Inogen, Inc. (INGN)

Sell Short / Sell

Stock Price: $143.03 as of January 23, 2019

Idea Generated from: Breaking Growth Model

SUMMARY

Inogen, a maker of portable oxygen concentrators (POCs) for people with respiratory diseases, uses decade+ old technology, with an undifferentiated product in a market with intensifying competition. ASPs are already trending downward. Margins and estimates are declining, yet the stock remains very expensive.

Growth is slowing. The company's recent ramp-up in sales and marketing expenses is losing effectiveness.

The industry has low barriers to entry. Inogen spends nearly nothing to stay competitive. POCs are not particularly complicated devices and all existing and upcoming products use the same technology.

Management is overstating its TAM. Management assumes 90% replacement of oxygen tanks by POCs within 7-10 years, from 15% now. We do not think that is reasonable.

Competition is intensifying. Two competitors, ResMed and Caire (Chart Industries), have introduced competing products. Both competitors are highly credible with adjacent products, established distribution and more resources.

Sales prices are declining already. Competition and declining reimbursement rates are taking their toll. ASPs are falling. (POCs are one-time sales. There is no recurring revenue.) An internal "price elasticity" study led the company to lower prices. Inogen's new product is coming out at the same price as existing products.

Oxygen therapy might be overprescribed. Several studies show that it can an unnecessary expense in many cases, and actually harmful in others.

Margins are declining. Flat gross margins show that operating leverage is being consumed by falling sales prices. EBITDA margins have been sliding since 2015, despite growth.

Inventory appears to be slowing relative to sales.

Estimates are being reduced.

The stock is very expensive, despite a drop in price. It trades at 8.5x EV/S, 57x trailing EBITDA, 48x forward EBITDA and 66x 2019 PE.

Potential Catalysts: We expect sales and earnings disappointments as sales slow on the anniversary of the salesforce ramp-up, continued product price declines and the introduction of competing products. A rerating of the company's growth prospects would cut the high multiples as well.

Risks: A return to favor for momentum stocks. A successful campaign to see POC's reimbursed on a sale, rather than a monthly rental, basis.

We recommend selling INGN short (selling/avoiding for long managers).

Trading	
Date	1/23/19
Price	143.03
52 Wk H/L	287.79 / 110.51
Market Cap/Ent. Value ($mns)	3,078 / 2,860
Avg Daily Volume (thou)	441.8
Shares Outstanding (mn)	21.5
Float (mn / %)	17.8 / 82.5%
Short Interest (mn / SISO%)	2.8 / 13.2%
Days to Cover	7.5

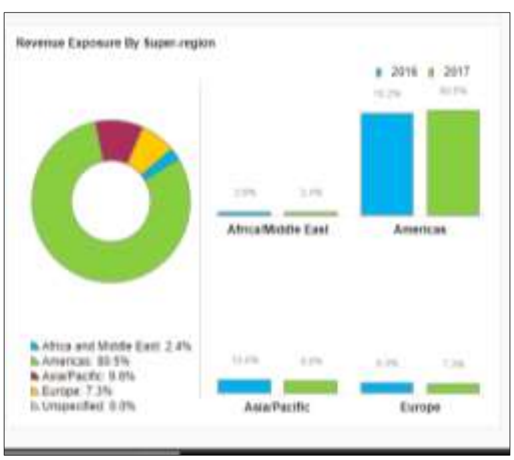
Source: Two Rivers Analytics; FactSet Research Systems

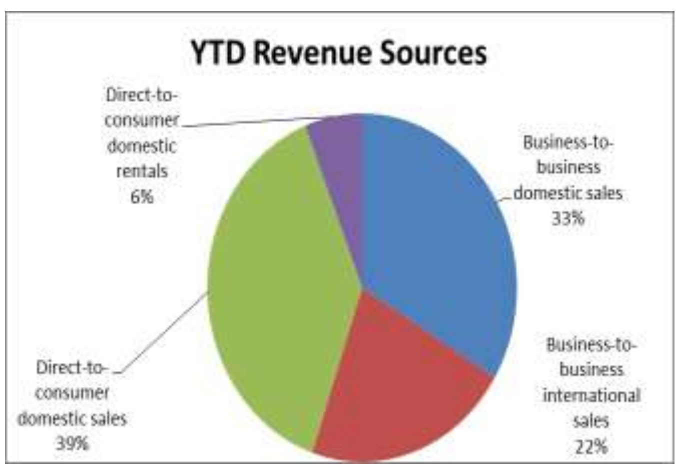
COMPANY DESCRIPTION

Inogen develops, manufactures and markets portable oxygen concentrators (POCs) which deliver supplemental long-term oxygen therapy to patients suffering from chronic respiratory conditions. The most common cases result from patients suffering from a respiratory disease like COPD (chronic obstructive pulmonary disease) or cystic fibrosis.

The company developed POC devices which use a chemical process to separate the naturally existing oxygen from nitrogen in the atmosphere. The original product, the **Inogen One, was launched in 2004** and has since seen several improvements but remains largely the same. Initially, the product was sold through healthcare providers and distributors. In 2008, Inogen acquired Comfort Life Medical for deminimus value, which allowed it to sell to Medicare patients. They subsequently launched a direct-to-consumer sales effort on top of selling through home medical equipment (HME) providers.

Seventy-five percent (77%) of sales are made in the US.





Source: Two Rivers Analytics; FactSet Research Systems

Competitors include ResMed, CareFusion, Philips Respironics, Teleflex, Caire (Chart Industries), Invacare, Lincare (Linde), DeVilbiss Healthcare and others.

Here is a guide to POCs from the COPD foundation.

The company reports earnings on February 26, 2019.

BACKGROUND AND SHORT INVESTMENT THESIS

Industry Background

Oxygen therapy is defined as the provision of supplemental oxygen to people with chronically low oxygen uptake such as results from severe COPD or cystic fibrosis. There are approximately 11mn people in the US that are diagnosed with COPD, and perhaps another 4+mn undiagnosed. Common causes of COPD are chronic bronchitis, emphysema, pulmonary fibrosis, pneumonia, asthma, respiratory distress syndrome, late stage heart failure, cystic fibrosis and sleep apnea. The **ageing demographics of the US favors growth in oxygen therapy** (subject to apparent over-prescription).

Oxygen therapy can be provided via **compressed oxygen tanks** (the most widely used method), **delivered liquid oxygen**, and **oxygen concentrators**. Oxygen concentrators can be further divided into stationary and portable, depending on size and weight. Stationary oxygen concentrators are generally capable of producing a continuous flow of oxygen, while portables, due to battery life and weight constraints, are generally “pulse flow”, meaning they deliver oxygen when the machine senses a patient inhalation. Obviously, people use more oxygen when mobile and “on the go”, thus raising the requirements for portable oxygen concentrators.

Over time, **POCs are displacing portable oxygen tanks**. Although more expensive up front, customers are slowly opting for the device over the tank. Inogen estimates that POCs represent roughly 15% of the total portable oxygen therapy market.

The global market for POCs is estimated to be growing at between 7.8% and 11.5%, depending on the source quoted. North America accounts for 40% of global revenues. The top players have carved out approximately a 75% share (globally) with Philips as the largest[1].

POCs have traditionally been sold through the same channels as oxygen tanks, namely, through home medical equipment vendors. Inogen has set up a direct to consumer channel, as have some other competitors.

Short Thesis

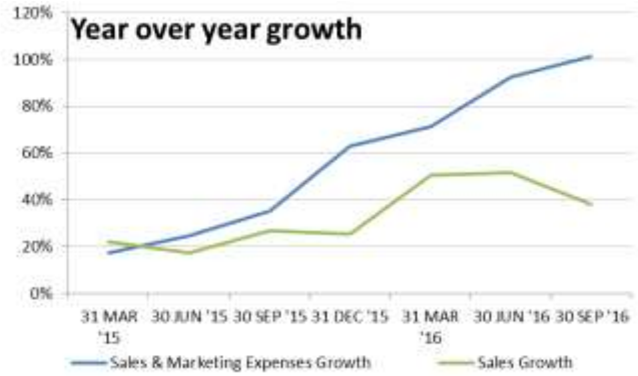
Growth is declining

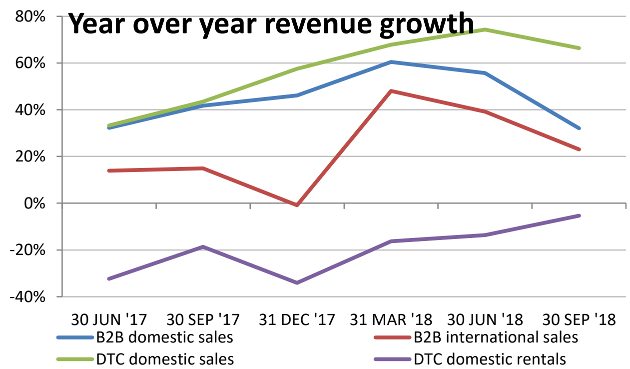
Imogen’s **sales growth is declining after a spike mid-last year**. Growth is still robust, at 38% year over year last quarter, but we expect the anniversary of certain sales initiatives to bring further slowdowns. During 2017, the company increased the number of sales reps in its direct sales channel to 263 from 177 at the end of 2016. That caused sales growth to spike to 50% over the prior year, before declining to 38% this year.

Inogen bulls expect the sales force expansion, the new Inogen G5 release, and the market shift to POCs to sustain growth and drive higher estimates.

1 https://www.futuremarketinsights.com/reports/portable-oxygen-concentrators-market

We see later that the **sales growth was driven by an even larger increase in SG&A, especially sales expenses**. Despite the ramp up in these expenses and the focus on direct-to-consumer, the last two quarter's sales slowdowns cut across business lines.





Source: Two Rivers Analytics; FactSet Research Systems

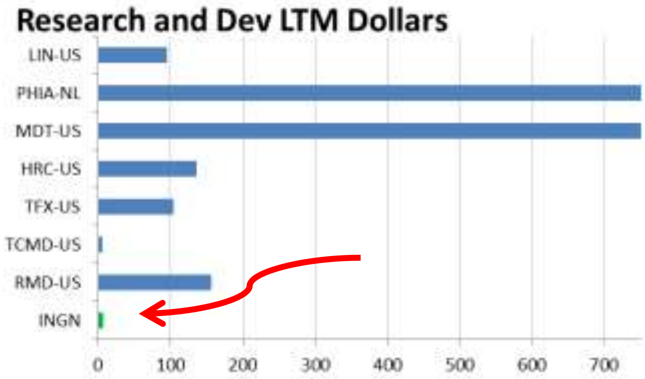
The result is that **Inogen has been able to accelerate growth to perhaps triple the market rate of growth**. **We believe this is unsustainable**. The **diminishing impact of additional sales expense** undergirds this view.

