

Investment Memo - iRobot Corporation (IRBT)

Thesis bottom line

iRobot (IRBT or 'company') is a leader in the Robot Vacuum Cleaner (RVC) space. Economic moats include Consumer Lock-In, Patents and a Learning Curve edge - strengthened by strategic positioning. Chip shortages, high tariff and material costs - all real concerns - have spooked investors and led to a 60% drawdown in price over the past four quarters. These headwinds raised costs and contracted margins during FY2021.

Embedded price expectations are too bearish for time horizons exceeding 2+ years. The headwinds are external and conceivably transitory.

The last traded price of \$67.85 is set for a significant revision (in 2-3 years) when chip supply recovers, and tariff concerns alleviate as factories relocate from China to Malaysia. Expected value analysis indicates a high likelihood for superior returns.

Note: I realize IRBT is sub-\$3b market cap today - but I chose it anyway owing to how compelling it is as an investment.

Business and Industry

IRBT is a US-based consumer robot company. It designs and builds premium robots that assist consumers with indoor solutions related to floor cleaning, mopping and air purifying.

Customers are urban dwellers in rich nations with annual incomes of \$60K or higher. They typically lead hectic lives, with demanding jobs, children and pets. Users have continuous access to high-speed internet, own smartphones, are savvy with apps and reside in cities where human domestic services are prohibitively expensive.

IRBT operates primarily in the RVC industry - with its vacuuming flagship *Roomba* (5-7 models) and robot mop *Braava* (3 models). The Global RVC market (+\$200 price point) is ~\$3.4b (\$2.5b excl. China) and has grown 24% YOY since 2016. IRBT controls 47% of the market today.

The company operates in North America, EMEA and Japan. In each geography, its control on market is 3-6x greater than the next largest player. Notably, IRBT does not operate in China.

IRBT is a pioneer in the industry - and its line-up commands high brand awareness. In the 90s, the company built rover parts for NASA missions and mine-hunting robots in Iraq. In 2002, IRBT introduced Roomba, which has since come to become a leading series in the space.

Financial history and Capital allocation

IRBT has an impressive record of wealth creation. ROC has averaged 19% over five years, and 20% over ten years. Annual economic profit (adjusted NOPAT minus Capital charge) per share has grown from \$1.79 in 2012 to \$4.12 in 2020 - a commendable feat by the management and reflecting significant owner's value creation.

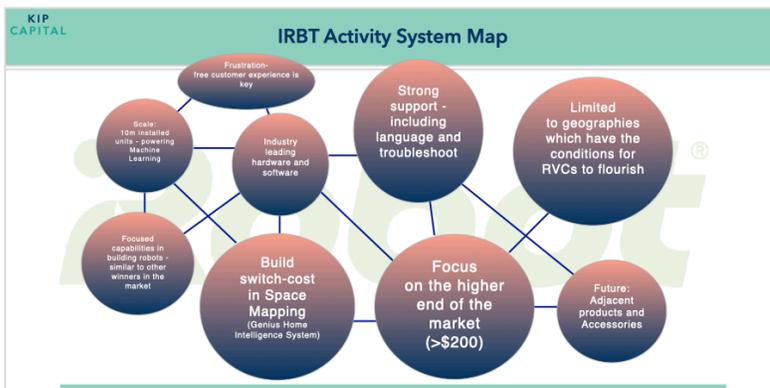
Cash generated (since 2011) includes cumulative NOPAT of \$870m, with no net issuances of equity and no bank debt. Cash used includes \$780m in reinvestments (growth capex including capitalized R&D, Ad&Promo, OpLeases, working capital, M&A) - of which over \$270m was spent toward acquisitions. The company also returned \$144m to owners as buybacks. In the meantime, equity/sh has grown 3.2x (\$28.54 from \$8.93).

