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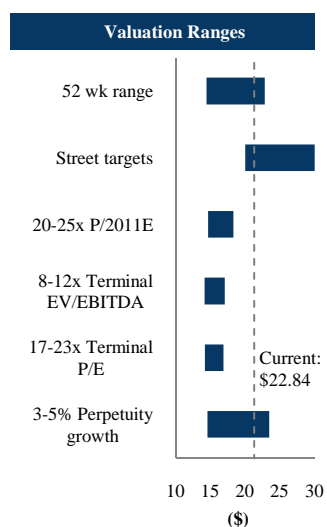
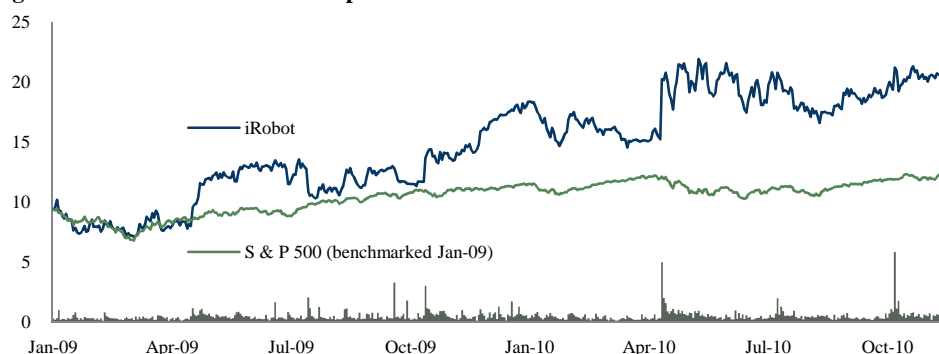
12/13/2010

Ticker: IRBT  
Price: \$22.84

Recommendation: **Sell**  
Price Target: \$15.20-16.60

Market Profile	
Shares O/S	25 mm
Current price	\$22.84
52 wk price range	\$14.45-\$23.00
Beta	1.86
3 mo ADTV	0.14 mm
Short interest	2.1 mm
Market cap	\$581mm
Debt	0
P/10E	25.2x
EV/10 EBITDA	13.5x
Instl holdings	57.8%
Insider holdings	12.5%

Figure 1.1: iRobot historical stock price



**iRobot is a SELL:** The company's high valuation reflects overly optimistic expectations for home and military robot sales. While we are bullish on robotics, iRobot's growth story has run out of steam.

- Consensus is overestimating future home robot sales:** Rapid yoy growth in 2010 home robot sales is the result of one-time penetration of international markets, which has concealed declining domestic sales. Entry into new markets drove growth in home robot sales in Q4 2009 and Q1 2010, but international sales have fallen 4% since Q1 this year, and we believe the street is overestimating international growth in 2011 (30% vs. our estimate of 18%). Domestic sales were down 29% in 2009 and are up only 2.5% ytd. Additionally, significant competition has entered the mass consumer market for the first time, and we project domestic growth of 2% next year vs. street estimates of mid single digit growth as iRobot's market share begins to decline.
- Military sales are likely to disappoint in 2011 and 2012:** Military robot sales growth, which has looked impressive next to depressed year ago comps, has been driven by short term field procurement needs rather than a long-term Army upgrade cycle. With a scheduled withdrawal from Iraq and Afghanistan next year, we anticipate a 6% fall in G&I sales in 2011 and a further decline of 28% in 2012, compared to street estimates of high single digit growth. The slowdown may have already started with *unit* sales falling every quarter this year (down 43% from Q4 2009).
- Earnings management has run its course – near term margins will disappoint:** Selling & Marketing expenses as a percentage of home robot sales are at an all-time low of 19% ytd relative to a historical average of 28%, and management has outlined a plan for the holiday season that is likely to elevate operating expenses and reduce margins. As new competitors aggressively enter the market over the next three years, we expect Selling & Marketing expenses will ramp up to the two-year trailing average of 25% of sales, compared to street expectations of continued lows.
- Lack of innovation in home robots division to continue:** We see iRobot following the path of Palm, which had an innovative product (the PDA), strong brand power and first-mover advantages, but lost steam as competitors like Research in Motion and Apple vaulted forward with better technology. iRobot has not launched a new, innovative consumer product since the Roomba first came out in 2002, and two of the three original founders have left to start new robotics companies instead of driving innovation within iRobot. While we see strong growth potential in the robotics sector, we are doubtful of iRobot's ability to capitalize on that potential.
- Materially overvalued – Priced like a growth stock, but not a growth stock:** We arrive at our target price of \$15.20-16.60 by discounting FCF at a WACC of 12.5%. This implies a P/2010E multiple of 17-18x and an EV/2010EBITDA multiple of 7.5-9x. Our DCF and multiples based valuation implies a downside of 25-35% as headwinds materialize in 2011. Conservatively, even if iRobot continues to trade at the consensus P/2011E multiple of 25x, our 2011 estimates imply a target price of \$18.50, a 19% downside from the current price.

Trailing Earnings (\$)			
	Q/Y	EPS	P/E
2007	Q1	(0.23)	
	Q2	(0.20)	
	Q3	(0.06)	50.2x
	Q4	0.85	
	Year	0.36	
2008	Q1	(0.16)	
	Q2	(0.18)	
	Q3	0.15	301.0x
	Q4	0.21	
	Year	0.03	
2009	Q1	(0.07)	
	Q2	(0.10)	
	Q3	0.10	135.4x
	Q4	0.20	
	Year	0.13	
2010	Q1	0.24	
	Q2	0.20	
	Q3	0.27	25.7x
	Q4E	0.18	
	Year	0.89	

## Business Description

iRobot (NASDAQ: IRBT) was founded by Colin Angel, Rodney Brooks, and Helen Greiner at MIT in 1990. The company has grown to become a multinational company with over 500 employees, operating in the United States, United Kingdom, France, India, China and Hong Kong. The company operates two main divisions: Home Robots Division (HRD) and Government & Industrial (G&I). The HRD business primarily consists of the Roomba floor vacuum robot. The Scooba floor washing robot and Looj gutter cleaning robot account for a small share of HRD sales. The PackBot for Explosive Ordnance Disposal (EOD) and Small Unmanned Ground Vehicle (SUGV) for infantry support account for the majority of G&I sales.

### BUSINESS DIVISIONS

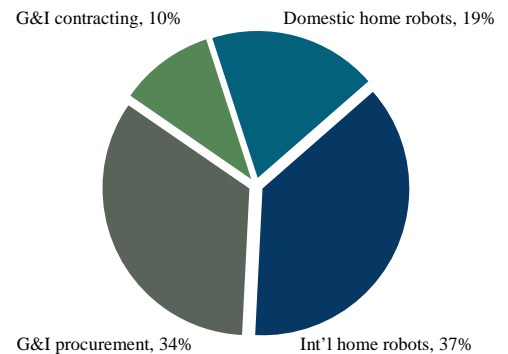
#### Home Robots Division

The home robots division accounted for \$160 mm of sales and \$62 mm of gross profits in 2010 ytd, or 56% of the company's total sales and 62% of total gross profits. The company essentially created the market for cleaning robots with the launch of the Roomba series in 2002. Subsequent product offerings have not resulted in significant sales or acceptance. In 2010 ytd, division sales included \$53 mm from the domestic business and \$107 mm from the international business.

#### Government & Industrial Division

The G&I division primarily provides robots to the US military with limited commercial and law enforcement sales. The ground robots group focuses on providing robotic solutions for dangerous and specialized tasks. Its primary products for EOD and infantry support include the PackBot and SUGV. International sales of other ground and maritime robots are limited due to the Arms Export Control Act (AECA). The division has shown stronger sales growth than home robots and appears to be management's focus for future growth, accounting for the majority of R&D expense and air time on earnings calls. Sales are highly concentrated with the US Department of Defense (DoD), posing a risk with shifting defense priorities. The company had G&I product sales of \$97 mm in 2009 and \$115 mm in 2010 ytd.

**Figure 2.1: Revenue segmentation**



*"I don't think we are going to see it in terms of home care robots ... To build a robot to give medical care in the home is a pretty tricky thing, because who is going to pay for it? Everyone is worried about health cost, nobody is going to pay for it."*

- Rodney Brooks, co-founder and current board member, during a public presentation on 11/23/10, attended by members of this team

#### New product initiatives: Maritime Robots & Healthcare

iRobot added maritime robots to their G&I business in September 2008 with the \$12.2 mm acquisition of Nekton Research. In recent years iRobot has added the 1KA Seaglider, 15A Ranger, and iRobot Transphibian in an effort to expand into the underwater robotics market. Sales in this business division have been very limited due to established competitors, and do not materially contribute to growth in our model.

In 2009 iRobot established a healthcare business unit, aimed at exploring the potential of robotics as an assistive technology. The company has not yet announced or released a home care robot, with no product visibly on the horizon.

#### Contract Research

Sales include revenues from conducting contract research for the DoD and other government agencies, mostly conducted on a "cost plus fee" basis. Contracted military research provides a relatively low risk revenue stream supporting the development of future technologies and may have crossover applications in home robots. In 2009, iRobot had research revenues of \$36 mm, and in 2010 ytd has revenues of \$30 mm.

### OPERATIONS

#### Distribution Channels

iRobot sells its consumer products through three primary channels: domestic direct (website), domestic retail, and international retail. In the US, the products are distributed through a network of 30 national retailers. Internationally, the robots are distributed through in-country distributors in over 40 countries who then resell the robots to retail stores. The single largest distribution outlet is iRobot's online store, which generated 15% of home robot revenues in 2009.

**Manufacturing**

Home robot manufacturing is outsourced to Jetta Company Ltd. and Kin Yat Industrial Co. Ltd., each of whom manufacture the products at a single factory in China. In April 2010, iRobot added Jabil Circuit as a US-based manufacturer for home robots to alleviate recent supply constraints. See Exhibit 16 for an analysis of recent shipping volumes using Department of Homeland Security data.

The PackBot family of robots is manufactured by Gem City Engineering and Manufacturing Corp. in Dayton, Ohio, the SUGV family of robots by Benchmark Electronics, Inc. in Nashua, New Hampshire, and the maritime robots by Polaris Contract Manufacturing, Inc. in Marion, Massachusetts. All military robots are manufactured within the US due to military procurement considerations.

*“80% of the team that worked on the Roomba has left the company.”*

- Our interview with former iRobot engineer

**KEY MANAGEMENT**

**Chairman and CEO Colin Angle** remains the only co-founder in an executive position at iRobot. The company has made some key personnel changes within the past two years. Co-founder and CTO Rodney Brooks left to start Heartland Robotics. Co-founder Helen Greiner resigned as Chairman in 2008 to start Droidworks.

**Executive VP, CFO, and Treasurer John J. Leahy’s** arrival in 2008 refocused iRobot’s financial strategy on working capital needs and tighter expense controls, especially for Selling & Marketing and R&D.

See Exhibit 19 for further discussion of management.

**Industry Overview and Competitive Positioning**

*“The consumer side is still struggling with what a cleaning robot is... Is it a high end appliance? Is it a gadget?”*

- Our interview with former iRobot home robots product manager

**HOME ROBOT TRENDS**

**Floor cleaning robots are not a replacement to traditional vacuum cleaners**

iRobot estimates that it has penetrated 10% of the \$1 billion North American market for high-end home vacuum cleaners (priced over \$200). However, we believe that floor cleaning robots will not gain the consumer acceptance needed to compete as substitutes for traditional vacuum cleaners, especially in an environment of better technology, falling ASPs and price competition in the traditional vacuum market. The seasonality of consumer demand is driven by holiday sales, as shown by global search trends (see Exhibit 17). This is strong evidence that consumers purchase the Roomba as a gift rather than as a replacement to their vacuum cleaners. A SWOT analysis of iRobot's position in this market is contained in Exhibit 13.

**2010: Competition has arrived**

Since its launch in 2002, the Roomba has had virtually no competition in the United States. The strength of the Roomba brand may sustain its dominance for a few more years, but we expect the company’s first-mover advantage to fade. Several new competitors have entered the market this year, some offering a value proposition that may be superior to what iRobot offers consumers. Many of these competitors offer better suction, advanced navigation, better battery life, and a stronger value proposition. As shown in Exhibit 12, there are at least 14 companies that currently market a robotic vacuum cleaner.

While additional entrants may add legitimacy to the market, we expect these entrants to capture a substantial portion of Roomba's current market. Consumer conglomerates such as Samsung, LG and Panasonic have more bargaining power with retailers and can maintain R&D and marketing at levels well beyond those sustainable by iRobot. Dyson has shown miniaturization capacity with its recent DC-26 launch, and is currently developing a robotic vacuum – the DC-06 – that will rely on this miniaturization.

