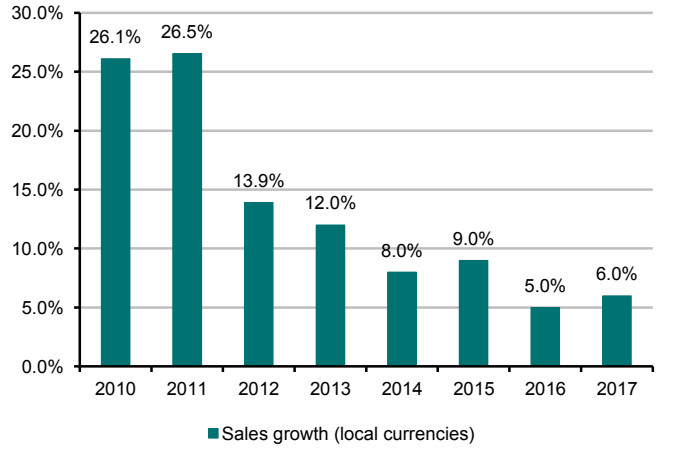
…with profitable growth, sales CAGR of 9% and adj. EBIT CAGR of 20% in the past 10 years

Figure 9: IAR Systems – sales (SEKm) and adj. EBIT margin



Source: Company

Figure 10: IAR Systems – sales growth local currencies



Source: Company

IAR Systems' key competitive advantage in our view is its flagship product, the IAR Embedded Workbench, which is a complete tool-chain for customers. Being independent, the software supports 12,000+ processors for embedded systems from the major process vendors with 8-, 16-, and 32-bit architecture, meaning customers can choose the programming environment and tools according to their own needs regardless of processor or project, which avoids locking customers in to one technical platform. Moreover, it can re-use 70–80% of previously developed code instead of rewriting it (saving time and resources).

Key competitive advantage: cutting-edge wholly owned technology that maximises customer benefits offering a complete solution…

Over the past few years, IAR Systems has expanded its product portfolio and now offers several adjacent products integrated in the IAR Embedded Workbench to optimise the code programming, for instance C-STAT and C-RUN (static and dynamic analysis that quality-assures and strengthens the reliability of the programming), Embedded Trust (security development environment for IoT solutions) via its acquisition of Secure Thingz, as well as support for Amazon FreeRTOS (IoT Microcontroller Operating System). In addition to driving add-on sales, this has – combined with a comprehensive support organisation – translated into impressive customer retention (95% recurring customers) and strengthened IAR Systems' competitiveness. The customer base is very broad as none of the 46,000+ customer organisations accounts for more than 3% of group sales.

…which combined with complementary integrated products and comprehensive support means a loyal customer base (95% recurring customers)

Figure 11: IAR Embedded Workbench ® sold to >46,000 customer organisations

IDE Tools	Build Tools	C-SPY Debugger
- Editor - Project manager - Library Tools	- IAR C/C++ Compiler - Assembler - Linker	- Simulator driver - Hardware debugging - Power debugging - RTOS plugins

Source: Company (information), DNB Markets (graph structuring)

IAR Systems in the embedded systems market

Market overview

An embedded system is computer hardware (microprocessors, chips) with software embedded in it that is fixed in capability and designed for a specific function(s), in other words it controls the functions in digital products. To understand IAR Systems' role (the software part of embedded systems), we must first dive into the microprocessor market (the hardware part).

Embedded system: a computer hardware (chip) that has software embedded into it as a critical component

Microprocessor market

A microprocessor is an integrated circuit (a chip, also called semiconductor) that incorporates core functions of a computer's central processing unit (CPU) with storage of code and data, meaning it is the programmable brain of a digital product that operates the binary instructions (the 1s and 0s) that are encoded to it.

Chip: the programmable brain of digital products

A processor's functions are determined by the instruction set architecture (ISA) and encoding it is programmed in, where different types of processors have different architectures. Processor architectures vary in size and complexity and are defined by the amount of code and data they can address (8-, 16-, 32-, and 64-bit), where a larger number of bits increases the complexity. Popular embedded ISA architectures include ARM, Atmel's AVR, Microchip's PIC, Texas Instruments' MSP430, and Intel's 8051. In some cases, leading processor vendors (i.e. chip manufacturers) Renesas Electronics, ARM, NXP, and Texas Instruments design their own architectures, with the most popular ones being licensed to other processor manufacturers.

Architecture: the bridge between the processor designers (hardware) and compiler writers (software)

Figure 12: Architecture is the interface between hardware and software

Hardware	Instruction set architecture	Software
(Processor designers)	*(ISA)*	*(compiler writers)*
- Renesas *- NXP* *- Cypress* *- Texas Instruments* *- STMicroelectronics*	*- ARM* *- Renesas Electronics* *- Intel's 8051* *- Texas Instrument's MSP430* *- Atmel's0 AVR (Microchip)* *- RISC-V*	*- Program(s) that transform source code written in a programming language into instructions that the processor can understand and execute* *- C/C++*

Source: DNB Markets

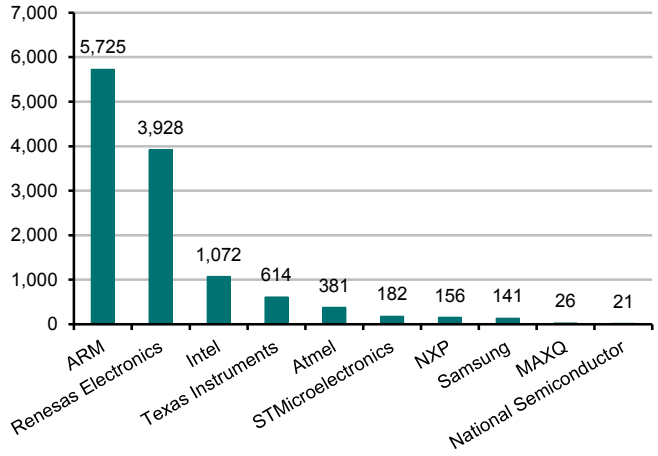
Critical parameters for architecture design include functionality, performance, and power. Arm's architecture (characterised by its low power consumption, easy-to-use, and without technical limitations) has established a strong global market share, as vendors are increasingly abandoning their own designs to use Arm's core standards for processors, resulting in fewer popular architectures.

Critical architecture parameters: functionality, performance, and power

This allows vendors to consolidate their software around a single architecture, without restricting the choice of suppliers, meaning they can retain their programmed code even if switching processor, while keeping one common infrastructure and facilitating product development for programmers. With a large and steadily growing share of embedded systems based on Arm's processors, IAR Systems could clearly benefit from being the leading tool supplier for Arm-based processors (we estimate ~70% of IAR Systems' sales stem from tools adapted for Arm's technology).

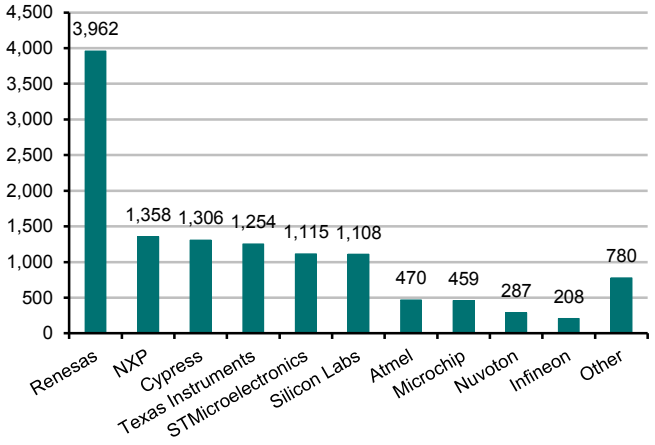
IAR Systems could benefit, having a complete offering for leading architecture Arm

Figure 13: IAR Systems – number of devices supported by architecture



Source: Company (data), DNB Markets (data structuring)

Figure 14: IAR Systems – number of devices supported by vendor



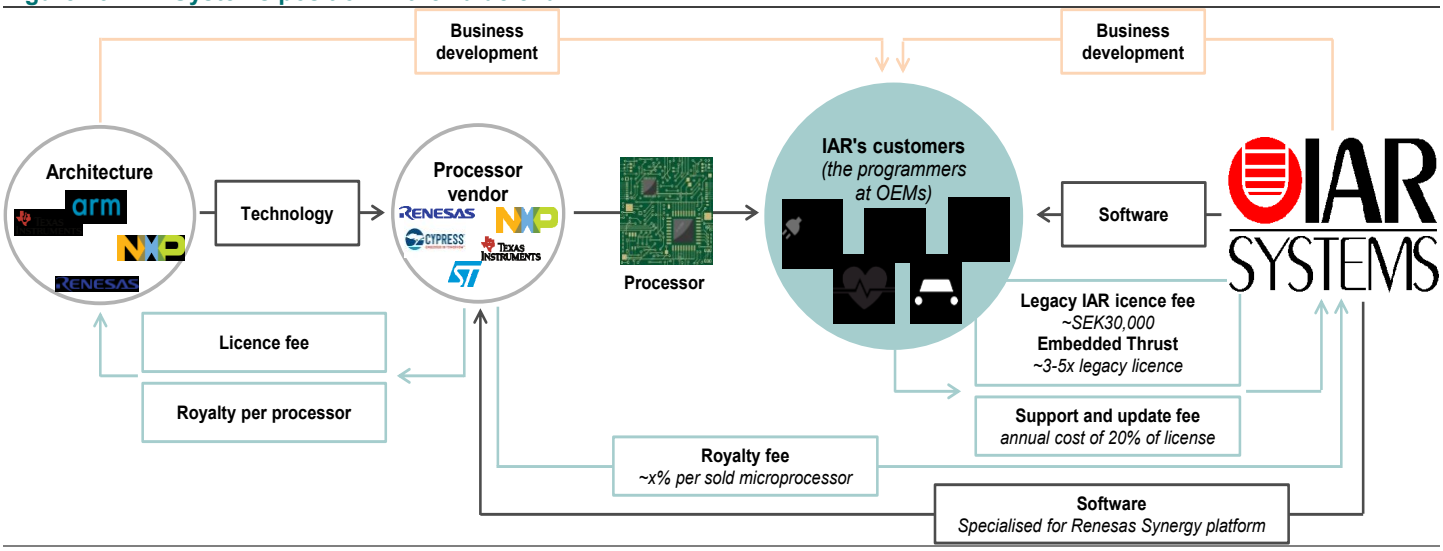
Source: Company (data), DNB Markets (data structuring)

As shown above, many processors share the Arm architecture. IAR Systems' products support all available Arm cores, from all major vendors including ST, TI, Renesas Electronics, NXP, Cypress, Microchip, etc. However, as embedded systems enter the IoT space where there is no dominant architecture, Arm's dominant position could be challenged by a new ISA, RISC-V, which we cover later.

IAR Systems' products target the programmers of both very specific processors and a wide range of architectures, as they are independent from processor vendors. Consequently, IAR Systems is positioned next to the programmers in the value chain, which it reaches by direct sales in most cases, but also via distribution agencies in some markets, and more recently also via vendors through the Renesas Synergy royalty agreement.

Being independent, IAR Systems supports a wide range of architectures

Figure 15: IAR Systems position in the value chain



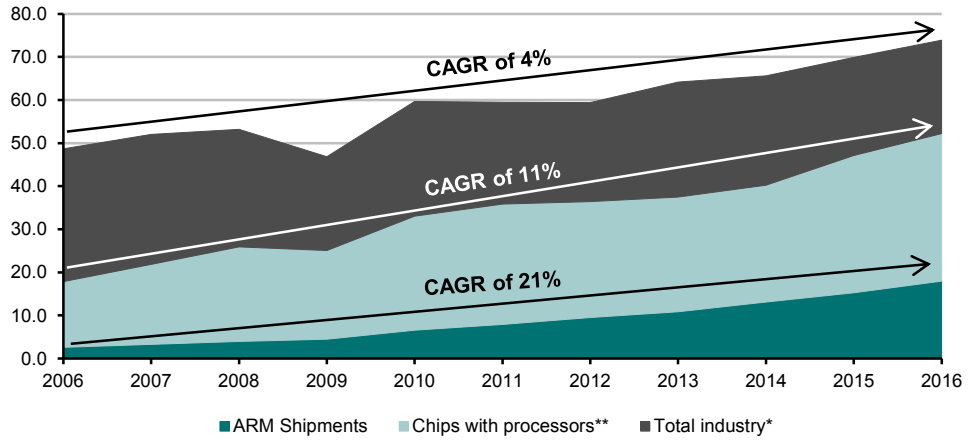
Source: DNB Markets

Embedded systems market

In 2016 the global semiconductor market for chips with processors that control the functions in digital products (i.e. embedded systems) was worth USD123bn, according to Arm.

Embedded systems market valued at USD123bn in 2016

Figure 16: Semiconductor industry growth (2006–2016, industry volume in bn)



Source: WSTS, March 2017 and Arm
Note: *Industry volume excluding analogue and memory, ** Arm estimates

The semiconductor industry as a whole continues to grow and had a 2006–2016 volume CAGR of 4%. Notably, the proportion of chips with processors is increasing as digital products are becoming more sophisticated and complex, and accounted for 70% of the industry in 2016 (CAGR of 11% 2006–2016). It is in this segment that Arm is rapidly increasing its market share, which was 34% in 2016.

While semiconductor market growth has slowed, the market for chips with processors has gained speed

While global semiconductor chip volumes and IAR Systems' sales do not have a direct relationship, it provides some insight into the state of the operating environment across its end-markets. However, in general we believe it is fair to assume that increased volumes of chips with processors should drive a need for software tools that develop chips.

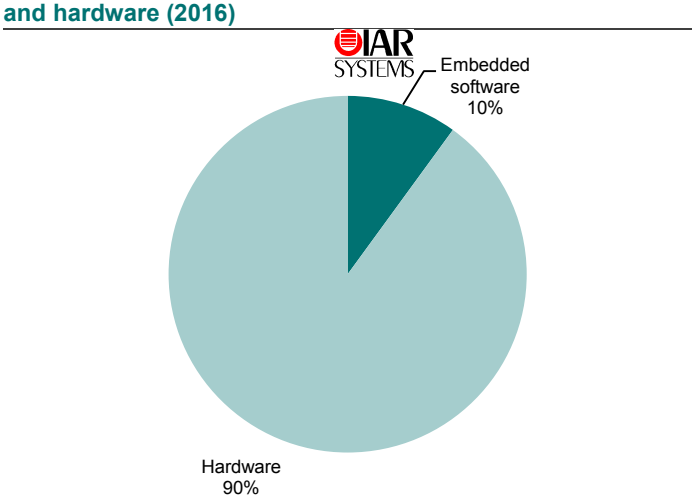
Directional moves in global semiconductor volumes could be a leading indicator of IAR Systems' sales

Embedded software market

The hardware part of embedded systems (i.e. chips) is still the dominant product category comprising c90% of the global market in 2016, as the embedded software market (i.e. the programming done to the chips) where IAR Systems operates was valued ~USD10bn in 2016 (our estimate). The most dominant applications in the embedded software market are telecommunication, consumer electronics, and industrial manufacturing.

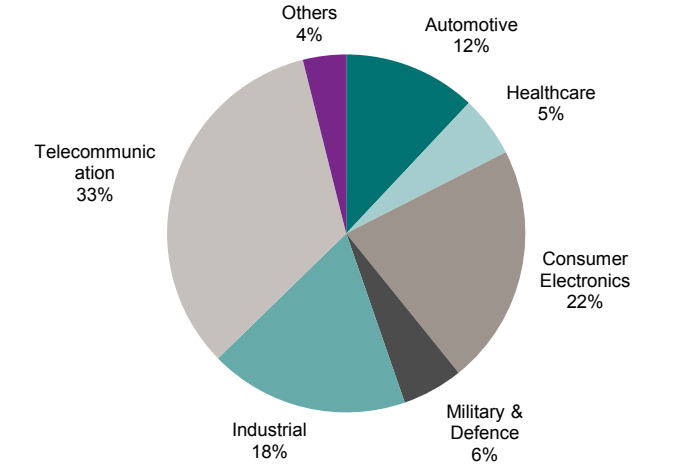
Market for embedded software is ~10% of embedded systems market

Figure 17: Embedded systems market – split by software and hardware (2016)



Source: DNB Markets

Figure 18: Overview of the embedded software market, by application (2015)



Source: Global Market Insights

Global Market Insights estimates a 2015–2023e global embedded software market CAGR of 7.4%, mainly owing to automotive (12% of the industry) benefiting from rising demand from in-vehicle infotainment and consumer electronics (22%) on increased penetration of

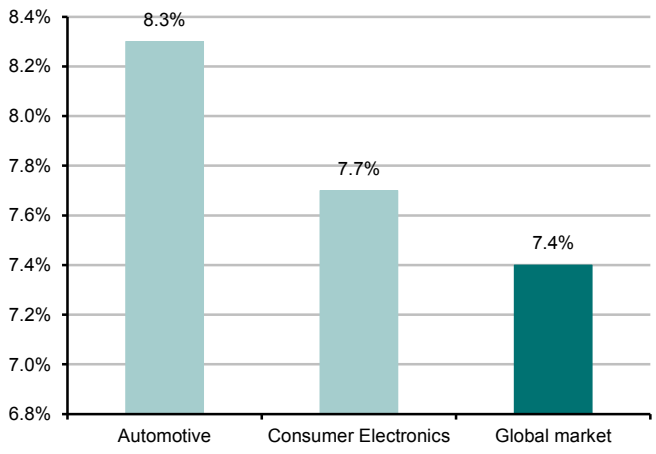
Automotive and consumer electronics expected to lead to market CAGR of 7.4% until 2023e

smartphones, tablets, and PCs, which Global Market Insights expects to have a CAGR of 8.3% and 7.7%, respectively in the same period.

In the embedded software market, IAR Systems offers an integrated development environment (IDE), which is the software that consolidates the tools needed to write and test the software. IDE players normally provide a source code editor (text editor program designed for editing source code to control embedded systems), a compiler (transforms source code written in programming language into instructions the microprocessor can understand and execute), a linker (combines smaller program segments into an executable program), and usually a debugger (helps programmers to locate problems and errors).

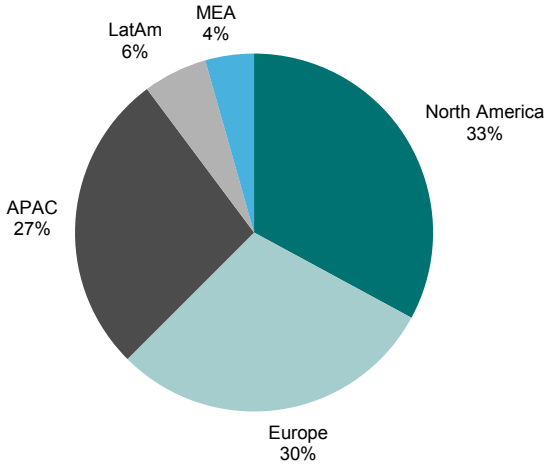
IAR Systems offers IDE that normally consists of source code, compiler, and debugger

Figure 19: Global embedded software market CAGR (2015–2023e)



Source: Global Market Insights

Figure 20: Geographical split of embedded software market (2015)



Source: Global Market Insights

From a regional perspective, North America was the largest embedded software market (33% of the global market in 2015 closely followed by Europe (30%) and Asia Pacific (27%). Asia Pacific (stimulated by China, Japan, and India) is forecast to have an above-global-market CAGR of 8.5% until 2023e, driven by increased broad-based demand across applications and the large number of fabrication plants, according to Global Market Insights. Meanwhile, we estimate – based on Global Market Insights data – that the US should have a CAGR of 6.8% in the same period, which everything else being equal implies steady market growth in Europe as well.

APAC (China, Japan and India) expected to experience strongest growth from regional perspective, with a CAGR of 8.5% until 2023e

Market drivers

The spread of digital technology is driving the market for embedded systems. Thus, the market has numerous underlying drivers that all indicate a continuation of the solid industry growth of the past decade, in our opinion. Continued growth is supported by:

- Continued increase in the number of embedded systems.
- Growing complexity of embedded applications.
- Market consolidation and partner network evolution.
- Demand for energy efficiency, code quality and reliability.
- Automotive as an increasing market.
- Focus on complete development platforms.
- Arm starting to suffer from dominance.
- Security and building trust in the embedded world.

Embedded systems growth fuelled by Internet of Things (IoT)

The importance of embedded systems continues to grow, driven by more computing power, ubiquitous connectivity, and the convergence of technology, resulting in embedded systems

Continued increase in number of embedded systems

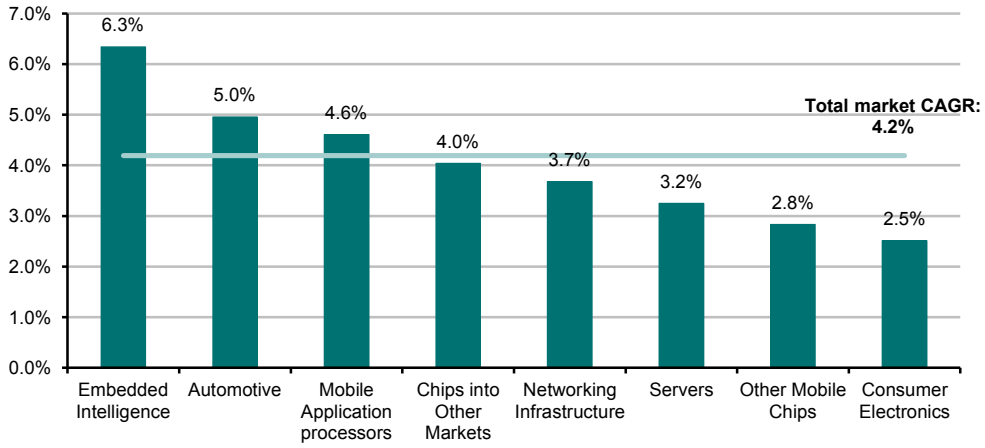
in everyday products and spaces. The Internet of Things (IoT) and the growing number of smart products with embedded systems to support connectivity should increase the number of processors and code programming, which in turn should drive demand for software development tools.

Number of embedded systems forecast to have 4.2% CAGR until 2025e

Based on applications in the embedded systems market (i.e. hardware and software), Arm forecasts that embedded intelligence, automotive, and mobile computing are the application areas that should experience above market growth (CAGR of 4.2% in the coming decade) as they are set for a CAGR of 6.3%, 5.0%, and 4.6% respectively. In other words, by 2020, there will be more than 40bn embedded systems, equivalent to five chips with microprocessors per person on earth.

Figure 21: Embedded systems market CAGR by application (2016–2025e)

Key growth markets expected to be embedded intelligence, automotive, and mobile computing



Source: Arm (underlying data), DNB Markets (further calculations)

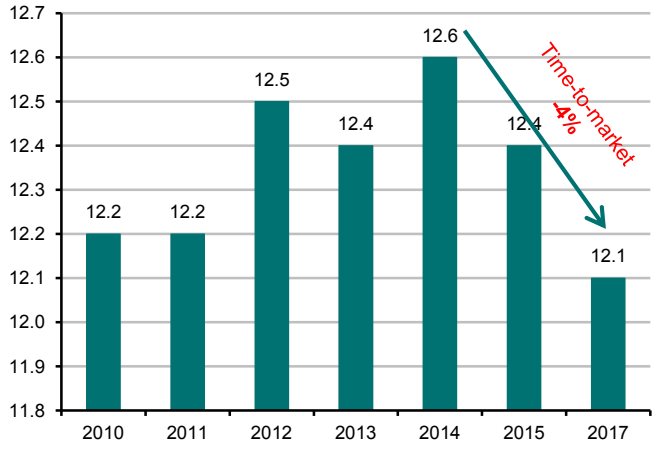
IAR Systems' customers under pressure to develop products faster to meet needs of new business models…

The rapid pace of development for digital products puts pressure on developers to shorten products' time-to-market, as experienced by the embedded market over the past three years with 4% shorter lead-times, according to a recent EE Times Embedded Market study. Tools that can streamline development and shorten time-to-market stand to benefit from this, we believe.

…and tools that can shorten time-to-market stand to benefit

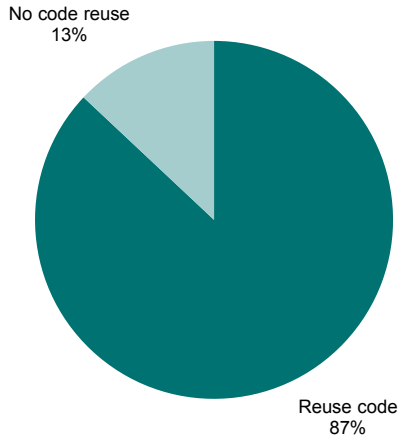
This is fuelling demand for solutions that enable code from earlier projects to be re-used. In 2017, 87% of the embedded market re-used code from earlier projects. Moreover, as IAR Systems' tools support the broadest number of processors, it enables customers to re-use 70–80% of the code even when changing processor, which should shorten time-to-market even further.