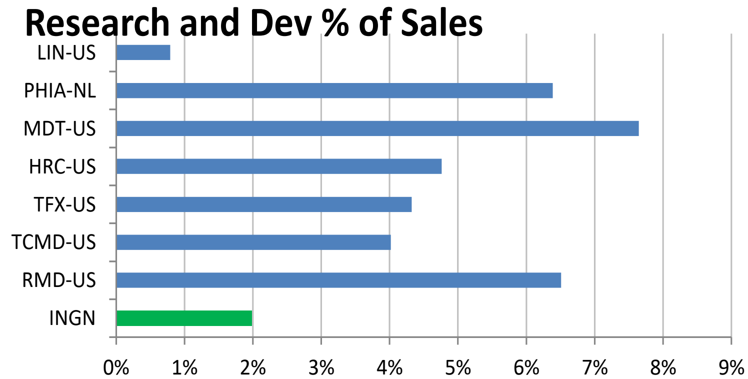
The industry has very low barriers to entry

The **products are nearly indistinguishable across vendors**. The **technology is the same**. The companies **compete based on liters of oxygen delivered per minute, battery life, weight and price** The tradeoffs are uniform across competitors. A heavier device will last more hours. The COPD foundation says:

> "Oxygen concentrators all work pretty much the same. The ambient air we breathe contains about 78% nitrogen, 21% oxygen and 1% of other gasses. The concentrator has the job of taking as much of the nitrogen out of the air as is possible while leaving the oxygen."

Even if it were possible to distinguish the products in any material fashion, **Inogen is in a weak position to stand out. It spends very little money on research**, both in absolute terms and relative to its peers.





Source: Two Rivers Analytics; FactSet Research Systems

POCs have a relatively straightforward regulatory approval path. They are classified as 501(k) devices, they are non-implantable and are not considered life sustaining. Inogen says,

> "Given the relatively low barriers to entry in the oxygen therapy device manufacturing market, we expect that the industry will become increasingly competitive in the future."

Here are links to two sets of reviews on various competing POCs: link and link.

Competition is intensifying

Since **POCs are nearly indistinguishable from one another**, the intensity of competition matters a great deal. There are many existing competitors, including several new ones and those that sell directly to consumers, as Inogen does. Competitors include: ResMed, CareFusion (Becton Dickinson), Philips Respironics, Teleflex, Caire (Chart Industries), Invacare, Lincare (Linde), DeVilbiss Healthcare and others.

Inogen management says,

> "We are going to be a little more cautious about sharing those [sales] metrics going forward because, as you know, there are at least two other manufacturers out there in the POC space that have said that they're putting their toe in the water with that same go-to-market strategy. So they're going to have to go learn on their own, not learn from our earnings calls."

ResMed is ramping up the launch of its Mobi POC device

ResMed deals primarily in equipment related to the treatment of sleep-related breathing disorders, including sleep apnea, chronic obstructive pulmonary disease (COPD), and other respiratory conditions. It manufactures CPAP equipment, as well as the S+, a wireless, consumer-oriented sleep analysis device. They have 6,000 employees, sell in 100 counties and have sales of $2.4bn.

Why is ResMed a credible competitor?

- **Their competitive product launch** is underway

  ResMed introduced a competitive product called the Mobi in 2018. At first, it pursued a controlled product launch. Now they are in the midst of the full rollout, which began this quarter (Q1 2019).

- Scope of products / customer base

  ResMed is much larger than Inogen and carries a broad range of respiratory care products, in contrast to Inogen who sells only oxygen concentrators. Its new POC is a small step from its **complementary product line**. ResMed's **distribution channels are well-established** and are receptive to the new product. Between its CPAP products and their AirView patient management system, ResMed has more than **8 million existing customers**.

- Digital

  ResMed's products revolutionized respiratory equipment through their cloud-connected devices. Mobi will, likewise, be cloud connected.

- Goals are ambitious

  ResMed first entered oxygen therapy in 2016, when it bought Inova Labs. Their launch of Mobi is a serious next step to become a more meaningful player in this space.

  "Look, there are a number of players in this space," CEO Farrell said. "We're not alone in having a portable oxygen concentrator…(But) throughout FY 2019, 2020 and beyond, you're going to see ResMed be a major player in the market."

- They are skeptical of the DTC approach, or "competing with the channel" as INGN and Philips do. ResMed's go to market strategy in strictly through the HME channel.

Caire (a subsidiary of Chart Industries) is introducing its FreeStyle Comfort POC

Chart Industries' CAIRE is a leading global manufacturer of medical oxygen concentrators and other oxygen delivery equipment for individuals with respiratory conditions. Their products include the AirSep portable concentrators, SeQual transportable concentrator, AirSep and CAIRE stationary concentrators, CAIRE liquid oxygen systems, and military applications. Chart Industries had sales of $1.1bn and 4,400 employees (vs $335mn and 770, respectively, for Inogen).

- Like ResMed, they have **far more in resources than Inogen**. They have a **range of established products** and **established distribution channels**. This new POC will slot nicely into Caire's existing operations and customer base.

- Their Aug 2018 Press release describes their "quiet controlled launch" of their new product. They are trying to differentiate the product by offering a 5lb device with a 4hour replaceable battery (optional 8 hour battery) and glow in the dark buttons. The product is designed to curve around the body in order to be more ergonomic. **Notice how weak the differentiation is across providers that device shape is worthy of being called out**.

- The product will offer **wireless connectivity** to Caire's telehealth solution.

Inogen is late on connectivity

ResMed and Caire already offer it. Inogen launched their connectivity platform in December. It will be built into the upcoming G5.

Sale prices are declining due to competition and falling reimbursement rates

Sales prices for Inogen's products are decreasing. The 10Q describes sales growth as follows: "…increases in unit sales offset by decrease in units rented and declining reimbursement rates and decline in patients on service."

In the second quarter, ASPs had fallen from $1,795 to $1,620, a **decline of ~10%**. In Q3, prices fell again, by approximately 3%.

Further evidence of competitive price pressures comes from the company's decision, following a "price elasticity study", to lower prices on the G3 and G4 (current generation) products. Even **the new G5 will be released at the same prices as the G4**.

On the rental side, they are subject to reimbursement rate changes. From the 10Q, here is a longer term picture that shows that decline:

The following table sets forth the current Medicare standard allowable reimbursement rates and the average of reimbursement rates applicable in Metropolitan Statistical Areas covered by rounds one and two of competitive bidding.

	Round two average 7/1/13-6/30/16	Round one re-compete average 1/1/14-12/31/16	Round two re-compete average 7/1/16-12/31/18	Round one 2017 average 1/1/17-12/31/18
E1390 (stationary oxygen rentals)	$ 93.07	$ 95.74	$ 76.84	$ 77.97
E1392 (portable oxygen rentals)	42.72	38.08	37.90	36.06
Total	$ 135.79	$ 133.82	$ 114.74	$ 114.03

Source: FactSet Research Systems

Medicare generally reimburses POCs on a rental basis only, and only for 34-42 months for patients that can prove need.

Lastly, we note that **there is a market in used POC machines**. That will also serve to keep a lid on prices.

Inogen's channel strategy has potential issues

Channel conflict is built into the company's strategy. The company sells direct to consumers and, at the same time, sells through the HME channel. **Inogen competes with its own channel**. ResMed, in contrast, is partnering with the HME providers with whom they have had long relationships.

In addition, Inogen's **aggressive direct sales tactics could backfire**.

From Family Practice Management

> "The commercials are pervasive. Every time I hear the line, **"I got a new scooter, and it didn't cost me a dime,"** I get an uneasy feeling, since the main message comes across as how to get "free stuff" from Medicare. It's not surprising that some of the companies that provide scooters, **oxygen**, diabetes supplies, and various durable medical equipment (DME) have been **investigated for fraud and abuse**. Certainly, there is something to be said for helping patients get medically necessary supplies and equipment. Still, aggressive tactics by some of these companies may also pose a risk for you. What's a physician to do?"

Aggressive **sales tactics may be responsible for patient satisfaction issues**. (Patients may have been talked into a product they were not sure they wanted.) Approximately 7-14% of consumers who purchase a system return the system during the initial post-sale 30-day return period. Here are some common complaints: Yelp complaints

The addressable market may be misunderstood

Portable oxygen concentrators cannot address all cases of COPD. Many cases require continuous flows of oxygen, which make portability impractical because weight and power constraints make it very difficult to provide continuous oxygen in a portable package. One reviewer of oxygen solutions says,

> ".. the Inogen is OK for folks who have low O2 flow needs but **will NOT meet higher flow needs** and probably won't work for most folks for sleeping at night. It's really important to get a good idea of your full range of needs before investing in a portable oxygen concentrator or other system that can cost $3000-5000 or more."

It also seems to us that management is overstating the penetration potential of the market. Recall that portable oxygen needs can be met by small oxygen tanks or liquid oxygen systems too. Tanks can be small and portable . A "D" sized tank weights just 6lbs and lasts 3 hours on continuous use, compatible to POCs. Tanks are obviously much cheaper. A typical aluminum tank costs $66, plus oxygen refills.

With POCs making inroads into tanks at an approximate penetration rate of 15%, Inogen management claims,

> "We expect the end of that curve of full penetration to be in, say, the low 60s of total patients. 60s in terms of percent. And remember, about 30% of the patients I'm rounding are stationary-only patients. So that's about **90% of the ambulatory patients would be on a portable oxygen concentrator**. We still expect that. And mathematically, to get there over that seven-year to 10-year period,"

We do not foresee that 90% of ambulatory patients will convert from tank to POC use.

Oxygen therapy appears to be over-prescribed

There is some **evidence of overprescription** of oxygen. Doctors find it very easy to prescribe oxygen for any number of illnesses. Some of the dangers of overprescription include serious drying of the airways which can lead to other ailments. There is, of course, the potentially unnecessary cost as well. (European Respiratory Journal)

An NHS Study report:

> "Patients with lung diseases such as **chronic obstructive pulmonary disease (COPD) are most vulnerable to over-oxygenation.** Their damaged lungs are unable to cope with high levels of oxygen and as a result they can fail to expel the resulting carbon dioxide effectively, which can lead to a form of acute respiratory failure."

From the Lancet:

> "In acutely ill adults, high-quality evidence shows that **liberal oxygen therapy increases mortality without improving other patient-important outcomes**. Supplemental oxygen might become unfavorable above an SpO 2 range of 94–96%. These results support the conservative administration of oxygen therapy. "

Medscape

> "supplemental oxygen reduces mortality for patients with resting hypoxia. Beyond that, the benefits are less certain. It stands to reason that patients who use ambulatory oxygen to improve exercise capacity and increase activity levels could benefit. I have had some patients say that they feel better using nocturnal oxygen. **That said, the results are inconsistent. Given the high prevalence of nocturnal and exertional hypoxia, the cost of therapy, and problems with adherence, expenditures are high and cost-efficacy is poor.** It is refreshing to read that the authors of this review recommend against screening and treating isolated nocturnal or exertional hypoxia. **Until better evidence is available, we need to change clinical practice and stop ordering so much oxygen**."

Mayo clinic

> **"Long-term oxygen therapy does not decrease the risk for hospitalizations or increase life expectancy for many patients with mild to moderate COPD, but may lower their quality of life**, according to Mayo Clinic researchers published in The Journal of the American Osteopathic Association.
>
> For decades, physicians have prescribed long-term oxygen therapy to patients with COPD based on research demonstrating that the therapy could extend their lives. However, **those studies were conducted in the 1980s and were significantly flawed**, according to the study authors. They note that more recent, better designed studies did not replicate the 30-year-old results."
>
> "Throughout medicine there are practices and treatments that continue simply because they have always been done," says Neera Agrwal, MD, PhD, a hospitalist at Mayo Clinic and co-author on this study. "But physicians have to consider new evidence and adjust accordingly, which is one of the biggest takeaways from this study."
>
> **While there is little evidence of long-term oxygen therapy's efficacy, it definitely comes with challenges**. Primarily, it is expensive, at a cost of several hundred dollars per month. Medicare is increasingly reluctant to pay for oxygen therapy, though it spends hundreds of millions on the treatment annually, according to Dr. Agrwal. Thus, many patients pay out of pocket if their physicians recommend this therapy."