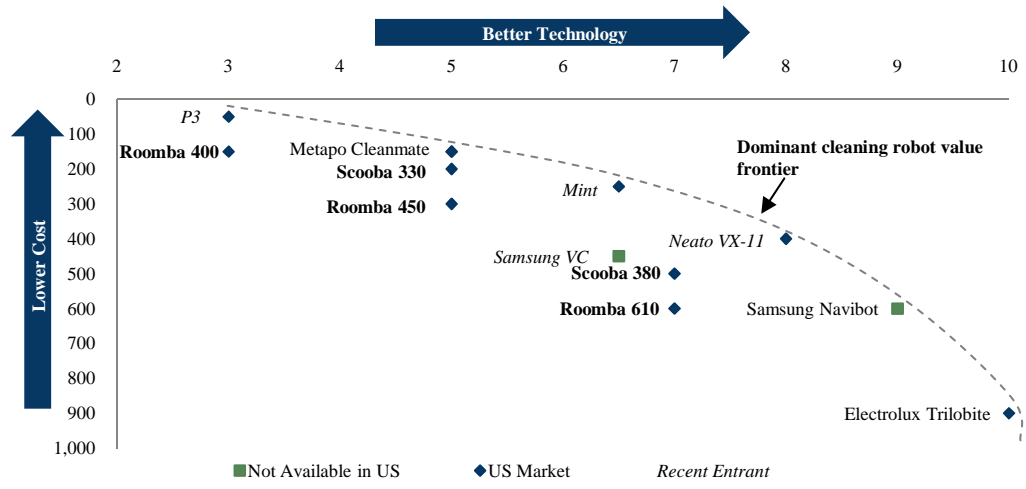
*“The real threats are the consumer conglomerates. To put an LG vacuum robot on the shelf, floor managers at Target and Costco have to take something else off. LG can leverage existing relationships with retailers to capture shelf space.”*

- Our interview with former iRobot home robots product manager

**Figure 3.1: Our field research shows new competition in traditional retail channels**  
Bed, Bath and Beyonds in the Boston area are carrying the "Mint" for the first time ever - and it had sold out (November 2010)



Figure 3.2: Competitors offer more attractive technology at better prices



**As the Palm went, so goes the Roomba**

Historically, market leaders in consumer products have struggled to retain market share as competitors have entered the market with more innovative products. For example, Palm dominated the Smartphone market in 2000 with a 70% share,<sup>1</sup> which has fallen to less than 1% due to innovations by competitors. In comparison, Apple’s iPhone has captured a 17% market share since its introduction in 2007.<sup>2</sup> We believe the entry of innovative competitors will materially pressure the unchallenged position the Roomba has so far enjoyed.

**MILITARY ROBOT TRENDS**

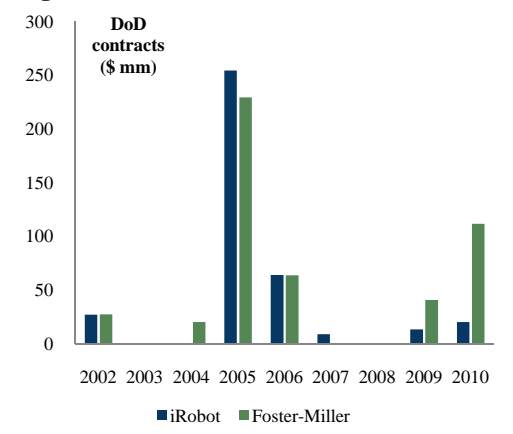
**Small UGVs: Recent growth from DoD contracts, but Foster-Miller is a threat**

The two dominant players for government small robot contracts are iRobot and Foster-Miller (a subsidiary of UK-based QinetiQ), with Remotec (a subsidiary of Northrop Grumman) and General Dynamics as marginal players. iRobot was the winning contractor for SUGVs in the Army’s Brigade Combat Team Modernization (BCTM) program, which envisions arming all combat brigades with small robots by 2025. Yet our research reveals that Foster-Miller won \$153 mm in DoD contracts over the last two years, compared to \$34 mm for iRobot, raising doubt about iRobot’s position going forward.<sup>3</sup> Foster-Miller’s primary offering in the military market is the Talon, a more durable and armable small robot. The Talon’s continued success with DoD contracts as the Army shifts combat operations to Afghanistan is disconcerting to iRobot’s prospects. See Exhibit 9 for a full overview of the BCTM program and Exhibit 14 for a SWOT analysis of iRobot’s position in this market.

**Large UGVs: Not iRobot’s market**

According to our research, General Dynamics has designed every mid-size (500 to 4,000 lb) platform field tested by the military in the last 20 years.<sup>4</sup> Lockheed Martin’s MULE is the only other midsized platform in which the military has expressed interest. iRobot’s R-Gator, codeveloped with John Deere, has failed to garner any interest. Large automated platforms require a completely different set of technologies and have a different set of dominant players. We view robotic platform technologies as very segmented, and iRobot’s expertise has only been demonstrated with small robots.

Figure 3.3: DoD small UGV contracts awarded



*“Talon robots can take a punch and stay in the fight. One was blown off the roof of a Humvee in Iraq while the Humvee was crossing a bridge over a river. Talon flew off the bridge and plunged into the river below. Soldiers later used its operator control unit to drive the robot back out of the river and up onto the bank so they could retrieve it.”*

- Foster-Miller

<sup>1</sup> New York Times, <http://select.nytimes.com/gst/abstract.html?res=F70A10F8345A0C718EDDA90994D940448>, accessed on 12/1/2010.

<sup>2</sup> Gartner, <http://www.gartner.com/it/page.jsp?id=1466313>, accessed on 12/1/2010.

<sup>3</sup> US Department of Defense, <http://www.defense.gov/contracts/>.

<sup>4</sup> General Dynamics Robotic Systems, <http://www.gdrs.com/robotics/index.asp?roboticsid=5>, accessed on 10/29/2010.

*“There is a general sentiment that spending needs to be cut somewhere. With the wars in the Middle East becoming increasingly unpopular, it’s getting harder to justify the projects started to support the war efforts.”*

- Our interview with a defense researcher familiar with DARPA contracting

**Our Army deployment model suggests UGV procurement will fall on withdrawals**

Our analysis of Unmanned Aerial Vehicle (UAV) contracts awarded by the DoD over the past ten years shows that UAV procurement is driven by short term field needs rather than a long term upgrade cycle (see Exhibit 11). We believe that the DoD views UGV procurement similarly to UAV procurement – another unmanned platform that reduces casualties. Recent elevated levels in robot shipments were a result of the Army beginning a transition to Afghanistan and adjusting to its new need for lighter robots. This is borne out by an increasing share of sales for the lighter SUGV relative to the heavier FasTac and 510 models. While this high rate of procurement may continue in the short term, the on-schedule withdrawal from Iraq in 2011 and the beginning of a withdrawal from Afghanistan in 2012, as outlined by President Obama and administration announcements, will reduce field needs and drive a slowdown in military robot sales. See Exhibit 7 for our detailed deployment schedule and G&I sales model.

**DoD 2011 Budget Request and the BCTM program schedule will not offset falling sales until early 2013**

Our research into the DoD 2011 Budget Request (Army P-1 subrequest) suggests that BCTM program sales will not ramp up until 2012-2013. The BCTM program serves as the master plan for upgrading Army combat formations from 2010-2030 and envisions the SUGV 320 as a critical component. Although public information is limited, our model of the schedule constructed from Army commentary and the Congressional Budget Office’s 2009 report on the Army Transformation Program suggests that all combat brigades will be equipped with small robots by 2025, with approximately 41 robots per brigade. This program drives our long-term G&I sales model. See Exhibit 7 for a more detailed build-up.

**Investment Summary**

**PRICED LIKE A GROWTH STOCK, BUT NOT A GROWTH STOCK: Though iRobot has experienced strong sales this year from entering new markets, we expect 2011 earnings to fall short of consensus estimates due to slowing sales growth and a return in margin pressure.**

*An indicator of domestic sales, waterborne shipments into the US (as tracked by the Department of Homeland Security) show that shipments of home robots from iRobot’s manufacturers in China were down from Q2 to Q3 this year, and have not shown a bounce in Q4 so far (see Exhibit 16).*

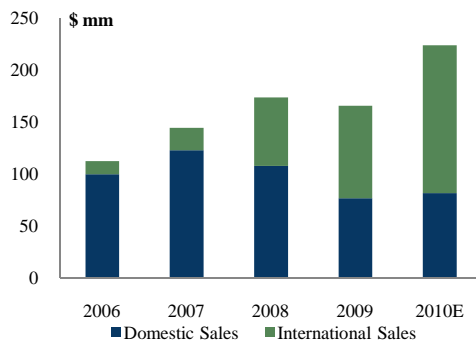
**Consensus projections overlook falling domestic sales, masked by recent growth in international sales**

Sell-side reliance on top-line growth in home robot sales neglects to consider weakening domestic sales – street projections assume a home robot sales growth rate of 22% in 2011 and 16% in 2012. However, domestic sales accounted for only 9% of top-line growth in 2010, and we expect international sales growth (which accounted for 91% of top-line growth) to slow significantly as the company struggles to expand in current markets. We estimate that domestic sales will grow at just 7% yoy in 2010 despite recent post-recession highs in retail spending. In Q3 2010, domestic sales were actually down 11% yoy, despite weak comps. In the medium term, we expect falling ASPs in the traditional vacuum market as well as new competition in the cleaning robot market to limit price inflation. We project a domestic home robot sales CAGR of -4% from 2010-2015 compared to consensus estimates in the mid single digits.

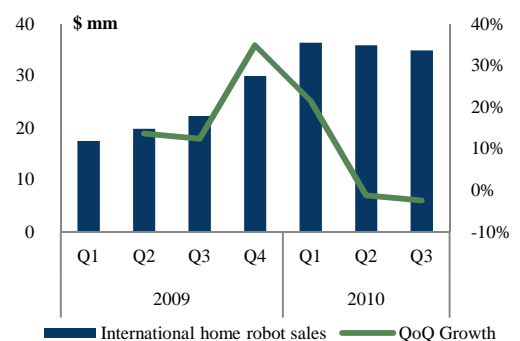
**Rapid growth in international sales is leveling off**

International home robot sales appear to have strong yoy growth (with weak 2009 comps), but we attribute this to the initial entry into new markets rather than sustainable sales growth. Sales are already down 3.9% from Q1 to Q3 of this year, and we expect this slowdown to continue. Additionally, we expect ASPs to come under pressure as the Roomba faces price competition from other cleaning robots with better value propositions. Though the company will continue to see some growth from entering new markets such as South America, we believe international sales growth will decline sharply from 60% in 2010 to about 20% in 2011, disappointing street estimates of 30%.

**Figure 4.1: International growth expected to account for 91% of HRD top-line growth in 2010**



**Figure 4.2: Growth in international home robot sales has stalled in 2010**

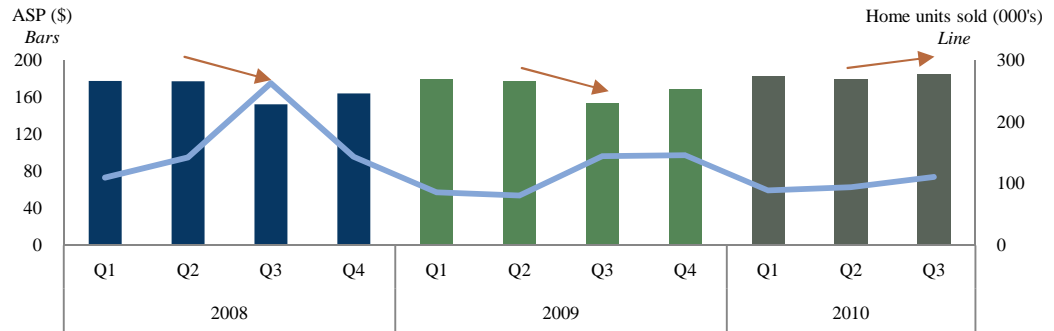




**Lack of pricing power will pressure margins**

Home robot ASPs have shown strong seasonality in past years with an average H1 price of \$178 and H2 price of \$159 (in 2008 and 2009), most likely driven by price cuts for holiday shoppers. While H1 2010 ASPs were more or less in line at \$182, Q3 ASPs remained elevated at \$185, which may have contributed to an estimated 23% yoy fall in domestic units sold in Q3, though the higher ASPs reduced the top line blow. This lack of pricing power, combined with the threat of new competitors, will pressure margins going forward. Recent discounting on iRobot's website supports our expectation of downward pressure on ASPs.

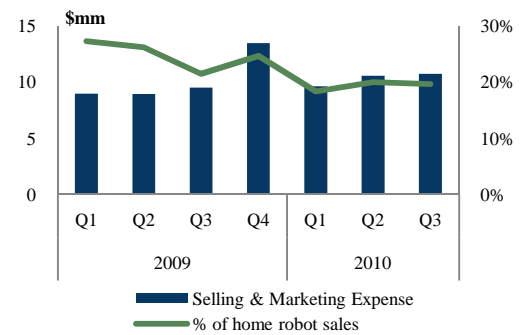
**Figure 4.3: Management did not cut Q3 ASPs as usual and est. domestic units sold were down 23% yoy**



**Rising Selling & Marketing expenses will pressure operating margins**

Based on the seasonality of Selling & Marketing expenses from last year, we expect that upcoming expenses could negatively impact qoq operating income by as much as 7%. Management reduced Selling & Marketing dramatically in 2009 to 25% of home robot sales as consumer sentiment waned, and further to 19% in 2010 ytd, compared to a four-year historical average of 28%. Though short-term EPS could positively surprise if management holds costs at these levels for another quarter, we expect Selling & Marketing expenses to revert back to historic levels, particularly with increased competition from new entrants such as the Mint this holiday season. CFO John Leahy has successfully improved operating efficiency over the past two years, but we see little room for margin improvement going forward.

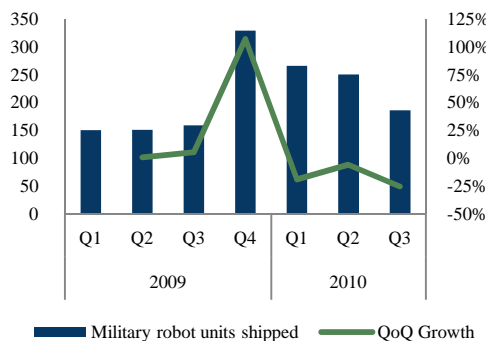
**Figure 4.4: Selling & Marketing expense may show a seasonal Q4 increase, pressuring margins**



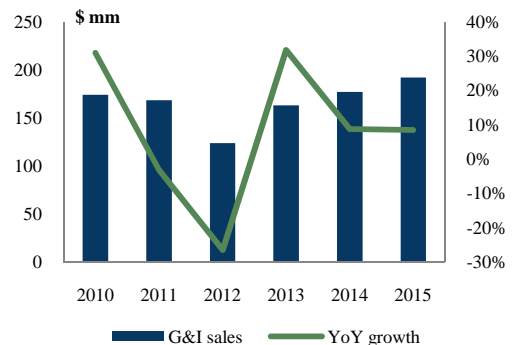
**Falling military unit shipments will surprise as 2011 revenue misses consensus**

Unit robot shipments have fallen every quarter this year, and are down 43.5% from Q4 2009. Dollar sales continued to benefit from a favorable increase in ASPs as procurement transitioned to the SUGV 320, but we are projecting a further fall in units in 2011, with not much benefit from ASPs. While G&I procurement revenues can be lumpy due to the IDIQ (Indefinite Delivery Indefinite Quantity) nature of DoD contracts, four straight quarters of declining unit sales is unusual. Based on our Army deployment model, we believe that a complete withdrawal from Iraq in 2011 and the beginning of a drawdown from Afghanistan in 2012 will continue to pressure sales going forward. See Exhibit 7 for a detailed analysis.