Figure 22: Months to complete an embedded project



Source: EE Times Embedded Market's Study 2017
Note: 2016 data is missing as EE Times did not conduct a survey that year

Figure 23: How many embedded projects re-use code?



Source: EE Times Embedded Market's Study 2017

Increasing complexity increases demand for complete platforms

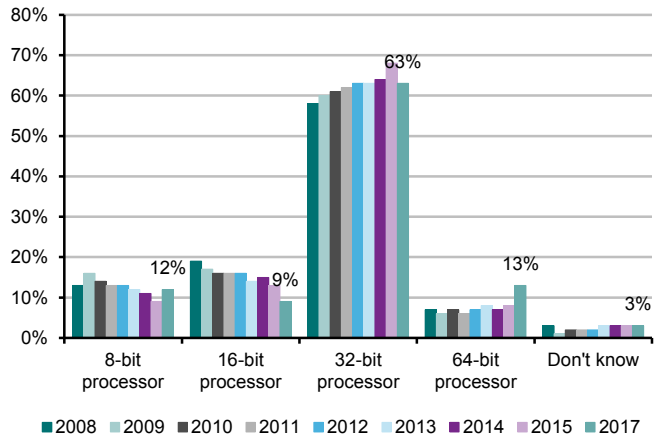
The degree of complexity in embedded systems is intensifying, as processors become increasingly powerful to meet the demands of more advanced applications. A processor's complexity is defined by the architecture, in other words if it is 8-, 16-, 32-, or 64-bit, where 64-bit is the most advanced (and often the most expensive), where the 32-bit segment represents the largest share of IAR Systems' sales (we estimate ~75%).

Increasing complexity demands more advanced processors (32- and 64-bit)

According to respondents in the EE Times survey last year, there has been a clear trend towards more 32- and 64-bit processors over the past decade. Moreover, respondents said that managing the increased code size in embedded systems and increased complexity is the industry's biggest technological challenge for 2018.

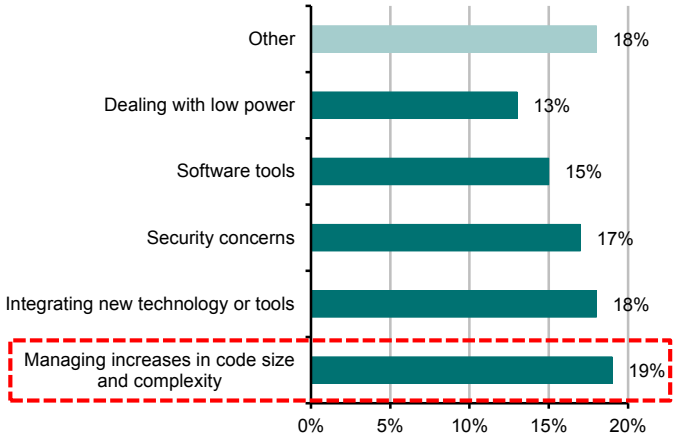
Biggest technological challenge in the industry is handling increased complexity

Figure 24: Current embedded project's main processor is a:



Source: EE Times Embedded Market's Study 2017
Note: 2016 data is missing as EE Times did not conduct a survey that year

Figure 25: What is your greatest technology challenge?

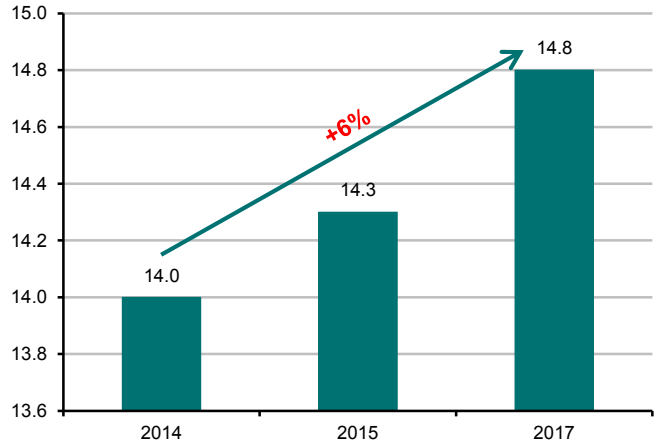


Source: EE Times Embedded Market's Study 2017

In our view, these trends are IAR Systems' friends, as higher level of complexity (and possibly more software code per product) drives demand for software tools to tests, analysis, debug. Customers should need a full user-friendly solution rather than just a single tool that should benefit a complete solutions provider like IAR Systems, we believe.

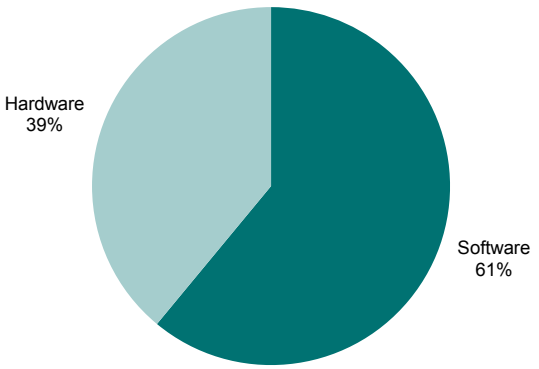
Complexity trend is IAR's friend

Figure 26: Embedded design environment – team size



Source: EE Times Embedded Market's Study 2017
Note: 2016 data is missing as EE Times did not conduct a survey that year

Figure 27: Development team's ratio of total resource spend (time/dollars/manpower) – software versus hardware



Source: EE Times Embedded Market's Study 2017

In addition, we consider it fair to assume that the more complex products could demand more developers, which should translate into more sold user keys for IAR Systems. In the past three years, the EE Times market study has shown that the total team size (i.e. number of engineers) per embedded project team has increased by 6%, while the software development team's claim that ~60% of its total resources (time/dollar/manpower) is spent on software.

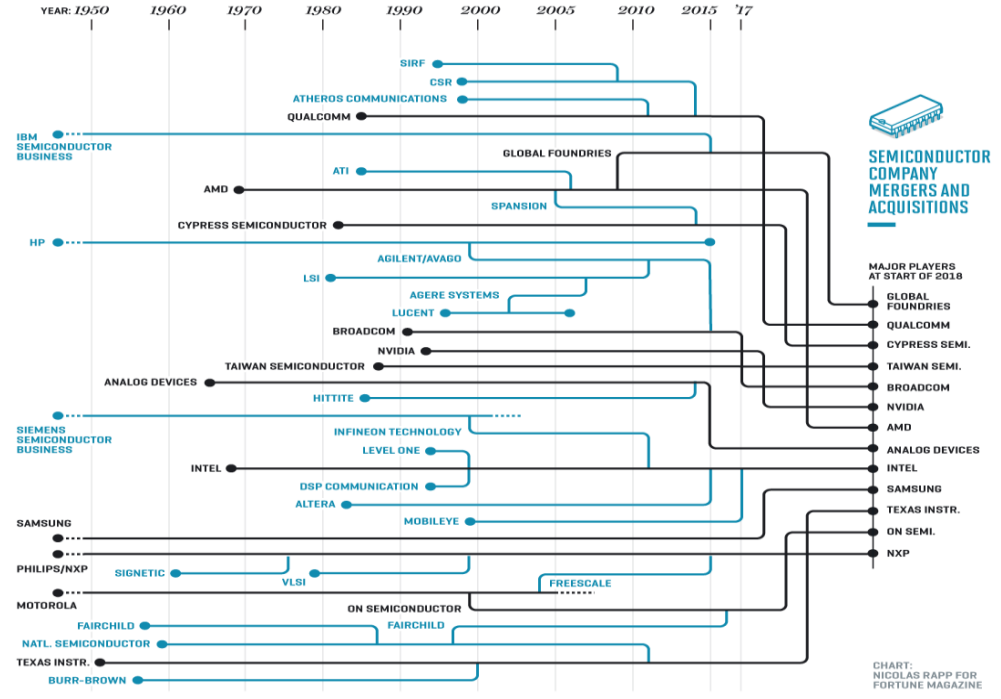
More developers should translate into growing demand for user keys for software development tools, we believe

Semiconductor consolidation raising interest and concerns

Deal-making boom across processor OEMs with seven deals in two years…

As the semiconductor industry has matured, a clear trend has been market consolidation with both major (see below) and minor acquisitions/mergers. This is the case for processor vendors (chip manufacturers) in particular: as commoditised chip-based sales growth (high volume low unit price) has slowed, the cost base for manufacturing the chips has been rather high, not adapting to the slower industry growth. Consequently the consolidation story has been based mainly on cost and synergies in an attempt to improve profitability through larger scale.

Figure 28: Semiconductor industry consolidation (1950–2017)

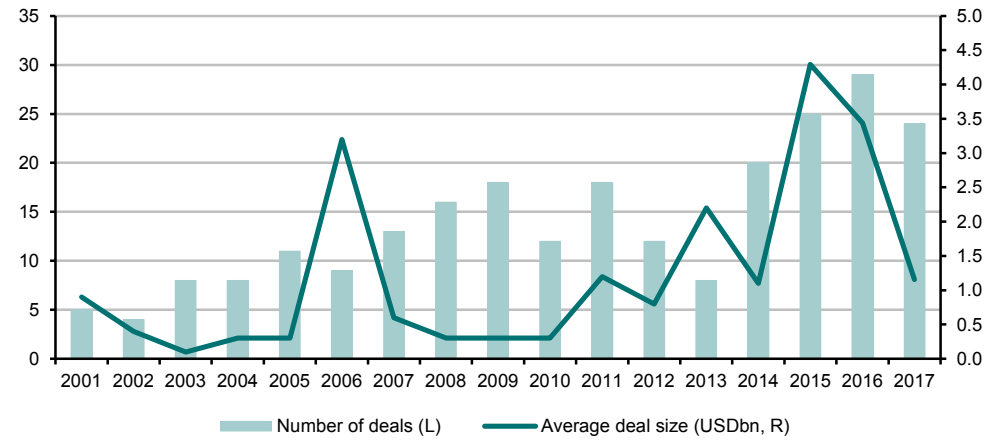


Source: Fortune

…has cast a shadow on IAR Systems as customers' decision-making has been postponed

As the consolidation trend concerns technology and vendors' product portfolios, it has increased the volatility for IAR Systems' customers choosing chip vendors (creating disturbance in its partner network). In other words, customers postpone investment decisions for new processors until they know which players will remain in the market to support that processor. Meanwhile, vendors have focused more on mergers than market activity and product launches, implying less demand for new development tools, which has hampered IAR Systems' growth.

Figure 29: Number of semiconductor M&A deals and deal size



Source: Dealogic, McKinsey, IC Insights

Processor vendors have tried to differentiate from the commoditised business model. One measure has been to offer complementary software, as exemplified by Renesas Synergy's platform, which allows developers to focus more development on the application level (instead of starting from scratch), which lowers development costs and time-to-market using IAR Systems' tools. This should facilitate taking a product from concept to production, which is particularly desired as IoT gains traction.

We see signs that processor vendors have tried to differentiate from the commoditised hardware model

The semiconductor industry is still rather fragmented with specialist companies focusing on each stage of the value chain. Thanks to its strong market position, broad partner network, leading technology, and healthy balance sheet, we consider IAR Systems well positioned to benefit from market consolidation (as customers seek a secure and stable global supplier), where it could both become an acquisition target and participate in the ongoing consolidation by widening its product offering.

In good shape to survive and even drive industry consolidation

In recent years, large industry players have intensified their efforts to secure access to software development tools to improve their processor ecosystems. In many cases large hardware players have acquired software companies at hefty multiples and then offered the development tools free with its hardware, to reduce development costs. While deal terms have been disclosed for only some deals, prices have averaged an EV/Sales of 6.8x for software tool suppliers, while Arm (architecture design) was acquired at a staggering 19.7x.

Recent acquisition EV/sales for peers that lack IAR Systems' leading market position/offering have averaged 6.8x

As shown below, the pool of potential acquisition targets for IAR Systems has shrunk significantly, which could pose a challenge for its strategy to add and integrate products.

Number of IAR Systems takeover candidates has fallen

Given IAR Systems' comprehensive product offering adapted for all leading processor vendors, we believe a potential takeover is not as likely from an industry player (as they would likely get more than they want), but rather believe that an outside player wanting to create a leading IoT platform could be a more probable acquirer.

Processor vendor could get more than it wants by acquiring IAR Systems, but we believe an outside player would be a more likely acquirer

Figure 30: M&A activity in the embedded software market

Year	Acquirer	Acquirer type of player	Target	Target type of player	Purchase price	EV/Sales*
2018	TPG	Private equity	Wind River Systems	Independent supplier	Not disclosed	-
2018	IAR Systems	Independent supplier	Secure Thingz	Technology	~SEK290m	70.0
2017	ST Microelectronics	Processor vendor	Atollic	Open source	~SEK65m	8.5
2016	Amazon Web Services	Other	Cloud9	Open source	Not disclosed	-
2016	Arm	Architecture design	Allinea Software	Independent supplier	~SEK200m	4.7
2016	Visteon	Processor vendor	AllGo Embedded Systems	Independent supplier	~SEK135m	7.2
2016	SoftBank	Other	Arm	Architecture design	~SEK275bn	19.7
2013	NXP	Processor vendor	Code Red	Open source	Not disclosed	-
2011	IAR Systems	Independent supplier	Signum Systems Corp	Technology	SEK23m	-
2009	Cavium Networks	Processor vendor	MontaVista Software	Independent supplier	~SEK330m	1.7
2009	Intel	Processor vendor	Wind River Systems	Independent supplier	~SEK6.1bn	2.2
2005	Arm	Architecture design	Keil Software	Independent supplier	~SEK155m	2.7

Source: Companies (deal terms), Orbis (financial data), DNB Markets (multiple calculations)
Note: * EV/Sales for CY, including earn-outs

Greater focus on safety, code quality, and energy-efficient solutions

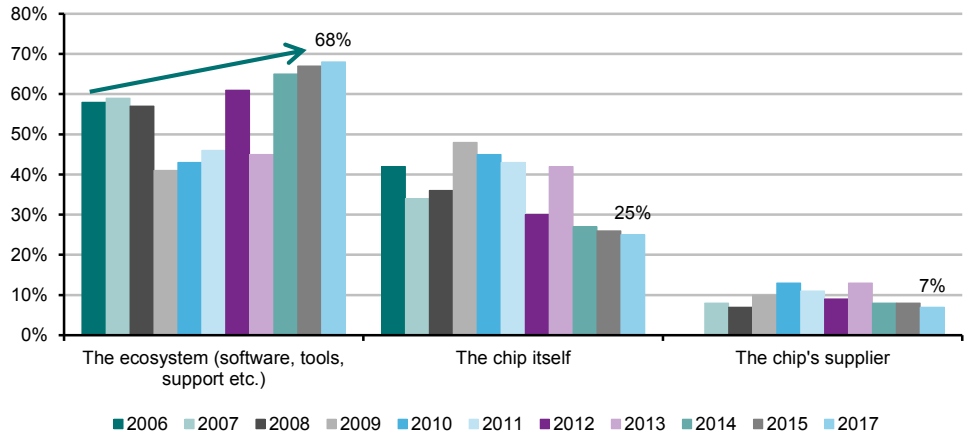
As many embedded systems are battery-powered and devices are used for several functions, demand for energy-efficient processors has increased. Thus, demand for tools that support the development of these solutions should also increase (see Figure 25), and this is considered a top-5 technology challenge for the market. We find it supportive for IAR Systems that its tools produce compact and efficient code, which is vital for low power consumption processors.

Consumers demand compact and high-performance digital products and do not want to recharge, driving the need for low-power embedded systems that can last the lifetime of the product

Not only is the number of embedded systems rapidly increasing, the criticality of its content is also on the rise, so ensuring precision and quality is becoming more important. With more safety-critical digital products found in industrial, automotive, and medtech applications, the need for reliable high-quality development tools that can meet the need for control and certification is vital, in our view.

Ensuring safety and high-quality drives demand for development tools that comply with industry standards

Figure 31: What are the most important factors in choosing microprocessor?



Source: EE Times Embedded Market's Study 2017
Note: 2016 data is missing as EE Times did not conduct a survey that year

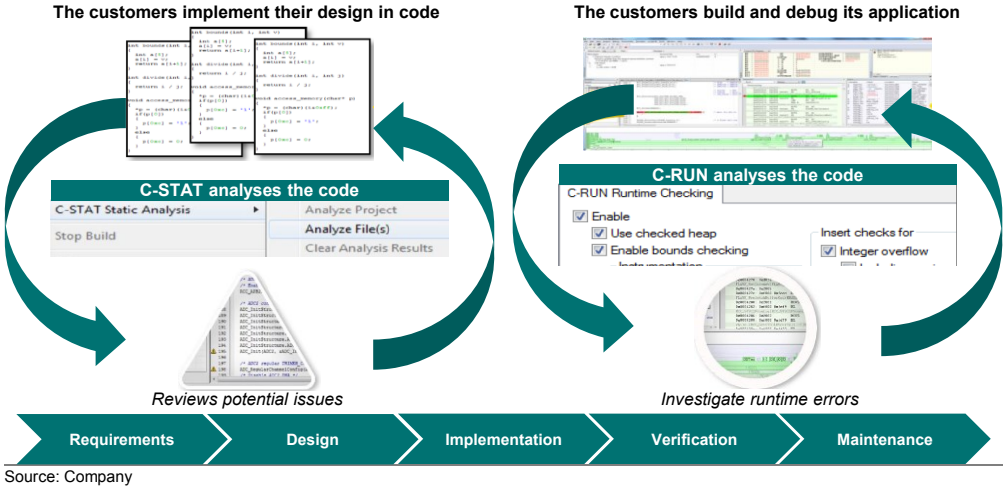
Based on the EE Times' Embedded Markets Study, the trend over the past decade is quite clear: the most important factor for choosing a microprocessor is increasingly the whole ecosystem surrounding the hardware (software development tools, support etc.), rather than the chip or chip-supplier itself, as 68% of respondents valued the ecosystem more highly in 2017.

Ecosystem (software tools etc) surrounding a chip is valued significantly higher than the hardware itself…

According to the company, many of its OEM customers require its safety-critical embedded systems to be thoroughly tested and documented to meet these needs, for which IAR Systems can offer safety certified tools that facilitate and streamline the development having launched several add-on products for code analysis (C-STAT, C-RUN etc.). In our view, a player like IAR Systems, which lets its customer take full control of the development, stand to benefit from the greater safety and quality requirements. Another example is the investment in Secure Thingz, where it supplemented its data security product portfolio, to provide a cost-efficient platform that can guarantee data security for customers.

…and we believe IAR Systems could benefit as its toolchain allows for customers to take complete control of the development

Figure 32: IAR Systems' products can meet the high-quality and reliability demanded

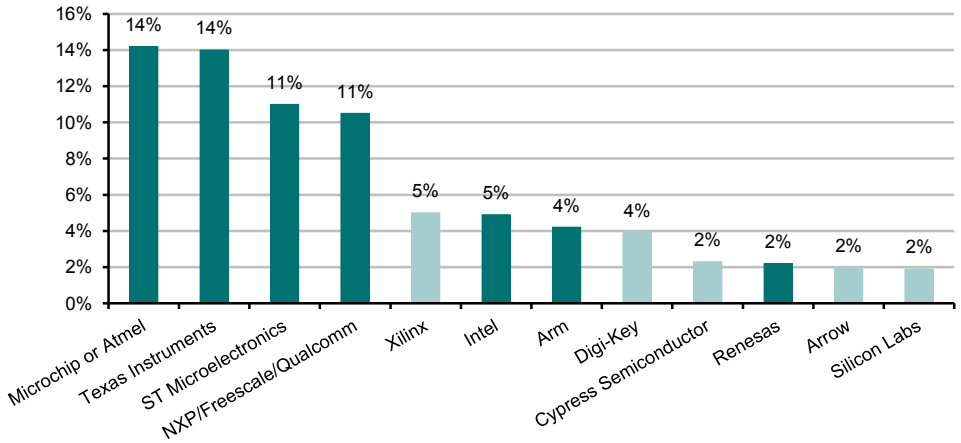


Source: Company

When asked which vendor provided the best ecosystem for stakeholders in embedded ecosystems, those using IAR Systems' tools were clearly overrepresented. However, consider that some vendors give away their own software tools free. In these cases they compete directly with IAR Systems.

While its tools support the industry's best-ranked ecosystems, it sometimes competes with vendors' own tools

Figure 33: Which vendor has the best ecosystem for your needs?



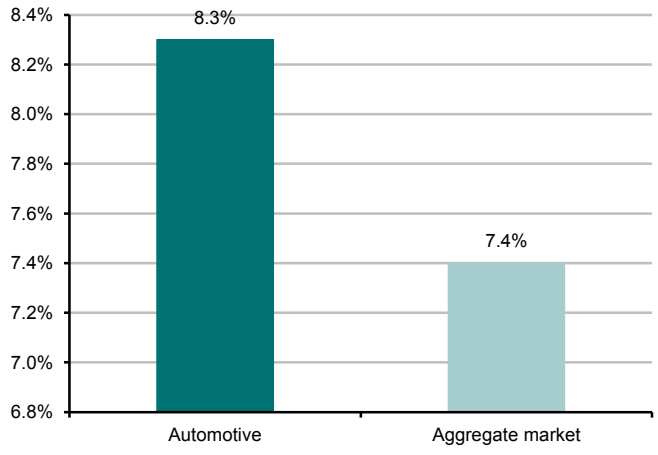
Source: EE Times Embedded Market's Study 2017
Note: IAR Systems-supported ecosystems highlighted in dark green

Automotive embedded systems – key growth opportunity

Cars are becoming mobile computing platforms in areas such as infotainment, telematics, electronics, safety & security, powertrain, and chassis control. In 2015 the market for automotive embedded software comprised c12% of the global market, according to Global Market Insights. However, this segment is forecast to experience the most rapid CAGR (8.3%) until 2023e as more intelligent functionalities should require more advanced chips and embedded systems.

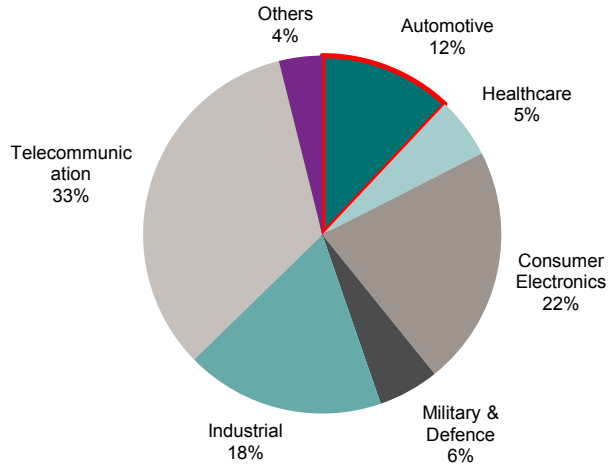
More advanced vehicles with higher safety requirements place a demand on high-quality software tools…

Figure 34: Embedded software market CAGR (2015–2023e)



Source: Global Market Insights

Figure 35: Overview of embedded software market, by application (2015)

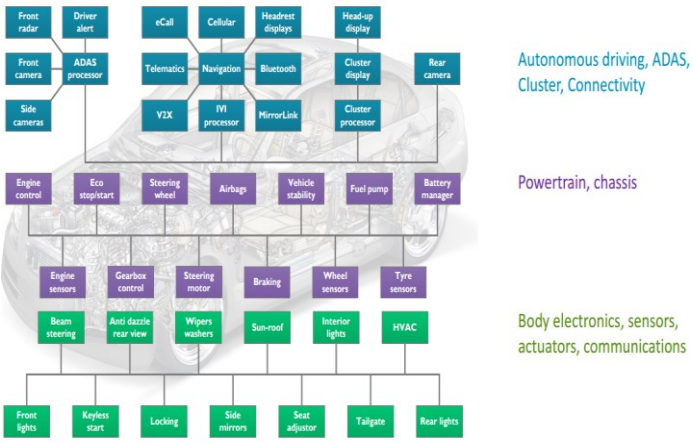


Source: Global Market Insights

90% of automotive embedded systems comprise electronic innovations, and it is the growing preference for advance technologies that is driving the market. Apart from this, the push from structural changes is driving the trend for vehicle electrification and the road to autonomous vehicles, which should boost the need for embedded systems.