POCs offer no recurring revenue

It is worth reminding ourselves that **Inogen sells a single-sale product**. There are **no recurring revenues** to be had with POCs. There are no tanks to fill or catalysts to be replenished.

The company is attempting to counter the sales slowdown with …

- The new G5 product

Inogen's new G5 product will be introduced in the first half of 2019. The product is intended be lighter with a longer battery life. The company has not released performance statistics, but it does not appear that the G5 is anything near a breakthrough, nor would we expect one given Inogen's level of R&D.

- New International initiatives

The company has built out its international infrastructure over the past several years. This includes sales in 45 international countries and a new contract manufacturing partner to support European sales volumes. They are also "in the process of developing regulatory and sales pathways to capture opportunities in emerging markets." While this poses some risk to our short, we point out Inogen still **sells 77.7% of revenues into the US market. Sales have been falling outside of the US for Inogen**. Any such initiatives will face existing competitors and will take time.

Inogen, Inc. (INGN) $147.42 Next Rpt Date: 26 Feb '19 Key Statistics

Revenue Exposure By Country

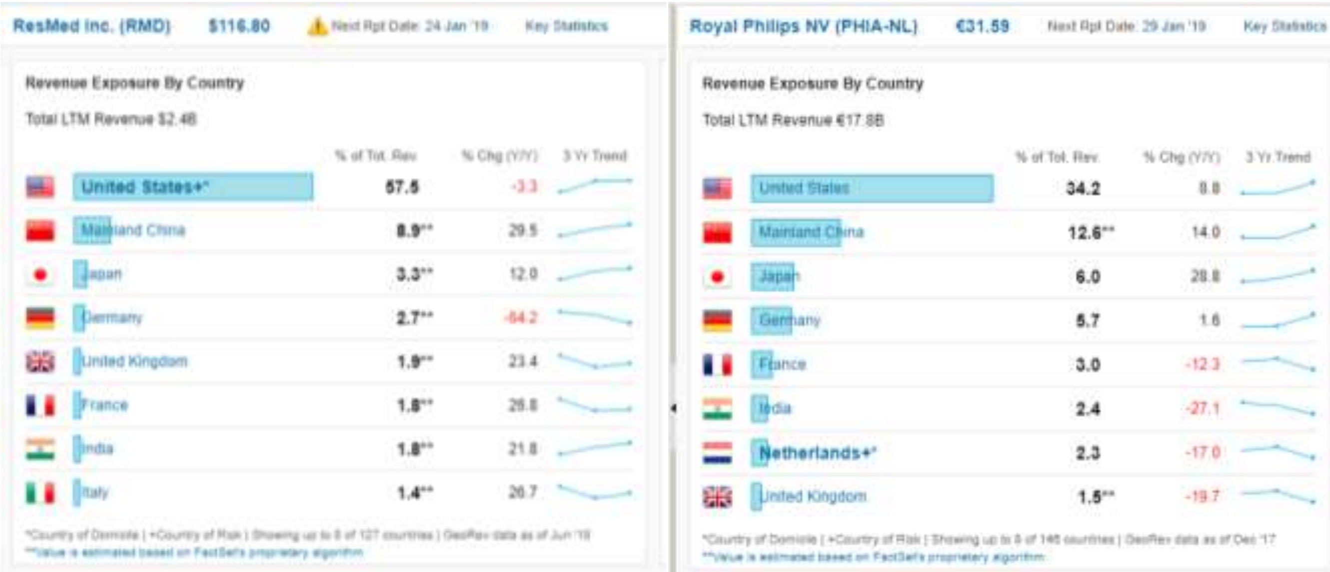
Total LTM Revenue $335.4M

	% of Tot. Rev.	% Chg (Y/Y)	3 Yr Trend
United States+*	77.7	3.2	
Mainland China	4.3**	-8.3	
Japan	1.8**	-14.6	
Germany	1.3**	-13.9	
United Kingdom	1.0**	-17.2	
India	0.9**	-5.2	
France	0.9**	-14.4	
Brazil	0.8**	3.7	

*Country of Domicile | +Country of Risk | Showing up to 8 of 110 countries | GeoRev data as of Dec '17
**Value is estimated based on FactSet's proprietary algorithm

Source: FactSet Research Systems

In contrast, **ResMed and Philips are already substantial outside the US**, both in raw dollar sales as well as in proportion. Not all of these sales are of POCs, of course, but they indicate what Inogen is up against.



ResMed Inc. (RMD) $116.80 Next Rpt Date: 24 Jan '19 Key Statistics

Revenue Exposure By Country

Total LTM Revenue $2.4B

Country	% of Tot. Rev	% Chg (Y/Y)
United States+*	57.5	-3.3
Mainland China	8.9**	29.5
Japan	3.3**	12.0
Germany	2.7**	-64.2
United Kingdom	1.9**	23.4
France	1.8**	26.8
India	1.8**	21.8
Italy	1.4**	20.7

*Country of Domicile | +Country of Risk | Showing up to 8 of 127 countries | GeoRev data as of Jun '18
**Value is estimated based on FactSet's proprietary algorithm

Royal Philips NV (PHIA-NL) €31.59 Next Rpt Date: 29 Jan '19 Key Statistics

Revenue Exposure By Country

Total LTM Revenue €17.8B

Country	% of Tot. Rev.	% Chg (Y/Y)
United States	34.2	8.8
Mainland China	12.6**	14.0
Japan	6.0	28.8
Germany	5.7	1.6
France	3.0	-12.3
India	2.4	-27.1
Netherlands+*	2.3	-17.0
United Kingdom	1.5**	-19.7

*Country of Domicile | +Country of Risk | Showing up to 8 of 146 countries | GeoRev data as of Dec '17
**Value is estimated based on FactSet's proprietary algorithm

Source: FactSet Research Systems

We believe that POCs, given their modest advantages and higher prices, will only be relevant in higher income countries, for the time.

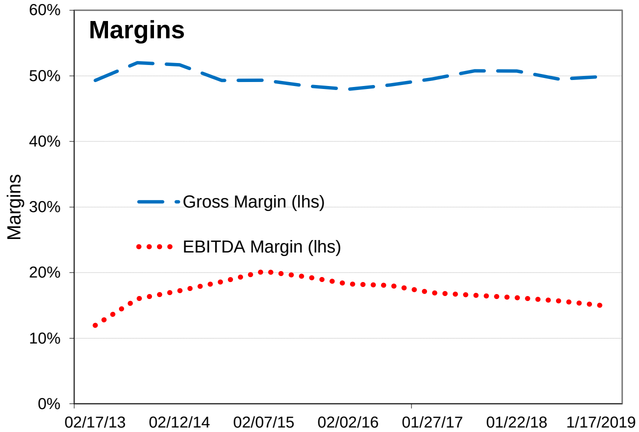
Margins are declining

To Inogen's credit, **they have held their gross margins despite the falling sales prices**. Rising unit volumes and operating leverage have their advantages. Gross margins have fallen 80bps from their 2017 highs. The last print was a slight uptick LTM and a more meaningful 300bps uptick over September 2017.

We are skeptical that gross margins can expand further. **ResMed's margins are slightly higher, at 56% but not only are they 4x Inogen's size** (and, hence, can drive more efficiencies) but **they sell higher margin products** such as full facemasks and software as a service, both with higher margins. ResMed admits that Mobi is coming out at lower margins.

> "Yeah, look certainly the portable oxygen concentrator market is closer to the gross margin profile of the CPAP range vs. that you'd find in a full face mask or a Software as a Service solution and so yeah, we think it's fantastic gross profit dollar contribution that we can achieve **from the portable oxygen concentrator market that it will be in a lower gross margin percentage**. We still think it's a great market to go after …, but then also in the future bring our digital health capabilities to bear, we think it's a great market to go after. So, yeah, you'll see both of those, growth in gross profit dollars, **some impact on the gross margin percentage**." – ResMed September earnings calls

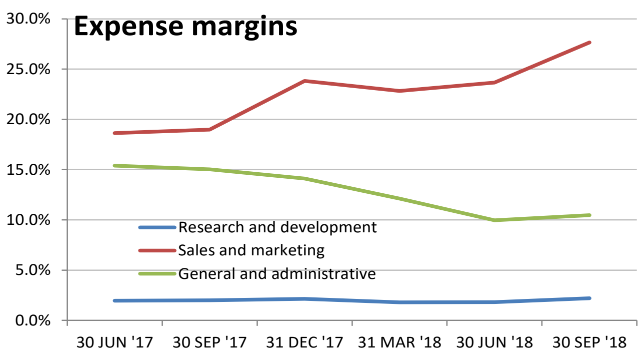
Inogen's margins are falling.

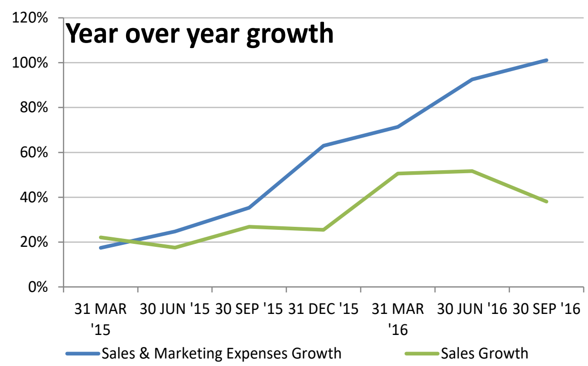


Source: Two Rivers Analytics; FactSet Research Systems

The worse problem, of course, is further down the income statement. **EBITDA margins have been declining since 2015**, even as gross margin has edged higher in certain periods. Even with R&D cut to the bone, earnings are declining. This is no way to stay competitive.

The problem lies mostly on the sales expense line. **Sales expenses are far outpacing revenues in a "land-grab" gambit** for share.

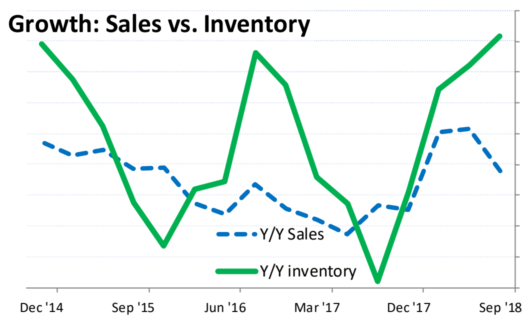


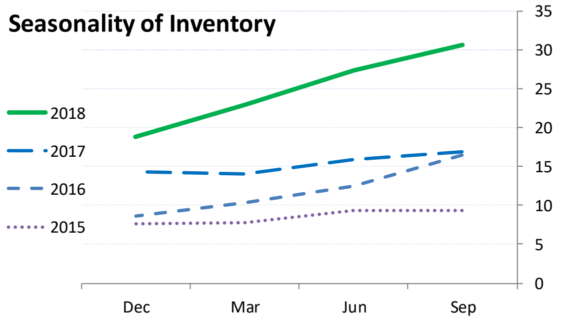


Source: Two Rivers Analytics; FactSet Research Systems

Working capital trends raise some eyebrows

Inventory turnover is slowing. Inventories have been growing faster than sales for a year. The account also shows an odd, unseasonal lift that defies prior years' patterns. There was no mention of why this is so either in the filings or from the earnings call.

