

As Seen On TV: 3D Printing Ready For Primetime

Positive View of the 3D Printing Sector; Recommending Leaders DDD and SSYS

- **3D printing ready to push beyond prototyping; Initiating on 3D Systems and Stratasys with a Buy** — We feel the 3D printing / additive manufacturing market is on the cusp of seeing much broader adoption across more upstream production applications and the consumer end market. We believe the addition of those two opportunities could more than triple the current \$2B+ market within 5 years (2017). As awareness of the technology's capabilities evolves, we believe demand for print systems, materials and custom parts will accelerate. We also expect to see increased utilization of existing systems as customers start to extend use case beyond small batch digital manufacturing.
- **Familiar script: Growing materials mix will drive margin expansion** — Similar to the 2D printer market, built on the razor/razor blade model, 3D print materials generate significantly higher gross margins (70%) than the printers (~40%). Consumables as a percent of revenue (mid-20s) is still low compared to the traditional print market (~80%) and we believe consumption will trend higher in the coming years. Additionally, adoption of higher-margin specialty materials which carry gross margins closer to 80% and a growing software component (~90%) will bolster overall profitability.
- **Prefer DDD for larger long-term TAM, clearer path to margin expansion** — We believe DDD's product line is best positioned to capitalize on all three potential market opportunities (Prototyping, Manufacturing, Consumer). We expect meaningful margin expansion from growing recurring revenue mix to drive earnings growth in excess of 30%. DDD's numbers already reflect years of investing in low-priced consumer market giving margins a clearer upward trajectory.
- **SSYS will drive better utilization/cross-sell into large user base** — We expect SSYS to benefit from increase materials usage and cross-sell (Objet / Makerbot) into its huge install base. The Makerbot acquisition also positions SSYS for an outsized share of the growing consumer market. We see sustainable margin expansion and earnings growth with materials consumption driving recurring revenue mix. The recent Objet merger coupled with Makerbot adds some integration risks.
- **Valuations justified by growth** — At first glance DDD and SSYS, trading at 19x and 17x our CY14 EBITDA appear inflated, however, we believe current multiples are justified due to sustainable EBITDA growth north of 30% over the medium term.

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Company	Ticker	Rating		Target Price		Current Year Earnings Estimates	
		Old	New	Old	New	Old	New
3D Systems	DDD	NA	1	NA	US\$60.00	NA	US\$0.98
Stratasys	SSYS	NA	1	NA	US\$125.00	NA	US\$1.89

See Appendix A-1 for Analyst Certification, Important Disclosures and non-US research analyst disclosures.

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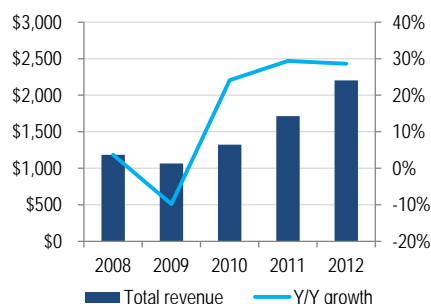
As Seen On TV: 3D Printing Ready For Primetime

Investment summary

We are initiating coverage of the 3D printing / additive manufacturing sector with the two market leaders; 3D Systems (DDD) with a Buy rating and \$60 price target and Stratasys (SSYS) with a Buy rating and \$125 price target. While we expect both stocks to benefit from the growing demand for 3D print systems, materials and services, we prefer 3D Systems over Stratasys for its ability to capture a greater share of the total addressable market and clearer short- and medium-term margin trajectory.

Additive manufacturing is the process of repeatedly applying thin layers of materials to build objects generated from 3D computer animated design (CAD) files. The technique is most commonly used by engineers during the prototyping stage of the design process. The main print materials are thermoplastic filaments, photopolymer resins, and powdered sand and metals, all of which are associated with specific print technologies and processes which we discuss in greater detail later on.

Figure 1. Market still early and accelerating



Source: Citi Research, Wohlers Report 2012

Market opportunity expanding: We believe the ~\$2B+ additive manufacturing market is beginning to attract customers beyond the traditional concept modeling and prototype engineers crowd. Larger manufacturing companies are looking to add elements of additive manufacturing into the production process and specialty end-markets such as medical, dental and jewelry are already printing end-use parts and goods for commercial use. General Electric is incorporating 3D printed components for its next generation LEAP engine due to the ability to create more complex and intricate geometries. Companies within the health vertical such as hearing aid maker Phonac and Invisalign braces manufacturer Align have already based their entire manufacturing process on the technology.