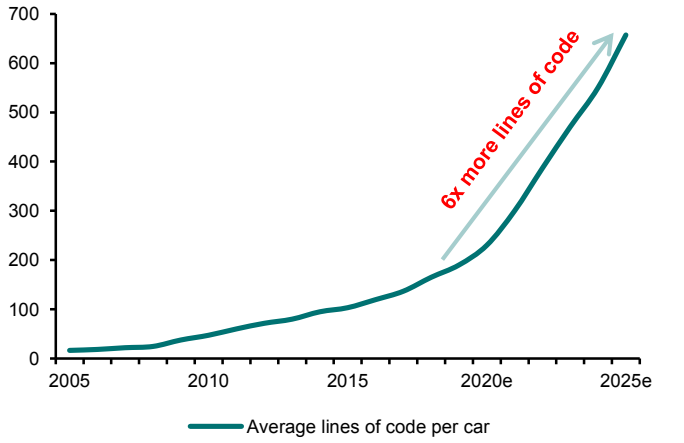
…underpinned by structural drivers e.g. electrification and autonomous driving

Figure 36: Growth opportunity in automotive



Source: Arm

Figure 37: Tomorrow's car set to have 6x more lines of code

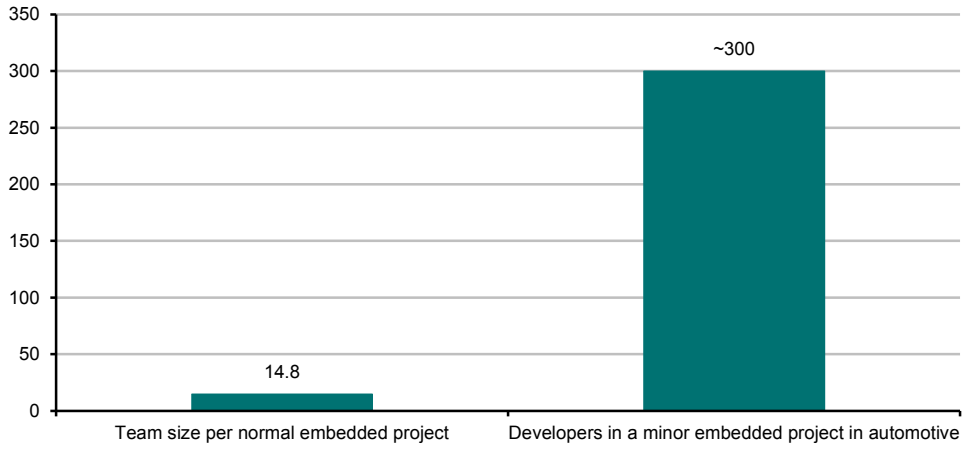


Source: NXP

Today's cars require ~150m lines of code, a number that is expected to increase by a factor of 6 by 2025, according to vendor NXP. Increasing connectivity, autonomy and electrification means more code and consequently more demand for processors and possible more programmers, implying more licences for development tools. To provide some colour on IAR Systems' opportunity in automotive, the average team size is almost 20x larger than the average embedded project, according to IAR Systems. 10 of the 15 largest component suppliers and subcontractors in the automotive industry are customers of IAR Systems.

6x more lines of code should boost need for more efficient workflow and ability to re-use code, with developer teams that are 20x larger than normal projects

Figure 38: Average embedded project team size versus automotive embedded project team size



Source: EE Times Embedded Market's Study 2017 & IAR Systems estimates

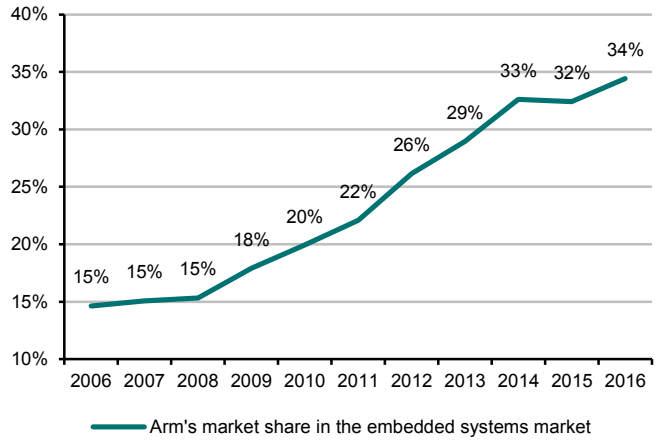
Moreover, we believe it is fair to assume that the need for high-quality, safety-critical, and advanced tools to develop these applications and ability to re-use large amounts of code should favour IAR Systems' offering.

Arm versus RISC-V: Arm starting to suffer from dominance

Arm-based processors had 34% of the global embedded systems market in 2016, having more than doubled in the preceding ten years. As we calculate a correlation of 70% between the sales growth of Arm and IAR Systems, the prospects of Arm's ability to continue to gain market share should consequently affect IAR Systems' ability to grow. We attribute the roughly doubled sales growth of Arm to its strong market position in mobile devices (90%) where IAR Systems is not represented.

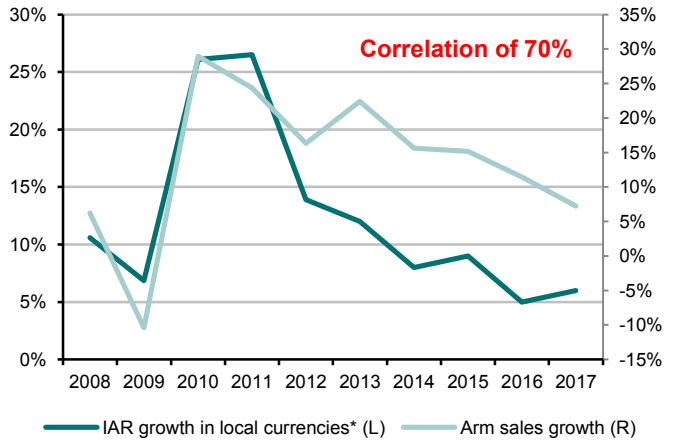
Arm's architecture has a dominant market position…

Figure 39: Arm's global market share in chips with processors



Source: Arm

Figure 40: IAR Systems' sales have had 70% correlation to Arm's sales



Source: Company (underlying data), DNB Markets (data structuring)
Note *IAR Systems' sales in SEK in 2008–2009

While we believe that continued market share gains and greater adoption of ARM architecture in new target markets such as automotive and IoT (where there is no dominant architecture) should be a net positive for IAR Systems, we have identified some challenges with Arm's dominant market position.

…and thus ensures strong pricing power

The almost monopoly-like position Arm has gained as an ISA has been driven by its superior offering, in that it provides proven IPs, a robust ecosystem (including software, cloud services, security solutions, silicon vendors), power-efficiency, reliable customer support, and improved time-to-market. However, Arm has not been late to monetise on its dominant position where customers pay a considerable upfront licence fee to access its technology (depending on design complexity) followed by royalty fees (typically 1–2% of the selling price of a chip). Moreover, as the design complexity is somewhat reduced in Arm's architecture to reduce costs, developers cannot always customise the product development satisfactorily.

To counteract this, open-source architecture RISV-V is offering a good-enough alternative to Arm at zero cost

On the back of this, RISC-V with its open-source ISA has gained support among processor vendors as it offers a good-enough alternative to Arm while being licence and royalty-free, with the full ability to tailor product development. Any ISA addressing low cost and a high level of customisation could play a dominant role as the industry moves towards IoT applications, we believe, or at least increase the purchasing power against Arm.

Figure 41: RISC-V Foundation members (70+ organisations)

Source: RISC-V

The RISC-V ISA is gradually building an ecosystem including vendors of IP, EDA, and software development tools etc, which include NXP, Google, NVIDIA, Qualcomm, and Samsung. In its current state it could be hard to disrupt Arm, but from a technological perspective we see no reason why the RISC-V implementation should be any slower than the current dominating ISAs in Arm, AMD and Intel. While this transition might not happen overnight, IAR expects to be able to deliver tools support for RISC-V during 2019 as a member of the RISV Foundation. The broad-based support IAR can offer should also facilitate the migration to RISC-V for customers, which is why we believe it is well-positioned to benefit when it materialises. However, one then needs to consider that it would likely cannibalise on IAR Systems' existing Arm sales.

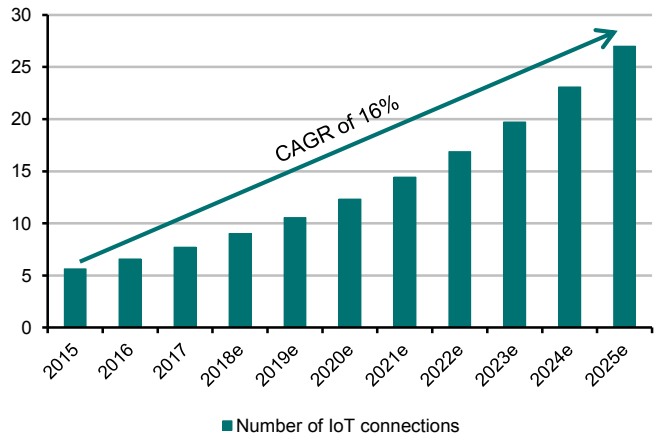
We do not expect this trend to affect IAR Systems materially in our forecast period, as we believe it is well-positioned to ride on the shift from Arm to RISC-V as it expects to deliver its development tools adapted for RISC-V by 2019

Security challenges for digital products

Alongside the rapid growth of IoT connected devices, the market for embedded systems is facing major security challenges such as data leaks, privacy breaches, and access to private property in the form of IP theft, overproduction, as well as data theft where even minor failures can have fatal consequences.

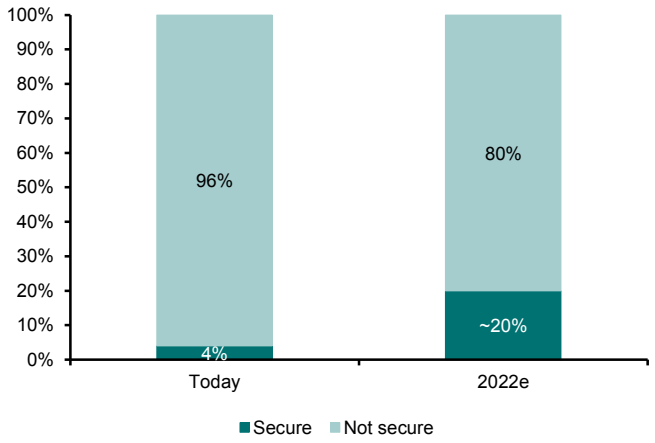
According to Machina Research, there will be 27bn+ IoT devices by 2025, implying a CAGR of 16% from today, with a total market value of a staggering USD3trn by end-2025. We consider it fair to assume that if not already – at least on the path to those figures – the lion's share of what defines the value in an enterprise should be software.

Figure 42: Global IoT connections



Source: Machina Research

Figure 43: IoT devices with embedded security (today–2022e)



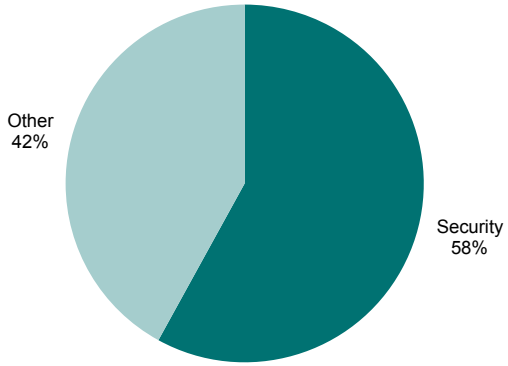
Source: ABI Research

Despite these threats, the security adoption in embedded products has been surprisingly low. ABI Research estimates that only 4% of IoT products today are secure. We attribute this to a lack of knowledge and risk awareness in the market and a lack of products and solutions that can build trust in the embedded world.

By 2022e, the same ABI Research report suggests the adoption of secure products could be close to 20%, suggesting a market worth of USD1.2bn for secure microcontrollers. This clearly reflects a sizeable market opportunity for software tools providers such as IAR Systems.

The number of secure microcontrollers (defined by the ability to use cryptographic code in the programming and protected memory areas for key and certificate storage) looks set to be the driving factor of security adoption. These are still limited, but large processor vendors such as Renesas Electronics, NXP, and STMicroelectronics have recently launched secure microcontrollers and IAR Systems expects the number of secure launches to accelerate in the coming years.

Figure 44: Top concerns about IoT



Source: Machina Research

Having acquired the remaining 80% in Secure Thingz in March 2018, IAR Systems is positioning itself as a frontrunner in this structural industry shift as it extends its offering and enables it to provide market leading security in embedded systems (more details on page 27).

We consider it likely that IAR Systems will continue to expand its security product portfolio by developing new tools that can develop secure software and manage critical IP in the development process through: 1) integrating Secure Thingz; and 2) new investments in knowledge, alliances, and technology.

Security add-on products to remain a key strategic priority, we believe

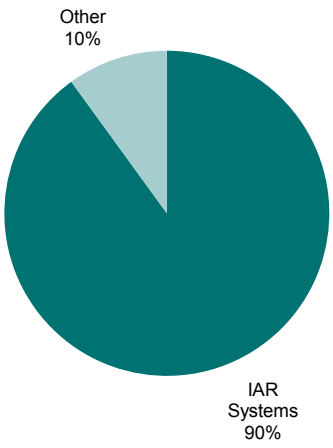
Competitive overview

The structure of the embedded software market is rather complex and divided between the architecture designers, processor vendors, independent software suppliers, as well as software suppliers that build their products on open source. According to IAR, it holds leading market positions across most processor types, as it holds a 90% market share for 8-bit processors (simple, low-energy processors), 70% for 16-bit, and c45% for 32-bit. As there is a structural shift in the market towards more advanced processors, we believe IAR Systems could stand to benefit if its current customers in the 8- and 16-bit architectures were to choose its tools when they convert to 32-bit for instance.

IAR Systems has leading market shares:

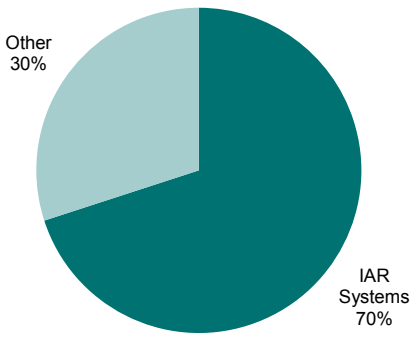
- 90% in 8-bit processors
- 70% in 16-bit
- 40–50% in 32-bit

Figure 45: Market shares 8-bit



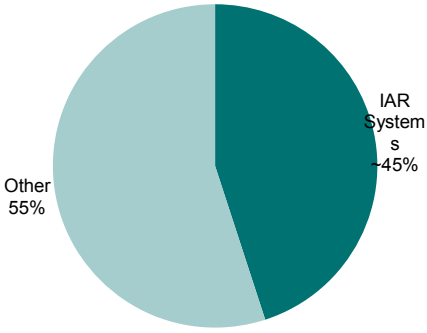
Source: Company estimates

Figure 46: Market shares 16-bit



Source: Company estimates

Figure 47: Market shares 32-bit



Source: Company estimates

- **Processor vendors** such as Texas Instruments, NXP, Atmel and Renesas Electronics sometimes provide software support with their chip sales. However, these tools are often limited to their own processor range and thus offer limited extra functionality.

- **Arm** is also a direct competitor to IAR Systems via its software development tools (notably Keil). With regards to Arm architecture becoming so dominant (34% global market share) the Keil development kit is an important competitor, in our view. However, it is not an independent supplier, lacks a broad product range like IAR Systems, and does not have comparable broad-based support to IAR Systems, which suits all key architectures and vendors.
- **Independent software vendors** such as US-based Green Hills, which is more focused on high-end processors found in 32- and 64-bit infrastructures. Like IAR Systems it also has its own RTOS and middleware, but its ecosystem and IDE are not officially supported by its RTOS competitors (with a few exceptions). German Segger, coming from the hardware side and debug-probes, is another competitor, especially in the RISC-V space, we believe. Also, in April Intel announced plans to sell Wind River to private equity firm TPG, paving the way for another independent competitor to enter the embedded software space, having been under the Intel umbrella for nine years. However, we wait to see whether it manages to carve out a market position.
- **Open Source** suppliers such as Coocox, Rowley, and Raisonance add packaged functionality and services that are free or cheap (USD200–500) based on open source solutions (GCC-based). However, as they do not develop their own compiler, offer no or limited support, and have limited features, we believe that competition from open source players is finite for IAR Systems' commercial customers.

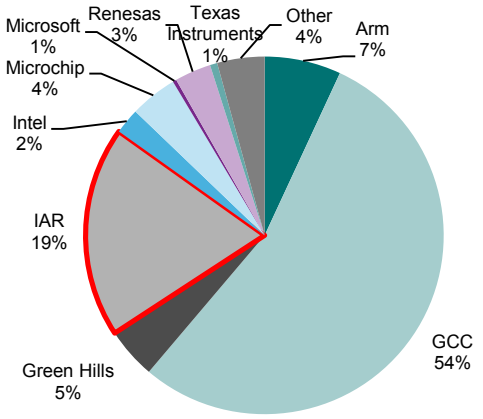
Figure 48: Competitor overview

	IAR SYSTEMS	Processor vendors	Arm	Independent suppliers	Open Source
Independent supplier				●	◐
Broad support for all key architectures				●	◐
Support for all major processor vendors				●	●
Good support & customer service		◐	●	◐	
User-friendly tools		◐	●	◐	◐
Documentation		◐	●	●	
In-house software development		◐	●	●	
Effective & small code size		◐	●	●	◐
Broad RTOS & middleware support		◐	●	◐	
Broad software support		◐	●		●
Listed/unlisted	*Listed*	*Listed*	*Private*	*Private*	*Private*
Years in business	*35 years*	*+35 years*	*+35 years*	*~35 years*	*~25 years*
Type of players		RENESAS, CYPRESS, NXP, ST, TEXAS INSTRUMENTS	KEIL Tools by ARM	SEGGER, Green Hills SOFTWARE, WIND	RAISONANCE

Source: Company (information), DNB (graph structuring)

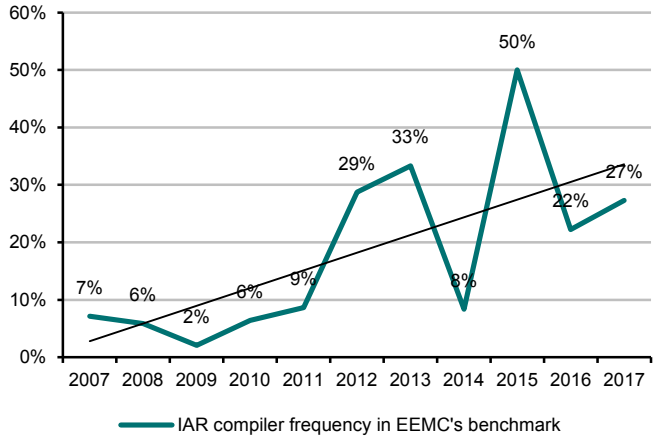
EEMBC benchmarks for compilers (only independent source of certified embedded compiler performance comparisons) lend support to the company's world-leading market positions. While in aggregate these benchmarks, as illustrated below, could provide some colour on the competitive environment for embedded development tools, we highlight that the split does not reflect the market value, rather IAR Systems' position should be seen relative to other commercial players (other than GCC). However, on an aggregate level, IAR Systems' compilers have been chosen ~20% of the time when developing processors since 2010, and the trend indicates positive momentum.

Figure 49: Frequency of complier selection (2010–2017) in EEMBC's CoreMark benchmark



Source: EEMBC (industry alliance, which develops benchmarks to help system designers to select optimal processors and understand performance and energy characteristics of their systems. CoreMark can test a processor's basic pipeline structure as well as basic read/write operations, integer operations, and control operations. However, it does not reflect how you would use a processor in a real application)

Figure 50: IAR Systems' compiler frequency in EEMBC's CoreMark benchmark



Source: EEMBC (industry alliance, which develops benchmarks to help system designers to select optimal processors and understand performance and energy characteristics of their systems. CoreMark can test a processor's basic pipeline structure as well as basic read/write operations, integer operations, and control operations. However, it does not reflect how you would use a processor in a real application)

Barriers to entry

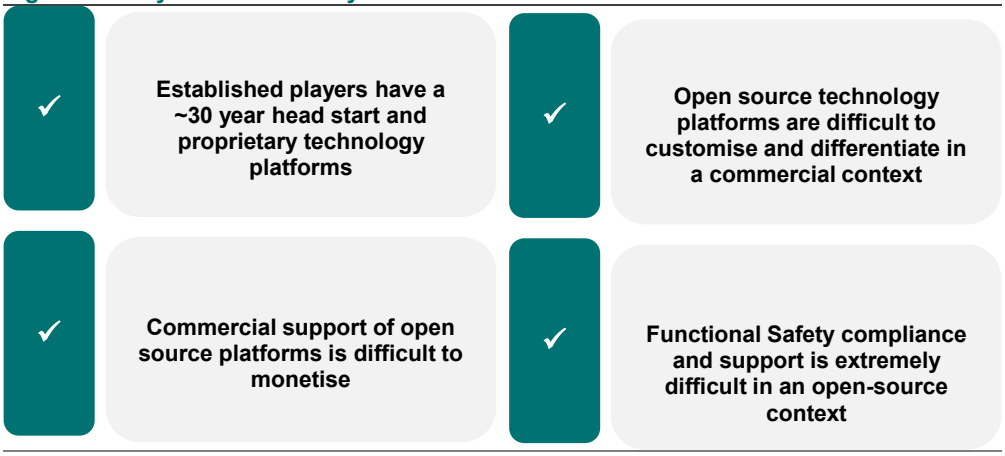
In our view, perhaps the most significant barrier to entry to the embedded software tools market is the ~30-year head-start and proprietary technology platforms of IAR Systems and many competitors. Moreover, as the products are highly important to end-customers they cannot compromise on the tools, code performance, reliability, user-friendliness, or time-to-market, particularly not the commercial customers that IAR Systems serves.

IAR Systems' customers are in the high-end segment, where established players have 30+ year head-start

We believe open source technology platforms pose a limited threat to IAR Systems' business model, as: 1) they are difficult to customise and differentiate in a commercial context; 2) the commercial support for an open source platform is difficult to monetise; and 3) meeting safety-critical compliance and support is more difficult in an open source environment.

Open source environments pose limited threat in commercial context

Figure 51: Key barriers to entry to embedded software



Source: Company

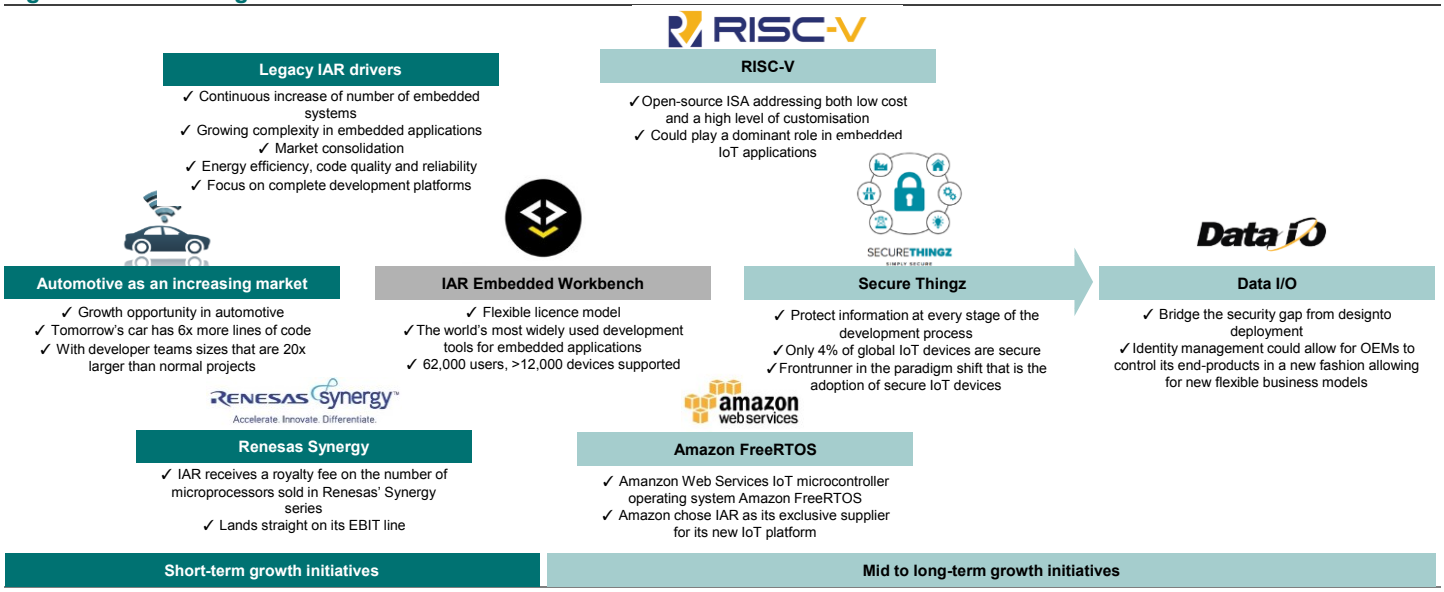
IAR 3.0

Since the inception of IAR Systems as the key strategic focus for the company back in 2010, it has gone through various phases, having: 1) streamlined the business towards proprietary software, creating a more specialised company; and 2) shifted its project-based business model to scalable licence sales, which has substantially improved its margin profile. In our view, the company is now facing its third phase, which should be the growth phase. We believe IAR 3.0 could be when it goes from being a supplier of a compiler to the go-to software tool partner for global players such as Amazon and Renesas Electronics when they position their embedded systems ahead of the Internet of Things.