**Figure 4.5: Military unit shipments down every Q this year, and are down 43% from Q4 2009**



**Figure 4.6: G&I sales will fall in 2011, refocusing the street on an even sharper fall in 2012**



**Former iRobot employees and contractors acknowledge that the company has lost its innovative edge**

Although the Roomba was undeniably one of the first exciting products in consumer robotics, the technology behind it is now commonplace. Our discussions with former employees and an engineering consulting firm that worked with iRobot suggest that the company’s priorities have shifted to its G&I business. The company has not created a materially profitable home robot since the Roomba was launched over seven years ago, and two of the three original founders have left to start new robotics companies. We also view the company’s high cash balance as evidence of a lack of attractive investment opportunities. Based on our interviews with former employees and industry experts, iRobot has evolved from a cutting edge and entrepreneurial start-up to a more risk-averse corporation.

**Strategic acquisitions or a buyout seem unlikely**

Based on our review of management comments and industry participants’ opinions, we do not expect iRobot to acquire assets or a firm that will be accretive to near-term earnings. Additionally, we consider a buyout of iRobot unlikely as described in Exhibit 15.

**Valuation**

**Price target**

**Our short term price target for iRobot is between \$15.20-16.60 per share. This implies a 25-35% downside from the current price of \$22.84.**

**Valuation methodology**

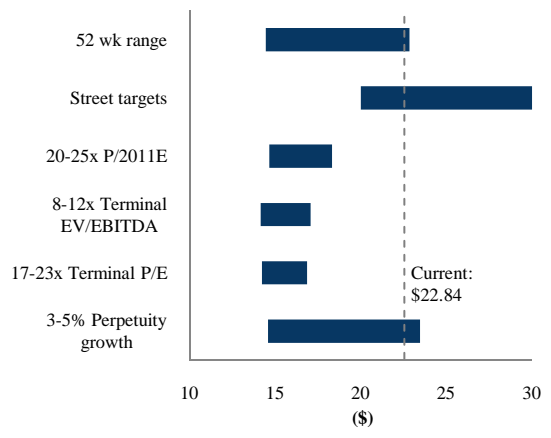
Our valuation is based on a DCF and multiples

methodology and a segmented sales analysis of home robot and military robot markets over the next 15 years. We assume a 12.5% WACC from comparables.

For the terminal value in 2025E we use (1) a 10x EV/EBITDA exit multiple, and (2) a 20x P/E exit multiple, from comparables, and (3) a perpetuity growth rate of 4%.

Our DCF based valuation implies a 17-18x P/2010E multiple and a 7.5-9x EV/2010 EBITDA multiple, at a discount of about 30% to current consensus multiples of 25.2x P/2010E and 13.5x EV/2010EBITDA, yet fairly in line with comparables.

**Figure 5.1: Relative valuation ranges**



**Relative valuation**

Our DCF and multiples based valuation represents a downside of 25-35% from the current price. In addition, the midpoint of our valuation also represents a 20% downside to the bottom and a 47% downside to the top of street price targets.

**Comparables**

iRobot operates in two businesses: home robots and military robots. As such, we view iRobot’s comparables as a blended basket of defense companies and consumer appliance manufacturers. As the only publicly traded pure-play on robotics, there are no perfect comparables for iRobot. However, the company aims for its flagship product, the Roomba, to gain acceptance as a replacement to traditional vacuum cleaners. This market view is reinforced by the recent entry of several appliance makers into the vacuum robotics market. As such, we believe that a basket of home appliance makers is an appropriate comparable for its home robot business. On the G&I side of the business, we believe that in the long run a basket of single product / single customer defense companies of similar size is an appropriate comparable.

We estimate that our defense basket has a WACC of 11.5% and the consumer appliances basket has a WACC of 13.5%. A 40/60 weighting to these leads to approximately our blended WACC of 12.5%. Average multiples across our basket of comparables are 16x P/2010E and 8x EV/2010EBITDA. Our exit multiples are thus rich to comparables, giving iRobot the benefit of faster growth in 2010. See Exhibit 5 for a full analysis of our WACC and multiples from comparables.

Sensitivity analysis

Perp growth	WACC					Term EV/EBITDA	WACC					Term P/E	WACC				
	9.5%	11.0%	12.5%	14.0%	15.5%		9.5%	11.0%	12.5%	14.0%	15.5%		9.5%	11.0%	12.5%	14.0%	15.5%
3.0%	20.07	17.66	16.18	15.22	14.58	8.0x	15.69	15.17	14.76	14.43	14.16	17.0x	15.84	15.30	14.86	14.51	14.22
3.5%	20.71	18.00	16.38	15.34	14.66	9.0x	16.03	15.46	14.99	14.62	14.31	18.5x	16.09	15.51	15.03	14.65	14.34
4.0%	21.46	18.39	16.60	15.48	14.75	10.0x	16.38	15.74	15.22	14.81	14.47	20.0x	16.35	15.72	15.20	14.79	14.46
4.5%	22.36	18.84	16.85	15.63	14.84	11.0x	16.73	16.02	15.45	15.00	14.62	21.5x	16.61	15.93	15.38	14.93	14.57
5.0%	23.46	19.36	17.13	15.79	14.94	12.0x	17.07	16.31	15.69	15.19	14.78	23.0x	16.87	16.14	15.55	15.07	14.69

Sales model accounts for current unsustainable sales volume

Our DCF free cash flow projections are based on a segmented sales model of the home robots and military robots businesses. We believe a 15 year projection is appropriate due to a temporary sales spike caused by a ramp up of the BCTM program from 2016-2024. See Exhibit 6 for a detailed analysis of our home robot sales model and Exhibit 7 for a detailed analysis of our military robot sales model.

Risks to our price target

We believe that our projections represent a significant downside to the current stock price, and that even these may be too bullish with entry of competitors with superior technology into the home robot market. However, risks to our SELL recommendation stem from a bull case for sales, and that is what we focus on.

- 1) International sales may continue to see rapid yoy sales growth for a sustained period of time if Roomba acceptance increases in international markets. In addition, domestic sales may show above trend growth from stronger than expected holiday sales growth. The bull case of our home robot sales model would increase the midpoint of our target price to \$16.10.
- 2) The SUGV’s success may accelerate the military’s acceptance of small robots. The bull case of our military robots model would increase the midpoint of our target price to \$23.35.
- 3) In addition, there are certain operating assumptions in our model that the valuation is very sensitive to, such as long-run R&D expense, Selling & Marketing expense, and military robot gross margin. We believe that the line item poses a limited risk at historic lows. Selling & Marketing expenses have averaged 19% of home robot sales ytd compared to a historical average of 28%.

Our model implies that the current stock price is only justified if we assign a 100% probability to the bull case for G&I sales.

Figure 5.2: Sensitivity to bullish scenarios

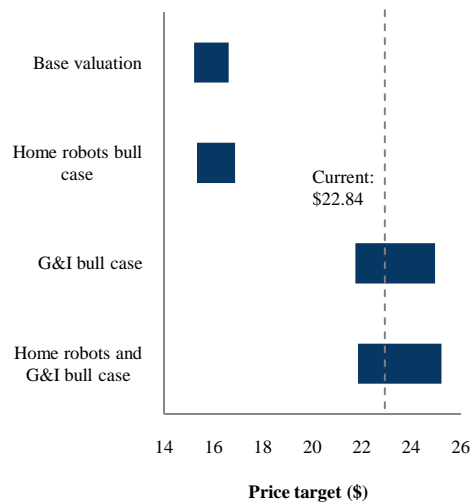
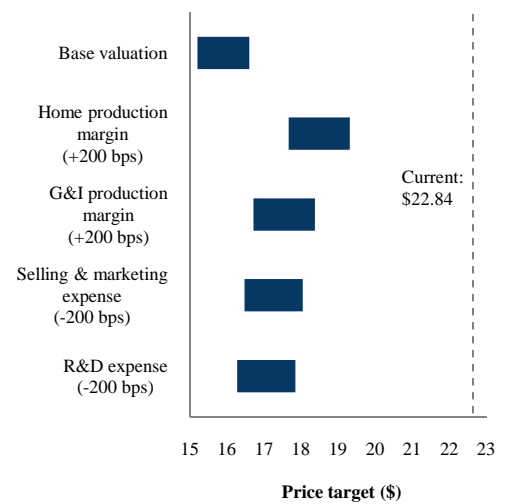


Figure 5.3: Sensitivity to operating assumptions



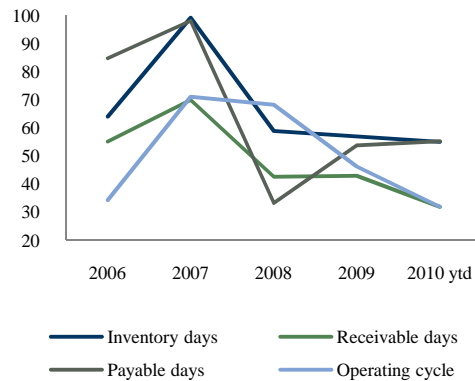


## Financial Analysis

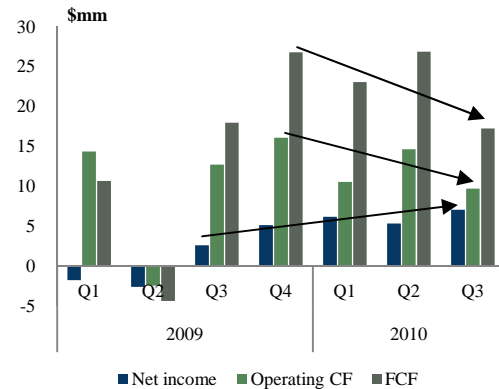
### Current all-time high margins are unsustainable

Though the company has grown gross margins to 35% ytd from an average of 33% since 2006, the improvement is primarily from an expansion of margins in home robots from 32% to 39% and in G&I contracts from 15% to 29% yoytd. We expect home margins to erode as new competitors enter the market. See Exhibit 8 for our analysis of margins as market share decreases. In contrast, margins in G&I procurement have fallen from 33% last year to 30% ytd. In addition, ytd contract margins have been temporarily inflated by the Aware 2 contract and we expect them to revert to the long-term average of 12%.

**Figure 6.1: Working capital gains have come from improvements in the operating cycle, but additional gains will be difficult**



**Figure 6.2: Net income gains have been accompanied by a fall in operating and free cash flows**



### Earnings management has run its course

Improving cash flows has been a significant focus for management, especially since CFO John Leahy joined in 2008. Cash flow from operating activities has grown from \$575k in 2006 to \$40.6 mm in 2009 partly from sales growth but also due to strong reductions in working capital needs. The overall operating cycle has improved from 71 days in 2007 to 46 days in 2009 (we project 33 days in 2010 and 36 days in 2011). However, management may be challenged in hitting this target, particularly on inventory days, as diversifying sales internationally will require stocking product in multiple locations.

The contribution of improvements in working capital to operating cash flows in 2008 and 2009 was extraordinarily high at 36% and 61%, respectively. We believe that incremental improvements in working capital will be much harder to come by, leading to somewhat lower operating cash flows going forward. In fact, we have already begun to see deteriorating earnings quality, with rising net income over the last 4 quarters accompanied by falling operating and free cash flows.

### Strong balance sheet, excess amounts of cash

iRobot's balance sheet is very healthy with no debt, and we project that it will end 2010 with almost \$105 mm in cash and equivalents. In addition, it has access to a \$40 mm unsecured line of credit with Bank of America until June 2012, which is currently undrawn. We estimate its working cash needs at about \$20 mm (2-3 weeks of sales), so it is in a very comfortable liquidity position. We project the ratio of excess cash to assets will grow to about 45% in 2015. Management's inability to reinvest in organic growth raises some doubt about the growth opportunities they may be seeing in the robotics space. However, we do understand that some companies view a strong cash balance as a strategic defense.

	2006	2007	2008	2009	2010E	2011E	2012E	2013E	2014E	2015E
<b>Profitability</b>										
Operating Margin (%)	4.0	2.3	2.7	4.5	9.4	8.2	5.1	5.3	5.4	6.5
Gross Margin (%)	36.9	33.2	30.4	30.5	35.1	35.8	35.2	34.3	33.5	32.6
Net Profit Margin (%)	1.9	3.6	0.3	1.1	5.8	4.5	2.5	2.8	3.0	3.7
Return on Assets (%)	2.6	5.4	0.5	1.7	9.6	7.4	3.7	4.2	4.2	5.0
Return on Equity (%)	3.8	8.2	0.6	2.5	14.0	10.2	4.9	5.5	5.5	6.4
<b>Per Share Data</b>										
Diluted Earnings (\$)	0.14	0.36	0.03	0.13	0.91	0.73	0.37	0.44	0.47	0.58
P/E	x	x	x	x	22.6	27.9	55.3	46.3	43.4	35.2
P/FCF	x	x	x	x	7.6	13.8	22.0	26.3	26.5	24.1

## Risks to Our Sell Thesis

### ECONOMIC RISKS

#### **Strong recovery in domestic home robot sales**

A strong recovery in holiday sales would support the domestic home robot business. See Exhibit 6 for our home robot sales, including the bull case for domestic sales. Additionally, we would expect to see a bounce in sales if iRobot begins to sell products at Wal-mart retail stores.