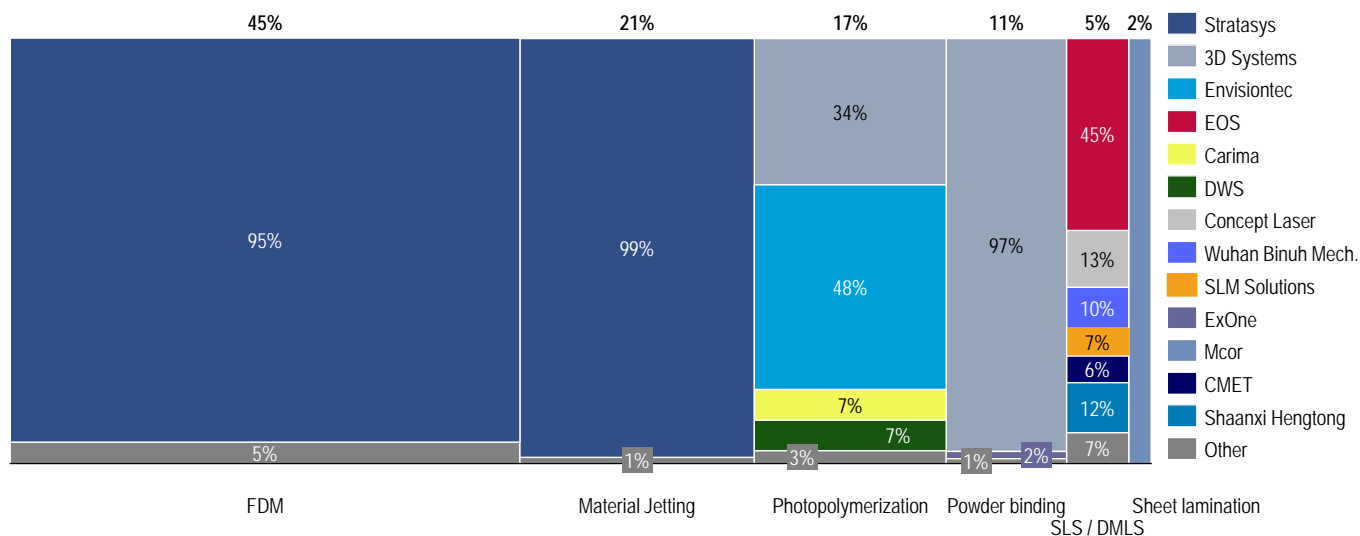
While advance manufacturing applications currently account for 10-15% of total sales, over the long term we believe direct digital manufacturing (DDM) could represent the biggest share of the 3D printing market. Additionally, the recent "Maker" movement has created a flood of consumer curiosity and interest which we believe will materialize into a significant new market segment. We see the addition of those two opportunities as more than tripling the addressable market. We believe as customer awareness of the technology's capabilities evolves, demand for print systems, materials and custom parts will accelerate.

Margin expansion coming from improving revenue mix: We expect growing print materials mix to drive sustainable long-term margin expansion. As is the case with the traditional 2D printer market, 3D printer manufacturers generate significantly higher gross margins (~70%) on the print materials than the actual systems (~40%). Materials, also known as consumables, currently accounts for <30% of total sales, much lower than the traditional print market (~80%) and we believe consumption will trend higher in the coming years. Additionally, adoption of higher-margin specialty materials which carry gross margins closer to 80% and a growing mix of software (~90%) will bolster the company's current margin profile.

3D printing is still a green field: We see plenty of open field for market participants to roam, but the competitive environment is getting warmer. While DDD and SSYS are the clear leaders in the sector accounting for a disproportionate share of the current market (Fig. 2), the industry is still early enough such that it is not yet a zero sum game. At the present, each system manufacturers offer relatively unique print capabilities and materials. Our discussion with those in the industry suggest it is not unusual for customers to have machines from multiple vendors

running side by side in order to address different needs and applications. M&A activity has been picking in the space creating overlap across technologies. Over time, we anticipate that as consolidation gets more pronounced the product overlap could eventually create a more intense competitive environment. For now, we believe a rising tide lifts all ships.

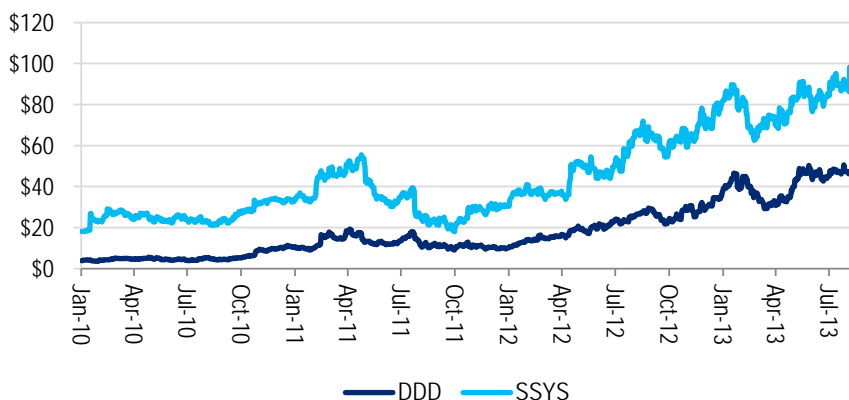
Figure 2. Unit market share by 3D print process



Source: Citi Research, Wohlers Report 2012, Company Websites

Valuations justified by growth: On the surface, current valuations (CY14E EPS - DDD: 36x / SSYS: 40x) appear inflated. However, we believe current multiples are justified due to sustainable earnings growth north of 30% over the medium term. Additionally, we believe investors will start to place greater emphasis on sector valuations from the perspective of EV/EBITDA instead of P/E as the growing capital investments needed to expand the services component of the business is a drag to pro-forma earnings. Through the lens of EV/EBITDA, Stratasys and 3D Systems are trading at 17x and 19x CY14 estimates respectively, with short- and medium-term EBITDA growth expected to be north of 30% by our forecast. Current multiples are also 20-25% below recent highs of 25x.

Figure 3. Stock performance



Source: Citi Research

Both companies are starting to generate a much greater share of sales from more profitable recurring revenue (materials and software). This dynamic has the dual effect of evening out lumpy printer sales and increasing revenue visibility and driving profitability. As we have seen with subscription-based valuation in the software sector, investors are willing to pay a premium for higher quality revenue. Lastly, there are limited assets to choose from in the 3D printing sector and so we recommend investors interested in adding exposure to this market buy both shares of DDD and SSYS.