IAR 1.0 – streamline the business
IAR 2.0 – shift to software model
IAR 3.0 – growth focus…

…and go-to software tools partner for global players positioning themselves ahead of IoT

Figure 52: IAR 3.0 – growth in focus



Source: DNB Markets

In our market overview, we identified key elements that should underpin organic growth for IAR Systems' legacy licensing business (especially in automotive) and the Renesas Synergy agreement in our forecast period. However, we do not believe these drivers factor in the growth potential of the strategic partnerships that IAR Systems has made to pave the way in the IoT future ~3–5 years out including: 1) Secure Thingz and Embedded Trust; 2) Amazon FreeRTOS; 3) RISC-V; 4) Data I/O; and 5) Express Logic.

We believe that the stock market does not put a value on IAR Systems' mid to long-term growth initiatives

According to the company, it has the capacity with the existing workforce to face these growth initiatives without having to make substantial new investments. However, we have not included any material sales from initiatives in our estimates, as we prefer to see revenues from these partnerships materialise first. However, IAR Systems is very early in the cycle of microprocessor sales, as customers first have to buy the development tools to produce its digital products. As a result, we believe it should be visible in IAR Systems' financials years before any of these initiatives gain traction in the mass market.

Secure Thingz

IAR Systems' interest in Secure Thingz (a leading provider of advanced security solutions for embedded systems in IoT) was initially noticed when it took a 10% stake in the company in 2017. Later that year, it took another 10% stake, having seen the potential in intensifying its product portfolio focus on security that helps the embedded systems value chain to protect information at every stage of the development process.

A leading provider of advanced security solutions, which helps customers to take control of the security of their digital products from day one…

IAR Systems acquired the remaining 80% of the company for a ~SEK230m consideration in March 2018, making itself the clear frontrunner for secure solutions in embedded systems. Secure Thingz was founded in 2016 by CEO Haydn Povey who has extensive industry experience (20+ years) from developing Arm's (the leading architecture provider) strategy for security and the Arm Cortex-M's microprocessor family (leader in embedded and IoT-

…making it the frontrunner in offering secure solutions for embedded systems

markets). It soon saw the potential in developing software solutions that simplify security development and deployment in embedded systems. In addition, we believe IAR Systems is scaling up its management team, as Mr Povey will remain the CEO of Secure Thingz.

Figure 53: IAR Systems security offering milestones

Source: Company

Secure Thingz has ~20 patents pending at a time when the embedded systems industry is at an inflection point, with the rapid increase in connected devices and spread of IoT, which is why the customers of Secure Thingz – and now also IAR Systems – need help in protecting against security concerns that could cause severe damage to their revenues, brands, liabilities etc. such as:

Secure Thingz has ~20 patents pending, and we believe it could be seen as an additional R&D department

- IP theft (software is stolen and reengineered).
- Overproduction (third-party manufacturers run unsolicited production batches).
- Ransomware (malicious software that encrypts files until a ransom is paid).

As mentioned earlier, only 4% of IoT products are secure according to Machina Research. However, by 2022e, ABI Research expects the adoption of secure products to reach almost 20%, and a total market for secure microcontroller's worth of USD1.2bn. Being positioned as the frontrunner in this market ahead of this paradigm shift, we believe IAR Systems could enjoy solid market share gains and have a head-start on that trajectory. With that in mind, we believe IAR Systems took the opportunity to acquire Secure Thingz before the market had valued the demand growth opportunity of its secure solutions.

We believe IAR Systems acquired Secure Thingz before the market had valued its demand growth opportunity

Figure 54: Combined entity builds trust in the embedded world

IAR SYSTEMS

✓ Secures a strong position as a frontrunner in offering solutions to secure embedded systems

SECURE THINGZ

✓ provider of advanced security solutions for embedded systems in IoT
✓ Founded in 2016
✓ Headquartered in Cambridge UK
✓ 15 employees
✓ Chosen by Renesas Electronics for Renesas Synergy Platform
✓ Several patents pending

Source: Company

Secure Thingz will become a separate segment in IAR Systems as of Q2 2018. In addition to the potential benefits above for IAR Systems, we believe Secure Thingz should benefit from leveraging on IAR Systems' worldwide sales and support organisation and tapping into its large customer base – Secure Thingz has four customers today but as part of IAR Systems it will have the potential to reach ~46,000 customers.

Completion of transaction due in Q2 2018

However, note that it is still early days for Secure Thingz, as in 2017 it had net sales of USD0.5bn and an operating loss of USD1.8m. Moreover, we do not believe that the up-take

Large opportunity – but still early days

to 20% adoption of secure embedded products will be linear given the level of knowledge and risk awareness across its customer base is still low. For instance, Barr Group revealed in a survey that 22% of embedded developers do not even specify security as a requirement yet.

According to the company, there is no competitor in this market right now, as there are standard products for this type of security offering. In some cases, IAR Systems' end-customers develop their own security solutions for seven-figure costs (in SEK). The lack of alternatives enables the opportunity for IAR Systems to price its security offering some 3-5x ahead of its Embedded Workbench licences, we believe. However, given the market potential an obvious threat to this business model would be if an industry giant, such as Google, were to invest heavily in a security offering for the IoT universe.

No competitors right now, but the largest threat would be market entry by an industry giant such as Google, we believe

To conclude we see untapped potential for solutions that can guarantee data security and reliability throughout the development process, which should become increasingly important as the number of connected devices grows, especially in a 3–5-year perspective. In the short term, IAR Systems has said it plans to offer its new product Embedded Trust (helping to streamline its customers' security development), starting in Q2 2018. However, only ~5 of its 20 patents pending will be included in this offering, therefore we believe it is fair to assume that additional product offerings should launch in the market in our forecast period. While revenues from Embedded Thrust are likely to be limited initially as it might have to educate customers, we believe security sales should be visible as early as 2019–2020e, with considerable potential thereafter.

Amazon Web Services

Amazon Web Services (AWS, Amazon subsidiary that provides cloud platforms), choose IAR Systems' development tools for its IoT microcontroller operating system Amazon FreeRTOS, where IAR Systems will enable developers to quickly gain access to everything it needs to easily develop and debug IoT applications. Unlike the Renesas Synergy IoT platform – where a processor vendor sells hardware and gets IAR Systems' offering 'free' – AWS has built its model based on cloud services adding the hardware, creating a secure platform for debug tools, cross-platform support, complex licensing requirements, and managing code from multiple vendors.

Amazon chose IAR Systems as exclusive supplier for its new IoT platform

In March 2018, IAR Systems recruited industry expert Ali Sebt who was previously president of Renesas Electronics America, senior VP of the Japanese parent company, and most recently president and chief marketing officer at VIMOC Technologies. All these senior roles have had a particular focus on the implementation of IoT strategies. In his new role as chief corporate development office at IAR Systems, his main responsibility will be its IoT strategy with the emergence of artificial intelligence, and his first priority will be building the model for the Amazon Web Services (AWS) partnership.

Hiring industry expert Ali Sebt should strengthen this growth leg. His first task will be to build the IAR Embedded Workbench via Amazon Web Services

RISC-V

As mentioned earlier, Arm's dominant position for ISA (instruction set architecture) could be challenged by the new open-source ISA RISC-V that is gaining traction in the embedded industry. The pros of this open-source alternative to other architectures like Arm, Intel, MIPS, etc. are mainly it being licence- and royalty-free, with the full ability to tailor its product development enabling a new level of innovation for companies.

RISC-V is set to challenge Arm architecture (comprising ~70% of IAR Systems' sales).

RISC-V is still immature, and for IAR Systems it is still early days and not certain how its strategy in this area will unfold. However, being a member of the RISC-V Foundation and at the forefront ready to launch its development tools for RISC-V in 2019 (being the only commercial software tools provider), we believe IAR Systems is positioning itself to become one of the preferred suppliers of development tools in the implementation of the new architecture across RISC-V Foundation members (70+ organisations including Google, NVIDIA, Cortus, C-Sky, NXP, Qualcomm, Western Digital, and Samsung). Being independent and having the industry's broadest support for microprocessors, migration from other architectures to RISC-V should be facilitated using IAR Systems, we believe.

However, being at the forefront to implement the shift to RISC-V this should be a net positive for IAR Systems

While we do not include any RISC-V sales in our forecasts, we believe a shift to this architecture could materially increase revenues for IAR Systems. To provide some colour, it took ten years for Arm-based architecture to grow into ~70% of IAR Systems' sales (~SEK250m). However, remember that a transition to RISC-V would likely cannibalise on existing Arm sales.

Data I/O

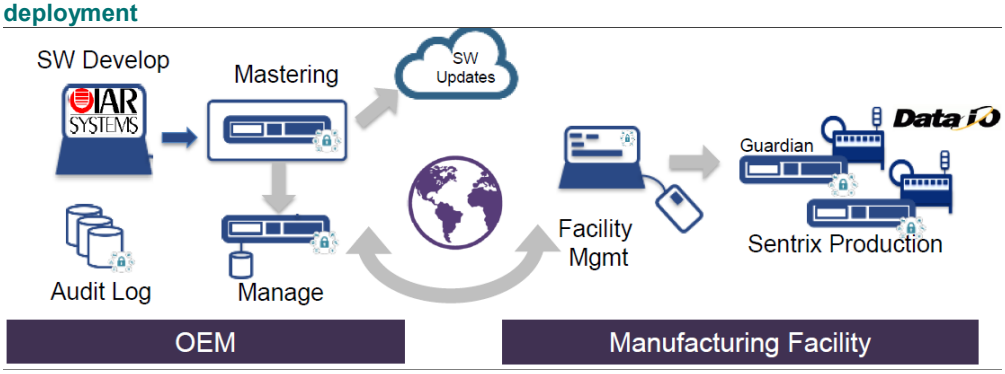
Data I/O partnership to bridge the gap from development to manufacturing. Combined with IAR Systems' security offering it could allow OEMs to change business models

In late February, IAR Systems announced a partnership with Data I/O (provides security provisioning and programming systems for flash memory, microcontrollers, and logic devices) to collaborate and deliver an integrated workflow that makes the development of manufacturing processes more efficient and improves the quality of embedded designs. In other words, the partnership should ease the transition from MCU firmware design from development to manufacturing for OEMs, where it bridges the separation of the growing complexity of high-quality embedded applications and security concerns in the embedded market.

We believe one of the most interesting aspects of this collaboration is the identity management of exactly who the OEMs customers are, how and when they are using the products etc, which could allow for more flexible business models, particularly in terms of payment models (shifting hardware products for services). We believe this partnership could provide revenue streams for IAR Systems by the end of our forecast period as it creates one secure unified workflow from development to manufacturing for the customers.

Having acquired Secure Thingz, IAR Systems is now the only player that can provide secure product development in the entire software phase, while its partnership with Data I/O offers the only solution that secures the entire chain from software to manufacturing.

Figure 55: IAR Systems + Secure Thingz + Data I/O = security from design to deployment



Source: Company

Express Logic

Collaboration with Express Logic regarding new IoT platform

In 2017, IAR Systems started collaborating with Express Logic, a leading supplier of real-time operating systems for embedded systems, regarding a new IoT platform (X-Ware). The platform meets industrial requirement and focuses on the development of fast and secure connectivity between sensors and devices.

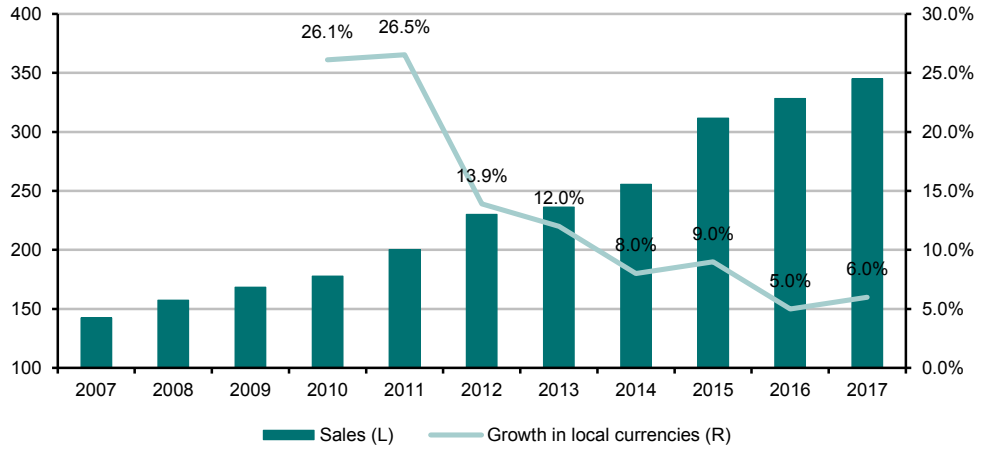
Financial performance

Sales CAGR of 9.2% in the past decade

Sales CAGR of 9.2% in the past decade

Looking at the historical financial performance, IAR Systems' growth story has been predominantly organic-driven (with the exception of the Signum acquisition in 2011), as it has been able to reach more customers, that are more loyal, resulting in more licence sales. In the 10 years to 2017, revenues grew from SEK143m to SEK345m implying a CAGR of 9.2%. In local currencies, the growth trend has waned in recent years as IAR Systems' growth in local currencies averaged 19.6% in 2010–2013 and 7.0% in 2014–2017.

Figure 56: Sales (SEKm) and growth in local currencies (%)

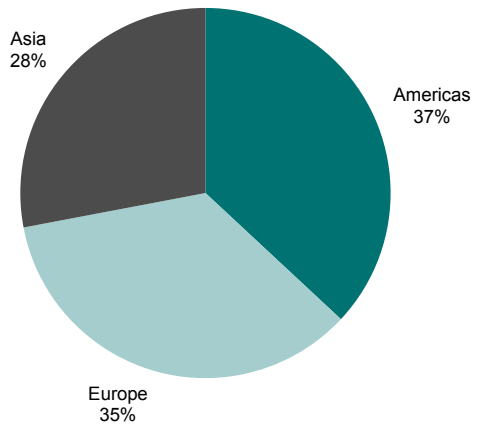


Source: Company

Slowing growth rates have been a common theme across all of IAR Systems' regions, particularly in the Americas (37% of 2016 sales), which has suffered from market uncertainty, according to the company. Moreover, the consolidation of the processor vendor market (and its product portfolios) has created uncertainty and volatility in its customers' choice of software tool supplier, which combined with fewer product launches of processors has halted growth.

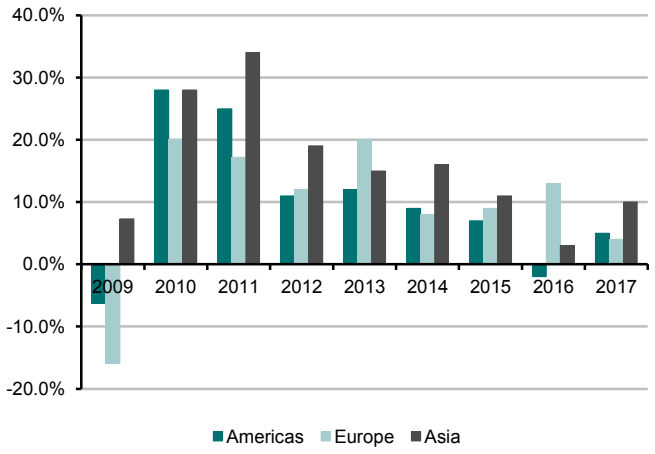
Organic growth slowing owing to market uncertainty and ripple effects from consolidation of semiconductor industry

Figure 57: Sales split (2017)



Source: Company

Figure 58: Sales growth in local currencies



Source: Company

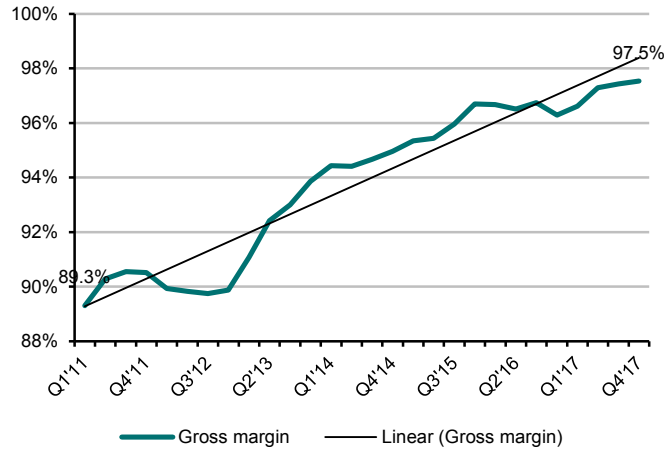
Scalable business models enable gross margin of 97.5%

Shift to software-based business model enabled scalability

When IAR Systems became part of Intoi in 2005, an explicit ambition was to shift from project-driven revenue streams to a software-based business model. This meant increased focus on revenue streams where customers pay for high-margin standardised software that offered scalability. Licence sales were 82% of 2011 sales, and as IAR Systems has increased

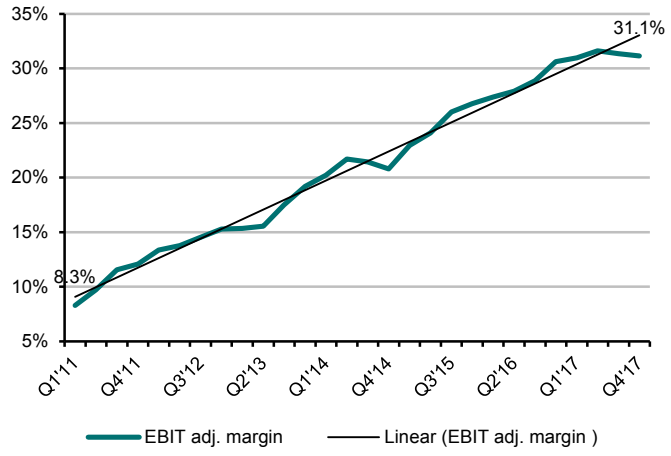
the number of proprietary products sold, licence sales comprised 98% in 2017. Together with increased cost efficiency, IAR Systems' leveraged scale and significantly boosted the gross margin from 89.3% in 2011 to 97.5% in Q4 2017 (rolling 12 months).

Figure 59: Gross margin (rolling 12 months)



Source: Company (historical data), DNB Markets (data structuring)

Figure 60: EBIT adj. margin (rolling 12 months)



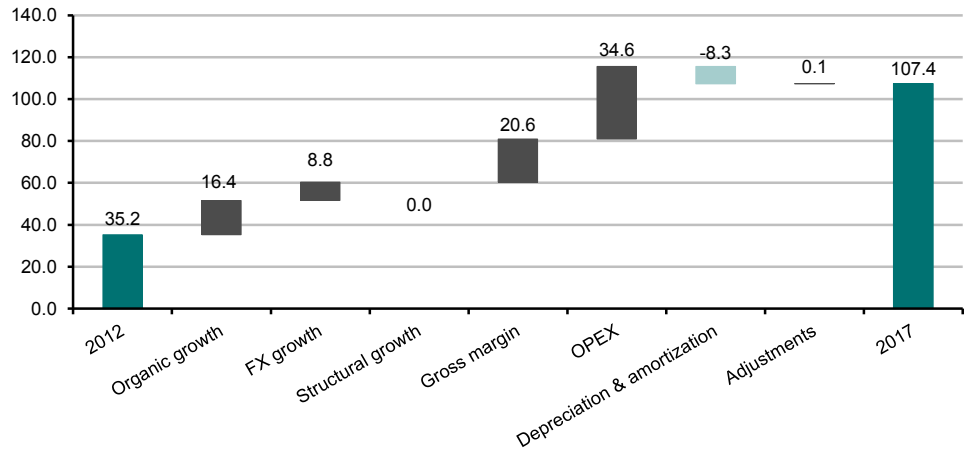
Source: Company (historical data), DNB Markets (data structuring)

Adding to the level of scalability of IAR Systems' business model is the largely fixed cost base. Personnel costs for developers and the sales force accounted for 46% of 2017 sales, while other external expenses (central overhead functions) comprised 14%. In 2012, IAR Systems had 157 employees and hired only a net of six employees between 2012 and 2017. In the same five-year period it increased sales by 50% and adjusted EBIT by 205%, and half the EBIT growth stemmed from maintaining a relatively fixed opex cost base. To shed further light on the adjusted EBIT margin improvements, it increased from 8.3% in Q1 2011 to 31.1% in Q4 2017 on a rolling 12-month basis, implying an adjusted EBT margin increase of 22.8% in seven years.

IAR Systems has proven the business model scalability with 2007–2017 sales CAGR of 9% and adjusted EBIT CAGR of 20%…

…and increased its adjusted EBIT margin by 22.8%-points in seven years; currently at 31.1% (LTM)

Figure 61: EBIT adjusted bridge (SEKm, 2012-2017)



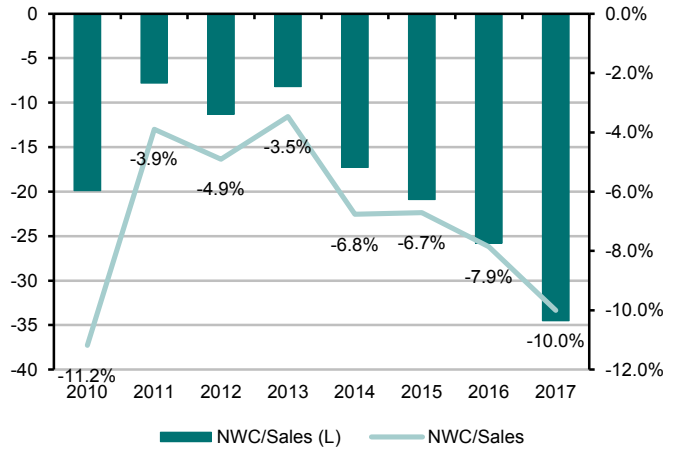
Source: Company (historical data), DNB Markets (data structuring)

Asset-light operating model with high cash conversion

As IAR Systems' customers pay in advance for the licences, it operates with negative net working capital (excluding cash). Its net working capital in relation to sales has been on a downward trend over the past five years and was -10% of sales in 2017. Meanwhile, capex requirements have been rather modest as it averaged 8% of 2012–2017 sales, and 6% in 2017, where the majority related to costs for in-house staff for developing the IAR Embedded Workbench, debug probes and analysis tools. Internally generated software development costs are then capitalised over the next 6–10 years.

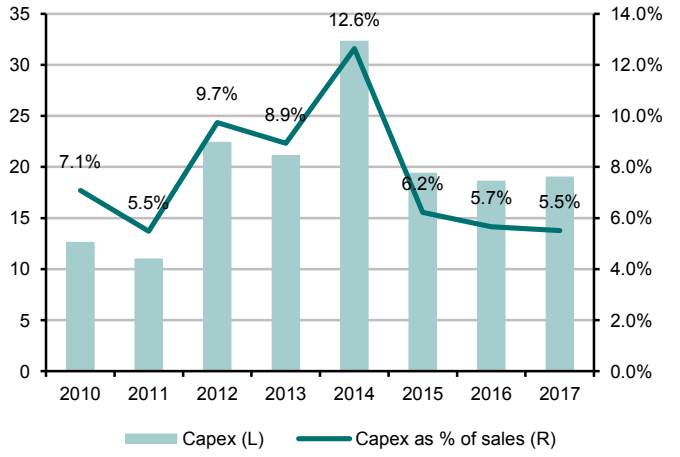
'One of those' negative NWC companies…

Figure 62: Net working capital/sales (SEKm)



Source: Company

Figure 63: Capex/sales (SEKm)



Source: Company

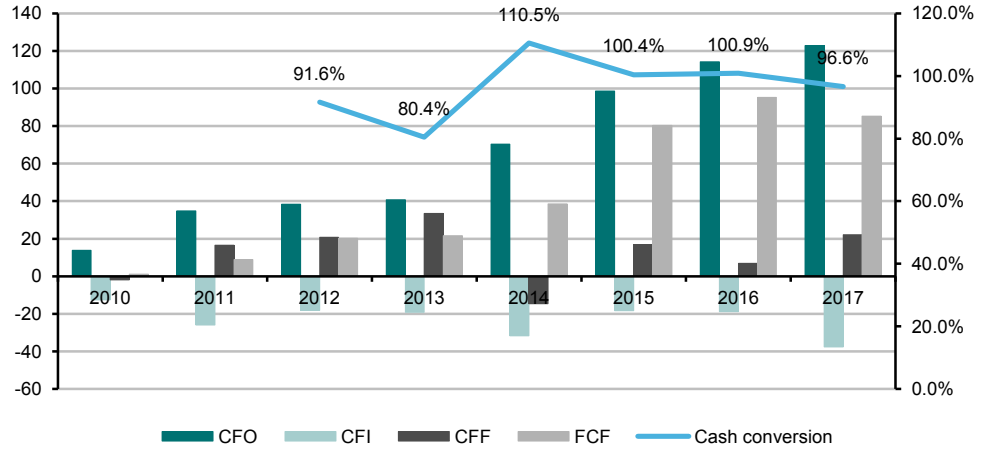
With little capital tied up in the operations and relatively low capex, it has experienced solid cash conversion averaging 97% in the past five years (operating cash flow to EBITDA).