#### **Continued strong growth in international markets**

The Roomba's acceptance as a broad replacement to vacuum cleaners in technologically sophisticated societies such as Japan could result in an upside surprise to our projections. See Exhibit 6 for our home robot sales, including the bull case for international sales.

Earnings management combined with stronger than expected holiday sales could temporarily inflate the stock price. Q4 earnings could surprise if management maintains historically low Selling & Marketing expenses for another quarter.

### POLITICAL AND REGULATORY RISKS

#### **Risk of new and renewed conflicts**

Political tensions in the Middle East or other regions may lead to the United States' involvement in a new conflict, or delay planned withdrawals from existing conflicts. Any extended or additional presence of troops on the ground could lead to increased sales of unmanned systems.

#### **Exports to friendly states**

iRobot's exports in the G&I segment are constrained by the Arms Export Control Act and the fact that most allies such as the NATO members have their own UGV production programs. However, some friendly nations currently involved in conflicts and lacking the expertise to produce unmanned systems, such as Iraq and Afghanistan, may clear export controls and lead to an attractive opportunity for iRobot.

### ACQUISITION RISK

#### **iRobot may make a favorable strategic acquisition**

With over \$100 mm of cash on the balance sheet and access to a \$40 mm working capital line of credit, iRobot has a boutique investment bank on retainer to evaluate targets. On the Q3 earnings call, CEO Colin Angle discussed M&A opportunities in the prepared remarks for the first time.

#### **Acquisition by a large defense contractor or consumer appliances company**

A large defense contractor could find attractive synergies and integration opportunities in an acquisition of iRobot. Boeing has expressed an interest in the technology by partnering with iRobot in marketing the SUGV. An acquisition by a consumer appliances company such as LG or Stanley Black & Decker is also a possibility, though we expect a defense contractor would lead a buyout and divest the consumer business. We further analyze acquisition risks in Exhibit 15.

### COMPETITIVE RISKS

#### **DoD procurement may favor iRobot over Foster-Miller**

According to our research, Foster-Miller has outpaced iRobot in winning DoD contracts over the last two years, winning \$153 mm in contracts vs. \$34 mm for iRobot. However, the SUGV 320 is smaller and lighter, and has been favored for the Army's BCTM program. Over time, DoD procurement may evolve towards a standardization of equipment, possibly benefitting iRobot's G&I sales.

### MARKET RISK

#### **Increasing international sales expose iRobot to foreign exchange risk**

Increasing international sales expose iRobot to movements in foreign exchange rates. A sustained weakening in the dollar would benefit foreign currency denominated sales.

**Exhibit 1: Income Statement**

in thousands

Source: Company documents, Student estimates

	2006A	2007A	2008A	2009A	2010E	2011E	2012E	2013E	2014E	2015E
<b>Total sales</b>	188,955	249,081	307,621	298,617	397,838	414,353	375,929	401,470	405,365	402,989
Home robots	112,430	144,483	173,602	165,860	224,038	251,081	257,931	255,445	247,027	231,652
Govt & Industrial	76,525	104,598	134,019	132,757	173,801	163,272	117,998	146,026	158,339	171,337
<b>Cost of goods sold</b>	119,220	166,494	214,150	207,421	258,236	265,930	243,797	263,730	269,714	271,522
Home	68,031	97,878	123,833	112,429	136,057	150,649	157,760	159,289	157,079	150,244
Govt & Industrial Products	32,384	49,811	66,417	64,202	94,643	80,255	50,310	68,000	75,465	83,365
Govt & Industrial Contracts	18,805	18,805	23,900	30,790	27,536	35,026	35,727	36,441	37,170	37,913
<b>Gross income</b>	69,735	82,587	93,471	91,196	139,602	148,423	132,132	137,741	135,651	131,467
Research and development	17,025	17,082	17,566	14,747	23,408	25,108	24,503	22,990	20,997	18,532
Selling and marketing	33,969	44,894	46,866	40,902	46,439	55,238	59,324	61,307	61,757	57,913
General and administrative	18,703	20,919	28,840	30,110	36,894	39,364	33,834	36,132	34,456	32,239
<b>Operating income</b>	38	(308)	199	5,437	32,861	28,714	14,471	17,312	18,441	22,783
Litigation expenses	0	2,341	0	0	0	0	0	0	0	0
Other income (expenses)	3,831	3,151	926	(81)	368	0	0	0	0	0
<b>Income before taxes</b>	3,869	502	1,125	5,356	33,229	28,714	14,471	17,312	18,441	22,783
Taxes	304	(8,558)	369	2,026	10,201	10,050	5,065	6,059	6,454	7,974
<b>Net income</b>	3,565	9,060	756	3,330	23,028	18,664	9,406	11,253	11,987	14,809
<b>Diluted EPS(\$)</b>	<b>0.14</b>	<b>0.36</b>	<b>0.03</b>	<b>0.13</b>	<b>0.91</b>	<b>0.73</b>	<b>0.37</b>	<b>0.44</b>	<b>0.47</b>	<b>0.58</b>
<b>Operating Drivers</b>										
	2006A	2007A	2008A	2009A	2010E	2011E	2012E	2013E	2014E	2015E
<b>Sales growth</b>		32%	24%	-3%	33%	4%	-9%	7%	1%	-1%
Home robots		29%	20%	-4%	35%	12%	3%	-1%	-3%	-6%
Govt & Industrial robots		37%	28%	-1%	31%	-6%	-28%	24%	8%	8%
<b>Margins</b>										
Gross margins	37%	33%	30%	31%	35%	36%	35%	34%	33%	33%
Operating margins	0%	0%	0%	2%	8%	7%	4%	4%	5%	6%
Net income margins	2%	4%	0%	1%	6%	5%	3%	3%	3%	4%
<b>Home robot assumptions</b>										
Expensed R&D as % of home robot sales	15%	12%	10%	9%	10%	10%	10%	9%	9%	8%
Selling & marketing as % of home robot sales	30%	31%	27%	25%	21%	22%	23%	24%	25%	25%
<b>Govt and Industrial assumptions</b>										
Installed units			1,100	1,889	2,830	3,513	3,696	4,060	4,469	4,923
Product life cycle revs as x of installed units			18	12	15	15	15	15	15	15
Contract research growth rate		-3%	52%	45%	13%	2%	2%	2%	2%	2%

**Exhibit 2: Balance Sheet**

in thousands

Source: Company documents, Student estimates

	2006A	2007A	2008A	2009A	2010E	2011E	2012E	2013E	2014E	2015E
<b>Assets</b>										
Working cash	5,000	20,000	20,000	20,000	20,000	23,905	21,688	23,162	23,386	23,249
Excess cash and equivalents	583	6,735	20,852	51,856	65,398	75,263	92,882	102,189	114,969	131,145
Short term investments	64,800	16,550	0	4,959	16,576	16,576	16,576	16,576	16,576	16,576
Accounts receivable, net	28,510	47,681	35,930	35,171	35,482	41,435	37,593	40,147	40,537	40,299
Unbilled revenue	1,961	2,244	2,014	1,831	2,817	2,449	1,770	2,190	2,375	2,570
Inventory	20,890	45,222	34,560	32,406	39,885	37,230	34,132	36,922	37,760	38,013
Deferred tax assets	0	5,905	7,299	8,669	9,922	10,359	9,398	10,037	10,134	10,075
Other current assets	2,863	2,268	3,340	4,119	3,992	4,972	4,511	4,818	4,864	4,836
<b>Current assets</b>	<b>124,607</b>	<b>146,605</b>	<b>123,995</b>	<b>159,011</b>	<b>194,072</b>	<b>212,189</b>	<b>218,550</b>	<b>236,041</b>	<b>250,602</b>	<b>266,763</b>
Property and equipment, net	10,701	15,694	22,929	20,230	23,721	20,317	17,633	15,528	13,886	12,617
Deferred tax assets	0	4,293	4,508	6,089	8,183	7,458	6,767	7,226	7,297	7,254
Other assets	0	2,500	12,246	14,254	13,774	13,330	12,886	12,442	11,998	11,554
<b>Total assets</b>	<b>135,308</b>	<b>169,092</b>	<b>163,678</b>	<b>199,584</b>	<b>239,750</b>	<b>253,294</b>	<b>255,836</b>	<b>271,237</b>	<b>283,783</b>	<b>298,188</b>
<b>Liabilities</b>										
Accounts payable	27,685	44,697	19,544	30,559	39,917	37,292	33,834	36,132	36,483	36,269
Accrued expenses	7,020	7,987	10,989	14,384	15,523	14,502	13,158	14,051	14,188	14,105
Accrued compensation	5,227	4,603	6,393	13,525	13,306	12,431	11,278	12,044	12,161	12,090
Deferred revenue	457	1,578	2,632	3,908	2,817	2,449	1,770	2,190	2,375	2,570
<b>Current liabilities</b>	<b>40,389</b>	<b>58,865</b>	<b>39,558</b>	<b>62,376</b>	<b>71,563</b>	<b>66,674</b>	<b>60,039</b>	<b>64,418</b>	<b>65,207</b>	<b>65,033</b>
Long term liabilities	0	0	4,444	4,014	3,584	3,154	2,724	2,294	1,864	1,434
<b>Total liabilities</b>	<b>40,389</b>	<b>58,865</b>	<b>44,002</b>	<b>66,390</b>	<b>75,147</b>	<b>69,828</b>	<b>62,763</b>	<b>66,712</b>	<b>67,071</b>	<b>66,467</b>
<b>Shareholders' equity</b>										
Common stock	238	245	248	251	254	254	254	254	254	254
Additional paid-in capital	117,718	122,318	130,637	140,613	148,763	148,963	149,163	149,363	149,563	149,763
Deferred compensation	(2,326)	(685)	(314)	(64)	0	0	0	0	0	0
Retained earnings	(20,711)	(11,651)	(10,895)	(7,565)	15,463	34,126	43,533	54,785	66,772	81,581
Accumulated OCI	0	0	0	(41)	123	123	123	123	123	123
<b>Total shareholders' equity</b>	<b>94,919</b>	<b>110,227</b>	<b>119,676</b>	<b>133,194</b>	<b>164,603</b>	<b>183,466</b>	<b>193,073</b>	<b>204,525</b>	<b>216,712</b>	<b>231,721</b>
<b>Balance sheet drivers</b>										
<b>Operating cycle</b>										
Inventory days	64	99	59	57	56	51	51	51	51	51
Receivable days	55	70	43	43	33	37	37	37	37	37
Payable days	85	98	33	54	56	51	51	50	49	49
<b>Current assets</b>										
Unbilled revenues as % of G&I sales	3%	2%	2%	1%	2%	2%	2%	2%	2%	2%
Deferred tax assets as % of total sales	0%	2%	2%	3%	2%	3%	3%	3%	3%	3%
Other current assets as % of total sales	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%
<b>Long term assets</b>										
Deferred tax assets as % of total sales	0%	2%	1%	2%	2%	2%	2%	2%	2%	2%
<b>Current liabilities</b>										
Accrued expenses as % of total sales	4%	3%	4%	5%	4%	4%	4%	4%	4%	4%
Accrued comp as % of total sales	3%	2%	2%	5%	3%	3%	3%	3%	3%	3%
Deferred revenues as % of G&I sales	1%	2%	2%	3%	2%	2%	2%	2%	2%	2%
<b>Plant, property &amp; equipment</b>										
Gross PPE growth rate			42%	-3%	20%	3%	3%	3%	3%	3%
Depreciation as % of beginning net PPE			44%	33%	20%	20%	20%	20%	20%	20%

**Exhibit 3: Cash Flow Statement**

in thousands

Source: Company documents, Student estimates

	2006A	2007A	2008A	2009A	2010E	2011E	2012E	2013E	2014E	2015E
<b>Cash flows from operating activities</b>										
Net income	3,565	9,060	756	3,330	23,028	18,664	9,406	11,253	11,987	14,809
Depreciation and amortization	3,743	5,311	7,029	8,074	4,046	5,188	4,507	3,971	3,550	3,221
Loss on disposal of property and equipment	7	48	231	202	117	0	0	0	0	0
Stock-based compensation	2,569	4,711	5,939	7,562	6,032	0	0	0	0	0
In process R&D (Nekton acquisition)	0	0	200	0	0	0	0	0	0	0
Benefit from deferred tax assets	0	(10,198)	(1,967)	(3,317)	(3,867)	288	1,652	(1,098)	(167)	102
Non-cash director deferred compensation	0	111	95	132	132	200	200	200	200	200
Changes in net working capital	(9,309)	(24,715)	6,827	24,658	185	(9,231)	1,016	(2,122)	(1,100)	(785)
Change in cash from operating activities	575	(15,672)	19,110	40,641	29,672	15,109	16,782	12,203	14,468	17,547
<b>Cash flows from investing activities</b>										
Additions of property and equipment	(7,485)	(10,352)	(14,817)	(5,038)	(7,537)	(1,340)	(1,380)	(1,421)	(1,464)	(1,508)
Purchase of Nekton Research, net of cash recv.	0	0	(9,743)	(2,500)	0	0	0	0	0	0
Change in other investments	0	(2,500)	0	0	0	0	0	0	0	0
Purchases of investments	(174,100)	(52,950)	(29,997)	(5,000)	(30,461)	0	0	0	0	0
Sales of investments	109,300	101,200	46,547	0	19,000	0	0	0	0	0
Change in cash from investing activities	(72,285)	35,398	(8,010)	(12,538)	(18,998)	(1,340)	(1,380)	(1,421)	(1,464)	(1,508)
<b>Cash flows from financing activities</b>										
Borrowings under line of credit	0	0	5,500	0	0	0	0	0	0	0
Repayment of borrowings under line of credit	0	0	(5,500)	0	0	0	0	0	0	0
Proceeds from stock options exercises	1,049	1,388	1,011	738	2,297	0	0	0	0	0
Inc. tax withholding associated w/ stock options	0	(1,588)	0	0	0	0	0	0	0	0
Inc. tax withholding associated w/ restricted stock	0	0	0	(76)	(284)	0	0	0	0	0
Tax benefit of excess stock-based comp deductions	0	1,626	2,006	2,239	855	0	0	0	0	0
Tax benefit of disqualifying dispositions	180	0	0	0	0	0	0	0	0	0
Change in cash from financing activities	1,229	1,426	3,017	2,901	2,868	0	0	0	0	0
Beginning cash	76,064	5,583	26,735	40,852	71,856	85,398	99,168	114,570	125,351	138,356
Change in cash	(70,481)	21,152	14,117	31,004	13,542	13,769	15,402	10,781	13,004	16,039
<b>Ending cash</b>	<b>5,583</b>	<b>26,735</b>	<b>40,852</b>	<b>71,856</b>	<b>85,398</b>	<b>99,168</b>	<b>114,570</b>	<b>125,351</b>	<b>138,356</b>	<b>154,395</b>
<b>Cash Flow Drivers</b>										
	2006A	2007A	2008A	2009A	2010E	2011E	2012E	2013E	2014E	2015E
Depreciation as % of beginning net PPE			44%	33%	20%	20%	20%	20%	20%	20%
Gross PPE as % of sales		0%	42%	-3%	20%	3%	3%	3%	3%	3%