Economic moat, Strategic positioning, Competition

IRBT's competitive advantage is a combination of two economic moats and strategic positioning. Moats include **consumer lock-in** based on personalization and machine learning, plus **patents** for industry-leading IP. The strategic positioning advantage is from hard-to-replicate value chain activities that tie with customer lock-in, lower churn and bolster loyalty.

Here's how the lock-in works. Modern RVCs require a great deal of data about the 'space' that is being cleaned. IRBT apps walk new users through a series of steps to 'train' the robot about floors they will be expected to clean - including floor types, prioritized areas and red zones that are to be avoided. There are additional settings including when to clean and whether or not to clean when no one's home. Owning RVCs involves a commitment to time-consuming and ongoing mapping and preference setting for the bot. This type of lock-in (as well as habits and familiarity) encourages repeat purchases for a given brand. This advantage would further accrue with time as IRBT the user buys into a growing smart living ecosystem.

As the largest RVC maker in the world, IRBT enjoys a large portfolio of patents that protect its IP for industry-leading RVCs. As of January 2, 2021, the company holds 538 U.S. patents, more than 1,000 foreign patents, additional design registrations, and has more than 1,500 patent applications pending worldwide. No single IP is solely responsible for protecting the product line. (10K, 2020)



Strategic positioning through well-integrated value chain activities puts IRBT's offering ahead of most incumbents and deters new entrants. Unlike traditional vacuum cleaners, after-sales support is key to a fruitful RVC owner's experience. IRBT's significant scale of customer support, a large installed base, focused expertise in consumer robots, industry-leading hardware and software and a smart trade-off focusing on high-end RVCs in wealthy nations make up IRBT's activity system. (as coined by Michael Porter). (see diagram for reference)

IRBT chief competitors are Shark in North America alone. Neato, Ecovac, Roborock and Cecotec in both North America and EMEA. And Panasonic, Hitachi, Electrolux, Dyson and Roborock in Japan. Importantly, IRBT has no presence in China.

Globally, IRBT's largest competitors are Shark, Neato, Cecotec, Ecovacs and Roborock. All five major competitors are almost exclusively RVC makers. Meanwhile, industry giants Samsung, Dyson and Panasonic have tried and failed for over a decade to gain significant share.

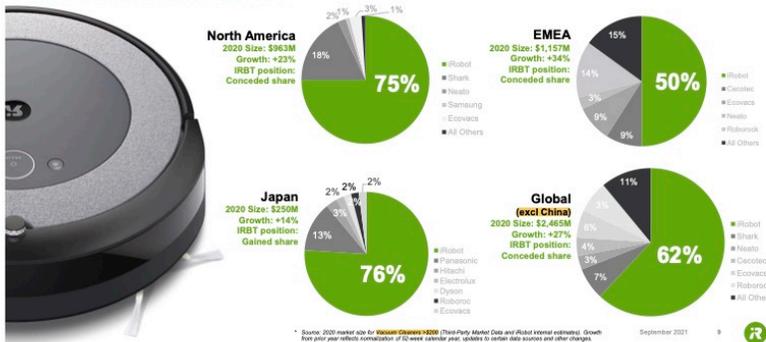
Why would large incumbents in traditional vacuum cleaners with deep experience and resources fail to crack robot vacuum cleaners? Because RVCs are distinct in several ways. They require the unique set of value chain activities discussed earlier. Advantages such as a **learning curve edge** in robotics, preference and user experience data gathered from large, connected installed bases, a dedicated focus on consumer robots are hard to overcome. Mature firms like Samsung and Panasonic with large, diverse product lines are weighed down by bureaucracy, and will not organize services around this fledgling, niche market. This serves as material evidence to the edge enjoyed by IRBT.