…with limited capex requirements…

Its transition to an asset-light scalable licence model is best evidenced by its free cash flow generation. In 2012–2017, it had a sales CAGR of 8.4%, adjusted EBIT CAGR of 25.0%, but a FCF CAGR of 33.4%.

…and cash conversion average of 97% since 2012

Figure 64: Cash flow and cash conversion (SEKm)



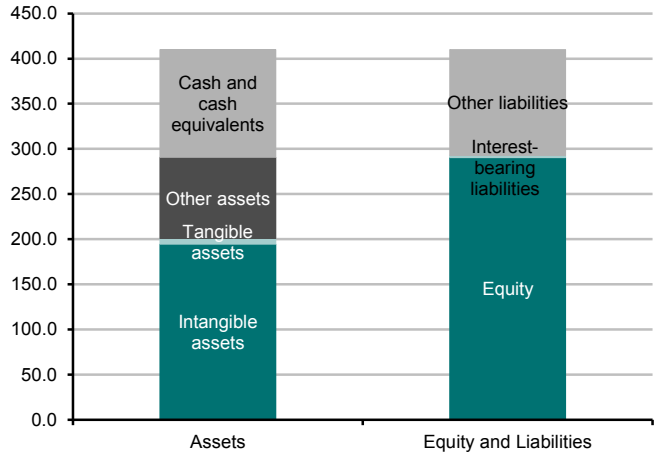
Source: Company (underlying data), DNB Markets (further calculations)

Healthy balance sheet with net debt/EBITDA of -0.9x

The largest items on the balance sheet as of end-December were: 1) equity; 2) intangibles (goodwill of SEK114m; trademarks, software, internally generated software development costs and customer agreements totalled SEK81m; and 3) cash of SEK120m. Meanwhile, interest-bearing liabilities were only SEK3m. As a result, IAR Systems had a net cash position of SEK117m as of end-Q4 2017, with a net debt/EBITDA of -0.9x on a rolling 12-month basis. Given the cash-generative nature of its business, we believe it could support a fairly aggressive gearing structure if it were to identify acquisition targets.

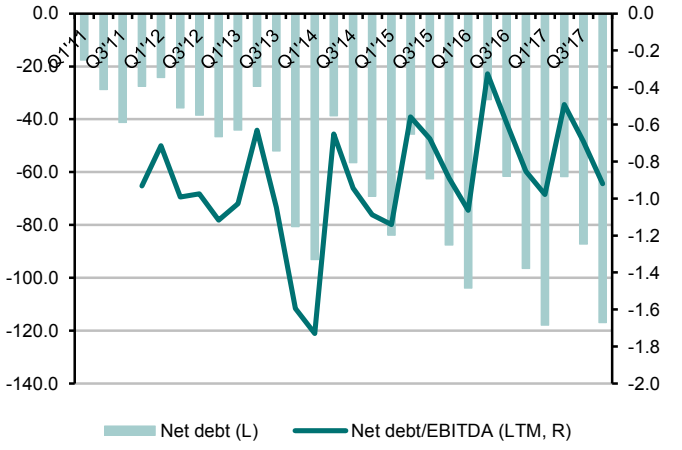
Healthy balance sheet with net cash position of SEK117m

Figure 65: Balance sheet (end-Q4 2017) (SEKm)



Source: Company

Figure 66: Net debt to EBITDA (SEKm)



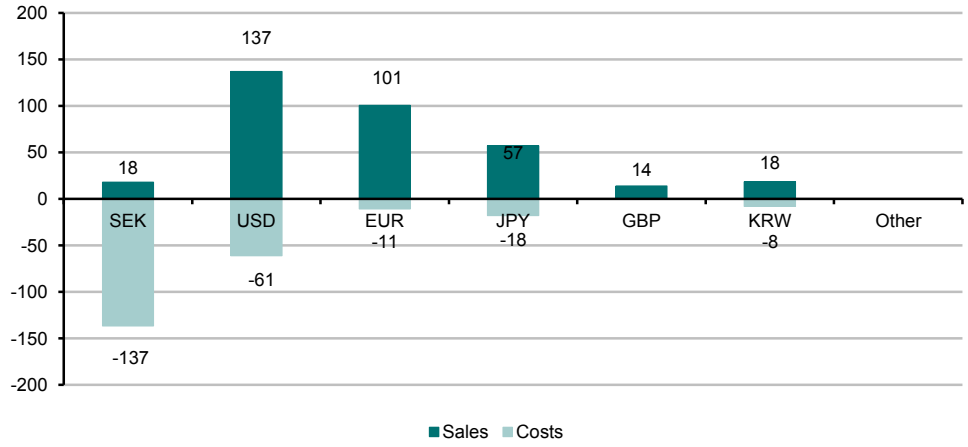
Source: Company

Quite substantial FX sensitivity

With more than 98% of sales stemming from markets outside Sweden, while the vast majority of the fixed cost base is denominated in SEK (58% due to product development taking place in Sweden), the company is rather sensitive to currency fluctuations to the SEK. The most important ones are the USD, the EUR, and the JPY and while it can balance some of its exposure as ~85% of its COGS are denominated in these currencies, COGS represent only 5% of its cost base.

Sensitive to strengthening of the SEK

Figure 67: Currency spread (2017)



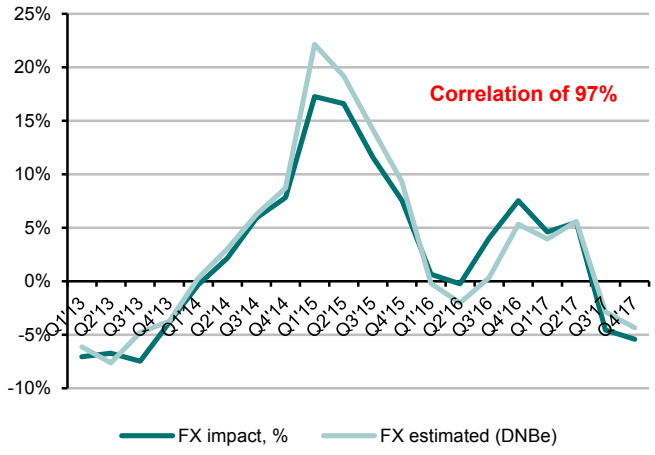
Source: Company (underlying data), DNB Markets (further calculations)

A weak SEK against most end-market currencies has provided quite a substantial FX tailwind in the past few years, which on average has added 3% per quarter to sales and 7% to EBIT. However, in some quarters, as in Q1 2015, the top line was boosted by 17% and EBIT by 54% due to the SEK weakening against all major currencies.

We find some comfort in the forecast FX impact with 97–99% correlation in our historical back tests

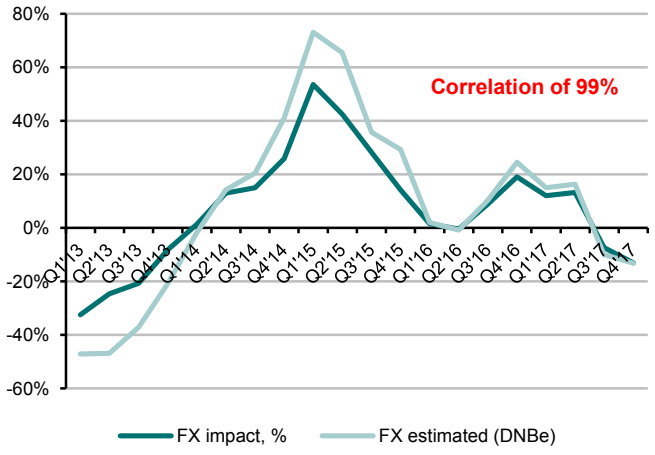
Given its significant FX exposure, we believe it is important to keep track of IAR Systems' weighted exposure. Therefore, we have constructed a FX sensitivity model, which shows correlations of 97% and 99% in the past four years for the sales and EBIT impact of currency fluctuations, respectively, providing a good foundation for estimated FX effects in our forecasts.

Figure 68: FX impact on sales



Source: Company (historical data), DNB Markets (estimates)

Figure 69: FX impact on EBIT



Source: Company (historical data), DNB Markets (estimates)

Estimates

We expect 10% 2017–2020 sales CAGR

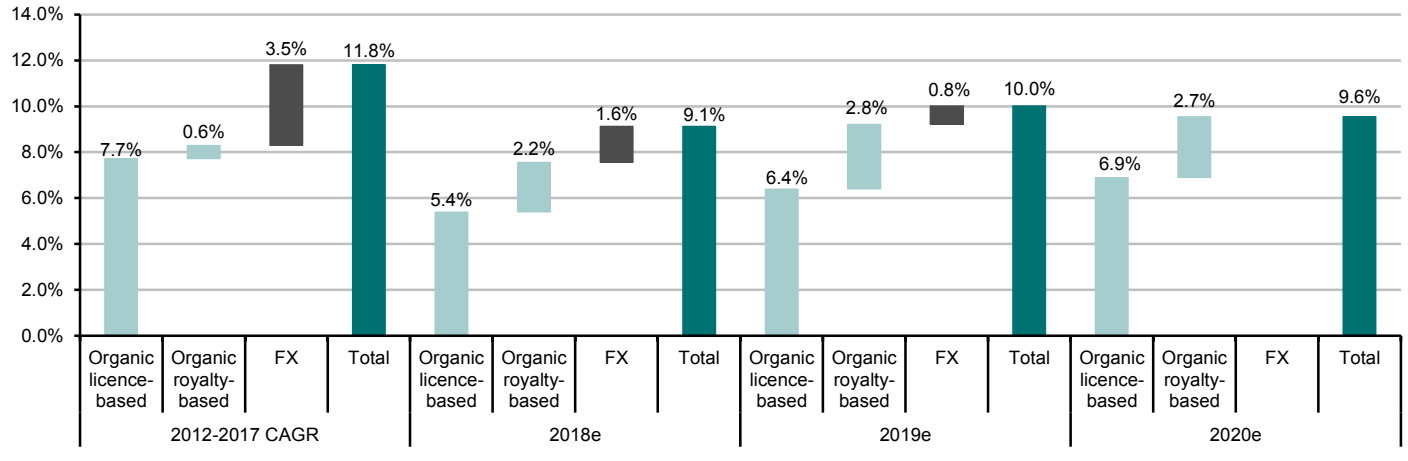
Set for 2017–2020e sales CAGR of 10%

Between 2007 and 2016, IAR Systems outperformed the underlying embedded systems market (chips with processors) by 3%-points per year, leading to a sales CAGR of 10%. We believe the outperformance could continue in the coming years, driven by:

- **More embedded products.** A growing number of smart products with embedded systems to support connectivity should increase the number of processors and lines of code, driving demand for software development tools and possibly programmers (user keys) for IAR Systems.
- **Faster time-to-market, increased complexity and focus on safety.** As processors become more safety-critical and complex, demand for software tools to test, analyse, and debug should grow. Moreover, with a push for developers to shorten the time-to-market for products, they should need a full user-friendly solution enabling them to re-use large amounts of code rather than starting from scratch with a single tool, which should benefit a complete solutions provider like IAR Systems.
- **Increased penetration from existing and new add-ons.** Having acquired Secure Thingz, the combined entity is now the frontrunner in offering secure embedded systems, a market that is in its inception phase we expect to see rapid growth as penetration of secure new IoT devices will go from 4% today to ~20% in 2022e, according to ABI Research. There is no real competitor in this market today and if IAR Systems were to capture considerable market share on that trajectory, we believe it could constitute a paradigm shift for the company. However, preferring to be prudent and see some of the potential materialise first, we have included only minimal sales from its security offering. However, even minimum sales from this offering should push the mid-single digit growth to near double-digits, we believe. Also, we consider it likely that IAR Systems will continue its growth initiatives by investing in new technology, markets, alliances, and partnerships.

Even conservative assumptions for the Secure Thingz offering indicate solid organic growth momentum, we argue

Figure 70: Sales growth components (2012–2020e)



Source: DNB Markets (forecasts), company (historical data)

For the licence business (98% of 2017 sales), our growth forecasts are driven by the expected embedded software market CAGR of 7.4% until 2023e, where we estimate a 2017–2019e organic sales CAGR of 6.5%, as we do not believe the volume of licences will grow at the same pace as the value of the market. However, with an offering tilted towards the fastest growing segments (automotive and IoT), we see upside potential to our growth estimates.

Given market uncertainty, we take a conservative view on the licence-business (2017–2020e organic sales CAGR 6.5%)

We estimate that revenues stemming from the royalty-based agreement with Renesas Electronics should contribute to an organic sales CAGR of 2.7% for IAR Systems until 2020e. However, as the dynamics of this agreement have not been disclosed, we take a conservative approach for estimating the revenue impact. According to IAR Systems, users in the Renesas

Royalty-based business should enjoy rapid growth from a low base, adding to group sales with organic sales CAGR of 2.7% until 2020e

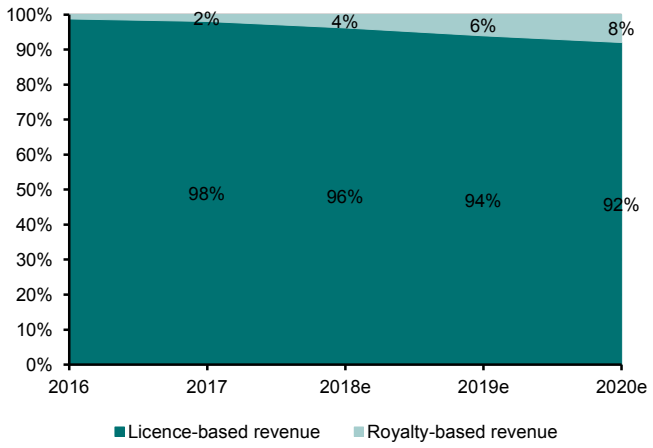
Synergy platform are still in a development phase, which is why production is expected to begin in 2018.

While the Renesas Synergy agreement should comprise a limited part of IAR Systems' sales in our forecast period (we expect 8% in 2020e), it should contribute more to EBIT growth. With all operating expenses for the platform covered by Renesas Electronics, all of the revenues fall straight to IAR Systems' operating profit (we estimate it should constitute c20–25% of 2020e EBIT).

The two revenue streams combined, and having taken into account currency movements, translate into a 2017–2020e sales CAGR of 9.6%. We find our forecasts slightly on the low side in light of IAR Systems' target to grow sales by 10–15% annually in local currencies, but choose to take this approach until we see organic growth pick up.

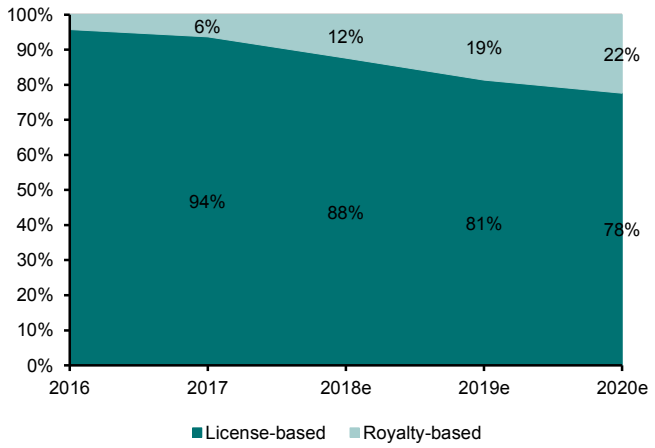
Our 8.9% organic sales CAGR forecast could be low given IAR Systems' goal of annual local currency growth of 10–15%

Figure 71: Revenue models share of group sales



Source: DNB Markets (forecasts), company (historical data)

Figure 72: Revenue models share of group EBIT



Source: DNB Markets (forecasts), company (historical data)

To forecast royalty-based revenues from the Renesas Synergy agreement, we start by looking at the minimum remuneration IAR Systems is guaranteed, which was SEK6.8m for 2017. In addition, IAR Systems receives a royalty determined by the number of microcontrollers (MCU) produced in Renesas Synergy series: the S1 (ultra-low power), S3 (high efficiency), S5 (high interaction), and S7 (high performance), where the first generation of embedded IoT products should drive volumes especially for general purposes, and consequently lower the lower-priced S1 and S3 series, we believe.

Revenue model consists of:
1) minimum remuneration
2) royalty fee per chip produced

We estimate Renesas Synergy sales at ~4% of its 2017 group sales (the general purpose MCU business in its Broad-Based business unit). We then use Factset consensus to estimate group sales growth, which is expected to have a 2017–2020e CAGR of 6.5% in SEK. As Renesas expects the Synergy MCU platform to be a key growth driver, we expect a linear up-take of its contribution to group sales of 20% in 2020e.

Renesas Electronics has said Synergy platform should become key growth driver, and we believe it could comprise 20% of 2020e sales

Moreover, as average selling prices (ASP) for microcontrollers have eroded by 5–15% a year for the past few years, we believe we should see price pressure upwards of 20% on an annual basis for the Synergy MCUs given the intensified competition in the IoT space. Based on our estimated ASP of SEK75.4/unit for 2017 (using a 20% discount to list prices for the Synergy series from vendors Digi-Key and Rutronik), price pressure, and linear up-take for Synergy platform penetration, we estimate that 30m Synergy MCUs were produced in 2017, which should rise to ~700m in 2020 on our estimates, which is below the target from Renesas Electronics to sell >800m Synergy chips by 2020e.

Price erosion for microcontrollers likely to continue as competition in IoT intensifies

The big question is how much royalty fee per MCU produced lands on IAR Systems' top line. To understand what other players in the value chain with royalty-based revenue streams can charge, we have looked at Arm, which charges a royalty of c1–2% of the ASP of every chip sold that contains its IP. However, given Arm's role in the value chain, we believe IAR Systems' royalty fee should be considerably less and have assumed 0.25%.

We estimate a royalty fee for IAR Systems of 0.25% per chip produced

Figure 73: Royalty-based revenues from Renesas Synergy agreement (SEKm)

	2016	2017	2018e	2019e	2020e
Renesas Electronics total revenues	50,335	59,515	61,237	67,926	71,848
Renesas Synergy share of total revenues	1%	4%	9%	15%	20%
Renesas Synergy revenues*	452	2,381	5,715	9,963	14,370
Number of produced Synergy MCUs (m)	5	25	95	206	372
Cumulative number of produced Synergy MCUs (m)		30	125	331	704
Average list price (SEK/MCU)*	90.5	75.4	60.3	48.3	38.6
Price pressure (YOY)		20%	20%	20%	20%
IAR royalty per produced MCU	0.25%	0.25%	0.25%	0.25%	0.25%
IAR royalty-based revenues (SEKm)	**4.1**	**6.8**	**14.3**	**24.9**	**35.9**
Share of IAR Systems' sales	1%	2%	4%	6%	8%
Number of MCUs per IAR licence (SEK30,000)	132,626	159,151	198,939	248,674	310,842
JPY/SEK	0.0789	0.0762	0.0751	0.0784	0.0784

Source: Company (historical data), DNB Markets (estimates), Bloomberg (spot rates), Digi-Key & Rutronik (ASP)
Note: *DNB estimated Synergy revenues based on Renesas Electronics' Broad-Based's revenue composition

Having Renesas Electronics on the hardware side, Embedded Trust and Amazon Web Services on the software side, we believe IAR Systems is well positioned as IoT solutions gain traction. Moreover, as IAR Systems has communicated that Renesas Electronics has a large backlog as it has not been able to produce enough microcontrollers to support the growing demand (much of which is driven by the automotive industry), 2018–2019 could be interesting for IAR Systems' royalty agreement.

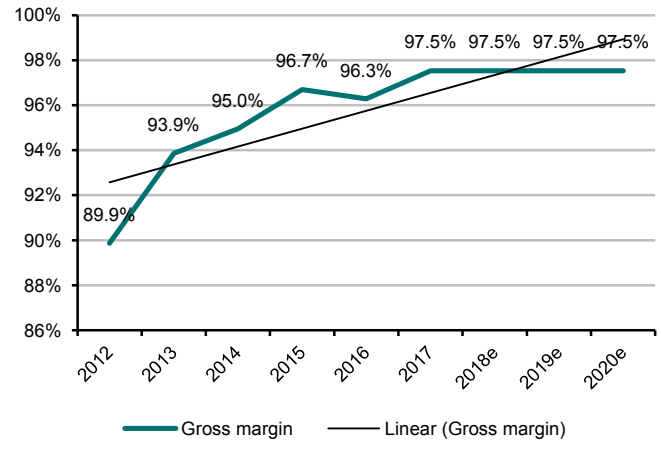
2018–2019 could be inflection point for new revenue streams

EBIT margin north of 35% by 2020e

Over the past few years, IAR Systems has made some impressive gross margin improvements from 89.3% in 2011 to 97.5% in Q4 2017 (rolling 12 months), as it has focused more on proprietary software, which has experienced limited price pressure. We attribute this to the technological challenges embedded software programmers are facing, which is why it cannot compromise on any quality aspects in the development phase benefiting a quality guarantor as IAR Systems. In our forecast period we expect its pricing power to remain as the cost of the licence comprises only a marginal share of the total costs linked to the development of customers' products, and forecast gross margins to remain at 97.5% throughout our forecast period.

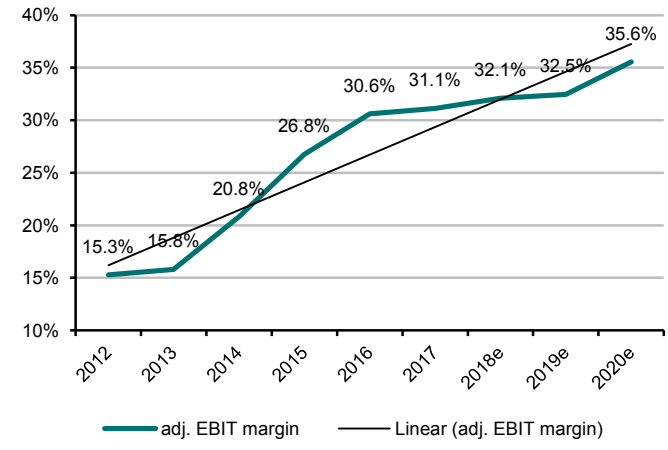
Pricing power should maintain gross margin at 97.5%

Figure 74: Gross margin



Source: DNB Markets (forecasts), company (historical data)

Figure 75: Adj. EBIT margin



Source: DNB Markets (forecasts), company (historical data)

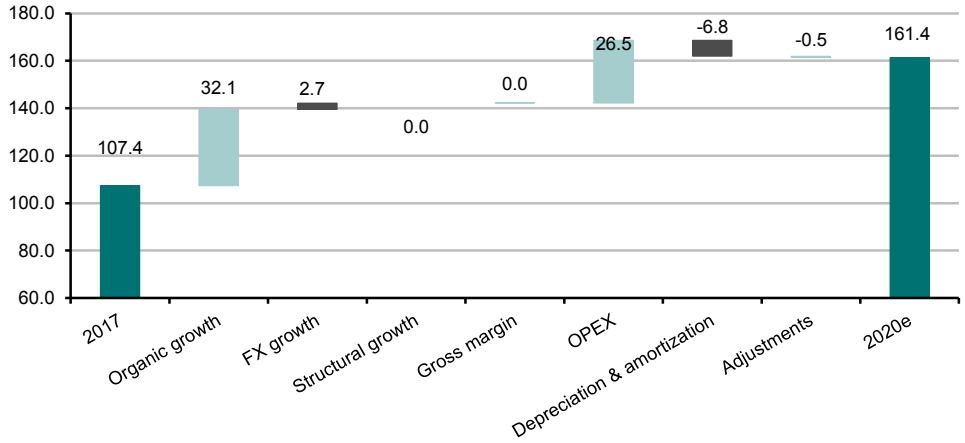
We forecast a 2017–2020e adj. EBIT CAGR of 14.5%, implying a margin gain from 31.1% in 2017 towards 35.6%, mainly driven by: 1) solid organic volume growth; and 2) operational leverage averaging 50% in our forecast period as we believe IAR Systems should continue to benefit from economies of scale due to its large fixed cost base. According to management, there is no need for extra hiring (software developers or sales personnel) to meet the new

We forecast 14.5% 2017–2020e adj. EBIT CAGR

growth initiatives. However, we prefer conservative assumptions for personnel costs, being the largest cost item (46% of 2017 sales), and estimate the headcount increases to 171 (up by eight in 2018), and in 2019–2020e increases by two a year for the traditional IAR Systems. On the back of the Secure Thingz acquisition, 15 additional employees will be added to the combined entity, which is why we expect the EBIT margin to fall by 0.4%-point YOY in 2018e. However, adjusted for non-recurring emission costs of SEK5m, we believe the margin should still improve by 1%-point YOY in 2018.