**Exhibit 4: Valuation**  
in thousands

Source: Student estimates

**Unlevered Free Cash Flows**

	Q4 2010E	2011E	2012E	2013E	2014E	2015E	2016E	2017E	2018E	2019E	2020E
EBIT	6,944	28,714	14,471	17,312	18,441	22,783	21,817	23,632	25,726	27,316	28,970
EBIAT	4,514	18,664	9,406	11,253	11,987	14,809	14,181	15,361	16,722	17,756	18,830
+ Depreciation and amortization	(1,627)	5,188	4,507	3,971	3,550	3,221	2,967	2,773	2,627	2,520	2,444
+ Stock based compensation	0	0	0	0	0	0	0	0	0	0	0
+ Benefit from deferred tax assets	0	288	1,652	(1,098)	(167)	102	802	391	244	(108)	(216)
+ Non cash director deferred comp	33	200	200	200	200	200	200	200	200	200	200
+ Change in net working capital	(8,124)	(9,231)	1,016	(2,122)	(1,100)	(785)	48	(349)	(469)	(601)	(571)
- Capex	0	(1,340)	(1,380)	(1,421)	(1,464)	(1,508)	(1,553)	(1,600)	(1,648)	(1,697)	(1,748)
<b>Free cash flow to all security holders</b>	<b>1,739</b>	<b>42,483</b>	<b>29,873</b>	<b>28,093</b>	<b>31,446</b>	<b>38,822</b>	<b>38,462</b>	<b>40,408</b>	<b>43,402</b>	<b>45,386</b>	<b>47,910</b>

**Valuation Drivers**

	FY 2010E	2011E	2012E	2013E	2014E	2015E	2016E	2017E	2018E	2019E	2020E
Adjusted EBITDA	42,939	39,703	24,241	26,903	27,666	31,646	30,165	31,659	33,528	35,046	36,694
Net income	23,028	18,664	9,406	11,253	11,987	14,809	14,181	15,361	16,722	17,756	18,830

**DCF @ WACC - 12.5%**

	Q4 2010E	2011E	2012E	2013E	2014E	2015E	2016E	2017E	2018E	2019E	2020E
PV of free cash flows	1,739	37,763	23,603	19,731	19,631	21,543	18,972	17,717	16,916	15,724	14,754
Present value of 2025 terminal value											
Exit EV/2025 EBITDA	10.0x	58,924									
Exit P/2025 E	20.0x	58,454									
Perpetuity growth	4.0%	93,908									
Total Enterprise Value											
Exit EV/2025 EBITDA		322,123									
Exit P/2025 E		387,051									
Perpetuity growth		357,107									
Net debt / (excess cash)	(65,398)										
Equity value											
					Price per share						
Exit EV/2025 EBITDA		387,521			Exit EV/2025 EBITDA	\$15.22	-33%				
Exit P/2025 E		387,051			Exit P/2025 E	\$15.20	-33%				
Perpetuity growth		422,505			Perp growth	\$16.60	-27%				

Perp growth	WACC					Term EV/EBITDA	WACC					Term P/E	WACC				
	9.5%	11.0%	12.5%	14.0%	15.5%		9.5%	11.0%	12.5%	14.0%	15.5%		9.5%	11.0%	12.5%	14.0%	15.5%
3.0%	20.07	17.66	16.18	15.22	14.58	8.0x	15.69	15.17	14.76	14.43	14.16	17.0x	15.84	15.30	14.86	14.51	14.22
3.5%	20.71	18.00	16.38	15.34	14.66	9.0x	16.03	15.46	14.99	14.62	14.31	18.5x	16.09	15.51	15.03	14.65	14.34
<b>4.0%</b>	21.46	18.39	<b>16.60</b>	15.48	14.75	<b>10.0x</b>	16.38	15.74	<b>15.22</b>	14.81	14.47	<b>20.0x</b>	16.35	15.72	<b>15.20</b>	14.79	14.46
4.5%	22.36	18.84	16.85	15.63	14.84	11.0x	16.73	16.02	15.45	15.00	14.62	21.5x	16.61	15.93	15.38	14.93	14.57
5.0%	23.46	19.36	17.13	15.79	14.94	12.0x	17.07	16.31	15.69	15.19	14.78	23.0x	16.87	16.14	15.55	15.07	14.69

Figure E4.1: Relative valuation ranges

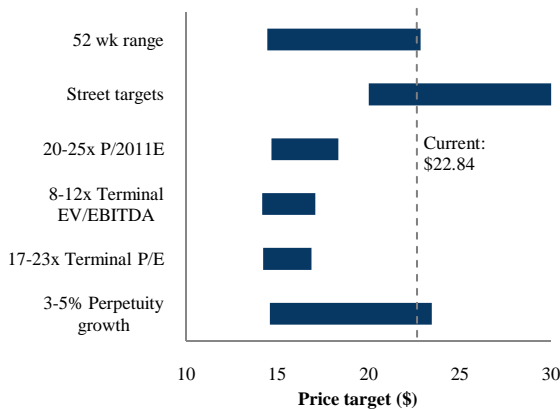
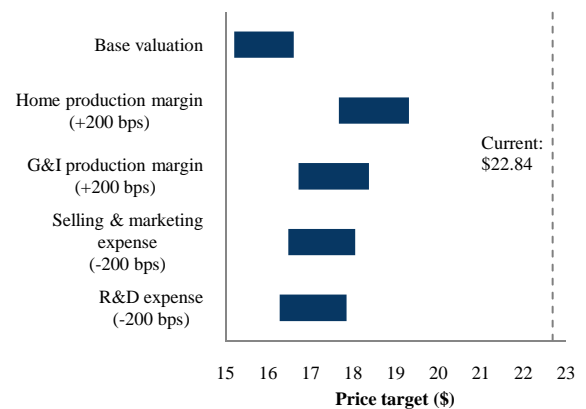


Figure E4.2: Sensitivity to operating assumptions





**Exhibit 5: Comparables - Weighted Average Cost of Capital and Multiples**

in millions where applicable

Source: Bloomberg, Company documents, Student estimates

(in \$mm where applicable)	Consumer Appliance Comps				Defense Industry Comps					
	Whirlpool	Electrolux	Stanley Black & Decker	Philips	FLIR Systems	SPR Aero Systems	Anaren	Herley Indus.	Hexcel Corp.	Orbital Sciences
Equity beta	1.65	1.66	1.32	1.76	0.98	1.44	1.32	1.27	1.50	1.04
Debt beta	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Market value of equity	6,498	8,047	10,674	29,444	4,450	2,884	313	234	1,751	1,026
Book value of debt	1,621	-376	1,811	-7	-364	957	-19	-13	253	-153
Total capitalization	8,119	7,671	12,485	29,437	4,086	3,842	294	220	2,004	873
D/E	0.25	-0.05	0.17	0.00	-0.08	0.33	-0.06	-0.06	0.14	-0.15
Effective tax rate	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%
Tax affected debt	1,054	-244	1,177	-5	-237	622	-12	-9	165	-99
Asset beta	1.43	1.71	1.20	1.76	1.02	1.20	1.37	1.32	1.38	1.14
P/2010E	9.1x	11.0x	19.0x	13.7x	17.3x	12.9x	16.3x	12.8x	23.1x	26.1x
EV/2010 EBITDA	5.1x	5.2x	9.3x	7.3x	9.8x	7.5x	7.5x	6.9x	10.3x	9.2x

	Cons. Comps	Defense Comps	IRBT
Target asset beta	1.53	1.24	1.85
Target debt beta	0.10	0.10	0.10
Target D/E	0.09	0.03	0.01
Target marginal tax rate	35.0%	35.0%	35.0%
Tax adjusted target D/E	0.06	0.02	0.00
Relevered equity beta	1.66	1.27	1.86
Risk free rate	4.0%	4.0%	4.0%
Market premium	6%	6%	6%
Cost of equity	14%	12%	15%
Cost of debt	6%	6%	6%
WACC	13.5%	11.5%	15.1%
Blended WACC (60/40)	12.7%		

Assumptions		
Equity beta	-	Bloomberg ytd adjusted betas, daily frequency
Debt beta	-	Market practice assumed debt beta
Effective tax rate	-	Assumed U.S. statutory rate
Risk free rate	4%	Approximate current risk free rate
Market premium	6%	Please see below

Equity market risk premium		
<b>Methodology</b>	6.38%	Average derived using Gordon growth formula for (1) Dividend yield (2) Earnings yield
Using mkt. dividend yield	3.96%	Assumes 2% growth rate, dividend yield of 1.92%
Using mkt. earnings yield	8.80%	Assumes 2% growth rate, P/E ratio of 15x

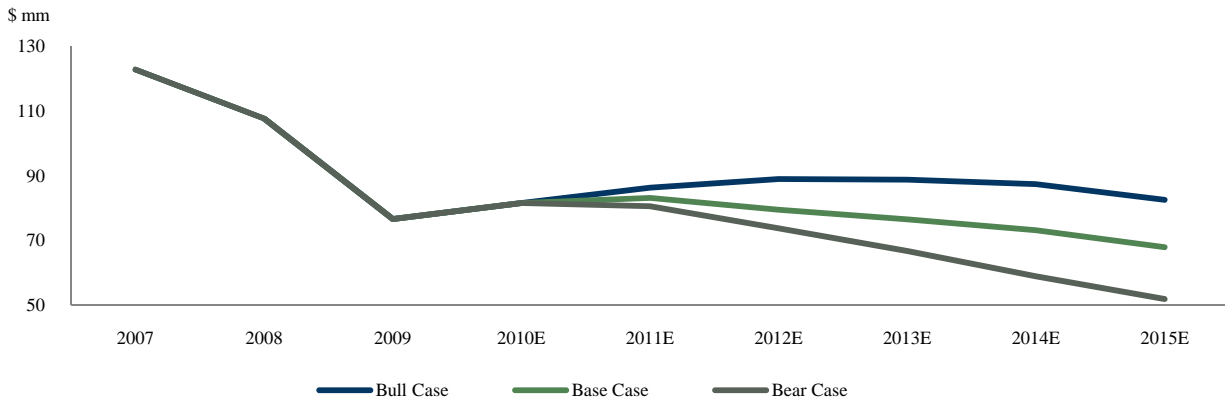
**Exhibit 6: Home Robot Division Sales Model**  
key drivers and assumptions

Source: Company documents, Student estimates

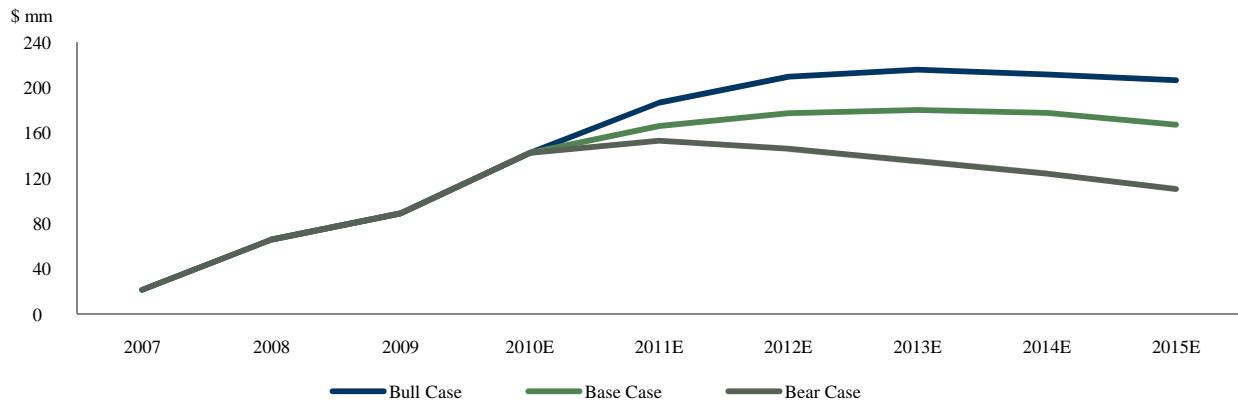
Our home robot sales model is driven by weighted probabilities of three scenarios:

Scenarios	
Bull Case (20%)	The company is able to maintain a steady product upgrade cycle, selling newer and more advanced versions of its floor cleaning robots on a recurring basis to a growing consumer base. Home robot prices are fairly stable over the next 5 years, though new competitors gain some market share.
Base Case (60%)	The company continues to focus its resources on growing non-consumer businesses while relying on the penetration of new international markets to sustain growth in home robot sales. New competitors steadily gain market share, putting downward pressure on home robot ASPs.
Bear Case (20%)	Mounting competition in both domestic and international markets, as well as limited growth in consumer acceptance of cleaning robots, significantly hampers growth. iRobot faces narrowing margins as its home robots struggle to compete with comparable products on price and value.