Floor cleaning efficiently requires a series of logic that is simple (often boring) to humans but challenging for bots using ANI (artificial narrow intelligence). Customers in rich nations increasingly prefer such bots - which must be easily trainable and highly reliable once programmed for 'right' behavior, and the consumer should get help from the vendor when needed. Traditional vacuum cleaner purchases are transactional with no active customer-vendor 'relationship'. An RVC must be good enough to match the consumer's minimum utilization expectation - that is, it should clean at least as well as people do. The inverse is when a robot is hard to train and cleaning is poor. The result is frustration, where a user reverts to DIY. Cutting-edge RVCs still don't match the result of a human with a powerful traditional canister vacuum cleaner. But after 20 years of R&D, the gap is closing fast. This illustrates how hard it is to crack this industry, even by the largest of white goods makers.

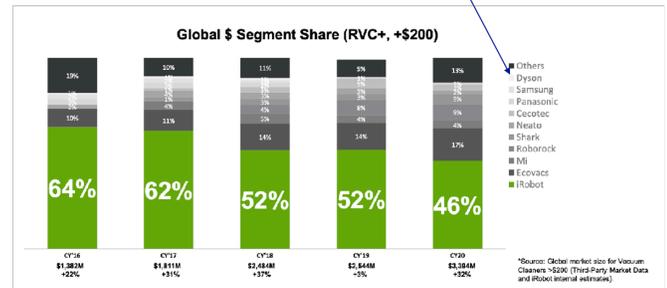


Category Leadership Fortified Through Innovation

2020 Regional Retail Share



Hugely different nature of product. Notice that none of the traditional giants have cracked it.



Risks

While IRBT enjoys a strong lock-in for existing customers, this doesn't apply to new buyers. Winning new customers is crucial to success in a high-growth market. Unique and tailored value propositions (VP) are important to any defensible strategy. IRBT focuses closely on wealthy markets and premium robots - which is a good start. But I worry that its VP is too similar to the other five major RVC makers. A first-time RVC buyer may make a like-for-like comparison of iRobot, Shark, Neato and others. Once a purchase is made, top competitors potentially enjoy the **same customer lock-in** benefiting iRobot. Ideally, the company's VP evolves into something more distinct - leading to a growing chasm between IRBT and the other five - until it is in a league of its own.

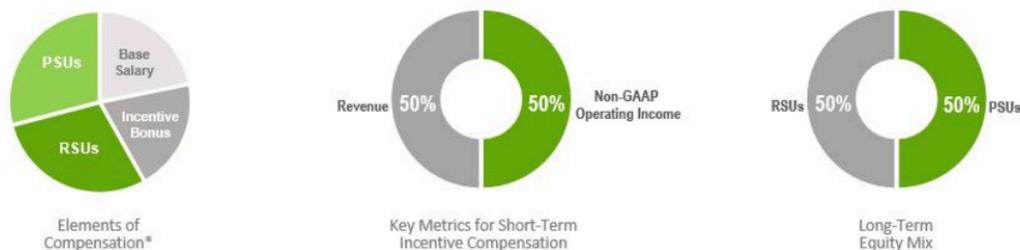
Other risks include IRBT's exposure to semiconductors, tariffs and trade wars, raw material and air/oceanic transport costs. These are four risks that have recently led to bearish market sentiment. While the risks are real, I believe that IRBT can endure cost cyclicity (owing to pricing power in its premium end-products), and that the tariff cost risk is being actively mitigated by iRobot relocating production to Malaysia.

Management

Colin Angle is a founding father at iRobot and a leading figure in the consumer robotics industry. His role as CEO since 1997 has coincided with IRBT's enduring position as the largest RVC player in the world - along with largely organic growth, a non-leveraged balance sheet, and impressive owner's wealth creation. iRobot is Colin's baby, and his long tenure at the firm and recent comments are indicative of his deep professional investment in the firm and a willingness to be part of its ongoing story.

IRBT's corporate structure and compensation program are satisfactory, albeit with some wrinkles. First, I would prefer that Colin not be chairman of the board while being the CEO. Boards are tasked with monitoring the CEO and other executives - so there appears a conflict. Second, Colin's total compensation is slightly extravagant. In general, total all-inclusive pay should not exceed 5% of net income - whereas, in IRBT's case, Colin's pay (\$6m+) ranges in 6-8% over the past three years.