Moreover, we estimate that depreciation of PPE should remain at 0.7% of sales in our forecast period and slightly higher amortisation of intangibles averaging 6.1% until 2020e, following historical trends.

Figure 76: EBIT adjusted bridge (SEKm)



Source: DNB Markets (forecasts), company (historical data)

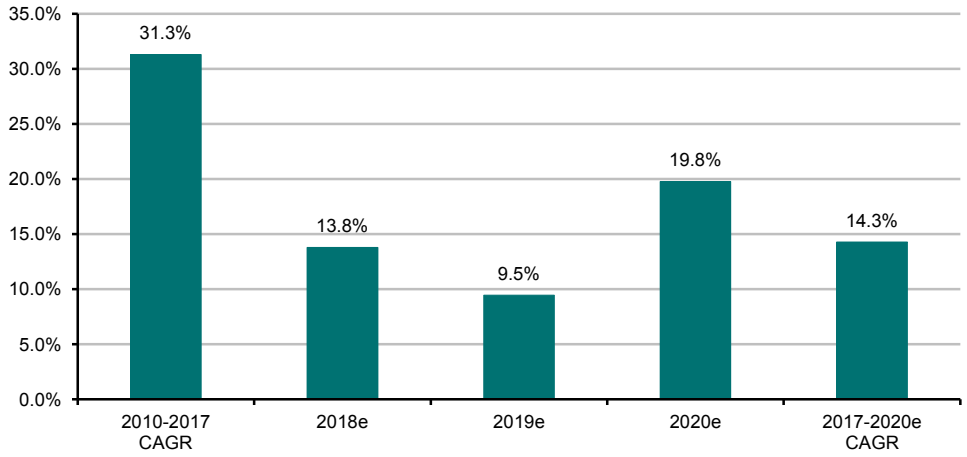
We forecast 2017–2020e EPS CAGR of 15%

Having utilised its tax-loss carry-forwards, it begins to pay full taxes in 2018e

With a net cash position of SEK117m as of end-Q4 2017, interest expenses should remain low. However, financial expenses has been hit by impairment losses over the past two years (mainly related to its NorNor Holding that now holds a fair value of SEK0m), as well as increased credit expenses for a raised credit margin of SEK200m. The acquisition of the remaining 80% of Secure Thingz for ~SEK230m (to be consolidated in Q2 2018) will be financed by a SEK179m rights issue, consequently keeping flexibility to utilise the remaining part of the credit margin for other initiatives; hence we do not expect a material uptick in financial costs.

We expect net financial items in relation to sales at 0.3–0.5% in our forecast period to reflect no further impairment losses, partly offset by increased interest-bearing liabilities from the Secure Thingz acquisition. As IAR Systems has utilised all its tax-loss carry-forwards, we expect it to pay full taxes from Q1 2018, and we assume a tax rate of 25%.This translates into an EPS CAGR of 14.0% in our forecast period.

Figure 77: EPS CAGR



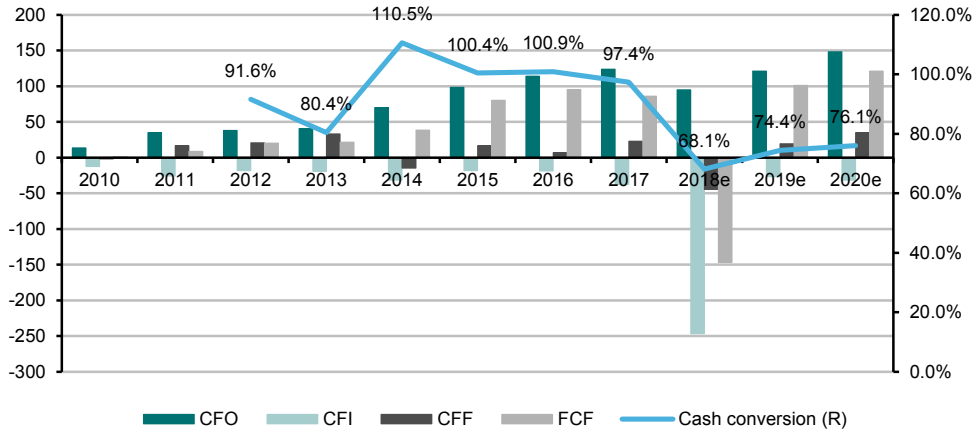
Source: DNB Markets (forecasts), company (historical data)

Solid cash flow to improve an already strong balance sheet

We view cash flow as a key strength for IAR Systems and forecast a 2017–2020e FCF CAGR of 12.0%, driven by: 1) EBITDA growth; 2) moderate capex requirements (c6% of sales or 1.1x D&A); and 3) healthy negative working capital. The average cash conversion in 2018–2020e is solid but not best-in-class at ~70-75%, somewhat below the 5-year average of ~97% as no tax-loss carry-forwards will be utilised in our forecast period.

As has no tax-loss carry-forwards to utilise in our forecast period, cash conversion will be solid at ~70-75%, but not best-in-class

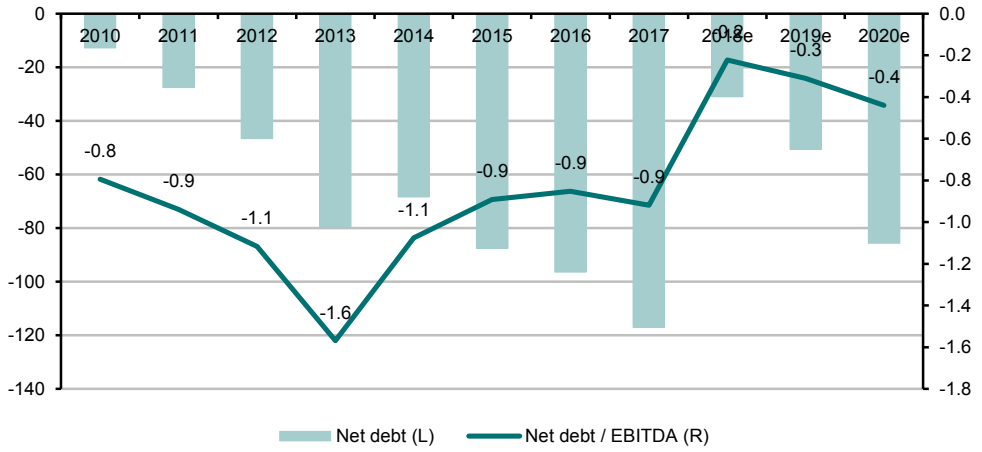
Figure 78: Cash flow and cash conversion (SEKm)



Source: DNB Markets (forecasts), company (historical data)

Our cash flow forecasts imply that the net cash position of SEK117m as of end-Q4 2017e should increase to end-2020e net cash position of SEK86m (net debt/EBITDA of -0.4x), taking into consideration the Secure Thingz acquisition. On our estimates, IAR Systems will have paid out SEK225m (or a DPS of SEK5 for 2017, SEK5.5 for 2018e, and SEK6.0 for 2019e – in line with its historical pay-out trend). For end-2020e, we calculate that IAR Systems would have surplus cash of ~SEK140m, which could be used as a "war chest" for add-on acquisitions or investment in knowledge, alliances and technology, or distributions to shareholders.

Figure 79: Net debt (SEKm) and net debt to EBITDA (x)



Source: DNB Markets (forecasts), company (historical data)

Financial targets

IAR Systems has one overriding corporate goal and two long-term financial targets:

- **Corporate goal:** to bring value to organisations that develop products for embedded systems by supplying the tools and services that make embedded systems development fast, efficient and reliable. This enables its customer base worldwide to deliver better products to their markets more quickly.
- **Financial goals:**
  - Net sales to grow by 10–15% annually in local currency.
  - Operating margin to exceed 25% over a business cycle.
- **Dividend policy:** the board will propose an annual dividend corresponding to 30–50% of net profit. In addition, it might recommend a further transfer of capital to shareholders, provided it considers it justified in view of expected future cash flow and investment plans.

Our estimates for organic growth remain below the communicated target, but on profitability and the dividend policy we are above IAR Systems throughout our forecast period.

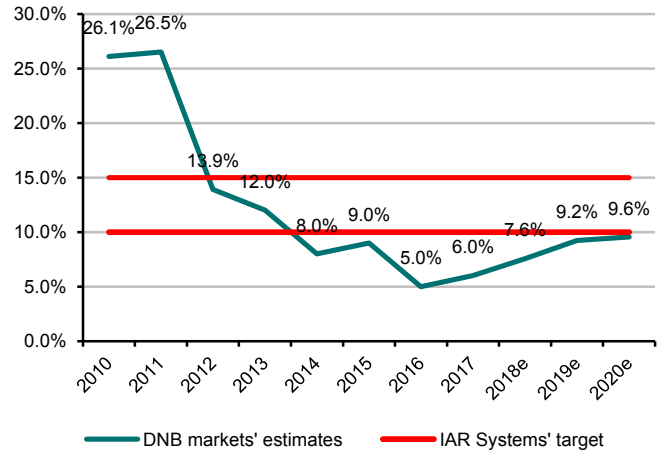
We believe its legacy business should be able to grow mid-single digits in our forecast period, as it has in the past two years, while new growth initiatives should accelerate organic growth. While we remain conservative in our estimates for IAR Systems' new revenue streams (most notably Secure Thingz), we believe that even limited success in our forecast period should be enough to accelerate growth up towards the lower end of its financial target. Given the scalability of the business model, accelerating growth should push its EBIT margin some way above its financial target; hence, we believe it fair to assume there is a possibility this goal could be raised in our forecast period.

Figure 80: IAR Systems' financial targets – reported and DNB Markets' estimates

	Reported fiscal years					IAR	DNB Markets' estimates		
	2013	2014	2015	2016	2017	target	2018e	2019e	2020e
Organic growth	12.0%	8.0%	9.0%	5.0%	6.0%	10-15%	7.6%	9.2%	9.6%
EBIT margin	15.8%	20.8%	26.8%	30.6%	31.1%	>25%	30.8%	32.5%	35.6%
Pay-out ratio	88.0%	149.3%	99.7%	113.3%	79.0%	30-50%	75%	75%	68%

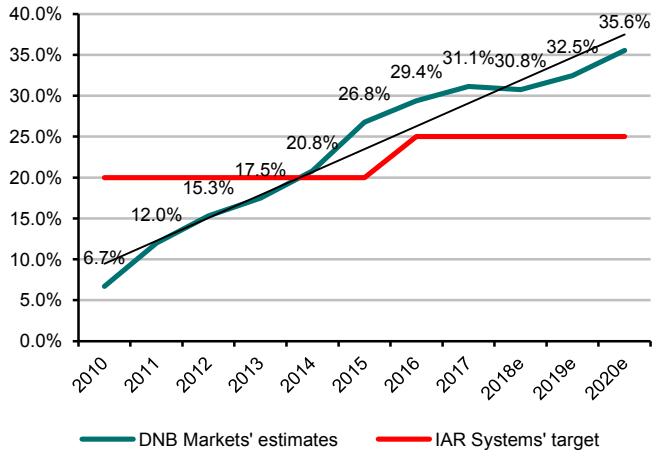
Source: DNB Markets (forecasts), company (historical data and targets)

Figure 81: Growth in local currencies – target and DNB Markets' estimates



Source: DNB Markets (forecasts), company (historical data)

Figure 82: EBIT margin – target and DNB Markets' estimates



Source: DNB Markets (forecasts), company (historical data)

Valuation

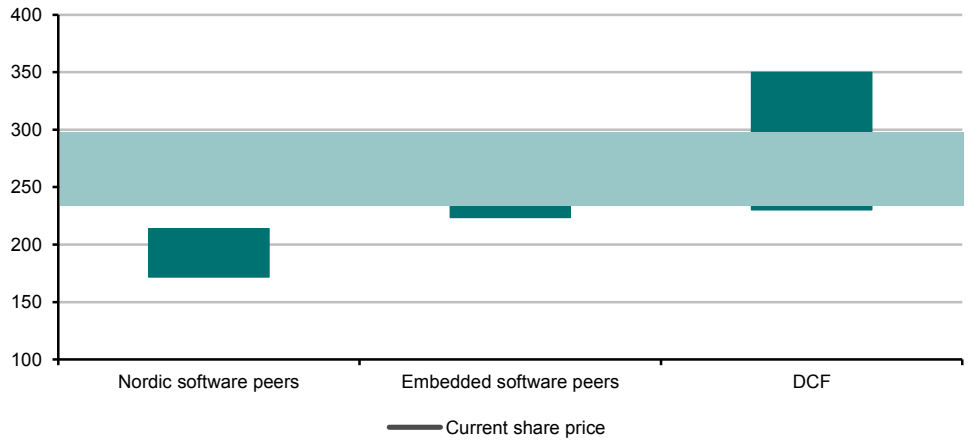
Our valuation framework is based on a long-term analysis and is not linked to a near-term assessment of the likely performance of the company's shares.

Summary

We calculate a fair value of SEK240–300

Based on our group of Nordic software peers (seven), embedded software peers (five), as well as our DCF model, we calculate a fair value of SEK240–300. On current share price, our estimates suggest a 2019e P/E of 33.9x, EV/EBIT of 24.7x, and EV/Sales of 8.0x.

Figure 83: Valuation summary (SEK/share)



Source: DNB Markets

We find no perfectly matching listed peer for IAR Systems, so have compared it with software companies that to various extents have similarities in terms of customer profile (B2B/ commercial), end-market characteristics (underpinned by digitalisation, and if possible in embedded systems, in industrial automation, medtech, telecom, consumer electronics and the automotive industry), scalable business models with high gross margins that have a cash-generative nature. For more detailed descriptions, see the Appendix.

- **Nordic software peers.** A valuation on a par with these stocks (many of which are listed on the OMX Nordic small- to mid-cap list) suggests a fair value of SEK170–215.
- **Embedded software peers.** The multiples of these peers suggest a fair value of SEK230–280. While we use the aggregate of our two peer groups, we believe this peer group better reflects IAR Systems' operating environment, business model, and growth prospects.
- **DCF.** Our DCF of SEK230–350 (WACC 10.5–8.5%) has a mid-point of SEK275 (WACC 9.5%). This assumes 7% revenue growth (in-line with the expected underlying market growth) and incremental EBIT margin gains of 0.5%-points annually (historical average >3.5%-point improvement a year) for 2021–2027e p.a., revenue growth of 3.5%, and an EBIT margin remaining at 39% in the terminal period.
- **Fair value of SEK240–300.** Our low-point fair value is based on blending multiples (EV/EBITDA, EV/EBIT, and P/E) of the aggregate of our total peer group (including a 20% premium to Nordic software peers) with our mid-point DCF. Our fair value ceiling uses the maximum of the valuation ranges for our aggregate peer group and high-end DCF.

Figure 84: Definition of valuation summary share price range (SEK/share)

DNB	Fair value	Comment
High	300	Using the ceiling range of aggregate peer group and high-point DCF, with a 20% premium to Nordic peers
Low	240	Average blend of total peers (2018-2020e multiples) and mid-point DCF

Source: DNB Markets

Relevant peer group valuation

As it is challenging to identify a perfect peer for IAR Systems, we have used two peer groups including a wide range of companies in various industries that we consider relevant for valuation purposes. The peer groups include similar companies in terms of business models, position in the value chain, and end-market exposure.

- **Software companies on Nordic small- and mid-cap lists** are largely niche market leaders with scalable (large fixed cost base), high-margin, and asset-light business models with cash-generative characteristics. We believe this is a suitable peer group, as it should be the go-to peers for the Nordic investment community who understand the valuation of these businesses. However, we do not believe they provide an inclusive foundation to value IAR Systems' shares.
- **Embedded software peers** have business models that largely comprise software tools and technologies that help software developers (many of which found in IAR Systems' end-markets) to design, manage, and accelerate their digital product development processes. Similar to IAR Systems, increased digital product complexity and security needs are fuelling growth for these companies where embedded systems and electronics found in the IoT and automotive end-markets represent a substantial opportunity. Moreover, with more comparable end-market drivers to IAR Systems, we believe this peer group better reflects the operating environment and potential in IoT, thus more in line with IAR Systems' transformation from a compiler to a comprehensive tools solution for embedded systems.

Figure 85: Peers

Nordic software peers	Ticker	Embedded software peers	Ticker
HMS Networks	HMS-SE	Synopsys	SNPS-US
SimCorp	SIM-DK	Cadence Design Systems	CDNS-US
Micro Systemation	MSAB.B-SE	ANSYS	ANSS-US
CellaVision	CEVI-SE	Xilinx	XLNX-US
INVISIO Communications	IVSO-SE	Altium	ALU-AU
RaySearch Laboratories	RAY.B-SE	Red Hat	RHT-US
HMS Networks	HMS-SE		

Source: Factset

Comparing our sales forecasts for IAR Systems to Factset consensus for the peer groups, we are slightly below Nordic software peers, as they expect sales growth of c15% p.a. (we estimate a 2017–2020 CAGR of 10% for IAR Systems). However, looking at margins, IAR Systems compares well above the average Nordic software names and more in line with embedded software peers (2018–2020e average of ~31%) as we estimate an EBIT margin of 32% for IAR Systems in 2018e, improving to 36% in 2020e.

According to Factset consensus, the total average EBIT CAGR for peers is 18% for 2017–2020e, boosted by high growth for Nordic small caps, compared to our EBIT CAGR forecast for IAR Systems of 15% for the same period.

Figure 86: Peer group (%)

	Sales growth			GM	EBIT margin			EBIT growth			EPS growth			2017–2020e CAGR		
	2018e	2019e	2020e	2017	2018e	2019e	2020e	2018e	2019e	2020e	2018e	2019e	2020e	Sales	EBIT	EPS
IAR Systems (DNBe)	**9.1**	**10.0**	**9.6**	**97.5**	**32.1**	**32.5**	**35.6**	**12.5**	**11.4**	**20.0**	**13.8**	**9.5**	**19.8**	**9.6**	**14.5**	**14.3**
IAR Systems (consensus)	**9.9**	**15.3**	**6.9**	**97.5**	**31.1**	**32.9**	**36.6**	**16.2**	**28.1**	**10.1**	**16.7**	**28.6**	**10.5**	**10.6**	**17.9**	**18.4**
DNB vs. consensus	-0.7	-5.3	2.7	0.0	1.0	-0.5	-1.0	-3.7	-16.8	9.9	-2.9	-19.1	9.2	-1.0	-3.4	-4.1
Nordic software peers																
HMS Networks	14.0	14.5	12.7	61.0	17.9	18.4	20.2	16.8	26.1	18.4	17.0	25.9	20.3	13.7	20.3	21.0
SimCorp	9.8	7.1	6.6	61.4	25.9	26.4	27.1	12.0	9.8	7.9	14.2	10.9	9.1	7.9	9.9	11.4
Micro Systemation	10.6	17.4	12.0	90.0	22.8	21.9	24.7	5.8	32.9	24.7	2.7	32.3	25.2	13.3	20.6	19.4
CellaVision	10.2	14.4	12.1	72.2	30.6	30.2	33.3	8.9	26.2	18.5	21.2	20.3	19.2	12.2	17.6	20.3
INVISIO Communications	17.6	22.6	24.0	55.3	22.6	24.9	27.5	29.5	35.1	30.9	39.0	30.4	31.7	21.4	31.8	33.7
RaySearch Laboratories	13.0	22.4	20.3	93.7	27.3	26.3	31.5	8.9	46.4	36.1	17.5	59.0	40.1	18.5	29.5	37.8
Average of the above	**12.5**	**16.4**	**14.6**	**72.3**	**24.5**	**24.7**	**27.4**	**13.6**	**29.4**	**22.7**	**18.6**	**29.8**	**24.3**	**14.5**	**21.6**	**23.9**
DNBe vs. peer group	-3.4	-6.4	-5.1	25.3	7.6	7.8	8.2	-1.1	-18.1	-2.8	-4.8	-20.4	-4.5	-4.9	-7.1	-9.6
Embedded software peers																
Cadence Design Systems	5.2	5.6	5.5	87.8	27.5	26.7	24.8	2.2	-2.0	4.2	11.5	9.3	-0.7	5.4	1.4	6.6
ANSYS	9.9	9.3	8.3	86.3	46.4	44.6	43.5	5.5	6.7	7.3	20.2	9.3	8.7	9.1	6.5	12.6
Xilinx	7.0	7.0		70.0	29.0	30.9	31.0	14.1	7.3		42.7	10.1				
Altium	29.5	20.0	18.9	50.0	28.3	30.1	31.7	37.6	26.5	23.7	38.9	28.0	23.1	22.7	29.1	29.8
Red Hat	18.1	15.2	11.6	85.3	23.9	23.9	24.4	18.2	17.7	13.2	15.1	17.6	19.6	15.0	16.4	17.4
Average of the above	**13.9**	**11.4**	**11.1**	**75.9**	**31.0**	**31.2**	**31.1**	**15.5**	**11.2**	**12.1**	**25.7**	**14.9**	**12.7**	**13.1**	**13.3**	**16.6**
DNBe vs. peer group	-4.8	-1.4	-1.5	21.6	1.1	1.2	4.5	-3.0	0.1	7.9	-11.9	-5.4	7.1	-3.5	1.2	-2.3
Average of total peer group	**13.2**	**14.1**	**13.2**	**73.9**	**27.5**	**27.7**	**29.1**	**14.5**	**21.2**	**18.5**	**21.8**	**23.0**	**19.6**	**13.9**	**18.3**	**21.0**
Median of total peer group	**10.6**	**14.5**	**12.0**	**72.2**	**27.3**	**26.4**	**27.5**	**12.0**	**26.1**	**18.4**	**17.5**	**20.3**	**19.9**	**13.5**	**19.0**	**19.8**

Source: Factset (6 April 2018)
Note (GM = gross margin)

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Figure 87: Peer group (x/%)

	M Cap	P/E (x)			EV/EBITDA (x)			EV/EBIT (x)			FCF Yield	RoE	Div. yield	Performance (%)		
	(SEKbn)	2018e	2019e	2020e	2018e	2019e	2020e	2018e	2019e	2020e	2018e	2018e	2018e	-1M	-3M	-12M
IAR Systems (DNBe)	**3.1**	**34.3**	**31.3**	**26.1**	**21.7**	**18.6**	**15.5**	**26.1**	**22.5**	**18.8**	**-4.4%**	**31.4%**	**2.4%**	**18.0**	**23.9**	**25.1**
Premium (+) / discount (-)		0%	14%	12%	-4%	1%	0%	4%	10%	9%						
IAR Systems (consensus)	**3.1**	**33.7**	**26.2**	**23.7**	**20.6**	**16.4**	**14.7**	**24.0**	**18.4**	**16.4**	**3.1%**	**29.1%**	**2.4%**	**18.0**	**23.9**	**25.1**
Premium (+) / discount (-)		-2%	-4%	2%	-9%	-11%	-5%	-5%	-10%	-4%						
Nordic software peers																
HMS Networks	5.6	33.6	26.7	22.2	19.8	15.8	13.3	23.6	18.3	15.0	2.7%	20.4%	1.4%	1.5	-7.0	39.5
SimCorp	22.8	28.4	25.6	23.5	21.3	19.2	17.8	22.1	20.0	18.5	3.3%	48.4%	1.6%	5.8	15.0	-5.1
Micro Systemation	1.2	23.2	17.5	14.0	15.3	11.3	8.6	15.6	11.4	8.8	4.4%	42.7%	3.6%	-0.6	-12.4	26.4
CellaVision	3.4	40.7	33.8	28.3	29.7	22.4	18.8	31.7	24.8	20.6	1.6%	29.3%	1.4%	-2.6	-9.7	17.1
INVISIO Communications	2.6	29.8	22.8	17.3	20.9	14.8	11.0	22.3	16.0	11.8	3.9%	26.9%	1.3%	-13.7	-28.2	-12.8
RaySearch Laboratories	3.1	36.2	22.7	16.2	14.8	10.8	8.1	23.4	15.6	11.0	1.6%	16.1%	0.5%	-13.2	-22.4	-50.8
Average of the above		**32.0**	**24.9**	**20.3**	**20.3**	**15.7**	**12.9**	**23.1**	**17.7**	**14.3**	**2.9%**	**30.6%**	**1.6%**	**-3.8**	**-10.8**	**2.4**
Premium (+) / discount (-)		5%	5%	17%	2%	4%	14%	4%	4%	15%						
Embedded software peers																
Cadence Design Systems	86.4	23.3	21.3	21.5	17.3	15.1		18.5	18.1		4.4%	36.5%	0.0%	-7.9	-17.3	17.9
ANSYS	109.6	32.3	29.5	27.2	21.3	19.3	16.8	22.1	20.2	18.3	3.3%	17.1%	0.0%	-4.6	2.1	48.0
Altium	144.7	33.6	23.5	21.4	20.4	17.9	15.7	22.5	19.6	18.1	4.2%	21.7%	2.1%	-7.1	-8.8	19.4
Xilinx	16.7	52.5	41.0	33.3	42.1	33.4	27.0	46.6	36.6	29.3	2.2%	25.6%	1.4%	-0.8	48.8	163.3
Red Hat	222.7	43.7	37.2	31.1	26.2	21.5	18.5	29.4	24.1	20.0	3.7%	32.4%	0.0%	0.0	20.7	77.0
Average of the above		**37.1**	**30.5**	**26.9**	**25.5**	**21.5**	**19.5**	**27.8**	**23.7**	**21.4**	**3.6%**	**26.7%**	**0.7%**	**-4.1**	**9.1**	**65.1**
Premium (+) / discount (-)		-9%	-14%	-12%	-19%	-24%	-25%	-14%	-22%	-24%						
Average of total peer group		**34.3**	**27.4**	**23.3**	**22.6**	**18.3**	**15.6**	**25.3**	**20.4**	**17.1**	**3.2%**	**28.8%**	**1.2%**	**-3.9**	**-1.7**	**30.9**
Median of total peer group		**33.6**	**25.6**	**22.2**	**20.9**	**17.9**	**16.3**	**22.5**	**19.6**	**18.2**	**3.3%**	**26.9%**	**1.4%**	**-2.6**	**-8.8**	**19.4**

Source: Factset (6 April 2018)

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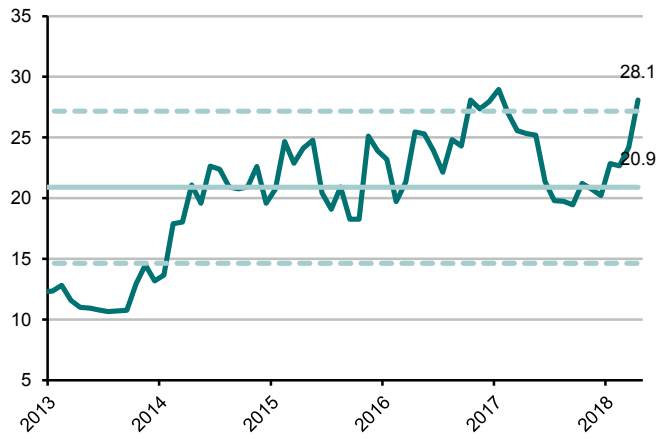
Relative valuation

On past 12-month rolling multiples, IAR Systems is trading at an EV/EBIT of 28.1x and a P/E of 39.2x, which is a ~30% premium to its historical valuation. At first glance, this could seem elevated; however, the valuation of its shares is a function of its revenue growth, we believe. Revenue growth declined throughout 2017 (hampered by uncertainty among customers and adverse FX) so its valuation fell below its five-year historical average.