Figure 4. Comparable company valuations: 3D printing

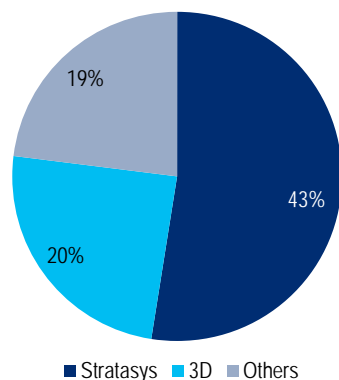
Company	Rating	Target Price	Price 8/23/13	Market Cap	Net Cash as % of Mkt Cap	Enterprise Value	EV as Multiple of EBITDA		EBITDA Growth '12-'13E	EV as Multiple of Revenue		Revenue Growth '12-'13E	P/E	
							CY13E	CY14E		CY13E	CY14E		CY13E	CY14E
3D Printing / Tools														
SSYS	1	\$125.00	\$105.82	\$4,092	4%	\$3,936	21.3x	16.7x	166%	8.5x	6.3x	114%	55.9x	40.0x
DDD	1	\$60.00	\$48.44	\$4,922	6%	\$4,605	26.6x	18.9x	67%	9.0x	7.2x	44%	49.7x	35.9x
XONE	NR	--	\$67.80	\$900	7%	\$839	NM	47.8x	NM	17.3x	11.2x	69%	NM	NM
PRLB	NR	--	\$71.11	\$1,802	7%	\$1,682	28.5x	23.7x	89%	10.4x	8.5x	28%	49.6x	41.3x
							Median	26.6x	21.3x	9.0x	7.2x		49.7x	40.0x
							Mean	25.4x	26.8x	9.8x	7.3x		51.7x	39.1x
CAD / Digital Design Software Vendors														
ADBE	1	\$52.00	\$45.77	\$22,989	10%	\$20,958	15.9x	14.2x	-27%	5.2x	5.0x	-7%	31.5x	28.9x
ADSK	2	\$36.00	\$38.91	\$8,821	23%	\$7,201	12.4x	11.9x	2%	3.1x	3.0x	-1%	22.1x	20.1x
PMTI	NR	--	\$27.39	\$3,261	NA	\$3,272	10.6x	9.4x	27%	2.5x	2.4x	3%	14.9x	13.3x
DSY-FR	1	\$108.00	\$99.39	\$12,536	9%	\$11,461	15.6x	13.7x	27%	5.4x	4.9x	5%	26.7x	24.2x
AVV-GB	1	\$24.60	\$23.84	\$1,522	NA	\$1,522	16.0x	14.0x	31%	6.3x	5.7x	12%	0.3x	0.2x
							Median	16.0x	14.2x	5.9x	5.3x		29.1x	26.6x
							Mean	18.4x	18.9x	7.1x	5.8x		31.3x	25.5x

Source: Citi Research, Factset

We want exposure to this secular story: We believe both companies will benefit from new customer growth as the technology extends to new markets and increased utilization of existing systems as customers extend use case to small batch digital manufacturing. However, we prefer DDD because the company is better positioned to capture a greater share of the long-term addressable market. We believe DDD's product line is best positioned to capitalize on all 3 potential market opportunities (Prototyping, Manufacturing and Consumer). Additionally, the company has already invested heavily in seeding the consumer market and we believe the headwind to earnings from the initiatives is already reflected in numbers giving the company a much cleaner path to higher profitability.

3D Systems is our preferred pick: We believe 3D Systems is one of the best positioned companies to take advantage of the rapidly growing additive manufacturing / 3D printing sector. We expect adoption of 3D printing to extend beyond the existing rapid prototyping market and *slowly* over time replace many processes currently employed by advance manufacturing. Additionally, contrary to current expectations, we believe the consumer market will develop rapidly with 3D printers fulfilling consumers' appetites for the next "it" gadget. We feel the company's product portfolio and strong market position uniquely qualify 3D Systems to address all three market opportunities. Finally we believe 3D Systems could deliver upside to out-year earnings estimates as high-margin recurring consumables revenue becomes a much bigger mix of total revenue.

Figure 5. Market share of install base
(Cumulative systems sold)



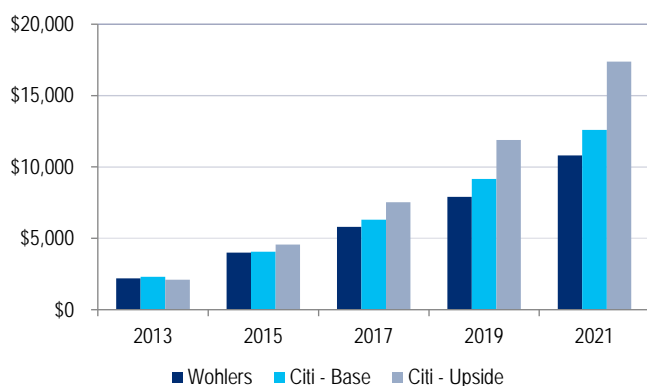
Source: Citi Research, Wohlers Report 2012

Stratsys will leverage large installed base: We think Stratsys is well positioned in the near term to drive incremental value from its large customer install base. While their business is more closely aligned with the “mature” prototyping market, we think the uptick in activity in the space will allow Stratsys to see increased materials sales. Additionally, the company recently finished training the combined Stratsys/Objet channel to sell the complete product line. Over the next 2-3 years, we believe SSYS can continue to capture a significant share of the prototyping market. The company’s recent Makerbot acquisition now positions Stratsys to leap into pole position in the Consumer segment, a market where it was previously absent. We do see integration risks with the Makerbot acquisition closing only 9 months after the company’s merger with Objet.

Unwilling to be typecast for just prototyping; Eyeing bigger roles in advance manufacturing & consumer

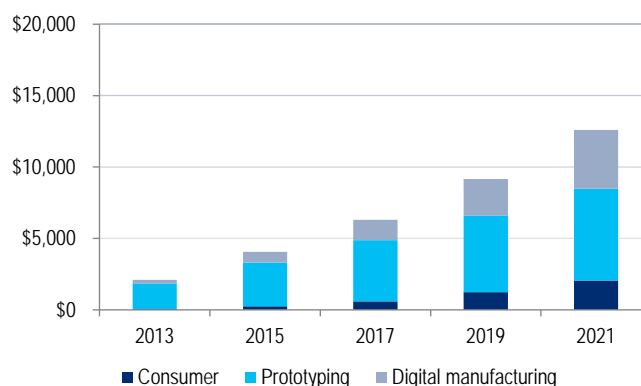
The market for print systems, materials and services in 2012 was estimated to be roughly \$2B and growing north of 20% by market research firm Wohlers Associates. We believe the 3D printing / additive manufacturing market is about to experience much broader adoption across more upstream production applications and the consumer end market and as such our baseline assumptions project a slightly steeper trajectory than industry estimates (Fig. 6). In the past 3D printers were seen as too slow to manufacture true production parts or end-use products and the machines / materials too expensive and technical expertise threshold too high for the average consumer. We believe digital manufacturing applications will become a much larger share of the overall pie and expect the segment to represent a third of the total revenue contribution by 2021.