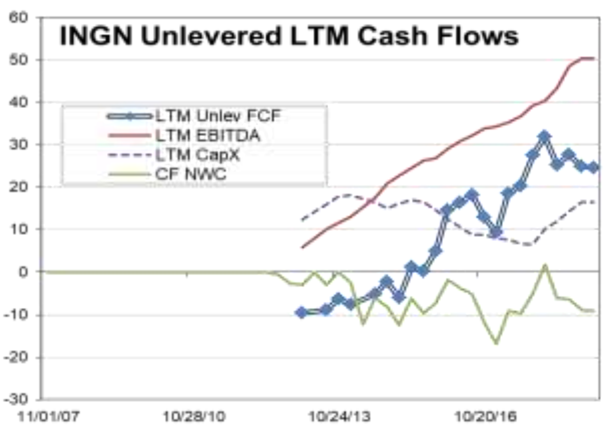


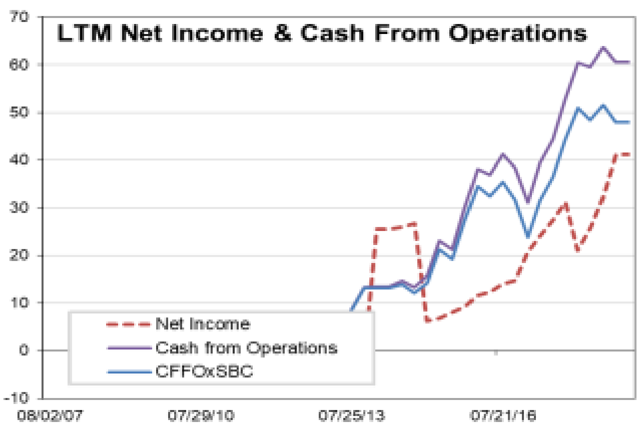


Source: Two Rivers Analytics; FactSet Research Systems

Free cash flow is stagnant; the company carries a modest amount of net cash

Free cash flow had been rising through 2017, primarily from rising EBITDA, but aided by falling capex. More recently , growth in EBITDA has been outweighed by increases in capex and the inventory issue flagged above. **Cash flow growth, which has flatlined now for several quarters, is not keeping up with accounting income**. GAAP net income doubled in the nine months just ended versus the prior year, while cash from operations was flat. On the positive side, the company carries a modest amount of cash. .



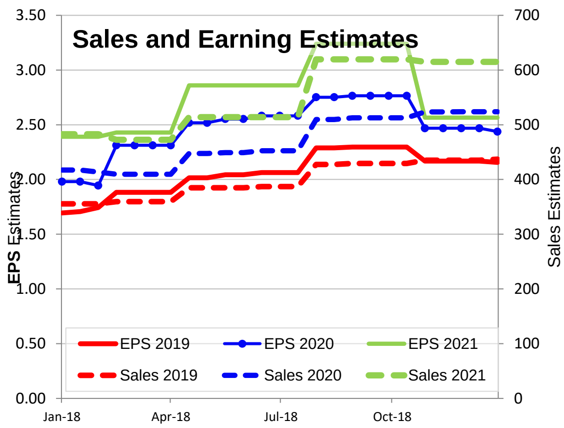


Source: Two Rivers Analytics; FactSet Research Systems

Estimates, trends and guidance

The trend in estimates has turned down

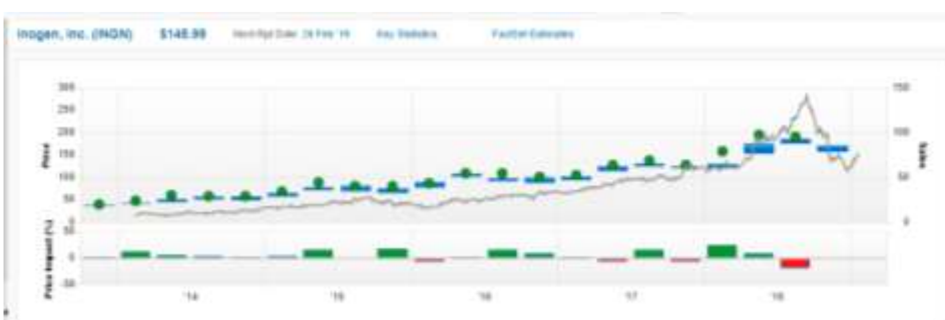
Estimates had been increasing for years and for most of 2018 until November, when **they were reduced for the first time**. Weak guidance gave analysts a reason to reduce their forecasts.



Source: Two Rivers Analytics; FactSet Research Systems

Surprises

The company has been adept at communicating with investors, such that it has a good history of beating estimates. While admirable, it does **expose the stock to dramatic declines if investors are disappointed**. We believe they are going to be.



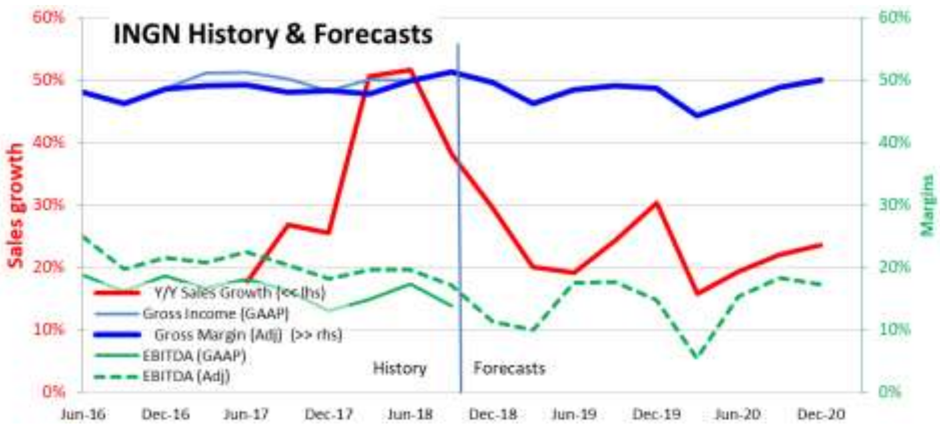
Source: FactSet Research Systems

Guidance and forecasts

At the last earnings call, the company increased sales guidance for full year 2018 to a midpoint of 40% sales growth and **reduced their guidance for EBITDA to 20% growth at the midpoint**. For 2019, the company is guiding to +22.9% to +25.7% topline growth with adjusted EBITDA rising +9.8% to +16.4%. Investors were disappointed with the changes in guidance and cut the stock by 19% on the day.

Street estimates shown a slowdown in top line growth from last quarter's 38% to a December 2018 quarter of 29%, then 20% before reaccelerating. We note that the introduction of the G5 is expected to have only a small impact on 2019. In fact, it is **expected to cannibalize the G3 without moving ASP**.

However, there is **some risk in the margin forecasts for the next two quarters**. The Street has Inogen producing an (adjusted) EBITDA of 11.3% this quarter, down from 17%, followed by a 10% margin quarter in Q2, before reverting back to 17%. Higher sales expenses are responsible. We see upside margin risk over the next two quarters, and downside risk after that. The CFO is suggesting that Q2 will be easier but Q3 and Q4 more difficult.



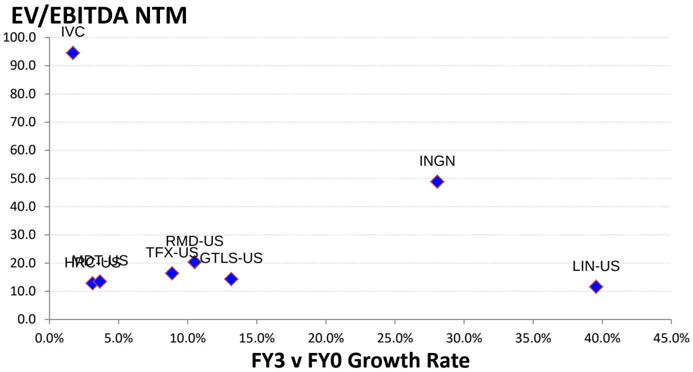
Source: Two Rivers Analytics; FactSet Research Systems

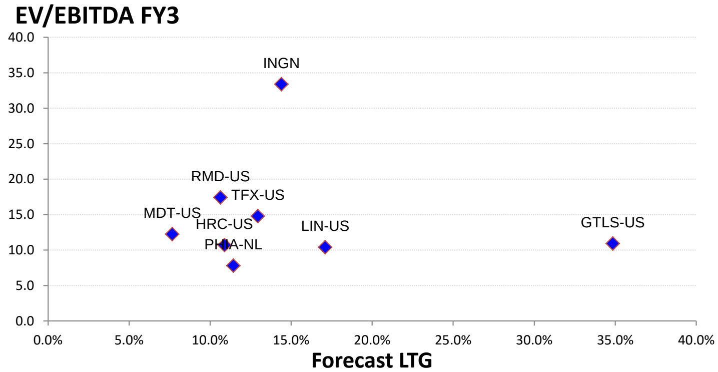
The stock is very expensive

Inogen had been a **momentum favorite** from 2016 until the market correction late last year. From February 2016 to October 2018, **the stock rallied eight-fold from $30 to $263**. It then dropped to $163 by mid-December before bouncing 9% to its current price.

Source: Two Rivers Analytics; FactSet Research Systems

The correction of November/December provided some valuation relief, but we would say **the multiples dropped from ridiculous to less ridiculous**. The **stock trades at 8.5x EV/S, 57x trailing EBITDA, 48x forward EBITDA and 66x 2019 PE.** The stock simply has too much growth priced in.





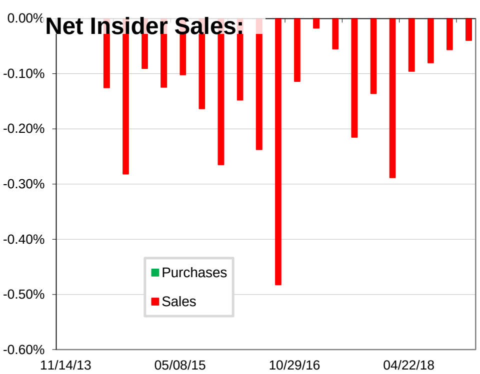
Source: Two Rivers Analytics; FactSet Research Systems

While Needham and others put forth a narrative that Inogen trades "at a discount to small/mid-cap growth peers despite higher projected revenue growth", we do not see that at all. Our numbers show a stock trading out of line with its peer group. **We also see a med-tech company on the lower end of "tech", with an undifferentiated product, surrounded by encroaching, capable competitors** for whom the POC market is decidedly "in their wheelhouse".

Other

This year's income benefited from some unusually high income tax benefits.

Insiders are selling at high rates.