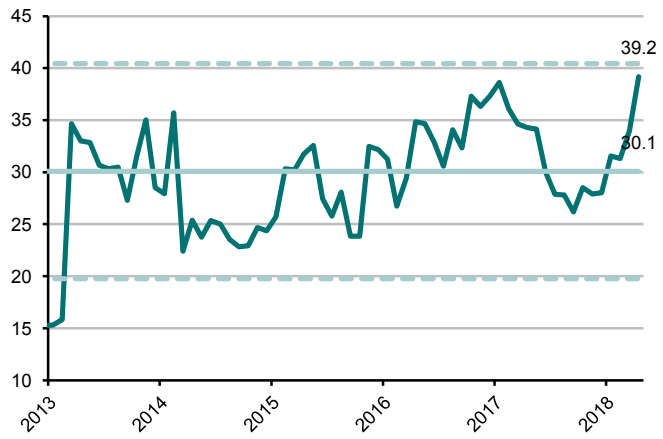
More recently, the valuation has bounced back, which we mainly attribute to the positive newsflow on new collaborations and partnerships (Secure Thingz, Data I/O, and Amazon FreeRTOS). With regard to the growth prospects these initiatives could entail, we believe the higher multiples are justified short-term with the potential for multiples expansion to reflect the higher revenue growth potential in the mid to long term.

Figure 88: IAR Systems EV/EBIT LTM



Source: Factset (underlying data), DNB Markets (further calculations)

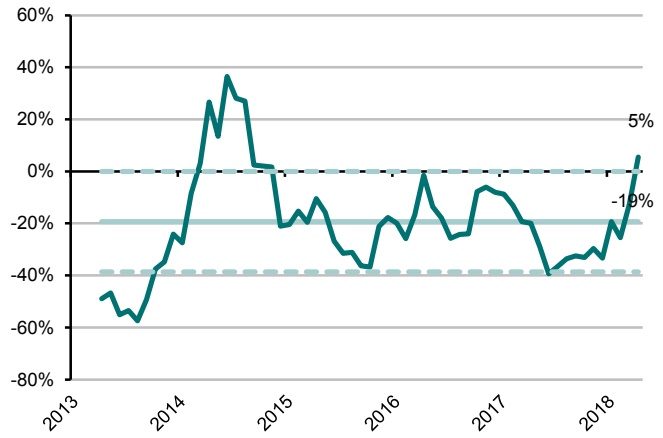
Figure 89: IAR Systems P/E LTM



Source: Factset (underlying data), DNB Markets (further calculations)

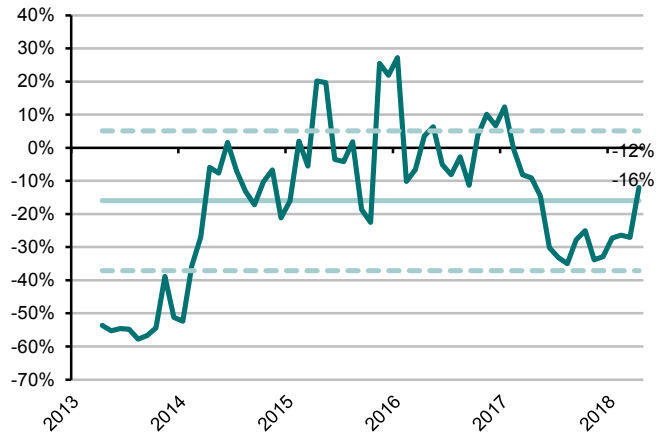
IAR Systems is trading at a 5% premium to Nordic software peers (5-year historical average discount of 19%). However, as we believe it should trade at multiples that reflect its transformation from a compiler to a comprehensive tools solution for embedded systems, the embedded software peer group should be a foundation for relative valuation. Relative to this peer group, IAR Systems is currently trading at a 12% discount, more in-line with the historical average.

Figure 90: Premium/discount EV/EBIT LTM IAR Systems to Nordic software peers



Source: Factset (underlying data), DNB Markets (further calculations)

Figure 91: Premium/discount EV/EBIT LTM IAR Systems to embedded software peers

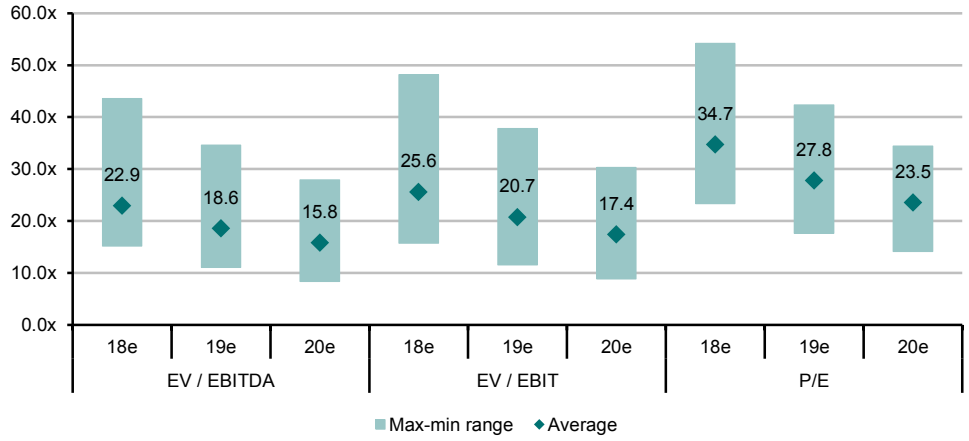


Source: Factset (underlying data), DNB Markets (further calculations)

Implied peer group valuation

Below, we show the ranges and average total peer multiple we apply to our valuation based on comparable multiples. The multiples are based on the average value of the total peer group.

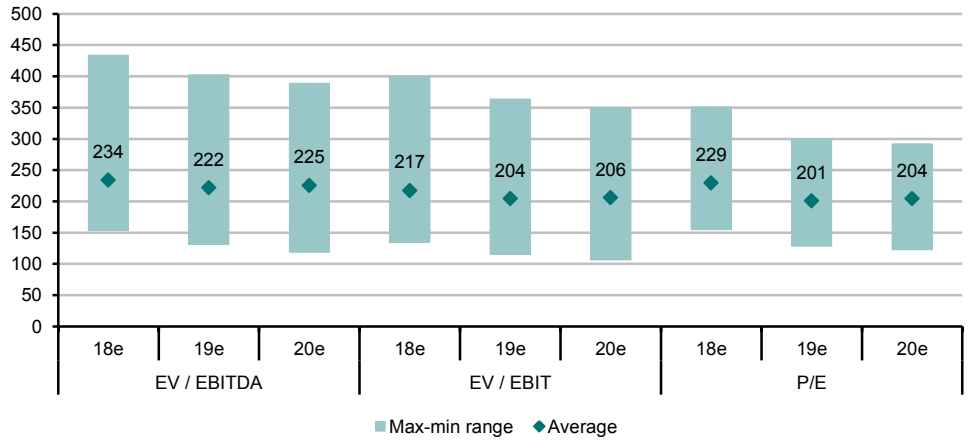
Figure 92: Peers' multiples used as basis for comparable valuation (x)



Source: Factset (underlying data), DNB Markets (further calculations)

Attributing our comparable valuation to the implied valuation from EV/EBITDA, EV/EBIT, and P/E for the entire peer universe suggests a fair value of SEK201-234 (based on average multiples in Figure 92).

Figure 93: Implied share price based on comparable peers' multiples (SEKm)



Source: Factset (underlying data), DNB Markets (further calculations)

In the table below, we summarise the EV multiples and P/Es for IAR Systems and our peer groups (11 stocks in total). Taking the average of the implied valuation of 2018–2020e EV/EBITDA, EV/EBIT, and P/E for our Nordic software peers suggests a fair value of SEK172–214, while the embedded software peers suggest a fair value of SEK223–282.

Figure 94: IAR Systems – implied peer group valuations

	EV/EBITDA			EV/EBIT			P/E		
	2018e	2019e	2020e	2018e	2019e	2020e	2018e	2019e	2020e
Summary of peers average (x)									
Nordic software peers (6 stocks)	20.3	15.7	12.9	23.1	17.7	14.3	32.0	24.9	20.3
Embedded software peers (5)	25.5	21.5	19.5	27.8	23.7	21.4	37.1	30.5	26.9
Total peers (11)	**22.6**	**18.3**	**15.6**	**25.3**	**20.4**	**17.1**	**34.3**	**27.4**	**23.3**
Implied IAR Systems valuation (share price)									
Nordic software peers (6 stocks)	210	190	187	199	177	172	214	182	178
Embedded software peers (5)	263	259	282	239	236	257	248	223	236
Total peers (11)	**234**	**222**	**225**	**217**	**204**	**206**	**229**	**201**	**204**

Source: Factset (6 April 2018)
Note: In parenthesis, number of companies in that peer group

DCF

Our base-case assumes:

- A 2017–2020e sales CAGR of 10%, revenue growth of 7% p.a. for 2021–2027e, and 3.5% growth in the terminal period.
- An EBIT margin improving from 31.1% to 35.6% in 2017–2020e. For the longer term 2021–2027e we estimate it should improve by 0.5%-points p.a. (in contrast to the average >3.5%-point increase per year over the past five years) with depreciation and amortisation at c7% of sales over the forecast period as we expect capex to remain at ~7% of sales. We expect finance costs to increase in line with top-line growth, a tax rate of 25%, and net working capital in relation to sales growth of c10%, which is in line with its historical trend.
- A weighted average cost of capital (WACC) of 9.5%, assuming a 9.5% cost of equity, a 5.1% cost of debt, and a leveraged beta of 1.0.

On these assumptions, we calculate a fair DCF value of SEK230–350 (WACC 10.5–8.5%).

Figure 95: DCF valuation mid-point

	SEK/share
PV of FCF 2018–2027e	170
PV of FCF in the terminal period	104
Total EV	274
Net debt	-2
Implied equity value	**276**
Cost of Equity	
Risk-free rate (2)	4.5%
Market risk Premium (3)	5.0%
Levered Beta (1)	1.00
Cost of Equity	9.5%
Cost of debt	
Cost of Debt (4)	6.8%
Taxes	25.0%
After Tax Cost of Debt	5.1%
WACC	**9.5%**

Source: DNB Markets
Note: 1) 10-year monthly adjusted Beta from Bloomberg, 2) long-term real rate of 2.5% and inflation of 2.0% (Fed and ECB both target 2%), 3) Dimson, Marsh, Staunton calculated historical equity risk premium at 3.5–5.3%, 4) Risk-free rate + Spread of 2.25% for a BBB rated firm

Our forecasts include the Renesas Synergy royalty agreement. As discussed earlier, IAR Systems receives a royalty for the number of microcontrollers (MCU) produced in Renesas Electronics' Synergy series. As this revenue stream has not yet shown its potential since the launch in 2016, we have used what we believe are conservative estimates of its potential upside in our DCF, as we do not have a well-seasoned view on the economic dynamics. The questions

and driving forces of the implications of our forecasts are: 1) the number of MCUs produced in the Synergy series; and 2) the royalty that IAR Systems receives on each produced MCU. On the same WACC assumptions as for IAR Systems, we calculate a fair value of SEK75 for the Renesas Synergy agreement (comprising ~27% of our fair value of IAR Systems).

Figure 96: Sensitivity analysis of Renesas Synergy deal (SEK/share)

Renesas Synergy MCUs sold by 2020e	IAR royalty fee per MCU				
	0.15%	0.20%	0.25%	0.30%	0.35%
400	23	30	38	45	53
550	34	45	56	67	78
700	45	60	**75**	90	104
850	56	75	93	112	130
1000	67	89	112	134	156

Source: DNB Markets

Appendices

Company history

Figure 97: Key events

1983	IAR Systems founded
1985	Nocom, conglomerate of IT distribution, software and communication companies founded
1985	IAR Systems launched world's first compiler for 8051
1990	First sales office in the UK opened
1990	First Renesas product launched
1991	Opened office in Germany
1993	IAR opened its first US office
1994	First version of IAR Embedded Workbench launched
1996	Texas Instruments MSP430 launched
1999	Nocom listed on O list of Stockholm Stock Exchange
1999	Launched Visualstate
1999	First version of IAR Embedded Workbench for Arm launched
2001	Stefan Skarin appointed CEO of Nocom
2001	IAR expanded to Asia, opening offices in Japan and China
2005	IAR Systems acquired by Nocom, becoming one of six IT subsidiaries
2005	Opened sales office in Brazil
2008	Nocom renamed Intoi; strategy changed to become investment company of IT companies focused on acquisitions, active ownership, divestments
2009	Stefan Skarin appointed CEO of IAR Systems
2010	Intoi renamed IAR Systems to reflect intensified focus, having divested subsidiaries Northern and distributed Deltaco to its shareholders
2010	Launched Power Debugging
2010	Opened sales office in France
2011	Acquired Signum, adding complementary technology for advanced embedded systems
2011	Launched debug probe I-Jet
2012	Opened sales office in South Korea
2013	Launched I-Scope debug probe
2013	Launched certified versions of IAR Embedded Workbench for Arm and Renesas RX
2015	Launched C-STAT
2015	Launched strategic partnership with Renesas on IoT
2016	Established new business model and exclusive royalty agreement with Renesas Electronics for Renesas Synergy Platform
2017	Moved from small- to mid-cap list of Nasdaq Stockholm
2017	Collaborated with Express Logic regarding new IoT platform
2017	Invested in data security through equity stake in Secure Thingz
2017	Started to support for Amazon Web Services' new IoT operating system, Amazon FreeRTOS
2018	Introduced new product Embedded Trust with Secure Thingz
2018	Joined RISC-V Foundation and committed to bringing leading development tools to the growing number of RISC-V users

Source: Company

Management and board

Management

- **Stefan Skarin – CEO since 2009.** Prior to being CEO, Mr Skarin had been a board member of the company since 2002. Having been CEO of Intoi in 2001–2006, he was a driving force of its acquisition of IAR Systems in 2005 and the intensifying Intoi's focus on IAR in 2011. He has 20+ years' experience of the IT and software industry from positions as sales director at Adobe Nordic, CEO of Interleaf Norden and senior international positions at Oracle Corporation. Shareholding: via endowment insurance (form of savings that goes via an insurance company).
- **Stefan Ström – CFO since 1997.** Mr Ström was COO of IAR Systems from 2006 to 2008. Like Mr Skarin, he was a driving force of Intoi acquisition of IAR Systems as well as the strategic process of refining Intoi's business to focus more on IAR Systems. Shareholding: via endowment insurance and 300 B-shares via his wife.

- **Carl Johan Toll – IT manager since 2014.** Mr Toll was IT manager at SDR Svensk Direktreklam for nine years and held various positions at Nocom for 15 years. Shareholding: 2,000 B-shares.
- **Mats Ullström – COO/product director.** Mr Ullström has been at IAR Systems since 2001. Prior to that, he was professional services manager at Mimer Information Technology and software consultant at Programator Consulting AB. Shareholding: 2,000 B-shares.
- **Petter Edman – CTO.** Mr Edman previously held key positions in technical development at IAR Systems for 20+ years. Prior to joining IAR Systems, he gained years of experience from the telecom sector, having been a team leader for Ellemtel, an R&D organisation jointly owned by Ericsson and Swedish Telecom. Shareholding: 10,000 B-shares.
- **Susanne Dahlén – director of engineering**. Mrs Dahlén has worked for IAR Systems in various positions since 1995, including support engineer, technical writer/information architect and documentation manager. She holds no IAR shares.
- **Anders Holmberg – director of corporate development.** Mr Holmberg has been at IAR Systems for 17 years. During the early 1990s he worked with numerical analysis on parallel computers and super computers. Since then he has been a university lecturer, technical consultant, C/C++ developer and development manager. More recently he has focused on advanced tools for developing embedded systems. He holds no IAR shares.

Board of directors

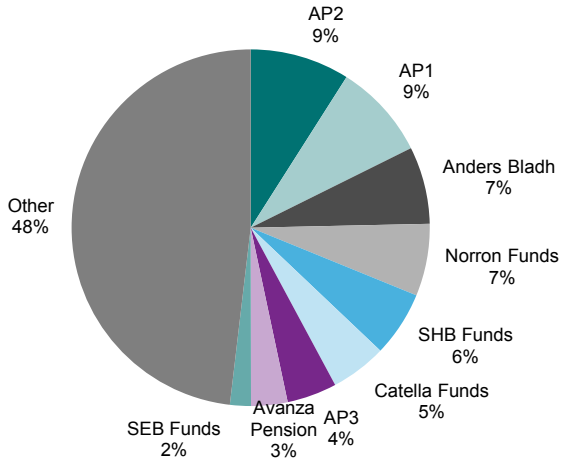
The board has five members, including the chairman elected at the general meeting in 2017.

- **Maria Wasing – chairman and board member.** Mrs Wasing has 20+ years' experience of the software and online industry, having held senior positions in marketing, communication, sales and partner strategy at EpiServer and Industri-Matematik. She also holds board assignments in Lundalogic while she is CMO at Axiell. Shareholding: 500 B-shares.
- **Kent Sander – board member**. Mr Sander has 30+ years' experience from leading positions in international telecom and high-tech IT companies having been CEO of TruePosition and executive VP sales in the US at Ericsson. He is also on the boards of Tobii (chairman), Mr Green & Co (chairman), OnePhone Holding (chairman), Expander Business Consulting (member), Edgeware (member), DMP Microlearning (member) and Triboron (member). Shareholding: no IAR Systems shares.
- **Lisa Kaati – board member.** Mrs Kaati is also a researcher at the Swedish Defence Research Agency (FOI) in the field of security informatics, deputy programme director of IoT Sweden, a strategic innovation program financed by Vinnova and other partners, focusing on how IoT can contribute to innovative social development. Shareholding: 100 B-shares.
- **Stefan Skarin – group CEO and board member.** Mr Skarin has been on the board since 2002. Shareholding: via endowment insurance.
- **Johan Mårtensson – board member.** Mr Mårtensson has been on the board since 2010. He is also part-owner and board member of Alted. Other board positions include of Alcadon Group (chairman) and Ownpower Projects Europe (chairman), Doro (member), DistIT (member) and JNM Invest (member). Previously, he worked for 17 years at investment banks (SEB Enskilda, Maizels, Westerberg & Co, Nordea). Shareholding: 10,000 B-shares.

Ownership

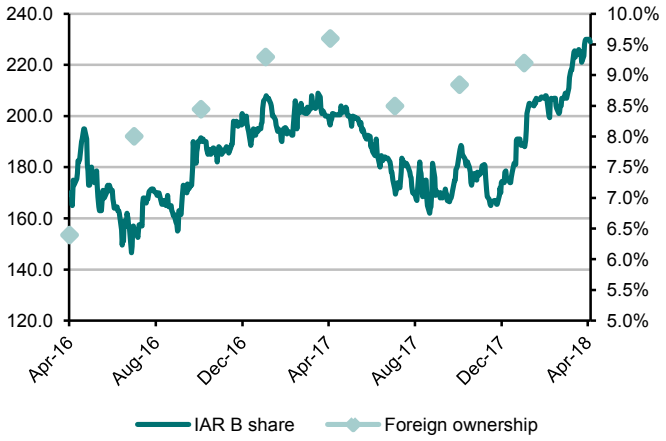
IAR Systems' B-share (IAR B) is quoted on the Nasdaq Stockholm mid-cap list with a relatively fragmented ownership base with 100% free float. According to ownership database Holdings, the five largest owners are the First and Second AP Fund (two of five buffer funds in the Swedish pension system), private investor Anders Bladh, Norron Funds, and Handelsbanken Funds. Over the two years, international ownership has risen from 6% to 9%.

Figure 98: IAR ownership structure (share of capital)



Source: Holdings (as of 4 April 2018)

Figure 99: International ownership in IAR



Source: Holdings (as of 4 April 2018)

Overview of peers

Key listed valuation peers – Nordic software

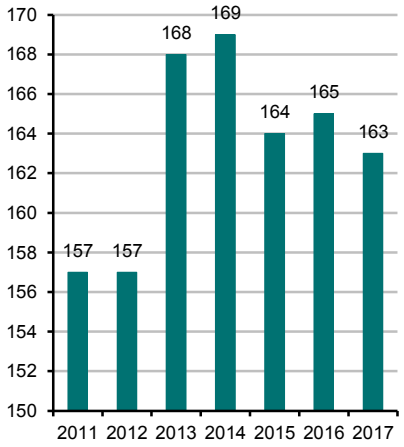
- **HMS Networks** is a global supplier and technological leader of products in industrial communication, which enables communication between industrial machines, devices, robots, IoT networks etc., i.e. connectivity solutions. Also, it develops products and software in wireless and remote solutions. Like IAR Systems, it is positioned to benefit from Industry 4.0 and automation trends. 2017 sales were SEK1,182m and it had ~500 employees. It is listed on NASDAQ OMX Stockholm Exchange's mid-cap list.
- **SimCorp** is a leading provider of investment management software solutions and service mainly for the global financial industry. Its core business model is similar to IAR Systems', as it is based on software licence sales combined with maintenance, giving it attractive recurring revenues. 2017 sales were EUR343m. It is listed on NASDAQ OMX Copenhagen Exchange's large-cap list.
- **Micro Systemation** is a global leader in forensic technology for mobile device examination, which through its proprietary system helps investigators and the authorities to extract and analyse information from confiscated mobile phones. The business model is based on licence sales, meaning a high share of recurring revenues. 2017 sales were SEK302m and it had ~150 employees. It is listed on NASDAQ OMX Stockholm Exchange's small-cap list.
- **CellaVision** develops and sells digital solutions (software products and hardware platforms) used for fast blood analysis and diagnosis. Its products replace manual microscopes with analysers based on digital image analysis technology, artificial intelligence and IOT. 2017 sales were SEK309m and it is listed on NASDAQ OMX Stockholm Exchange's mid-cap list.
- **INVISIO Communications** develops and sells communication systems with hearing protection that enable professionals in noisy and mission-critical environments to communicate and work effectively with customers primarily found in defence and police forces. 2017 sales were SEK366m and it is listed on NASDAQ OMX Stockholm Exchange's mid-cap list.
- **RaySearch Laboratories** develops software solutions for improved radiation therapy of cancer. Its products offering includes the legacy product RayStation, Partner Products, and Research, which are sold via licences and service fees to cancer centres on a global scale. 2017 sales were SEK585m and the stock has been listed on Nasdaq OMX Stockholm since 2003 as a spin-off from Karolinska Institutet and is traded on the mid-cap list.