Figure 6. Market size projections: Citi vs. Industry expectations (in MM)



Source: Citi Research, Wohlers Report 2012

Figure 7. Market is expanding beyond prototyping (Base case)



Source: Citi Research

Next industrial revolution likely premature, but broader adoption of Direct Digital Manufacturing (DDM) seems inevitable

Our colleagues on the Citi Industrials research team delve in greater detail on the potential impact on the global manufacturing sector ([3D Printing: Rewriting Global Manufacturing](#))

The media has already proclaimed additive manufacturing as the next industrial revolution. While it is a bit early to make such grand projections, we do believe that the use case is extending beyond prototyping and pre-production mold making to the manufacture of actual end-use parts. Currently, we believe this activity accounts for less than 10-15% of \$2B+ in revenue generated in the industry, but we expect it to contribute more meaningfully over the next 3-10 years as global manufacturers incorporate the technology in an effort to gain any edge to differentiate against the competition. By 2015 we expect revenue contribution from advance manufacturing applications to account for close to \$800M, ~20% of all AM revenue and in less than 10 years (2021) the mix should be nearly a third (\$4B).

We expect any transition to be gradual as the technology is not yet capable of producing at the scale and speed necessary for large run manufacturing. The costs in larger build volumes can also be prohibitive with like for like materials for 3D print processes typically sold for 10-100x what traditional plastics, waxes and metals sell for.

However, we see continued improvement in capabilities, speed, build volumes and price of production systems which better address the needs of advance manufacturing. The technology has been shown to help manufacturers improve time to market by speeding up the iterative design process. In small batch production and for customized end products, the cost of 3D printing can be meaningfully below traditional manufacturing processes.

We are already seeing signs of increased interest and broader adoption from Fortune 500 companies. Microsoft uses the technology extensively in the design process of their PC hardware and accessories. General Electric has not only produced engine parts for its next generation LEAP engine but has also invested heavily in the technology with acquisitions of large 3D print service bureaus. Many companies within the health vertical, such as hearing aid maker Phonac and Invisalign braces maker Align have already based their entire manufacturing process on the technology.

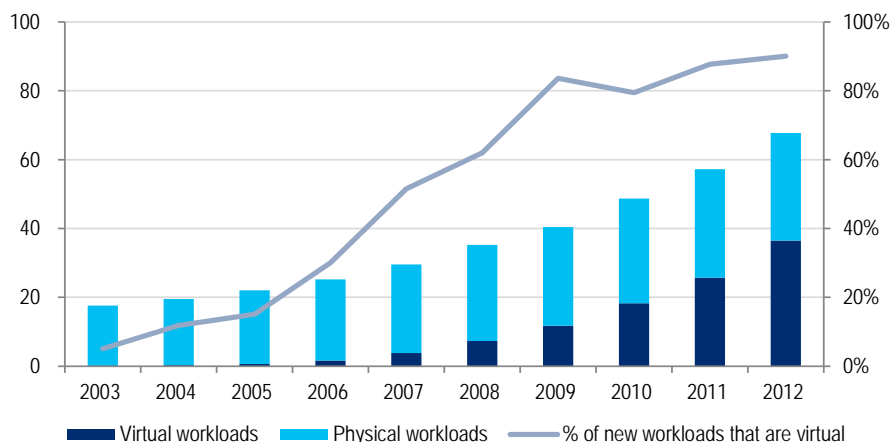
Establishing a framework to understand the advance manufacturing opportunity

We believe the transition to digital manufacturing for traditional industrial production companies will be slow and gradual with the customer incorporating the technology in niche product areas, most likely new product development. We liken the adoption of 3D printing to server virtualization as it was initially used in development & testing and quality assurance environments and rarely for implementation of enterprise applications. We recognize that the comparison is not perfect since server virtualization produced a compelling upfront ROI, but we believe the mechanics of how incremental workloads were migrated over to a new process are a good case study for how investors should think about the timeframe of additive manufacturing adoption.

As we have seen with other new technologies, adoption accelerated as large customer begin to surface, their case studies provided tangible evidence that enabled proper benchmarking of virtual environments to traditional physical workloads customer adoption accelerated. Virtualization began to penetrate low level workloads such as web servers and slowly saw deployments across higher

priority workloads. Only now, more mission critical infrastructure such as the databases are being evaluated. We provide a detailed transition timeline below and believe the concept can be applied to manufacturing.