**Figure E6.1: Projected North American Sales**



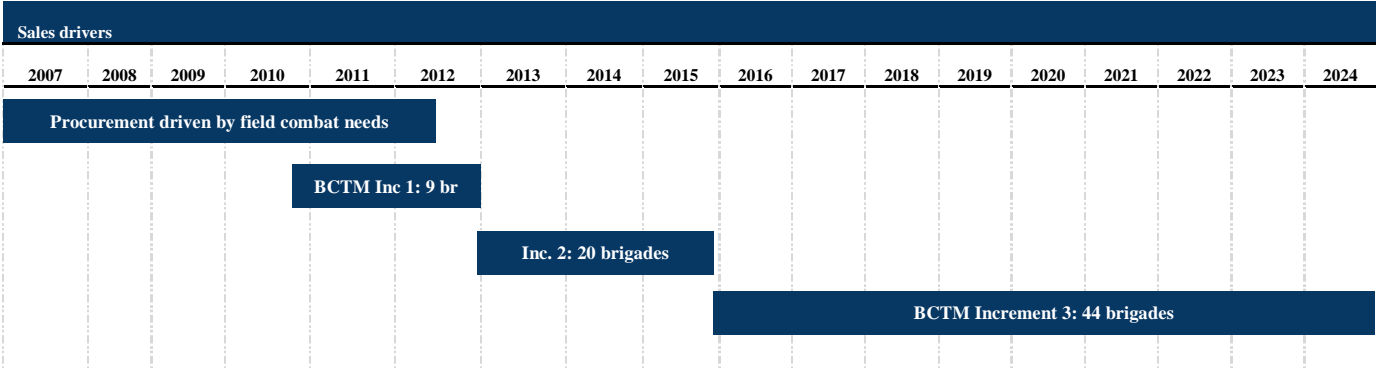
**Figure E6.2: Projected International Sales**



**Exhibit 7: Government & Industrial Division Sales Model**

key drivers and assumptions

Source: Company documents, U.S. Department of Defense press releases, Publicly available news and reports, Student research and estimates

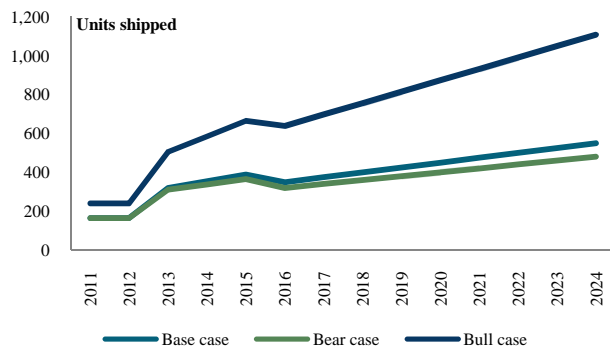


Deployment schedule (avg projected troop presence)							
Iraq troop presence <sup>5</sup>	50,000	20,000	0	0	0	0	0
MiTT <sup>6</sup>	2,000	800	0	0	0	0	0
Afghan. troop presence	110,000	110,000	110,000	110,000	75,000	50,000	0
BCTs <sup>7</sup>	27.5	27.5	27.5	27.5	18.75	12.5	0
Deployment robot needs <sup>8</sup>	3,128	1,928	1,128	1,128	769	513	0

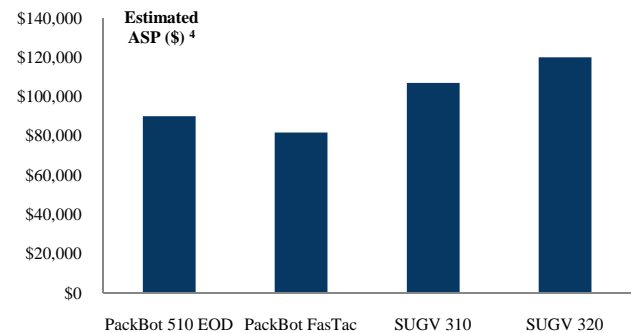
Units (approx.) – actual and blended scenario projections															
510	246	55+	25												
FasTac	494	380+	168												
SUGV 310	10	360+	308												
Seaglider	x	15	x												
SUGV 320		42	184	184	364	409	453	417	449	482	515	548	580	613	646

Scenario Analysis			
	Likelihood	Upgrade Cycle	Comments
<b>Base</b>	60%	8 years	Field needs drive procurement until H1 '12. BCTM program @ 41 SUGVs per brigade from 2010. Moderate replacement cycle.
<b>Bull</b>	25%	5 years	Army implements BCTM procurement @ 60 SUGVs per brigade vs. 41 currently. Innovation drives rapid replacement cycle.
<b>Bear</b>	15%	10 years	Field needs drive procurement until H1 '12. BCTM program @ 41 SUGVs from 2010. Conservative replacement cycle.

**Figure E7.1: Ground robot unit shipment scenarios**



**Figure E7.2: Estimated ground robot ASPs**



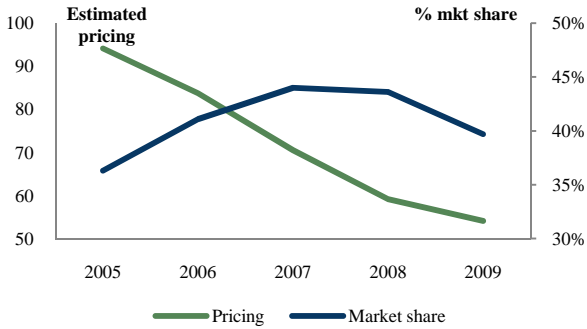
<sup>5</sup> Military Transition Teams of 15 combatants per team, assumes 60% deployment of ground forces into MiTT teams.  
<sup>6</sup> Assumes on average 4,000 troops per Brigade Combat Team.  
<sup>7</sup> Assumes need for 1 ground robot per MiTT and 41 ground robots per BCT. Full analysis of BCT equipment needs in Exhibit 9.  
<sup>8</sup> Unit sales estimated from management earnings commentary. ASPs estimated using total sales \$s vs. unit sales.

**Exhibit 8: Case studies of market share loss and ASPs | *Entry of new competitors will negatively impact iRobot's pricing and margins***

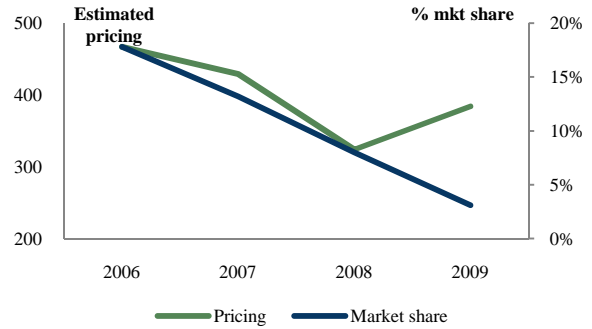
Source: Trefis.com estimates, Student research and estimates

Our research into the historical growth and pricing trends of consumer companies indicates that iRobot's high pricing power during this period of low competition is temporary. The data points to aggressive price cutting by management as new competitors enter and begin to take market share, leading to gross margin compression. Below are several cases of competition in the electronics and consumer appliance markets that resulted in ASP deterioration, which may parallel iRobot's situation over the coming years.

**Figure E8.1: Nokia emerging market phones**

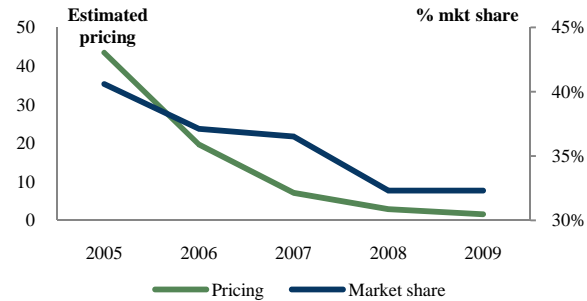


**Figure E8.2: Palm phones**



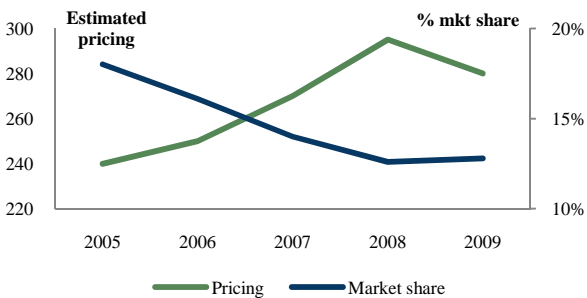
Even though Nokia had falling market share in emerging market phones in the 2005-2007 period, management did not cut ASPs in an effort to boost revenues. However, the loss of market share to new competitors such as Apple and HTC, as well as renewed competition from old rivals with new models such as Motorola with the Droid phone, forced management to cut ASPs beginning in 2007. We note that this was before the emerging markets recession in 2008, and ASP cuts sustained beyond the recession and into the consumer recovery of late 2009. Palm phones faced a similar dilemma over the same period. Management responded to the threat posed by the likes of Apple, HTC and Motorola by cutting ASPs aggressively.

**Figure E8.3: SanDisk mobile flash memory**



The smart phone boom that threatened Nokia and Palm also impacted suppliers to the phone manufacturers, such as makers of flash memory. With a relatively small market before 2005, competition in mobile flash memory was limited. However, with the smart phone boom, the opportunity for flash memory makers grew exponentially, resulting in increased competition for the traditional suppliers. Management at SanDisk responded to increased competition and loss of market share by cutting pricing steeply.

**Figure E8.4: Dell printers**



A similar study of Dell's printers division shows the company in both phases of market share loss and stabilization. From 2005-2008 management chose to raise prices, potentially driving their significant loss in market share over the period. In 2009, management finally cut ASPs, leading to somewhat of a stabilization in market share.

**Exhibit 9: Future Combat Systems and the Brigade Combat Modernization Program**

*Source: Various U.S. Department of Defense press releases, Publicly available news and reports, Student research and estimates*

**FCS Overview**

The Future Combat Systems (FCS) program was first introduced by Chief of Staff of the Army General Eric Shinseki in 1999 as a plan of modernization for the Army's Brigade Combat Teams (BCTs). It took its current form under General Peter Schoomaker during President Bush's tenure in 2003. Boeing and SAIC were selected as lead indicators for the FCS program. However, Defense Secretary Robert Gates asked for a reevaluation of the FCS program as part of President Obama's inaugural budget on April 6<sup>th</sup> 2009, believing that the program overreached on cost and technology. Consequently, the Army cancelled the program on June 23<sup>rd</sup> 2009 and instead spun off a subset of technologies as the Brigade Combat Team Modernization (BCTM) program, with Boeing and SAIC as the lead integrators.

**SUGV 320<sup>9</sup>**

iRobot's SUGV 320 is a critical component of the program and it is envisioned that all combat brigades will be equipped with small robots by 2025. However, there is some uncertainty in the public domain on the exact number of robots per brigade that the Army intends to equip. The original FCS program as conceived by President Bush's administration intended to equip 15 specialized "FCS BCTs" with 81 robots each and 43 Infantry BCTs (IBCTs) with 38 robots each, leaving the 11 Heavy BCTs (HBCT) and 7 Stryker BCTs (SBCT) unequipped with SUGVs.

Due to the success of small robots in the field, the program was expanded under President Obama's administration evenly across all BCTs. However, the number of robots per brigade under the new program is unclear. We believe the most likely scenario is outlined in the CBO's June 2009 study, which estimates a need for 41 robots per brigade. Notably, iRobot plans to supply 40 robots to the Army under a Low Initial Rate of Production (LRIP) for field testing by the 3<sup>rd</sup> Armored Division in Afghanistan, which supports the figure of 41 robots per brigade.<sup>10</sup> Our base case military robot sales model assumes a procurement need for 41 robots per brigade. However, we assume success on the battlefield raises the Army's procurement need to 81 robots per brigade in our bull case military robot sales model.

**FCS Unmanned Ground Vehicles<sup>2</sup> | *Mid-size UGV development continuing on schedule and no role for iRobot***

The FCS program funded the development of two unmanned systems besides the SUGV – the MULE and ARV systems. The Multifunction Utility / Logistics and Equipment (MULE) vehicle developed by Lockheed Martin is a large UGV intended to provide an automated common chassis for a variety of different platforms. The XM1219 Armed Robotic Vehicle-Assault-Light (or ARV-A-L) is an unmanned weaponized platform based on the MULE chassis. The Department of Defense's 2011 budget request intends to provide \$236 mm of research and development funding for the MULE-Countermine (MULE-CM), MULE-Transport (MULE-T) and the ARV-A-L.<sup>11</sup> The Army intends procurement of the three platforms beginning in 2013 as the backbone of their large to midsized UGV needs.<sup>12</sup>

**Manned Ground Vehicle / Ground Combat Vehicle | *Program likely to be cancelled soon, reducing future growth opportunities***

The Manned Ground Vehicle (MGV) component of the FCS program was intended to develop the Army's future Infantry Fighting Vehicle (IFV). It was cancelled by Defense Secretary Robert Gates along with the rest of the FCS program in June 2009, since it was believed that the development plan had not learned from the lessons learned during combat in Iraq. The GCV program is the Army's replacement to the MGV. Though the Army intended to award a contract to 2-3 teams on August 25<sup>th</sup> 2010 for the Technology Development Phase, the RFP was delayed for "up to 60 days", and has still not been released. In the meanwhile, the leading teams bidding on the project have come to light. The first consists of General Dynamics (on the MGV team), Raytheon (designer of the MULE) and MTU Detroit Diesel. The second consists of SAIC & Boeing (lead integrators on FCS/BCTM), Kraus Maffei Wegman and Rheinmetall Defense. The latter two have worked on the Puma, which has already been fielded as Germany's future infantry vehicle and will form the base for their proposal.<sup>13</sup>

We view the third team, consisting of BAE, Northrop Grumman and iRobot as the laggards in the competition. iRobot was added to the team on October 26<sup>th</sup> 2010, seemingly as an afterthought, to work towards an autonomous driving capability and enable the operation of SUGVs from within the GCV. We believe that iRobot's addition to the team does not increase its attraction in a competition where the vehicle isn't intended to be unmanned, and moreover, the competing teams have more expertise in large unmanned vehicles anyway (the MGV program also funded General Dynamics' Autonomous Navigation System).