Key listed valuation peers – embedded software

- **Cadence Design Systems** develops system design enablement, in other words EDA software, IP, and some hardware that helps customers in electronic systems, semiconductors, and technology companies to design electronics systems and complex integrated circuits. Similar to IAR Systems, it helps customers to manage and accelerate the development processes of its digital products while its sales are highly dependent on new design projects. 2017 sales were USD1.9bn. It is quoted on the NASDAQ stock exchange.
- **ANSYS** develops engineering simulation software and technologies used by engineers and developers for design analysis and optimisation on a global scale in many end-markets. Its software accelerates a customer's time-to-market, reduces production costs, optimises product quality and improves the development process. 60% of its revenue streams are software licensing, and maintenance/service 40%. 2017 sales were USD1.1bn in 2017. The stock is quoted on the NASDAQ stock exchange.
- **Xilinx,** designs, develops and markets complete programmable logic solutions including advanced integrated circuits in the form of programmable logic devices (PLDs), software design tools and embedded platforms etc. which lends greater design flexibility for end-customers and cuts time-to-market. 2017 sales were USD2.4bn and the stock is traded on the NASDAQ stock exchange.
- **Altium** develops electronic design automation software for Microsoft Windows. Its products facilitate the product development process and design of electronic products such as printed circuit boards. Like IAR Systems, Altium's business is benefiting from the rise of smart connected devices and the emerging market for the IoT, where its microcontroller and embedded systems offering comprised ~10% of 2017 group sales of USD110m. The stock is listed on the Australian Securities Exchange.
- **Red Hat** is a world leading developer of open source software solutions including the Red Hat Linux operating system, dominating the Linux market. It typically distributes under open source licences that permit access to a comprehensive technology solution on a subscription basis. 2017 sales were USD2.4bn. It is listed on the New York Stock Exchange.

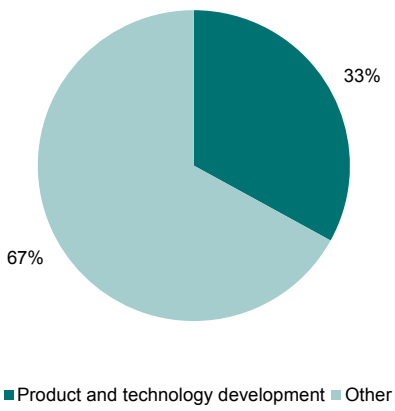
Employees

Figure 100: Number of employees



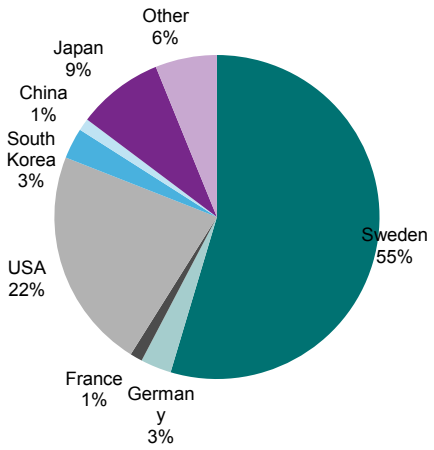
Source: Company
Note: At end of period

Figure 101: FTE by function (2017)



Source: Company
Note: Other includes: sales, support, marketing, FAEs, IT/administration, and product & technology

Figure 102: Location of employees (2017



Source: Company

Key customers

Figure 103: Existing key customers

Source: Company

Glossary

- **Compiler** – transforms source code written in programming language into instructions that a microprocessor can understand and execute.
- **Debugger** – helps programmers to locate problems and errors.
- **Embedded systems** – the control function of digital products.
- **Embedded Trust™** – security development environment for IoT solutions.
- **IAR 3.0** – a term we have coined to define the next phase of the company's development, where IAR 1.0 was about streamlining the business, IAR 2.0 was the shift to a software model, and IAR 3.0 will mark the shift toward an intensified growth focus.
- **Industry 4.0** – trend of automation and data exchange in manufacturing technologies.
- **Instruction set architecture (ISA)** – the bridge between the processor designers (hardware) and compiler writers (software).
- **Integrated circuit** (IC) – a small, typically rectangular silicon substrate on to which micro-meter-sized transistors are mounted, sometimes in numbers of more than one million.
- **Internet of things (IoT)** – a collective term for the trend of equipping objects, such as machinery, vehicles and household appliances, with sensors and processors so they can perceive and communicate with the world around them.
- **Linker** – combines smaller program segments into an executable program.
- **Microprocessor –** a single integrated circuit (or at most a few integrated circuits) that incorporates the functions of a computer's central processing unit (CPU) with storage of code and data.
- **RISC-V** – an open-source instruction set architecture (ISA) based on established reduced instruction set computing principles.
- **Source code editor** – a text editor program designed for editing source code to control embedded systems.

Quarterly numbers

(SEKm)	Q3 2016	Q4 2016	Q1 2017	Q2 2017	Q3 2017	Q4 2017	Q1 2018e	Q2 2018e	Q3 2018e	Q4 2018e	Q1 2019e
Revenues	**81**	**85**	**86**	**87**	**84**	**88**	**89**	**93**	**95**	**99**	**100**
Cost of sales	-2	-3	-2	-2	-2	-3	-2	-2	-2	-3	-3
Gross profit	**79**	**82**	**84**	**85**	**82**	**85**	**87**	**91**	**93**	**96**	**97**
Operating expenses	-46	-51	-53	-54	-49	-53	-53	-58	-59	-58	-59
EBITDA	**33**	**31**	**31**	**31**	**34**	**32**	**34**	**33**	**34**	**38**	**38**
Depreciation	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Amortisation	-4	-4	-4	-5	-5	-5	-4	-5	-6	-6	-5
EBIT	**29**	**27**	**26**	**26**	**29**	**27**	**30**	**22**	**28**	**32**	**32**
Net financial items	0	0	-1	0	0	0	0	0	0	0	-1
PBT	**29**	**26**	**25**	**26**	**28**	**26**	**29**	**27**	**27**	**31**	**32**
Taxes	-7	-6	-7	-5	-8	-7	-7	-7	-7	-8	-8
Net profit	**22**	**20**	**19**	**21**	**20**	**20**	**22**	**20**	**21**	**23**	**24**
Adjustments to net profit	0	0	0	0	0	0	0	-4	0	0	0
Net profit adj	22	20	19	21	20	20	22	16	21	23	24
Dividend paid	0	0	0	-63	0	0	0	-68	0	0	0
Per share data (SEK)											
EPS	1.73	1.59	1.49	1.67	1.61	1.56	1.61	1.48	1.51	1.72	1.75
EPS adj	**1.73**	**1.59**	**1.49**	**1.68**	**1.61**	**1.56**	**1.61**	**1.48**	**1.51**	**1.72**	**1.75**
DPS ordinary	0.00	0.00	0.00	5.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00
DPS	0.00	0.00	0.00	5.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00
Growth and margins (%)											
Revenues, QOQ growth	-0.9	4.8	1.6	0.5	-3.0	4.0	2.1	3.6	2.8	3.8	1.0
Revenues, YOY growth	1.6	12.0	7.3	6.1	3.8	3.1	3.5	6.8	13.3	13.0	11.8
EPS adj, YOY growth	16.0	45.7	-2.1	25.4	-6.9	-2.0	8.2	-11.6	-6.1	10.2	8.5
Gross margin	97.2	96.6	97.2	98.2	97.7	97.0	97.2	98.2	97.7	97.0	97.2
EBITDA adj margin	nm	nm	nm	nm	nm	nm	nm	nm	nm	nm	nm
Depreciation/revenues	-0.9	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7
EBIT adj margin	35.1	31.4	30.3	29.7	34.0	30.6	33.0	29.3	29.0	31.9	32.2
Net profit margin	nm	nm	nm	nm	nm	nm	nm	nm	nm	nm	nm

Source: Company (historical figures), DNB Markets (estimates)

Adjustments to quarterly numbers

(SEKm)	Q3 2016	Q4 2016	Q1 2017	Q2 2017	Q3 2017	Q4 2017	Q1 2018e	Q2 2018e	Q3 2018e	Q4 2018e	Q1 2019e
EBITDA	**33**	**31**	**31**	**31**	**34**	**32**	**34**	**33**	**34**	**38**	**38**
EBIT	**29**	**27**	**26**	**26**	**29**	**27**	**30**	**22**	**28**	**32**	**32**
Other EBIT adjustments	0	0	0	0	0	0	0	-5	0	0	0
EBIT adj	29	27	26	26	29	27	30	27	28	32	32
Net profit	**22**	**20**	**19**	**21**	**20**	**20**	**22**	**20**	**21**	**23**	**24**
Other EBIT adjustments	0	0	0	0	0	0	0	-5	0	0	0
Tax adjustments	0	0	0	0	0	0	0	0	0	0	0
Other adjustments	0	0	0	0	0	0	0	0	0	0	0
Net profit adj	22	20	19	21	20	20	22	16	21	23	24

Source: Company (historical figures), DNB Markets (estimates)

Quarterly numbers by segment and assumptions

(SEKm)	Q3 2016	Q4 2016	Q1 2017	Q2 2017	Q3 2017	Q4 2017	Q1 2018e	Q2 2018e	Q3 2018e	Q4 2018e	Q1 2019e
Revenue											
License-based	80	84	84	85	83	86	86	90	92	95	95
Royalty-based	1	1	3	1	1	1	3	3	4	4	5
EBIT											
License-based	28	25	23	24	27	26	26	24	24	27	27
Royalty-based	1	1	3	1	1	1	4	3	4	4	5
EBIT margin											
License-based	34.4%	30.3%	27.9%	28.6%	32.9%	29.6%	30.2%	27.0%	26.3%	28.8%	28.7%
Royalty-based	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	102.9%	99.8%	95.0%	96.9%	99.5%
Assumptions											
Revenue org. % YOY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structure impact % YOY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Currency impact % YOY	4.01	7.51	4.60	5.50	-4.56	-5.41	-3.04	0.22	5.64	3.55	3.52

Source: Company (historical figures), DNB Markets (estimates)

Annual P&L

(SEKm)	2011	2012	2013	2014	2015	2016	2017	2018e	2019e	2020e
Revenues	**200**	**230**	**236**	**256**	**312**	**328**	**345**	**377**	**414**	**454**
Cost of sales	-19	-23	-15	-13	-10	-12	-9	-9	-10	-11
Gross profit	**181**	**207**	**222**	**243**	**301**	**316**	**337**	**367**	**404**	**443**
Operating expenses	-152	-165	-171	-179	-203	-203	-209	-228	-241	-248
EBITDA	**29**	**42**	**51**	**64**	**98**	**113**	**127**	**139**	**163**	**195**
Depreciation	-2	-2	-2	-2	-3	-3	-2	-3	-3	-3
Amortisation	-4	-4	-7	-8	-12	-14	-17	-21	-26	-30
EBIT	**24**	**35**	**41**	**53**	**83**	**97**	**107**	**116**	**135**	**161**
Net financial items	0	0	0	0	0	0	-2	-1	-2	-2
PBT	**24**	**35**	**37**	**54**	**83**	**100**	**106**	**120**	**133**	**159**
Taxes	3	-22	-12	-11	-20	-22	-26	-29	-33	-40
Effective tax rate (%)	-12	63	31	21	24	22	24	24	25	25
Net profit	**27**	**13**	**26**	**42**	**63**	**78**	**80**	**91**	**100**	**119**
Adjustments to net profit	0	0	3	0	0	-3	0	-4	0	0
Net profit adj	27	13	29	42	63	75	80	87	100	119
Dividend paid	0	-11	-23	0	-63	-88	-63	-68	-75	-82
Per share data (SEK)										
EPS	2.44	1.14	2.10	3.34	5.02	6.18	6.33	6.32	7.32	8.77
EPS adj	**2.44**	**1.14**	**2.10**	**3.34**	**5.02**	**6.18**	**6.33**	**6.32**	**7.32**	**8.77**
DPS ordinary	0.00	0.98	1.85	0.00	5.00	7.00	5.00	5.00	5.50	6.00
DPS	0.00	0.98	1.85	0.00	5.00	7.00	5.00	5.00	5.50	6.00
Growth and margins (%)										
Revenue growth	12.6	14.8	2.7	8.3	21.9	5.4	5.1	9.1	10.0	9.6
EPS adj growth	126.9	-53.2	83.4	59.2	50.2	23.0	2.6	-0.2	15.8	19.8
Gross margin	90.5	89.9	93.9	95.0	96.7	96.3	97.5	97.5	97.5	97.5
EBITDA margin	14.7	18.2	21.4	24.9	31.5	34.5	36.9	37.0	39.3	42.9
EBITDA adj margin	nm	nm	nm	nm	nm	nm	nm	nm	nm	nm
Depreciation/revenues	-0.8	-1.0	-0.9	-0.9	-0.8	-0.8	-0.7	-0.7	-0.7	-0.7
EBIT margin	12.0	15.3	17.5	20.8	26.8	29.4	31.1	30.8	32.5	35.6
EBIT adj margin	12.0	15.3	15.8	20.8	26.8	30.6	31.1	32.1	32.5	35.6
PBT margin	12.0	15.3	15.8	21.0	26.7	30.5	30.6	31.8	32.1	35.1
Net profit margin	nm	nm	nm	nm	nm	nm	nm	nm	nm	nm

Source: Company (historical figures), DNB Markets (estimates)

Adjustments to annual P&L

(SEKm)	2011	2012	2013	2014	2015	2016	2017	2018e	2019e	2020e
EBITDA	**29**	**42**	**51**	**64**	**98**	**113**	**127**	**139**	**163**	**195**
EBIT	**24**	**35**	**41**	**53**	**83**	**97**	**107**	**116**	**135**	**161**
Other EBIT adjustments	0	0	4	0	0	-4	0	-5	0	0
EBIT adj	24	35	37	53	83	101	107	121	135	161
Net profit	**27**	**13**	**26**	**42**	**63**	**78**	**80**	**91**	**100**	**119**
Other EBIT adjustments	0	0	4	0	0	-4	0	-5	0	0
Tax adjustments	0	0	0	0	0	0	0	0	0	0
Other adjustments	0	0	0	0	0	0	0	0	0	0
Net profit adj	27	13	29	42	63	75	80	87	100	119
Per share data (SEK)										
EPS	2.44	1.14	2.10	3.34	5.02	6.18	6.33	6.32	7.32	8.77
Recommended adjustment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EPS adj	2.44	1.14	2.10	3.34	5.02	6.18	6.33	6.32	7.32	8.77

Source: Company (historical figures), DNB Markets (estimates)

Cash flow

(SEKm)	2011	2012	2013	2014	2015	2016	2017	2018e	2019e	2020e
Net profit	27	13	26	42	63	78	80	91	100	119
Depreciation and amortisation	5	7	9	10	15	17	20	24	28	33
Cash flow from operations (CFO)	**35**	**38**	**41**	**70**	**99**	**114**	**124**	**105**	**121**	**148**
Capital expenditure	-11	-22	-21	-32	-19	-19	-19	-16	-27	-32
Acquisitions/Investments	-15	0	0	0	0	0	0	-230	0	0
Divestments	0	0	0	0	1	0	0	0	0	0
Cash flow from investing (CFI)	**-26**	**-18**	**-19**	**-32**	**-18**	**-19**	**-38**	**-246**	**-27**	**-32**
Free cash flow (FCF)	**9**	**20**	**22**	**39**	**80**	**95**	**86**	**-142**	**94**	**117**
Net change in debt	7	0	0	0	0	0	0	0	0	0
Dividends paid	0	-11	-23	0	-63	-88	-63	-68	-75	-82
Share issue (repurchase)	0	0	22	-53	0	0	0	175	0	0
Other	1	12	12	0	0	0	0	0	0	0
Cash flow from financing (CFF)	**8**	**1**	**12**	**-53**	**-64**	**-88**	**-63**	**107**	**-75**	**-82**
Total cash flow (CFO+CFI+CFF)	**17**	**21**	**33**	**-15**	**17**	**7**	**23**	**-35**	**20**	**35**
FCFF calculation										
Free cash flow	9	20	22	39	80	95	86	-142	94	117
Less: acquisitions	15	0	0	0	0	0	0	230	0	0
Less: divestments	0	0	0	0	-1	0	0	0	0	0
Growth (%)										
CFO	152.2	10.1	6.3	72.7	40.4	15.7	8.5	-15.3	15.5	22.3
CFI	-105.6	30.1	-5.5	-66.0	42.3	-3.3	-98.9	-555.6	89.2	-18.1
FCF	641.7	127.0	6.9	78.7	108.3	18.5	-9.4	-264.0	166.8	23.5
CFF	348.4	-92.2	1866.7	-550.8	-19.5	-39.0	28.5	269.2	-170.0	-9.1
FCFF	nm	nm	nm	nm	nm	nm	nm	nm	nm	nm

Source: Company (historical figures), DNB Markets (estimates)

Balance sheet

(SEKm)	2011	2012	2013	2014	2015	2016	2017	2018e	2019e	2020e
Assets	**309**	**324**	**370**	**375**	**399**	**396**	**410**	**657**	**681**	**720**
Inventories	5	4	3	4	5	6	5	6	7	7
Trade receivables	32	29	34	39	44	48	51	57	62	67
Other receivables	11	14	15	11	20	19	12	63	63	63
Current financial assets	7	3	1	0	0	0	0	0	0	0
Cash and cash equivalents	30	49	82	71	89	99	120	85	105	140
Current assets	**85**	**98**	**135**	**124**	**158**	**172**	**187**	**211**	**237**	**278**
Property, plant and equipment	6	6	6	8	7	6	6	7	9	11
Other intangible assets	139	152	164	186	192	197	194	417	413	409
Defferred tax assets	74	62	59	51	37	16	3	3	3	3
Non-current financial assets	6	5	5	6	5	5	20	20	20	20
Non-current assets	**224**	**226**	**235**	**251**	**241**	**224**	**223**	**446**	**444**	**442**
Total assets	**309**	**324**	**370**	**375**	**399**	**396**	**410**	**657**	**681**	**720**
Equity and liabilities	**309**	**324**	**370**	**375**	**399**	**396**	**410**	**657**	**681**	**720**
Total equity	**241**	**254**	**295**	**289**	**291**	**280**	**290**	**483**	**508**	**546**
Trade payables	11	6	6	5	5	5	6	8	7	8
Other payables and accruals	52	53	54	65	84	92	96	96	96	96
Short-term debt	1	1	1	1	1	1	1	1	1	1
Total current liabilities	**63**	**61**	**61**	**71**	**90**	**99**	**102**	**105**	**104**	**105**
Long-term debt	2	1	1	2	1	2	2	53	53	53
Deferred tax liabilities	4	9	13	15	17	15	14	14	14	14
Other non-current liabilities	0	0	0	0	1	1	2	2	2	2
Total non-current liabilities	**5**	**10**	**14**	**16**	**18**	**18**	**17**	**69**	**69**	**69**
Total liabilities	**68**	**70**	**75**	**87**	**108**	**116**	**120**	**174**	**173**	**174**
Total equity and liabilities	**309**	**324**	**370**	**375**	**399**	**396**	**410**	**657**	**681**	**720**
Key metrics										
Net interest bearing debt	-28	-47	-79	-68	-88	-97	-117	-31	-51	-86

Source: Company (historical figures), DNB Markets (estimates)

Valuation ratios

(SEKm)	2011	2012	2013	2014	2015	2016	2017	2018e	2019e	2020e
Enterprise value										
Share price (SEK)			39.77	74.75	150.00	206.00	189.00	247.50	247.50	247.50
Net interest bearing debt	-28	-47	-79	-68	-88	-97	-117	-31	-51	-86
Adjustments to NIBD	0	0	0	0	0	0	0	0	0	0
Net interest bearing debt adj	-28	-47	-79	-68	-88	-97	-117	-31	-51	-86
Valuation										
EPS	2.44	1.14	2.10	3.34	5.02	6.18	6.33	6.32	7.32	8.77
EPS adj	**2.44**	**1.14**	**2.10**	**3.34**	**5.02**	**6.18**	**6.33**	**6.32**	**7.32**	**8.77**
DPS ordinary	0.00	0.98	1.85	0.00	5.00	7.00	5.00	5.00	5.50	6.00
DPS	0.00	0.98	1.85	0.00	5.00	7.00	5.00	5.00	5.50	6.00
P/E			18.9	22.4	29.9	33.4	29.8	39.1	33.8	28.2
P/E adj			18.9	22.4	29.9	33.4	29.8	39.1	33.8	28.2
P/B			1.66	3.27	6.51	9.31	8.22	6.97	6.63	6.17
Average ROE	6.4%	5.3%	9.4%	14.5%	21.9%	27.3%	28.1%	23.5%	20.1%	22.6%
Dividend yield			4.6%	0.0%	3.3%	3.4%	2.6%	2.0%	2.2%	2.4%

Source: Company (historical figures), DNB Markets (estimates)

Key accounting ratios

	2011	2012	2013	2014	2015	2016	2017	2018e	2019e	2020e
Profitability (%)										
ROA	5.1	4.1	7.5	11.3	16.4	19.6	19.9	17.1	14.9	17.0
ROCE	5.2	14.0	13.4	18.1	28.5	34.9	36.7	28.8	24.5	27.8
ROCE after tax	3.8	10.4	9.9	13.4	21.1	25.8	27.2	21.3	18.1	20.6
Return on invested capital (%)										
Net PPE/revenues	2.9	2.7	2.6	3.1	2.1	1.9	1.8	1.8	2.1	2.5
Working capital/revenues	10.9	16.4	31.2	20.9	22.0	22.4	24.6	28.3	32.1	38.0
Cash flow ratios (%)										
FCF/revenues	4.4	8.8	9.1	15.1	25.8	29.0	25.0	-37.6	22.8	25.7
CFO/revenues	17.4	16.6	17.2	27.5	31.7	34.8	35.9	27.9	29.3	32.7
CFO/capex	316.4	171.0	192.9	217.6	508.8	614.0	652.1	636.3	453.5	469.6
CFO/current liabilities	55.4	63.3	66.8	99.4	110.2	115.8	121.1	100.2	116.7	141.1
Cash conversion ratio	33.0	155.4	83.4	91.5	126.8	122.2	107.9	-155.5	94.8	97.7
Capex/revenues	5.5	9.7	8.9	12.6	6.2	5.7	5.5	4.4	6.5	7.0
Capex/depreciation	647.1	973.9	959.1	1404.3	776.0	744.0	791.7	636.6	947.8	1032.8
OpFCF margin	-5.5	-9.7	-8.9	-12.6	-6.2	-5.7	-5.5	-4.4	-6.5	-7.0
Total payout ratio	0.0	85.4	88.0	0.0	99.7	113.3	79.0	79.1	75.1	68.4
Leverage and solvency (x)										
Net debt/EBITDA	-0.94	-1.12	-1.57	-1.08	-0.89	-0.85	-0.92	-0.22	-0.31	-0.44
Total debt/total capital (BV)	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.08	0.08	0.07
Cash conversion cycle										
Inventory turnover days	88.4	61.1	83.1	104.7	180.7	167.5	223.3	249.6	244.3	237.8
Receivables turnover days	79.2	67.7	75.3	70.9	74.5	74.7	66.2	116.3	110.5	105.1
Credit period	205.6	95.6	143.5	147.1	170.1	158.6	244.8	322.8	260.9	274.5
Cash conversion cycle	-38.0	33.3	14.8	28.5	85.1	83.7	44.8	43.2	93.9	68.4

Source: Company (historical figures), DNB Markets (estimates)

Important Information

Company: IAR Systems
Coverage by Analyst: Joachim Gunell
Date: 07-4-2018

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