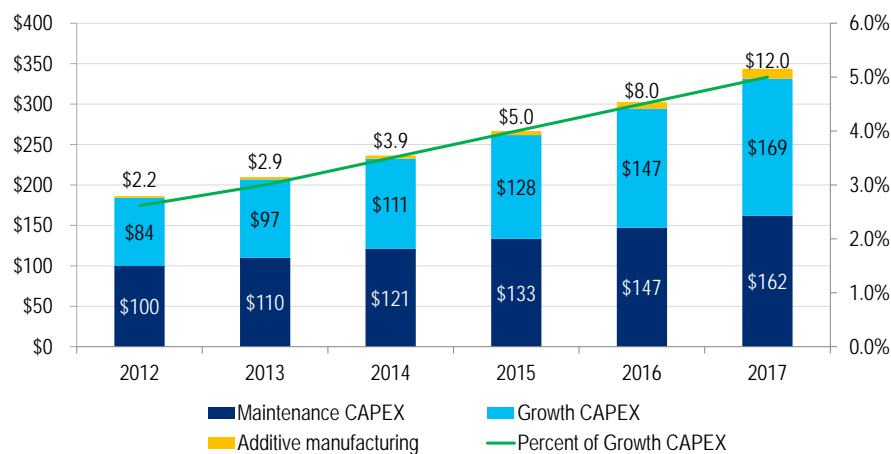
Figure 8. Server virtualization penetration



Source: Citi Research

We believe the most important takeaway from the comparison to server virtualization is that existing manufacturing capabilities (physical workloads) such as injection molding or CNC (computer numerical control) do not have to be replaced for additive manufacturing to carve out a bigger market. As detailed in our server virtualization example (Fig. 8), the total number of physical workloads actually has increased in the past 10 years. However, with new workloads moving faster to VMs, in time the install base of virtual instances became the dominant process. While the pace may be slower due to manufacturers being slower to change than tech companies, we believe this dynamic will occur with 3D printing in the industrials.

Figure 9. Conservative 5-year trajectory of additive manufacturing as a share of growth capital spending budgets of customer verticals



Source: Citi Research

We applied the server virtual adoption concept to additive manufacturing to determine how large this market could potentially become. We aggregated growth and maintenance capital spending estimates across 284 global manufacturing and industrial companies that we believe are potential end users that are covered by Citi analysts. We then applied the 5-year historical CAGR of maintenance and growth

CAPEX spending (10% and 15% respectively) out to 2017. Last, we looked at total revenue from 3D printing as a percent of 2012 growth CAPEX spending (2.6%) and added 50bps to each subsequent year. We believe the potential market could be \$12B by 2017, well ahead industry projections of ~\$6B. Our conservative projection does not factor in the potential of the consumer market which we believe can be a billion dollar market in 5 years.

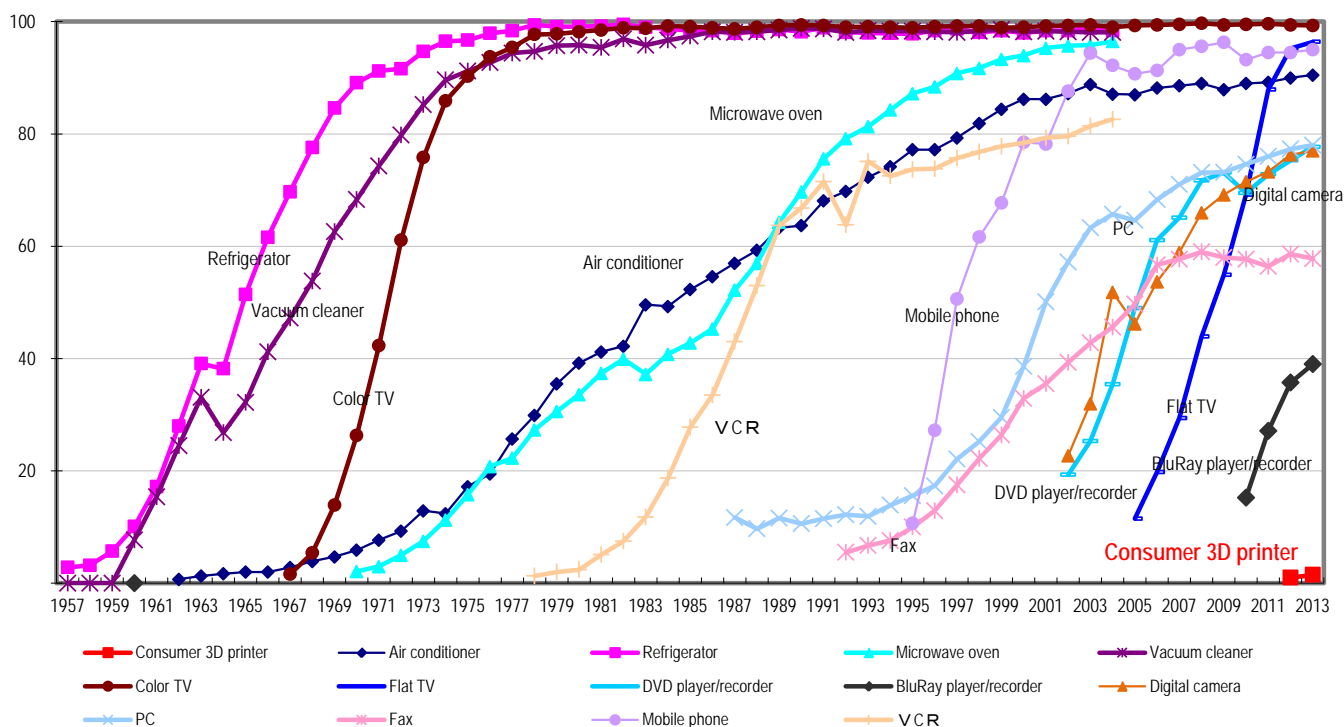
3D Printers: More likely to be the next VCR than a Segway

Stratasys and Makerbot recently estimated that 35-40K desktop 3D printers were sold in 2012 and projected this figure to double in 2013. There remains a great deal of uncertainty around the trajectory of the consumer market with skeptics questioning the use case for the device and bulls envisioning a world where everything is printed in the home. While we are not yet convinced the technology will be in every home, we do believe that consumer 3D printers could eventually be a multi-million unit opportunity (annual). While a rising consumer tide likely lifts all boats, as an early mover we would expect 3D Systems to capture an above-average share of the incremental revenue.

Trajectory of past consumer devices offer perspective on possible adoption timeframes

With the help of our consumer electronics colleagues in Asia we were able to map the adoption of popular household electronics in Japan which we believe to be a reasonable proxy for the trajectory of other developed markets. The typical time to achieve 5% penetration of households was 3-5 years, with the 10% milestone taking an additional 2-4 years and full penetration requiring about 20-25 years.