More importantly, we believe that a cancellation of the GCV program is very likely. Not only is the repeated delay of the program disconcerting to its prospects, the DoD's 2011 budget request reduces research & development funding for the program from \$275 mm in 2010 to zero in 2011. While we do not believe that street price targets have priced this program into iRobot's stock price, cancellation of the program would further reduce the future growth opportunities available to the company.

<sup>9</sup> "An Analysis of the Army's Transformation Programs and Possible Alternatives", CBO, June 2009

<sup>10</sup> "BCTM Increment 1: FCS Spinout Moves Ahead", DefenseIndustryDaily.com, August 2010

<sup>11</sup> Department of Defense 2011 Budget Request, Exhibit R-2, pg. 914.

<sup>12</sup> "Army Brigade Combat Team Modernization: Versatile Capabilities for an Uncertain Future", Army Chief of Staff, General George W. Casey, Jr., www.Army.mil.

<sup>13</sup> "GCV Shortlist Revealed", Shephard News, May 21<sup>st</sup> 2010.

**Exhibit 10: U.S. Department of Defense 2011 Budget Request**

in thousands where applicable

Source: U.S. Department of Defense 2011 Budget Request, Student research and estimates

**2011 Department of Defense Budget Request | Indicates no BCTM procurement until 2012 and likely cancellation of GCV program**

The line items of interest to iRobot’s military robot prospects are shown below. Appropriation requests for MTRS systems appear stable at near H2 2010 levels, contrary to our expectations for a fall in 2011. However, we believe that this request is likely driven by contingency planning on the part of the DoD. However, we do note that BCTM procurement does not appear to be material until H2 2012, verifying our timeline for the SUGV 320. In addition, we note that the budget request reduces R&D appropriation for the GCV program from \$275 mm in 2010 to zero in 2011. Along with the repeated delays by the DoD in issuing the expected RFP for the program, we believe that this indicates the program is likely to be cancelled in the near future.

Item Description	Source	H1 2010	H2 2010	H1 2011	H2 2011	H1 2012	H2 2012	Comments
MTRS Systems	Army P-1	4,480	8,694	8,372	9,519	9,352	x	MTRS procurement to be stable at near current levels
iRobot Hand Controller		122	66	0	0	0	x	
BCT UGV		0	0	0	5,328	6,048	18,144	BCTM procurement won't pick up until at least H2 2012
<i>SUGV units contracted</i>		<i>0</i>	<i>0</i>	<i>0</i>	<i>37</i>	<i>42</i>	<i>126</i>	
FCS UGVs	Army R-1							
<i>SUGV FY 11 Inc 2</i>		12,304		14,131			x	
FCS Manned Ground Vehicle		275,116		0		0		GCV program probably cancelled

**Exhibit 11: UAV procurement by the DoD | Procurement due to volatile short term needs rather than long-run upgrade cycle**

in thousands where applicable

Source: U.S. Department of Defense contracts data, Publicly available news and reports, Student research and estimates

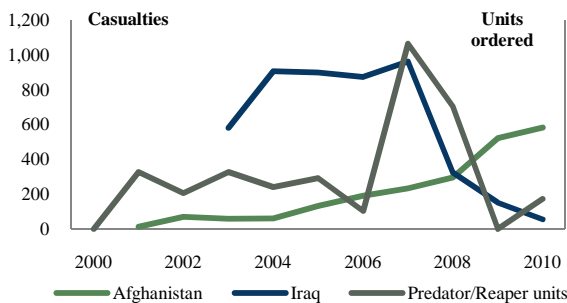
**DoD doesn’t buy UAVs when field needs do not demand it...**

We believe that the DoD views UGV procurement similarly to UAV procurement – another unmanned platform that reduces casualties. Predator/Reaper UAVs initially under low rate production saw the first jump in production in the early 2000s as the DoD prepared for the conflict in Iraq. The units produced under low rate production were sufficient until the conflict suddenly intensified in 2006, when a large number of orders were placed. The procurement rate reduced sharply in 2007 and 2008, the number was still high as the number of casualties and the intensity level in Afghanistan began to climb rapidly. However, with the rapid drawdown in Iraq during 2009 and 2010, Predator/Reaper production has continued to reduce significantly. Global Hawk unit orders have seen a very similar procurement pattern, with the exception of a larger initial jump in procurement in the run up to the Iraq conflict. This was likely because the United States forces did not have bases in Iraq itself and would have needed longer range aircraft for combat and surveillance purposes.

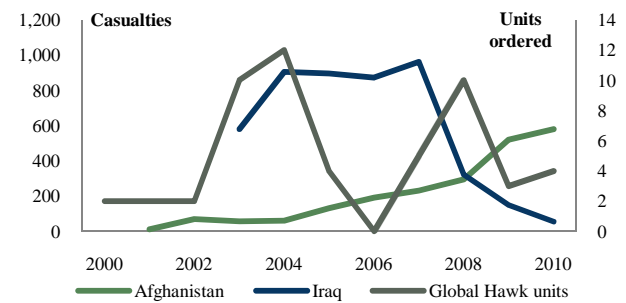
**...Withdrawal from the field will negatively impact procurement for similar equipment**

A withdrawal from conflicts in Iraq will likely reduce the Army’s needs for UGVs, just as relative calm in Iraq in the 2003-2005 years reduced UAV procurement. We believe that continued strong sales for iRobot’s UGVs despite a period of withdrawals is the result of a stroke of luck in the UGV development cycle and the shift of policy attention to Afghanistan. Initial models such as 510/EOD were heavier and by no means man transportable, but did not hinder operations significantly in the urban terrain of Iraq since the devices could be transported by mechanized infantry. However, the robots were not light enough for the dismounted operations required by the rugged and unpaved terrain of Afghanistan. As such, we believe that the recent spurt in UGV procurement is a result of the Army re-equipping with lighter models, a hypothesis borne out by the significant shift away from the 510 to the Fastac and SUGV 310 models in units shipped by iRobot. This wind is temporary – as the Army finishes re-equipping to new needs and reaches peak deployment, a complete scheduled withdrawal from Iraq and the handover of responsibilities in Afghanistan will reduce field needs, and negatively impact UGV procurement.

**Figure E11.1: Predator UAV procurement vs. casualties**



**Figure E11.2: Global Hawk UAV procurement vs. casualties**





**Exhibit 12: Robotic Cleaning Market Product Offerings**

Source: Student research

US Competitors						
Company	Product(s)	Price Ranges	Cleaning	Navigation	Battery Power	Key differentiator
iRobot	Roomba 400 – 610	\$150 - \$600	☐ - ●	☐ - ●	☐ - ●	Brand; product offering breadth
iRobot	Scooba 330 – 380	\$300 - \$500	● - ●	● - ●	☐ - ●	Brand; product offering breadth
Evolution Robotics	Mint	\$250	☐	●	●	Uses advanced NorthStar® navigation system
Neato	XV-11	\$400	●	●	☐	Uses laser range-finder to map efficient cleaning route
P3	P4920; P4960	\$30 - \$90	☐	☐	☐	Low Cost
Metapo (Infinuvo)	Cleanmate; QQ-2	\$100 - \$250	☐	☐	☐	UV cleaning technology; distributes pleasant scents while cleaning
Electrolux	Trilobite	\$899	●	●	●	All-surface cleaner; advanced sonar navigation; self-scheduling
iTouchless	AV002A	\$150	☐	☐	☐	Low Cost

☐ - Poor   ● - Fair   ● - Good   ● - Excellent

Global Competitors						
Company	Product(s)	Price Ranges	Cleaning	Navigation	Battery Power	Key abilities
Samsung	Navibot, VC-RS60; VC-RP30W	\$400 - \$1,100	● - ●	● - ●	● - ●	UV cleaning technology; cyclone vacuum; remote activated via net; mounted camera
Matsutek	RV-14; TRV-10; M1; and 7 others	only avail. in bulk	☐	☐	☐	Self-charging; low-cost
Karcher	Robo-cleaner	\$1,500	●	●	●	Automatically empties dust-bin
Yujin	iClebo smart and home		●	●	●	Mops and vacuums; can climb small objects; long running time; self-scheduling
LG	Roboking	\$900	●	☐	☐	Cyclone vacuum; HEPA filters

Products in Development						
Company	Product(s)	Price Ranges	Cleaning	Navigation	Battery Power	Key abilities
Panasonic	Fukitorimushi		☐	●		Uses microfibers to wipe floor
Dyson	DC-06		●			Dyson style cyclone cleaning system

Note: price ranges reflect actual prices found in online and retail channels

**Exhibit 13: iRobot Home Robots SWOT**

Source: Student research

Home Products SWOT	
Strengths	Weaknesses
Brand power First-mover Established distribution channels Economies of scale	Inferior technology and/or value proposition relative to new competitors Supply constraints Inability to monetize robotics expertise beyond Roomba
Opportunities	Threats
Continued international expansion Other home robotic products	Near and long-term competition Manufacturing issues with Jabil Patent litigation

**Exhibit 14: iRobot Government and Industrial SWOT**

Source: Student Research

Government and Industrial SWOT	
Strengths	Weaknesses
BCTM contracts with U.S. Military Co investment with U.S. Military Acceptance of Packbot/SUGV platform Partnerships with leading defense contractors	Dependency on U.S. military as dominant customer
Opportunities	Threats
International expansion Future advanced UGVs and UUVs	Reduced U.S. Military spending Competition

**Exhibit 15: Potential iRobot Acquisition Scenarios**

Source: SDC Platinum, Student Research

We believe that the most likely acquirer of iRobot is a traditional military contractor with more experience developing, building, and servicing products for the US military. Any potential acquirer would need the ability to integrate iRobot’s R&D without risking losing human capital and government contracts, limiting the list of potential acquirers to experienced military contractors without a significant existing robot division. The list of possible acquirers includes BAE, Boeing, Lockheed, and General Dynamics.

BAE has a history of acquiring firms to grow its product offering, such as its \$4.2 bn acquisition of United Defense Industries and its 2008 \$1 bn acquisition of Detica Group. However, in light of the failure of UK-based QinetiQ to maintain Foster-Miller’s contracts with the US military, we do not expect BAE to be willing to risk acquiring iRobot.

Lockheed Martin has a history of using excess cash to repurchase shares and we do not expect that policy to change. Lockheed has historically acquired very small private firms to increase its product pipeline; only acquiring larger companies to facilitate backward integration. Though the company has the means and is already partnering with iRobot on UUV development, we do not anticipate Lockheed having a strong interest in acquiring iRobot.

General Dynamics has a history of acquiring firms that offer products related to the company’s current product lines. For example, in 2009 the company acquired Axsys Technologies Inc, a producer of camera and other optical systems used primarily in military applications, and Jet Aviation International, a servicer of many of the planes that General Dynamics produces. Moreover, General Dynamics Robotic Systems (GDRS) is deeply involved in the medium to large robots space, having produced every mid-sized unmanned vehicle field tested by the US Army. It hasn’t so far, however, shown an interest in the small robots space.

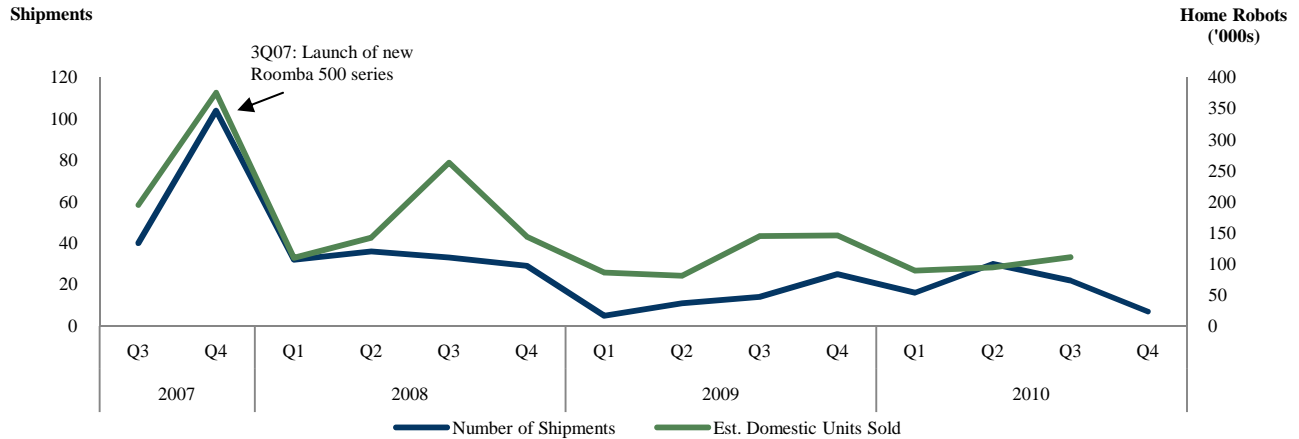
Boeing (through its subsidiary Boeing Integrated Defense Systems) is the most likely acquirer of iRobot. Boeing is already partnered with iRobot to develop and market the SUGV for the Army. Boeing has shown a desire to break into the UV market through its purchase of Insitu, a provider and developer of UAVs. Additionally, the company has over \$10 billion of cash and short-term investments on its balance sheet, easily giving it the ability to engage in strategic transactions. However, iRobot would be the largest Boeing product growth acquisition since the \$3.75 bn purchase of the satellite operations of Hughes Electronics in 2000. Since 2000, Boeing’s large acquisitions have been related to forward or backward integration, rather than strategically adding to its product platform.