Source: Two Rivers Analytics; FactSet Research Systems

Source: Two Rivers Analytics; FactSet Research Systems

POTENTIAL CATALYSTS TO A SHORT CALL

- Sales and earnings disappointments from:
    - tough comps after the anniversary of large increases in sales and marketing expenses;
    - erosion of any technological differentiation due to paltry sum spent on R&D;
    - introduction of directly competing products from ResMed and Caire; and
    - continued product sale price erosion.
- Any reassessment by doctors on overprescription of oxygen therapy.
- Further retrenchment of the stock's high multiples.
- Any inventory problems "under the covers" as suggested by slowing inventory turnover.

RISKS TO A SHORT CALL INCLUDE

- There is a risk that momentum stocks come back into favor, boosting stock prices regardless of valuation.
- Operationally, there is a risk that the company's investment in sales infrastructure compensates for the lack of differentiation and new products coming on the market.
- Currently Medicare reimburses POCs on a monthly rental basis. If INGN is successful in changing this to reimbursing the equipment cost up front, that could make it a lot easier for HME suppliers to sell POCs.
- The new Inogen Capital arm may have the effect of pulling some sales forward.

APPENDIX / GLOSSARY

Company Data: Inogen, Inc. (INGN)

Trading

Date	1/23/19
Price	143.03
52 Wk H/L	287.79 / 110.51
Market Cap/Ent. Value ($mns)	3,078 / 2,860
Avg Daily Volume (thou)	441.8
Shares Outstanding (mn)	21.5
Float (mn / %)	17.8 / 82.5%
Short Interest (mn / SISO%)	2.8 / 13.2%
Days to Cover	7.5

Balance Sheet

	Sep-18
Cash & Eqv.	224
Total Debt	6
Net Debt	(218)
Net Debt / Capital (@mkt)	-8%
Net Debt / EBITDA	-4.3x

Earnings and Cash Flow

				LTM	Forecasts		
	Dec-15	Dec-16	Dec-17	Sep-18	Dec-18	Dec-19	Dec-20
Revenue	159.0	202.8	249.4	335.4	353.6	436.1	520.5
EBITDA	29.1	34.3	40.4	50.3	58.7	68.6	87.6
Interest Expense	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cap Exp.	-12.5	-8.0	-10.2	-16.5	-11.8	-13.0	-14.5
Subtotal	16.6	26.3	30.1	33.8	46.9	55.6	73.1
Net Income	11.6	20.5	21.0	41.2	47.5	49.5	56.4
EPS	0.56	0.90	0.97	1.84	2.11	2.16	2.41

Valuation

	LTM	Forecasts		
	Sep-18	Dec-18	Dec-19	Dec-20
EV/EBITDA	56.8x	48.7x	41.7x	32.7x
EV/Sales	8.5x	8.1x	6.6x	5.5x
FCF Yield	1%	2%	2%	2%
PE	146.8x	67.9x	66.3x	59.2x

Source: Two Rivers Analytics

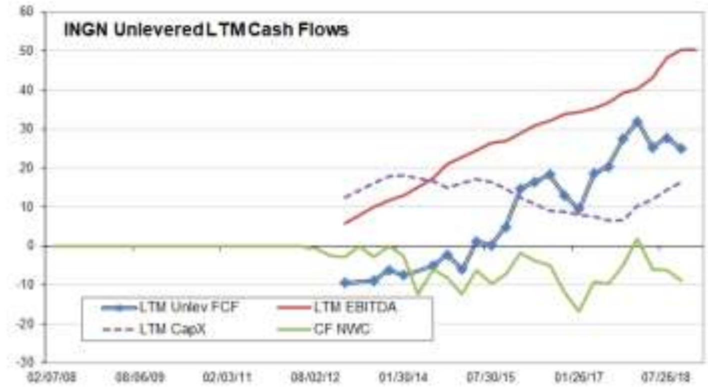
Below, please find:

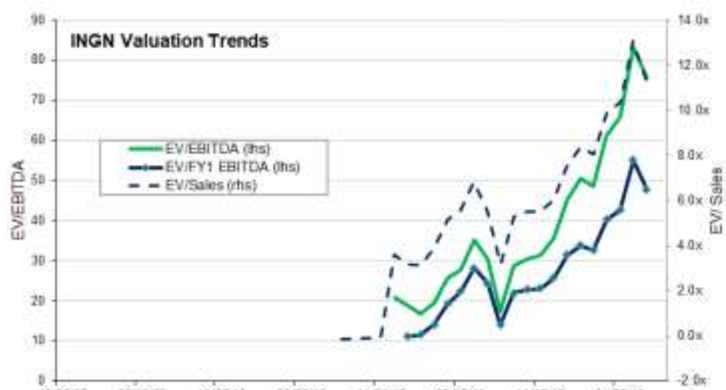
- Time series data on key company metrics
- Comparable companies analysis
- Time series charts on the company vs. its comps
- Scatter plots of forecast growth and valuation multiples
- Revisions trend vs. its comparables
- Correlations of stock price to various estimate revisions

Inogen, Inc. (INGN)

updated 1/24/2019

Historical Metrics: Sales, Margins, Cash Flow, Leverage, Valuation, Estimates & Short Interest





* As per GAAP financial statements. Unadjusted.

Comp Companies Analysis: Inogen, Inc. (INGN)

Pricing date: 1/24/2019

All financials in USD millions

				comp 'fit':	a	a	b	b	b	b	b	a
Tickers	**INGN**				**RMD-US**	**TFX-US**	**GTLS-US**	**HRC-US**	**MDT-US**	**PHIA-NL**	**LIN-US**	**IVC**
Names	Inogen, Inc.	Fav / Unf	*Mean*	*Median*	ResMed Inc.	Teleflex Incorporated	Chart Industries, Inc.	Hill-Rom Holdings, Inc.	Medtronic plc	Royal Philips NV	Linde plc	Invacare Corporation
Price Performance												
Price (latest, USD)	144.63		104.30	91.66	116.75	262.42	72.94	96.50	86.82	36.39	157.31	5.25
Price (latest, local curr.)	--		--	--	--	--	--	--	--	*32.05*	--	--
1 day % change	1.1%	-	1.6%	0.4%	-0.4%	0.7%	0.4%	0.4%	-0.4%	0.7%	-1.0%	12.4%
1 week % change	6.5%	-	3.9%	3.2%	1.7%	2.5%	5.6%	3.9%	2.3%	5.1%	-1.8%	11.9%
1 month % change	-1.9%	-	-0.8%	-2.3%	4.4%	-4.7%	14.8%	-0.5%	-11.0%	-3.6%	-1.1%	-4.5%
YTD % change	15.2%	F	4.1%	2.9%	2.9%	0.8%	11.7%	8.6%	-4.2%	2.9%	1.9%	8.6%
1 year % change	18.5%	-	-2.3%	1.0%	16.8%	-4.9%	37.8%	8.0%	2.3%	-4.6%	-0.2%	-73.5%
52w High/Low	287.79 / 110.51		--	--	118.50 / 87.67	288.78 / 226.02	80.31 / 43.50	99.81 / 78.16	100.15 / 76.41	46.75 / 33.14	169.75 / 140.00	20.00 / 3.05
% of H/L Range	19.2%	U	57.0%	58.1%	94.3%	58.0%	80.0%	84.7%	43.9%	23.9%	58.2%	13.0%
Consensus Price Target	231.20		116.40	102.50	111.47	290.58	92.00	102.09	102.90	44.32	174.20	13.67
% to Price Target	59.9%	F	12.7%	10.7%	-4.5%	10.7%	26.1%	5.8%	18.5%	21.8%	10.7%	nm
Size												
Market Value	3,078	-	34,376	14,343	16,704	11,982	2,266	6,410	117,060	32,850	87,579	155
Enterprise Value	2,860	-	37,863	15,447	17,003	13,891	2,632	8,269	132,129	32,850	95,809	321
Date of Financials	09/30/18				09/30/2018	09/30/18	09/30/18	09/30/2018	10/31/2018	09/30/18	09/30/18	09/30/18
LTM Sales	336	-	9,168	2,626	2,405	2,402	1,100	2,848	30,378	21,196	12,037	979
LTM EBITDA	50	-	2,438	669	713	625	152	582	9,814	3,678	3,941	-3
LTM Capex	17	-	389	73	69	73	40	90	1,041	nm	1,395	16
EBITDA-CapX	34	-	1,872	552	644	552	113	493	8,773	nm	2,546	-19
Assets	357	-	6,390	3,068	3,068	6,201	1,739	nm	nm	nm	19,979	963
Employees	770	-	28,218	12,200	5,940	14,400	4,424	10,000	86,368	73,951	26,461	4,200
Shares	21.5	-	392.5	104.6	142.5	46.0	31.2	66.7	1,343.0	926.2	551.1	33.2
Profitability/Productivity												
LTM Sales/Tot Assets	94%	-	68%	63%	78%	39%	63%	nm	nm	nm	60%	102%
LTM Sales/Employee	435,542	F	303,919	285,711	404,851	166,797	248,680	284,800	351,727	286,622	454,896	232,982
LTM Gross Margin (-3Q)	50.7%	-	44.3%	44.8%	56.1%	54.8%	27.5%	44.2%	63.5%	45.3%	33.2%	29.8%
LTM Gross Margin (-2Q)	50.5%	-	44.6%	45.4%	56.2%	55.6%	27.0%	44.7%	63.9%	46.2%	33.4%	29.8%
LTM Gross Margin (-1Q)	49.5%	-	44.7%	45.5%	56.2%	56.0%	26.5%	45.0%	64.4%	46.0%	33.5%	29.8%
LTM Gross Margin (0Q)	49.9%	-	44.7%	45.7%	56.2%	56.3%	26.5%	44.8%	64.7%	46.5%	33.5%	29.3%
LTM EBITDA Margin (-3Q)	16.2%	-	20.5%	22.8%	28.1%	25.9%	10.9%	19.8%	31.7%	16.5%	32.2%	-1.2%
LTM EBITDA Margin (-2Q)	15.7%	-	21.0%	23.2%	28.6%	26.2%	11.8%	20.1%	32.0%	18.0%	32.4%	-0.7%
LTM EBITDA Margin (-1Q)	15.7%	-	21.1%	23.2%	29.1%	26.0%	12.1%	20.4%	32.3%	16.7%	32.6%	-0.4%
LTM EBITDA Margin (0Q)	15.0%	-	21.5%	23.2%	29.6%	26.0%	13.9%	20.4%	32.3%	17.4%	32.7%	-0.4%
LTM EBIT Margin	11.6%	-	15.0%	15.5%	24.6%	17.5%	9.3%	13.5%	23.6%	11.4%	22.5%	-2.0%
LTM Pretax Margin	12.1%	-	10.5%	8.1%	22.9%	7.9%	5.1%	6.9%	17.4%	8.3%	20.5%	-5.0%
LTM Net Margin	12.3%	-	6.3%	6.5%	13.9%	2.8%	5.7%	8.9%	7.4%	5.6%	11.9%	-6.2%
LTM R&D / Sales	2.0%	F	5.1%	5.6%	6.5%	4.3%	nm	4.8%	7.6%	6.4%	0.8%	nm
LTM Capex / Sales	4.9%	-	4.2%	3.1%	2.9%	3.0%	3.6%	3.1%	3.4%	nm	11.6%	1.6%
ROA	13.1%	F	3.5%	3.6%	10.2%	1.1%	3.6%	5.7%	2.5%	na	7.1%	-6.0%
ROE	16.1%	-	8.2%	8.5%	17.0%	2.7%	8.5%	17.0%	4.5%	na	23.0%	-15.0%
Growth												
LTM Sales (-3Q)	23.0%	-	1.3%	14.9%	na	14.9%	15.1%	na	na	-26.1%	na	na
LTM Sales (-2Q)	30.0%	-	2.7%	16.3%	na	16.3%	22.4%	na	na	-30.7%	na	na
LTM Sales (-1Q)	39.3%	-	13.3%	17.2%	na	17.2%	33.2%	na	na	-10.5%	na	na
LTM Sales (0Q)	41.8%	F	12.2%	16.3%	na	16.3%	22.6%	na	na	-2.3%	na	na
LTM Gross Profit (0Q)	37.0%	F	13.1%	16.2%	nm	20.0%	16.2%	nm	nm	3.1%	nm	nm
LTM EBITDA	28.5%	-	39.7%	10.6%	nm	10.6%	100.0%	nm	nm	8.4%	nm	nm
LTM EBIT	45.5%	-	57.6%	10.5%	nm	-2.1%	164.5%	nm	nm	10.5%	nm	nm
LTM Asset	32.3%	F	5.9%	5.9%	na	9.2%	2.7%	na	na	na	na	na
Employees YoY	27.9%	F	-2.8%	-1.2%	-2.3%	14.3%	9.2%	0.0%	-5.4%	-29.2%	-0.1%	-8.7%
LTM Capex	95.0%	F	10.3%	1.5%	-6.5%	2.1%	37.5%	na	-11.8%	na	1.0%	39.6%
LTM EPS (recurr)	34.6%	-	0.2%	1.5%	-0.6%	-49.8%	nm	79.8%	-45.1%	3.6%	nm	13.3%
LTM EPS (basic)	27.9%	-	27.4%	14.3%	-6.0%	nm	nm	86.8%	nm	6.6%	nm	22.1%
LTM EPS (diluted)	26.9%	-	19.5%	5.5%	-5.6%	nm	nm	87.6%	nm	5.5%	-12.1%	22.2%
Forecast LTG	14.4%	-	15.1%	11.4%	10.6%	13.0%	34.9%	10.9%	7.7%	11.4%	17.1%	nm
EPS FY1 v FY0	119.4%	-	56.7%	37.8%	67.0%	nm	125.7%	37.8%	125.8%	-19.7%	29.4%	30.7%
EPS FY2 v FY1	2.3%	U	19.0%	12.9%	11.6%	11.9%	42.3%	10.9%	6.9%	20.6%	14.0%	34.0%
EPS FY3 v FY2	12.0%	-	32.7%	15.8%	12.3%	15.6%	36.8%	11.0%	8.6%	16.1%	16.4%	144.9%