Figure 10. Household penetration of consumer devices (Japan)



Source: Citi Research, "Consumer Confidence Survey" Cabinet office, Government of Japan

Sizing the consumer market

Not all products are created equal and we see three possible paths that could unfold. The most positive scenario being near 100% adoption by households over time much like refrigerators, TVs, microwave, etc. The trajectory of these products was typically much steeper with nearly 5% penetration of households in fewer than 3 years and 20%+ adoption within 10 years. When we apply these adoption rates to the 120M US households, we estimate cumulative sales could grow to \$2B by 2015.

We believe adoption will be closer to devices such as the fax machine and video camcorders which had a specific value proposition to a large demographic but not the entire population. Adoption for these types of products typically inched up over time hitting ~10% after ten years, eventually reaching ~60-70% of households over the product life. When we apply these adoption rates to the 120M US households, we estimate cumulative sales could be just under \$1B by 2015.

The last scenario shows how adoption would look if 3D printers turn out to be a passing fad like mini disk and HD DVD players. These types of products usually showed modest adoption in early years before eventually petering off and showing only limited production runs to niche users. When we apply these adoption rates to the 120M US households, we estimate cumulative sales could be ~\$300M by 2015 but would likely tail off after this point.

Figure 11. Potential consumer market adoption / opportunity

(in millions, except ASPs)	Full Adoption				Broad Adoption				Limited Adoption			
	2013	2014	2015	2022	2013	2014	2015	2022	2013	2014	2015	2022
Penetration	0%	1%	4%	25%	0%	1%	2%	10%	0%	0.3%	0.5%	4%
Install base	0.04	1.2	4.8	30.0	0.04	0.6	1.8	12.0	0.04	0.3	0.6	4.8
Estimated ASP	\$1,000	\$500	\$450	\$100	\$1,000	\$500	\$450	\$100	\$1,000	\$500	\$450	\$100
Cumulative sales	\$40	\$620	\$2,240	\$8,270	\$40	\$320	\$860	\$3,455	\$40	\$170	\$305	\$1,247

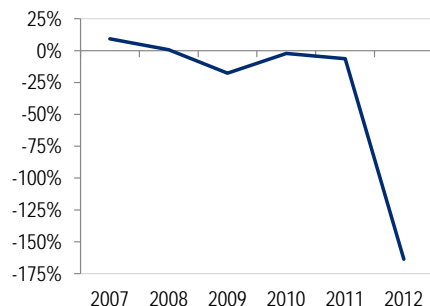
Source: Citi Research

Roadblocks to broader consumer adoption slowly being removed

We realize that the adoption analysis above cannot be viewed in a vacuum and recognize that several factors will also determine the trajectory of the consumer market. Pundits typically highlight the lack of a clear-cut use case, but we believe that is a problem that should resolve itself over time as is typically the case with all new and revolutionary consumer products. It is only in hindsight that the applications for PCs, cell phones, microwaves and other novel consumer products become apparent. Considering the infinite number of application that a 3D printer could be used for, we believe it would be unrealistic to pigeon hole the device to a singular "ideal" use case.

We believe there are three main impediments to broader consumer adoption of 3D printers: 1) Price; 2) Content creation tools; 3) Distribution.

Figure 12. Contribution from price to DDD's systems revenue growth



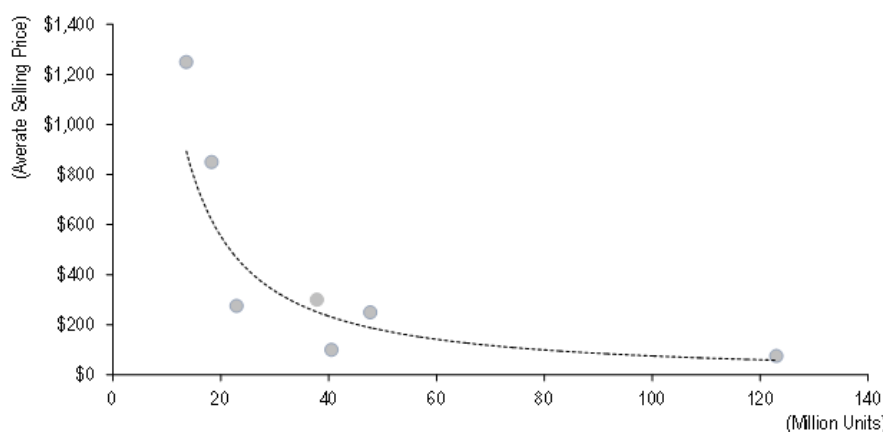
Source: Company reports, Citi Research

Pricing trending toward consumers' comfort zone

The average selling price of professional 3D printers has fallen dramatically since 2001 from \$117K to ~\$80K. We recognize that a consumer would never pay \$80K for a printer, but the chart does illustrate for us the downward pressure that the industry is seeing on price. The recent Maker movement building on the RepRap open source initiative has resulted in a flood of cheap consumer-oriented manufacturers such as Makerbot entering the market. We are already starting to see devices priced as low as \$500 from some Chinese manufacturers.

However, we recognize that the vast majority of consumers are unlikely to purchase a poorly made product from unknown vendors, but we do think there is a market for a well-made \$500 printer from a respected brand. 3D Systems Cube printer is currently priced at \$1,200, likely still well above the threshold for the average consumer, but CEO Avi Reichental has stated on numerous occasions that the company will introduce a \$500 Cube printer by the end of the year. Over time we expect the pricing trends discussed above to drive price points even lower.