**Exhibit 16: Waterborne shipments from Chinese manufacturers to iRobot, reported to US Department of Homeland Security**

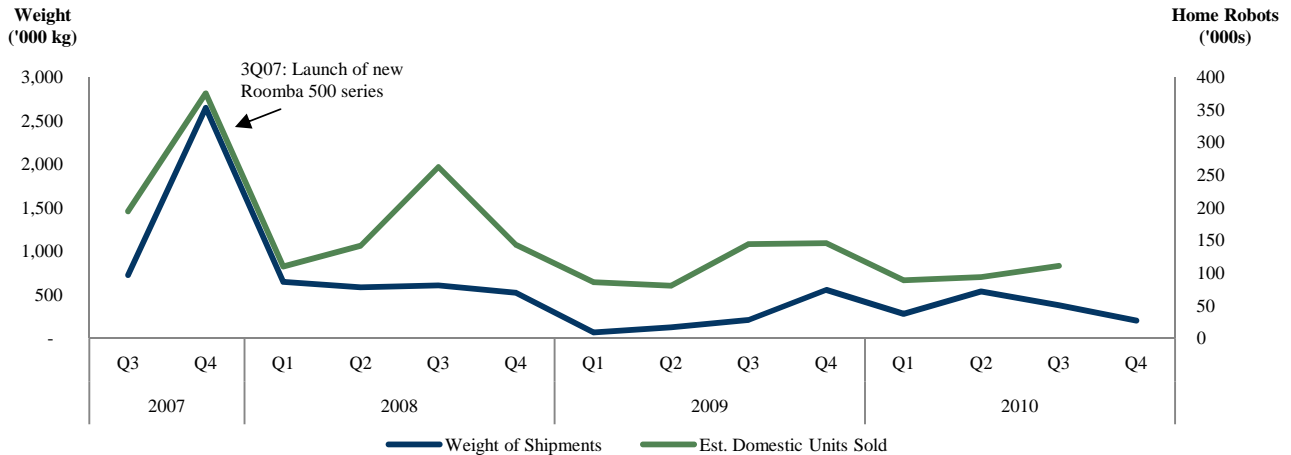
Source: US Department of Homeland Security

After researching records of waterborne shipments into the US, we find a clear relationship between inbound shipments of home robots from iRobot’s Chinese manufacturers and the approximate number of home robot units sold in North America by quarter. Shipments were down from Q2 to Q3 of this year, and so far have not shown a rebound in Q4, suggesting expectations of weak domestic sales.

**Figure E16.1: Waterborne shipments by units**

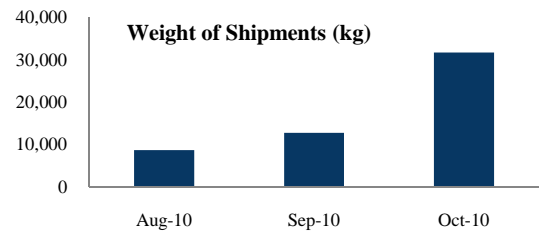


**Figure E16.2: Waterborne shipments by weight**



**Figure E16.3: Waterborne shipments of Mint cleaning robots**

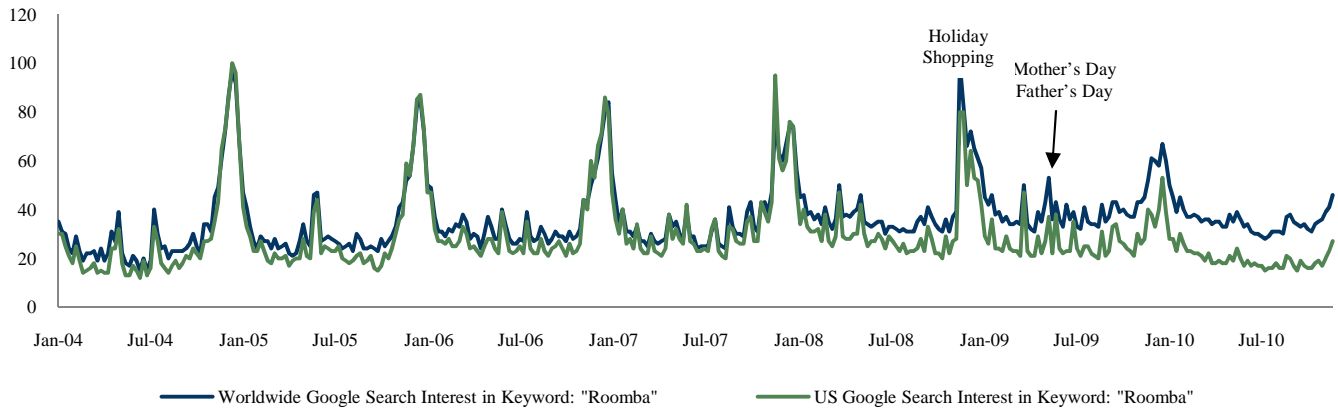
In contrast to iRobot’s trend of decreasing manufacturer shipments to the US, incoming shipments of Evolution Robotics’ Mint floor cleaning robot have been rising sharply over the past few months in anticipation of Q4 sales.



**Exhibit 17: Google Insights reflects seasonality of consumer interest in the Roomba**

Source: Google Insights for Search

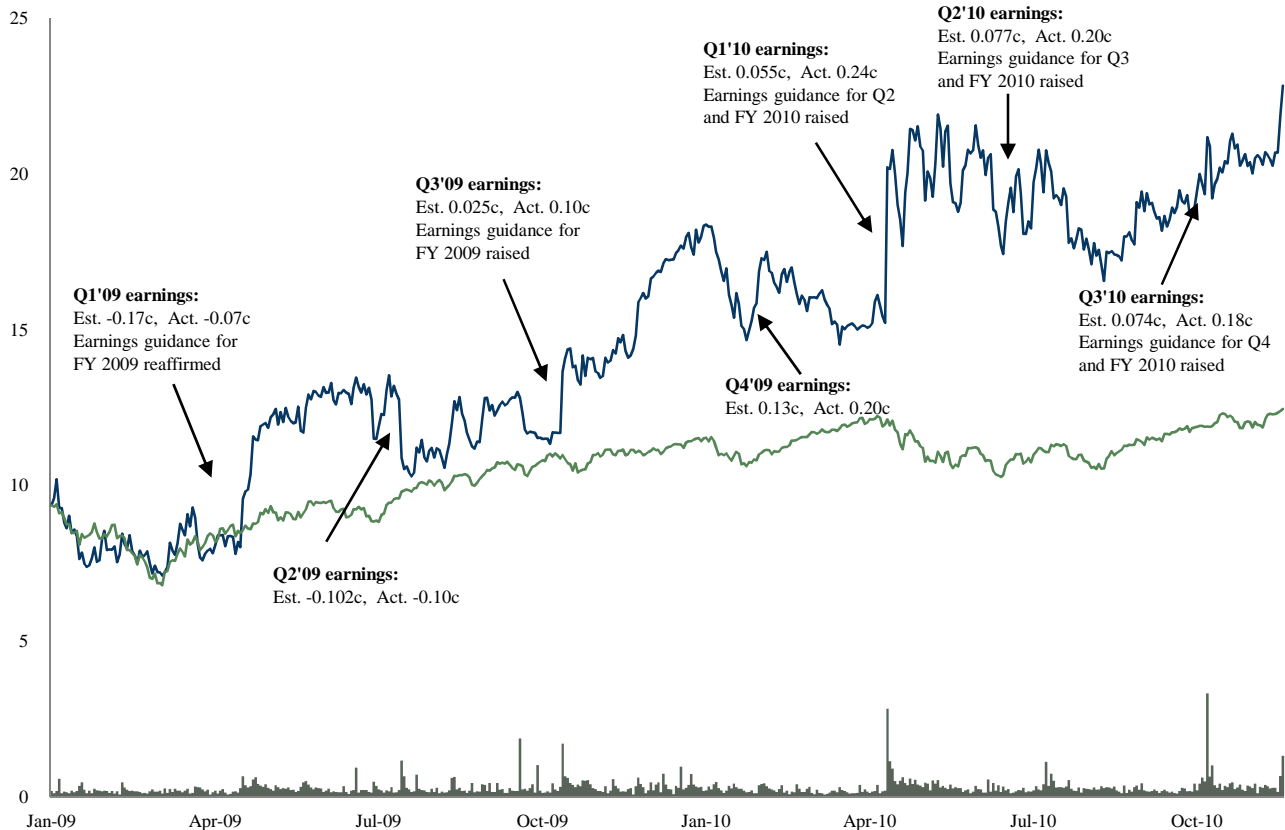
**Figure E17.1: Google Insights search interest for "Roomba"**



**Exhibit 18: Stock Price and Key Events**

Source: CRSP data and Factiva search results

**Figure E18.1: IRBT stock price from January 2009 to present**

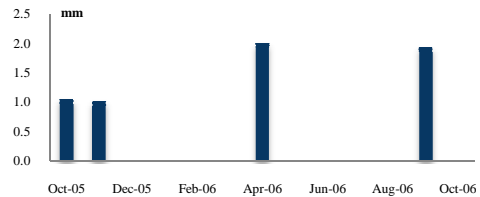


**Exhibit 19: Key Management and Insider Transactions** | *Insiders have been net sellers during the last twelve months*

Source: Student research and Company form 4-Ks

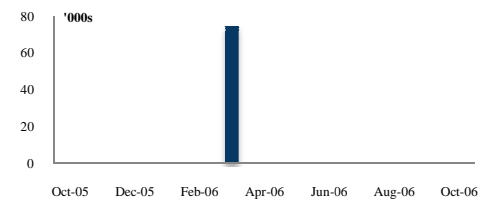
**Chairman and CEO – Colin Angle**

Colin Angle co-founded iRobot in 1990. He has served as the Chairman of the Board since October 2008 and the CEO since June 1997. Prior to this, he served as the President since November 1992. Mr. Angle holds a BS in Electrical Engineering and an MS in Computer Science, both from MIT.



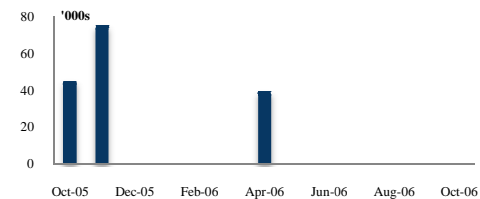
**Executive VP, CFO, and Treasurer – John Leahy**

John J. Leahy brings over 25 years of extensive financial experience. Prior to iRobot, he served as Executive President and CFO of Keane Inc., from 1999 to 2007. Mr. Leahy holds a BS in Finance from Merrimack College and an M.B.A from Boston College.



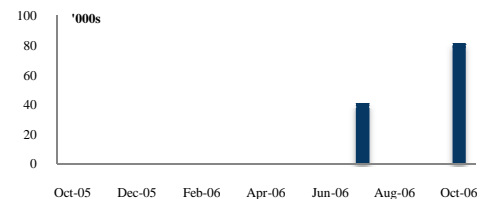
**Chief Operating Officer – Joseph Dyer**

Joseph W. Dyer is responsible for the day-to-day operations of iRobot. Before becoming the COO, he served as President of the G&I division. Prior to iRobot, Mr. Dyer served in the U.S. Navy for 32 years. Mr. Dyer holds a BS in Chemical Engineering from North Carolina State University and an MS in Finance from the Naval Postgraduate School, Monterey, California.



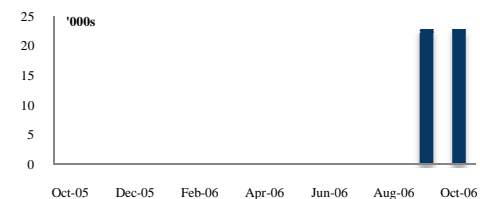
**President, Home Robots Division – Jeff Beck**

Jeff Beck is the President of the Home Robots Division. Prior to joining iRobot, Mr. Beck served at AMETEK Inc., as Senior Vice President of their Aerospace & Defense division. Mr. Beck holds a BS in Mechanical Engineering from the NJ Institute of Technology and an MBA from Boston University.



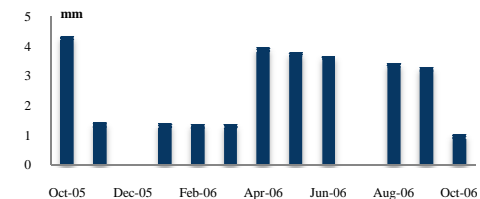
**President, Government & Industrial – Robert Moses**

Robert Moses is the president of Government & Industrial division. Prior, he served as the division's Senior Vice President of Operations. Before joining iRobot in 2003, Mr. Moses served as a Director of Contracts for the Naval Air Systems Command. Mr. Moses holds a Bachelor's in Business Administration from the University of Mississippi and a Master's in Acquisition & Contract Administration from the Naval Postgraduate School in Monterey, California.



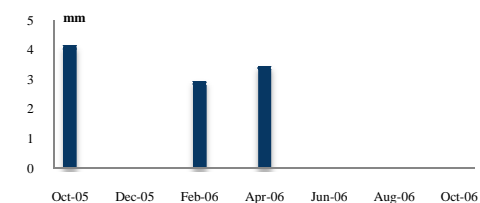
**Board Member and Co-founder – Helen Greiner**

Helen Greiner is a co-founder and former Chairman of iRobot. After resigning in 2008, she founded CyPhy Works, focusing on Unmanned Aerial Vehicles. She holds a BS in Mechanical Engineering and an MS in Computer Science, both from MIT.



**Board Member and Co-founder – Rodney Brooks**

Rodney Brooks is a co-founder and Chair of iRobot's Technical Advisory Board. He is the founder, Chairman and CTO of Heartland Robotics and is the Panasonic Professor of Robotics at MIT. He is also the former director of the MIT Computer Science and Artificial Intelligence Lab (CSAIL). Mr. Brooks received degrees in pure mathematics from the Flinders University of South Australia and a PhD in computer science from Stanford University.



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