Source: Two Rivers Analytics; FactSet Research Systems * As per GAAP financial statements.

Comp Companies Analysis: Inogen, Inc. (INGN)

Pricing date: 1/24/2019

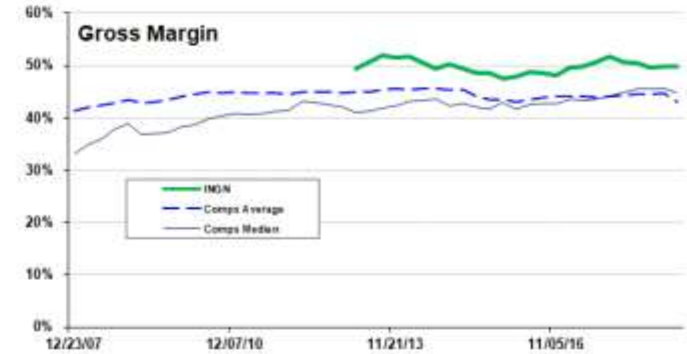
All financials in USD millions

				comp 'fit':	a	a	b	b	b		b	a
Tickers	**INGN**				**RMD-US**	**TFX-US**	**GTLS-US**	**HRC-US**	**MDT-US**	**PHIA-NL**	**LIN-US**	**IVC**
Names	Inogen, Inc.	*/ Unfa*	*Mean*	*Median*	ResMed Inc.	Teleflex Incorporated	Chart Industries, Inc.	Hill-Rom Holdings, Inc.	Medtronic plc	Royal Philips NV	Linde plc	Invacare Corporation
Sales Estimates & Expected Growth												
Sales FY0	249		--	--	2,340	2,146	989	2,848	29,953	20,055	11,437	966
Sales LTM	335		--	--	2,405	2,402	1,100	2,848	30,378	21,196	12,037	979
Sales NTM	409		--	--	2,715	2,545	1,231	2,897	31,094	18,899	29,651	984
Sales FY1	354		--	--	2,639	2,449	1,119	2,898	30,554	20,591	27,966	967
Sales FY2	436		--	--	2,916	2,586	1,288	2,994	31,861	21,684	29,477	968
Sales FY3	521		--	--	3,169	2,770	1,432	3,123	33,361	22,694	31,084	1,016
#Estimates	7		10	8	14	11	7	8	24	4	4	4
Growth: FY1 v FY0	41.8%	F	6.7%	2.7%	12.8%	14.1%	13.2%	1.7%	2.0%	2.7%	nm	0.1%
Growth: FY2 v FY1	23.3%	F	6.2%	5.4%	10.5%	5.6%	15.1%	3.3%	4.3%	5.3%	5.4%	0.1%
Growth: FY3 v FY2	19.4%	F	6.4%	5.2%	8.7%	7.1%	11.2%	4.3%	4.7%	4.7%	5.5%	5.0%
CAGR (FY3 v FY0)	27.8%	F	10.6%	6.5%	10.6%	8.9%	13.2%	3.1%	3.7%	4.2%	39.6%	1.7%
EPS Estimates & Expected Growth												
EPS FY0	*0.96*				*2.19*	*3.27*	*0.89*	*3.73*	*2.27*	*2.13*	*4.31*	*-2.34*
EPS FY1	2.11		--	--	3.66	9.89	2.01	5.14	5.13	1.71	5.58	-1.62
EPS FY2	2.16		--	--	4.09	11.07	2.86	5.70	5.48	2.06	6.36	-1.07
EPS FY3	2.41		--	--	4.59	12.80	3.91	6.33	5.95	2.39	7.40	0.48
#Estimates	7		10	9	15	13	7	10	26	3	2	4
Growth: FY1 v FY0	119.4%	-	56.7%	37.8%	67.0%	nm	125.7%	37.8%	125.8%	-19.7%	29.4%	30.7%
Growth: FY2 v FY1	2.3%	U	19.0%	12.9%	11.6%	11.9%	42.3%	10.9%	6.9%	20.6%	14.0%	34.0%
Growth: FY3 v FY2	12.0%	-	32.7%	15.8%	12.3%	15.6%	36.8%	11.0%	8.6%	16.1%	16.4%	144.9%
CAGR (FY3 v FY0)	36.0%	-	32.5%	29.1%	28.0%	57.6%	63.8%	19.2%	37.9%	3.9%	19.7%	30.2%
Revisions, 3M Chg in:												
FY1 EPS	0.2%	-	-4.3%	0.5%	1.0%	0.8%	-1.2%	1.3%	0.1%	1.5%	-17.6%	-20.4%
FY2 EPS	-6.1%	-	-39.9%	-1.6%	0.6%	-2.0%	0.1%	0.8%	-1.2%	-3.1%	-14.4%	-300.0%
FY3 EPS	-12.7%	U	-4.2%	-3.0%	1.6%	-2.2%	-3.5%	na	-1.0%	-3.0%	-6.3%	-15.0%
Target Price	-11.3%	-	-4.0%	-0.7%	4.6%	2.3%	0.0%	3.4%	-1.5%	-1.9%	-1.7%	-36.9%
Leverage												
Net Debt / Book Capital	nm	-	36.0%	31.0%	13.6%	43.2%	30.4%	53.5%	23.3%	nm	56.9%	31.0%
Net Debt / Mkt Capital	-7.6%	F	15.4%	12.6%	1.8%	13.7%	13.9%	22.5%	11.4%	0.0%	8.6%	51.7%
Net Debt / EBITDA	nm	-	1.8x	2.1x	0.4x	3.1x	2.4x	3.2x	1.5x	0.0x	2.1x	nm
Total Debt	6	--	--	--	530	2,266	519	2,042	25,095	0	8,312	286
Minority Interest	0	--	--	--	0	0	4	0	107	0	518	0
Preferred	0	--	--	--	0	0	0	0	0	0	0	0
Cash	224	--	--	--	230	356	157	183	10,133	0	600	120
Net Debt	-218	--	--	--	299	1,909	366	1,859	15,069	0	8,230	166
Net Cash/Share (if >0)	$10.14	--	--	--	na	na	na	na	na	na	na	na
as % of share price	7.0%	F	nm	nm	nm	nm	nm	nm	nm	nm	nm	nm
Working Capital												
A/R DSO	37.3	F	62.8	69.0	70.4	56.9	70.2	74.4	69.0	nm	56.2	42.9
Inventory (days)	66.5	-	89.3	84.9	98.0	142.9	84.9	67.7	128.1	nm	28.3	74.8
Accounts Payable (days)	25.3	-	24.4	22.7	15.0	14.8	31.5	22.7	20.9	nm	29.7	36.2
Cash Cycle (days)	78.4	-	127.7	123.7	153.4	184.9	123.7	119.4	176.2	nm	54.8	81.5
Valuation												
EV/LTM Sales	8.5x	U	4.0x	3.6x	7.1x	5.8x	2.4x	2.9x	4.3x	1.5x	8.0x	0.3x
EV/LQA Sales	7.5x	U	4.0x	3.6x	7.2x	5.7x	2.4x	2.7x	4.4x	1.6x	7.9x	0.3x
EV/FY1 Sales	8.1x	U	3.4x	3.1x	6.4x	5.7x	2.4x	2.9x	4.3x	1.6x	3.4x	0.3x
EV/NTM Sales	7.0x	U	3.3x	3.0x	6.3x	5.5x	2.1x	2.9x	4.2x	1.7x	3.2x	0.3x
EV/FY2 Sales	6.6x	U	3.2x	3.0x	5.8x	5.4x	2.0x	2.8x	4.1x	1.5x	3.3x	0.3x
EV/FY3 Sales	5.5x	U	3.0x	2.9x	5.4x	5.0x	1.8x	2.6x	4.0x	1.4x	3.1x	0.3x
EV/LTM EBITDA	56.8x	U	17.8x	17.3x	23.9x	22.2x	17.3x	14.2x	13.5x	8.9x	24.3x	nm
EV/LQA EBITDA	54.6x	U	17.1x	14.4x	24.4x	20.5x	14.4x	11.9x	14.1x	10.2x	24.1x	nm
EV/FY1 EBITDA	48.7x	U	15.0x	13.8x	20.8x	19.0x	17.2x	12.6x	13.8x	9.7x	11.8x	nm
EV/NTM EBITDA	47.7x	-	26.0x	14.2x	20.3x	16.5x	14.2x	12.8x	13.4x	nm	11.4x	93.1x
EV/FY2 EBITDA	41.7x	U	15.2x	13.2x	18.8x	16.9x	13.4x	11.6x	12.9x	8.7x	11.1x	27.8x
EV/FY3 EBITDA	32.7x	U	12.0x	10.9x	17.3x	14.9x	10.9x	10.6x	12.3x	7.9x	10.3x	nm
EV/EBIT	73.8x	U	25.2x	25.7x	28.7x	33.1x	25.7x	21.4x	18.4x	13.6x	35.4x	nm
EV/(EBITDA-CapX)	84.5x	U	24.1x	24.3x	26.4x	25.2x	23.4x	16.8x	15.1x	nm	37.6x	nm
EBITDA Yld LTM	1.8%	-	5.4%	5.1%	4.2%	4.5%	5.8%	7.0%	7.4%	11.2%	4.1%	-1.1%
EBITDA Yld FY1	2.1%	-	6.0%	6.5%	4.8%	5.3%	5.8%	8.0%	7.3%	10.3%	8.5%	-2.3%
EBITDA-CapX Yld	1.2%	-	3.0%	4.0%	3.8%	4.0%	4.3%	6.0%	6.6%	nm	2.7%	-6.0%
NI+D&A-CpX Yld	1.2%	-	-3.0%	2.3%	2.3%	1.7%	3.3%	5.6%	3.3%	nm	1.5%	-38.9%
NI[1]+D&A-CpX Yld	1.3%	-	-0.5%	2.3%	2.3%	1.4%	2.8%	4.3%	2.9%	nm	1.3%	-18.8%
CFFO/Mkt Cap	1.9%		2.2%	3.9%	2.7%	3.3%	3.9%	6.0%	5.0%	nm	6.9%	-12.6%
LTM PE	nm	-	66.9x	66.9x	nm	nm	nm	110.2x	nm	nm	nm	23.7x
FY1 PE	68.7x	U	25.7x	26.5x	31.9x	26.5x	36.3x	18.8x	16.9x	21.3x	28.2x	nm
FY2 PE	67.1x	U	21.8x	23.7x	28.6x	23.7x	25.5x	16.9x	15.8x	17.6x	24.7x	nm
FY3 PE	59.9x	U	17.7x	17.0x	25.4x	20.5x	18.7x	15.2x	14.6x	15.2x	21.2x	10.9x
PEG (FY1 PE/LTG)	4.8x	U	1.9x	1.9x	3.0x	2.0x	1.0x	1.7x	2.2x	1.9x	1.6x	nm
Price / Book	10.7x	U	4.3x	4.0x	8.8x	4.8x	2.7x	4.0x	2.4x	nm	7.3x	0.5x
Price / CFPS	68.6x	-	50.9x	48.4x	85.3x	44.7x	43.8x	25.8x	52.1x	neg	53.8x	neg