Figure 13. Impact of pricing on adoption of recent consumer devices



Source: Citi Research, Gartner

Content creation being simplified with "Complete Stack"

We view the lack of easy to use, cheaply accessible content creation tools as limiting consumer interest to early adopters and the hobbyist community. Our discussions with 3D Systems as well as other players in the market indicate that this is a top priority. DDD has been aggressive acquiring software and content related technologies (Geomagic, Vidara, FreshFiber, TeamPlatform) to help bridge the technical gap between the hardware and the average consumer. Even traditional CAD software vendors such as Autodesk have brought their core AutoCAD downstream to consumers with Autodesk 123D.

We also see the growth of online service bureaus and content repositories such as Shapeways, Thingiverse and even eBay as helping to bring the technology down to the masses. Like parts services bureaus catering to large manufactures, we believe consumer-facing service bureaus will help evangelize the technology and serve as a good feeder system for future printer sales.

Broadening distribution across multiple channels

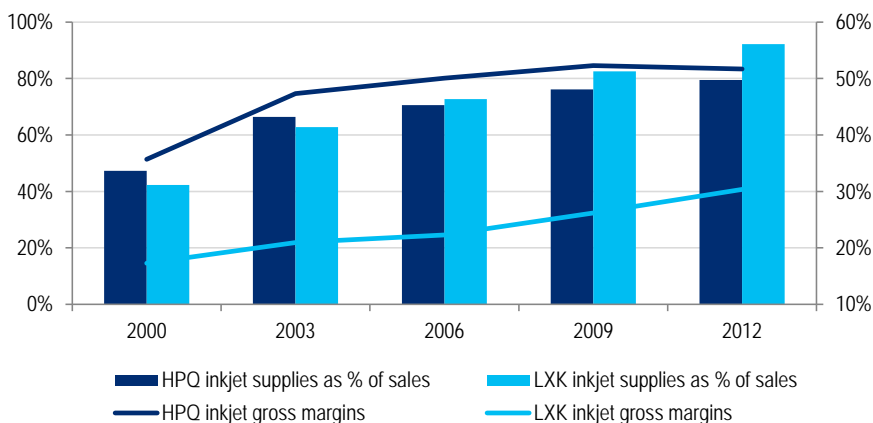
The majority of personal desktop printers were sold direct to customers from a manufacturer's website. While consumers have grown more adept at purchasing direct from a company's website, we believe broader distribution channels and

marketing will be needed to accelerate growth. The key players (Makerbot and 3D Systems) are already expanding their go-to-market with retail distribution deals. We first saw it with 3D System's Cube being offered at Staples last year. More recently we have seen partnerships with Amazon, Office Depot, UPS and Microsoft. We expect this trend to pick up steam in the coming month and would not be surprised to see 3D printers surface in other mainstream retailers such as Best Buy, Wal-Mart and Target.

We've seen this plot before: Growing mix of high-margin materials will drive profitability

Similar to traditional 2D printer manufacturers, the underlying business principle is built on the razor / razor blade model where sales of materials (consumables) generate significantly higher margins (70% gross margins) compared to system sales which generate ~40% gross margins. Additionally, the continued adoption of higher-margin specialty materials which we believe carries gross margins closer to 80% and a growing mix of software (typically 90% margins) will improve upon the profitability of the company's current margin profile.

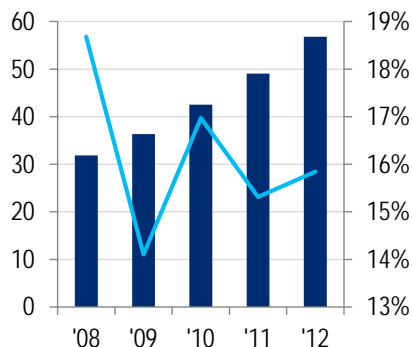
Figure 14. Impact of traditional inkjet supplies mix on gross margins



Source: Citi Research, HPQ Company reports, LXX Company reports

Seeding of systems in 2012 and 2013 will bear fruit in the future

Figure 15. Growth of install base establishes foundation for higher materials sales

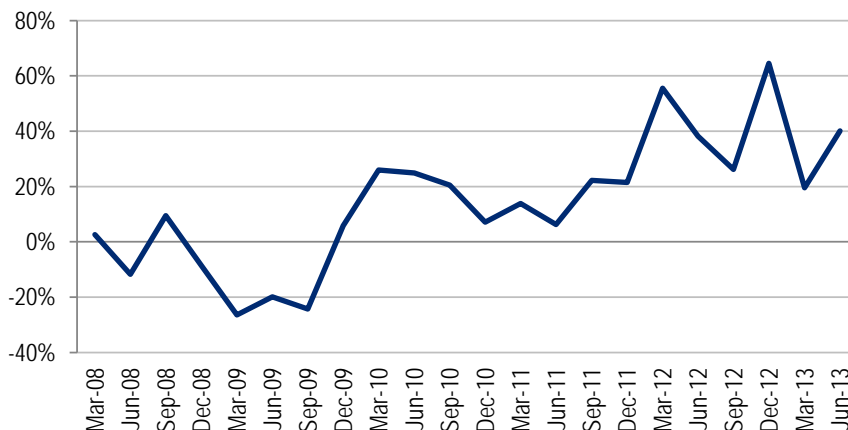


Source: Citi Research

We believe FY12 and FY13 was a "seeding" period for print manufacturers with the spike in interest helping to drive systems sales. 3D Systems and to a lesser extent Stratasys invested heavily in building out their own customer parts service bureaus. The service bureaus bring a strong pipeline of incremental revenue in addition to serving as a great lead generator for future system sales.

We believe the growth of the install base will help drive future consumable sales which have already started to show in results. Consumables revenue growth that is generated by volume has jumped up considerably in the past 12-18 months. Since the start of 2012, DDD has seen volumes on average account for 40% of the increase in materials revenue compared to 18% in 2010 and 2011. SSYS does not break out this level of detail but on a high level growth of their consumable have remained consistently strong (+mid-20s Y/Y growth) over the past 12 quarters.