On the bright side, the compensation breakdown between base, RSUs, PSUs (long term targets) and incentives (short term targets) is well aligned with the interests of owners.



Embedded expectations

Price-implied-expectations takes last traded price and analyst estimates to reverse engineer DCF and 'read' embedded expectations about a trigger operating driver.

At \$67, the assumptions inputs are average sell-side estimates of 14.5% yoy top-line growth and 1.9% EBIT margin for the next two years, then a recovery to 6.5% in year 3. Other assumptions were made about incremental reinvestments, acquisitions, cash tax rate and WACC based on recent past and CAPM.

The market projects value to crater down to ~\$25 with a healthy sales growth but painful contractions in gross and operating margins (which is IRBT's trigger driver). A dramatic recovery is then expected to take place in 2024, 2025 and onward - so that value would revert to ~\$100 in year 3 and ~\$120 in year 5.

At \$67, the market appears to have assigned high uncertainty to IRBT's recovery, and an outgrowth period of fewer than three years for a high growth, quality business with a resilient balance sheet. Before I jump into valuation, the embedded expectations alone make IRBT a compelling Buy today.

Valuation, Scenarios, Intrinsic value range

With iRobot entering brand new verticals (acquired air purifying company Aeris in 2H2021), forecasting a TAM is trickier than usual. Given this, it is best to keep things simple and assume a conservative outlook wherein IRBT continues operating primarily in the robot floor cleaning industry (expected to grow at an impressive 18-22% clip).

To get a handle on IRBT's DCF, I broke down Sales to volume robot units and gross average selling price (GASP).

For Scenario A, I assumed operating margins for years 1 and 2 to contract to ~2% based on consensus, and then recover to 6.5%. I also assumed a GASP CAGR of 3% yoy (par with historic average) and volume growth on par with average industry growth rate forecast of 20%. The resulting intrinsic value was about \$160.

For Scenario B, altered the year 3 (when semis shortage and other headwinds are anticipated to subside) operating margin to recover to a more optimistic 8.5%. All other assumptions remained equal. The resulting intrinsic value was about \$210.

At \$67, the stock is trading at a 60-70% margin of safety. A quick TSR calculation, assuming EPS grows 4-5x in 5 years, powered by both profits growth and share buybacks, and a sector median P/E of 20, implies a return ranging in 36-43% CAGR. Even a result half as good implies this is a great time to enter this quality business.

While exactness can be comforting, I remain fearful of false precision. IRBT is a resilient business in a fast-growing industry, with optionalities to grow into new verticals, and is unfairly punished for transitory cost headwinds. While I have little idea what IRBT's exact future will be, this seems directionally accurate.

What would make me wrong

This section is a *premortem* that stress-tests the thesis. Here are scenarios that could spell trouble:

- A long-term risk would be a collapsing value proposition as IRBT ventures into new verticals. Management is tasked with either developing new types of products or acquiring existing players in new markets (which comes with usual risks) - while maintaining a first-rate value chain. Potential product segments include robot lawn mowers, home security, a series of integrated smart plugs, switches, sprinklers, bulbs, thermostats, door locks and smoke detectors.
- Large incumbents like Panasonic, Samsung and Dyson form smaller companies with a singular focus on a premium RVC value chain. R&D cycles would be 5-10 years, but owing to the attractive TAM growth, it is not inconceivable for IRBT's competitive landscape to change notably.
- The production ramp-up in Malaysia gets delayed by 3-5 years, which asserts IRBT's dependency on China-based manufacturing. Tariff costs consequently remain high weighing down on medium-term margins.
- New COVID variant spikes and other factors keep transport and raw materials costs higher than usual beyond 2023, weighing down on margins.