Inogen, Inc. (INGN) and its comparable companies

updated 1/24/2019

Growth, Margins, Capex, Leverage, & Valuation



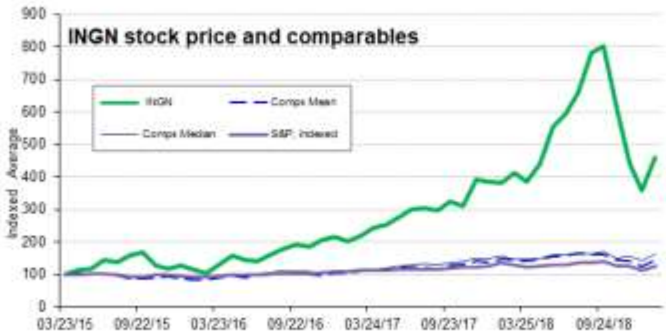
Source: Two Rivers Analytics;

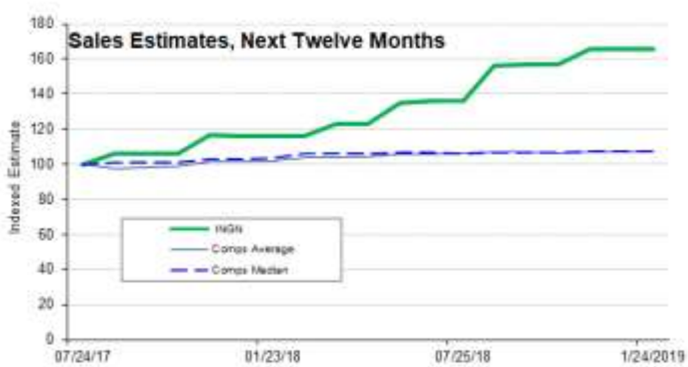
Comparable companies: ResMed Inc (RMD), Teleflex Incorporated (TFX), Chart Industries, Inc (GTLS), Hill-Rom Holdings, Inc (HRC), Medtronic plc (MDT), Royal Philips NV (PHIA-NL), Linde plc (LIN), Invacare Corporation (IVC),

Inogen, Inc. (INGN) and its comparable companies

updated 1/24/2019

Stock Price, forecast growth, target prices, estimates and short interest



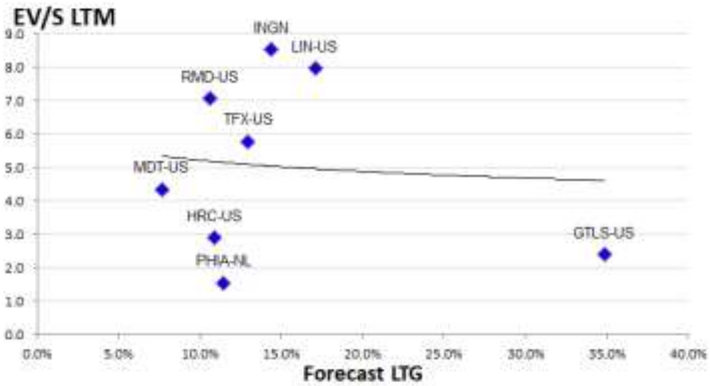


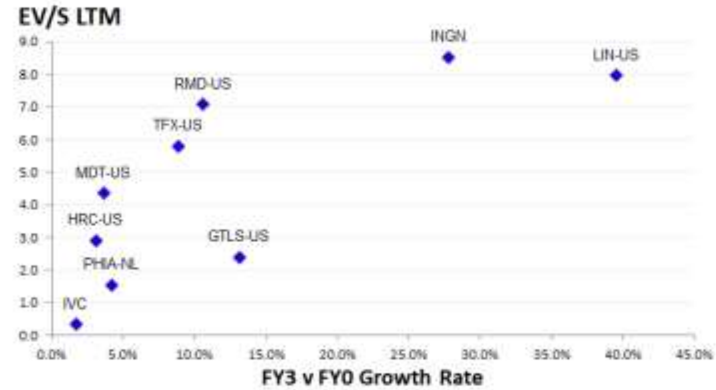
Source: Two Rivers Analytics;

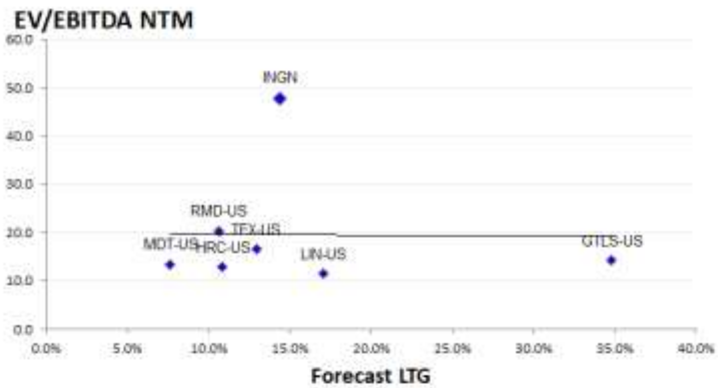
Comparable companies: ResMed Inc (RMD), Teleflex Incorporated (TFX), Chart Industries, Inc (GTLS), Hill-Rom Holdings, Inc. (HRC), Medtronic plc (MDT), Royal Philips NV (PHIA-NL), Linde plc (LIN), Invacore Corporation (IVC).

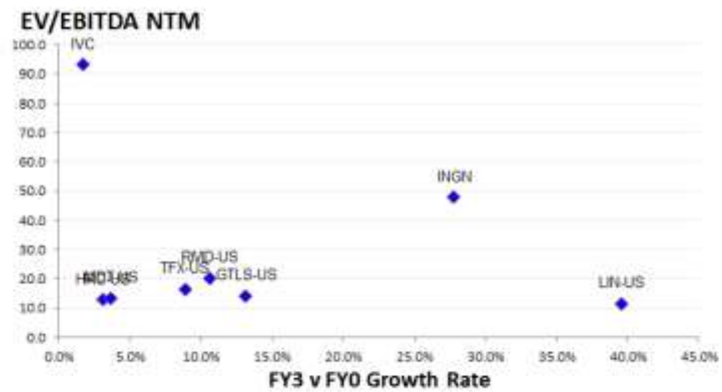
Forecast Growth Rates vs. Valuations: Inogen, Inc. (INGN) and its comparables

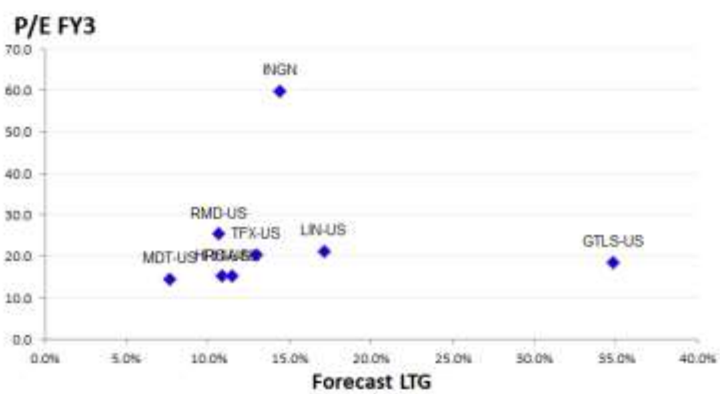
1/24/2019

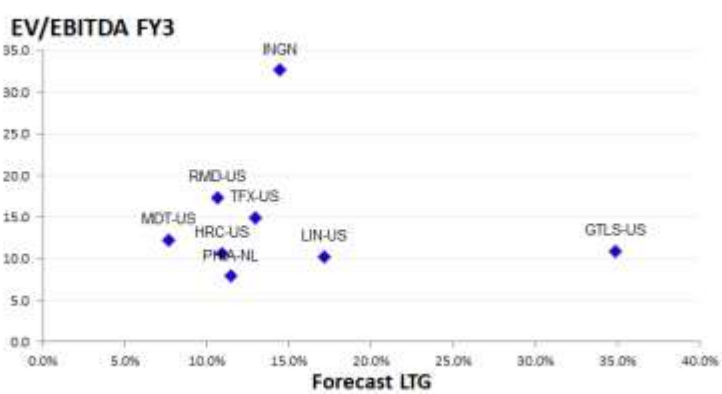


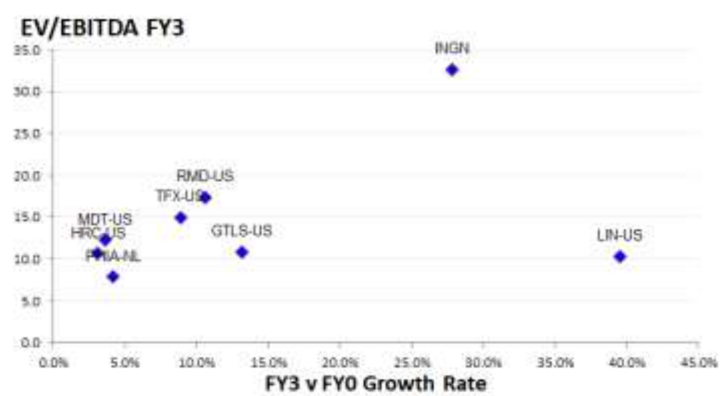






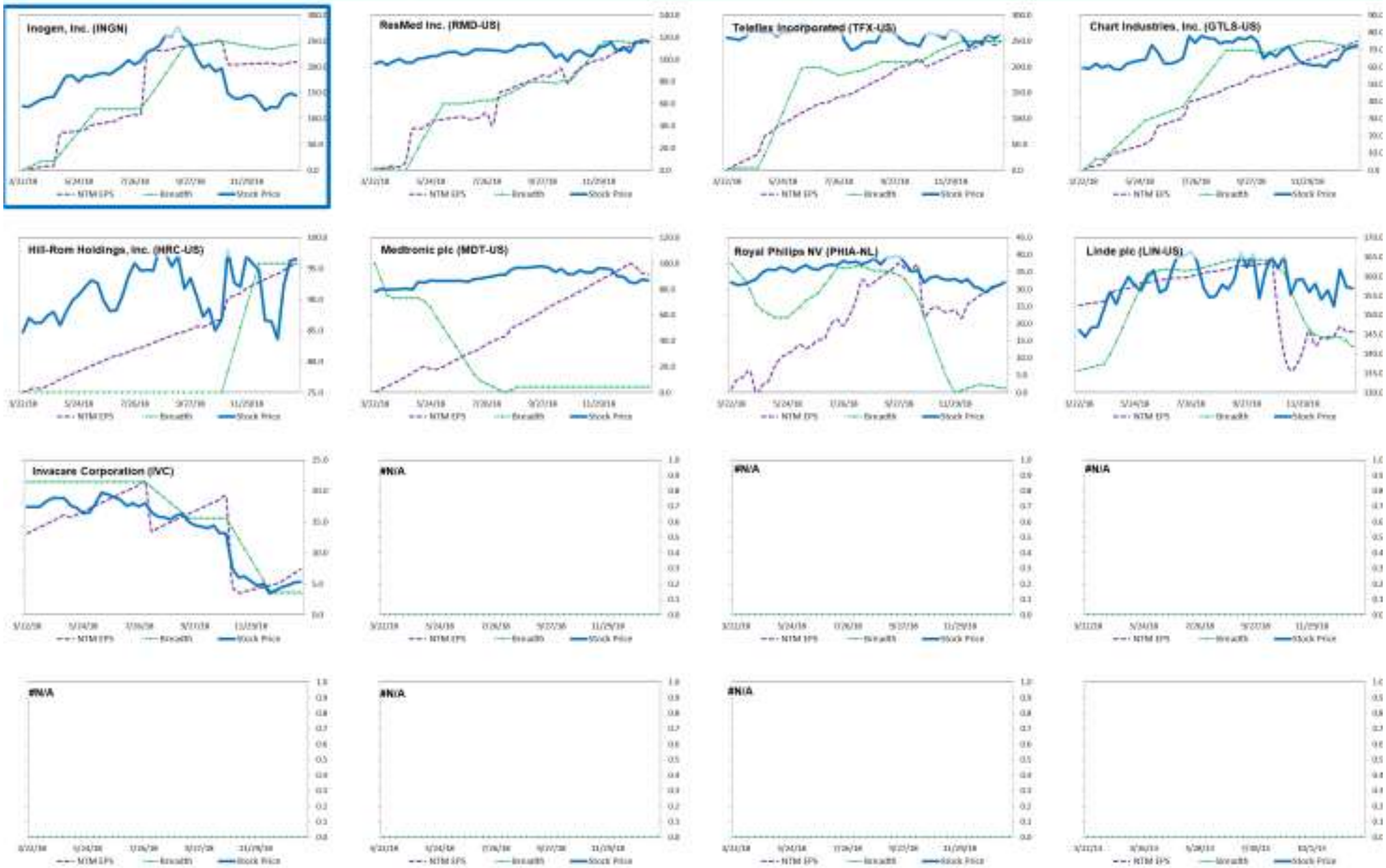






Source: Two Rivers Analytics; *Comparable companies: ResMed Inc (RMD), Teleflex Incorporated (TFX), Chart Industries, Inc (GTLS), Hill-Rom Holdings, Inc (HRC), Medtronic plc (MDT), Royal Philips NV (PHIA-NL), Linde plc (LIN), Invacare Corporation (IVC),*

Stock prices and Estimate Revisions



Source: Two Rivers Analytics; FactSet Research System Key: NTM EPS: The time weighted annual next twelve months consensus mean EPS. (FY1 EPS * % of year remaining in FY1 + FY2 EPS * (1 - % of year remaining in FY1))
Breadth: The percent of analysts increases minus percent decreases over the past 45 days. The total is accumulated to create the time series. (If this period, more analysts cut than raise, the net % is subtracted from the prior period's total.)
Stock Price: Only the stock price is scaled on the chart. The other metrics are to be viewed for their trends.

Inogen, Inc. (INGN)

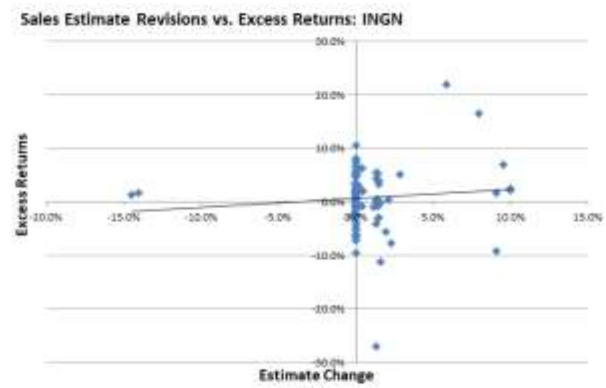
updated 1/24/2019

Correlations with Wall Street Analysts Estimates

2 Yr. Correl. 19.0%
6 Mon. Correl 19.1%
3 Mon. Correl 22.7%

Economic Significance:
Slope 0.22
"a 1% increase in estimates = an x% increase in stock price"

R-squared 0.04



2 Yr. Correl. 9.2%
6 Mon. Correl -2.0%
3 Mon. Correl -1.3%

Economic Significance:
Slope 0.17
"a 1% increase in estimates = an x% increase in stock price"

R-squared 0.01

2 Yr. Correl. 22.1%
6 Mon. Correl 46.8%
3 Mon. Correl 55.0%

Economic Significance:
Slope 0.37
"a 1% increase in estimates = an x% increase in stock price"

R-squared 0.05

2 Yr. Correl. 33.5%
6 Mon. Correl 59.8%
3 Mon. Correl 65.2%

Economic Significance:
Slope 0.43
"a 1% increase in target price = an x% increase in stock price"

R-squared 0.11

Source: Two Rivers Analytics; data from FactSet Research Systems
Outliers cut off at +70% and -70%

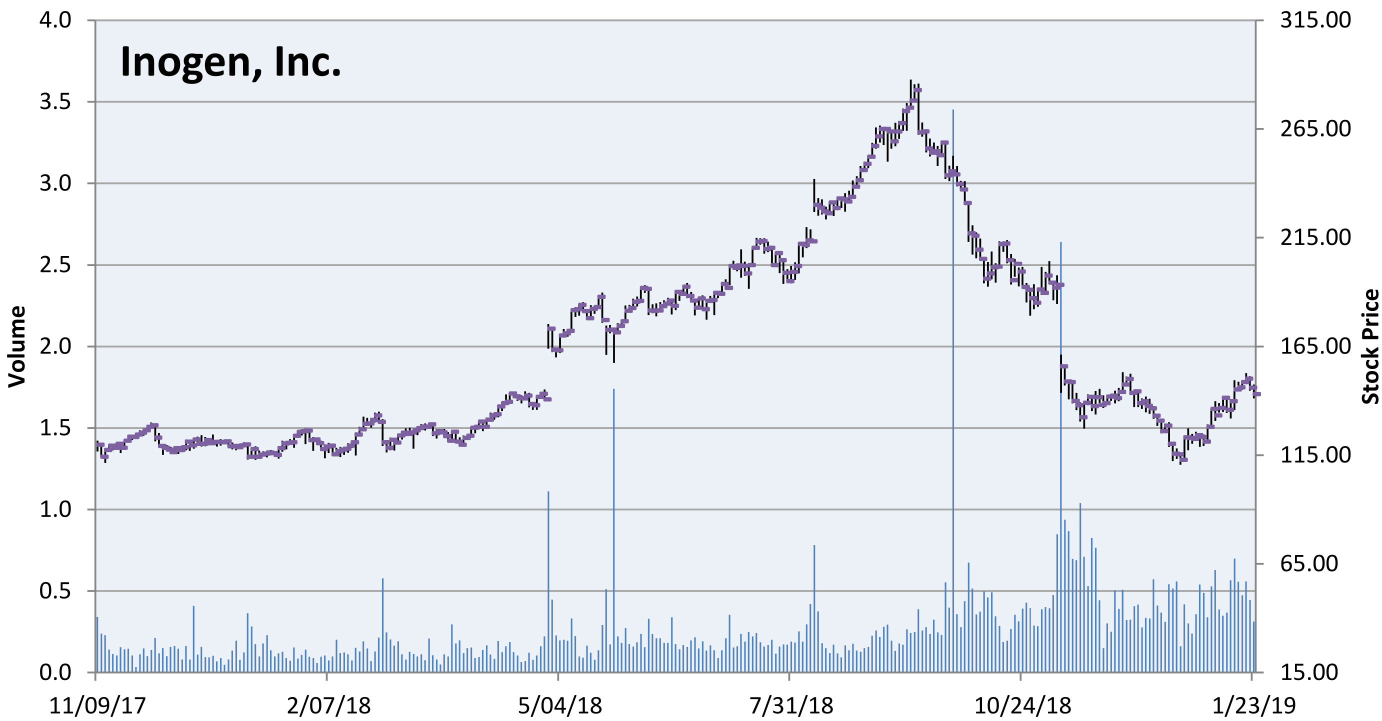
About Two Rivers Analytics

Two Rivers is dedicated to providing actionable, high quality investment ideas, with an emphasis on short ideas, to institutional investors.

Our work uses a hybrid quantitative/qualitative process to identify companies at high risk of a declining equity price. Our quantitative screening process identifies multiple categories of risk to create this Stock at Risk ranking. The ranking is vetted further through a timing/catalyst analysis and a shortability assessment. The best short ideas are analyzed fundamentally and presented to clients. The Stock at Risk ranking is also the basis for our Long/Short model portfolio.

For more information, including our process, influences and biographies, please visit TwoRiversAnalytics.com.

Important Disclosures



Ratings History: We are initiating coverage with a short recommendation.

Two Rivers Analytics rates a stock Sell/Sell Short based on characteristics that we feel indicate the stock is poised for a significant downturn and will underperform the market substantially. We have not issued any Buy or Hold ratings to date.

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