Figure 16. Contribution from volumes to DDD's materials revenue growth

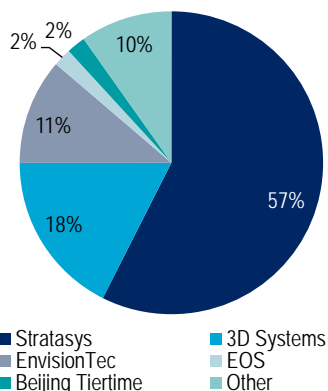


Source: Citi Research, DDD Company reports

Competitive landscape: Enough growth to go around

The additive manufacturing / 3D printing landscape is fairly top heavy consisting of a few dozen manufacturers globally. In terms of unit sales, Stratasys and 3D Systems are the two largest accounting for nearly three quarters of the market. System manufacturers offer relatively unique print capabilities and materials. It is not unusual for customer to have machines from multiple vendors running side by side. Each technology allows the manufacturer to address different needs and applications.

Figure 17. 2012 unit market share



Source: Report Wohlers 2012

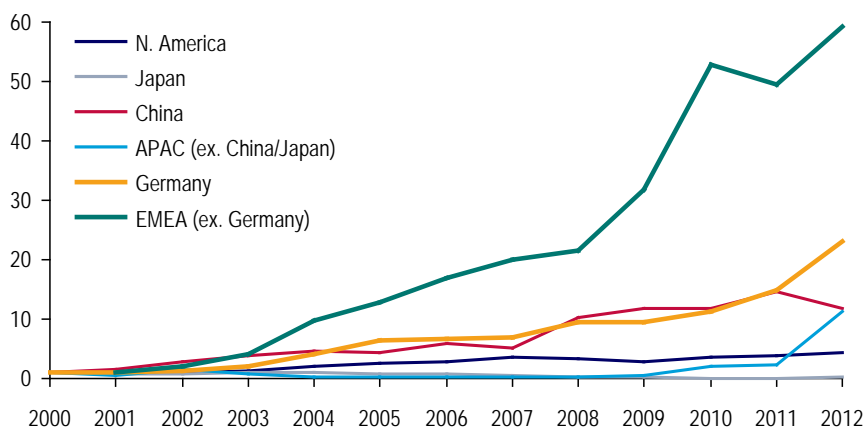
While 3D Systems and Stratasys are clearly competing for market share and mind share, the industry is still early enough that it is not yet a zero sum game. At this time we are not worried that about share shifts as there is still plenty of green field for all market participants to benefit. Our conversations with industry experts and customers indicate that the lack of true competition has allowed the manufacturers to maintain pricing power on materials. Print systems have fallen in price that is due more to typical hardware pricing dynamics and a strategic objective to penetrate the more price sensitive consumer market.

Regional share shifting outside of North America

International manufacturers, specifically in Europe and Asia, have experienced a noticeable increase in sales of 3D print systems. European and Asian vendors have traditionally targeted more upstream applications for advance manufacturing, specializing in processes such as direct metal laser sintering and electron beam melting, which are used to create metal parts. These technologies are better suited for the needs of the large manufacturing base common in these regions.

While the data shows a modest pull-back in sales from China, we believe there is the potential for long-term disruption from the emergence of 3D-printing. On one hand, 3D printing could emerge as an even lower-cost production methodology than China's low labor cost model which would favor the 3D printing sector as whole. On the other hand, we would expect Chinese manufacturers to get more aggressive in this market to offset the shift. We are already seeing a bigger push from Chinese manufacturers of consumer desktop printers which accounted for nearly 75% of the vendors at a recent Maker event we attended.

Figure 18. Asian and European vendors seeing accelerated growth



Source: Citi Research

M&A activity warming up





























The competitive environment is undoubtedly getting warmer as evidenced by the uptick in M&A activity. Over the near term, we expect acquisitions to be of the nip tuck variety. 3D Systems takes a fairly measured approach and typically does not get overly aggressive with large M&A. In contrast, Stratasys has to digest the Objet merger and the recently closed Makerbot acquisition. However, both companies recognize that their equity is a valuable currency right now and we would not completely rule out larger targets. Over time, we anticipate that as consolidation gets more pronounced the product overlap could create a more intense competitive environment. For now, we believe a rising tide lifts all ships.

Figure 19. Recent mergers & acquisition activity

Date	Buyer	Target	Value	Description
Aug-13	3D Systems	CRDM	--	UK service bureau
Aug-13	3D Systems	VisPower Technology	--	Collaborative design and project management platform
Jul-13	3D Systems	Phenix Systems	\$16	Manufacturer of DMLS 3D printing devices
Jun-13	Stratasys	MakerBot	\$615	Leading provider of consumer desktop printers
May-13	3D Systems	RPDG	--	Service bureau specializing on-demand parts
Jan-13	3D Systems	Co-Web	\$1	Content hosting and publishing platform for 3D goods
Jan-13	3D Systems	Geomagic	\$55	3D design and authoring software tools
Oct-12	3D Systems	Rapidform	\$35	3D scan-to-CAD software provider
Oct-12	3D Systems	The Innovative Modelmakers	--	Netherlands-Based service bureau
Jul-12	3D Systems	Viztu Technologies	\$1	Online platform to turn photos/videos into 3-D creations
May-12	3D Systems	Bespoke Innovations	--	Provider of custom designed and delivered prosthetics and orthotics
May-12	3D Systems	Fresh Fiber	\$1	3D printed consumer goods company
Apr-12	Stratasys	Objet	--	Merger with leading polyjet 3D printing manufacturer
Apr-12	3D Systems	Paramount Industries	--	Service bureau specializing in aerospace & medical device applications
Apr-12	3D Systems	Resolutex 50	--	
Apr-12	3D Systems	My Robot Nation	--	Consumer-oriented 3D printing platform
Nov-11	3D Systems	Contex Holding	\$137	Multijet 3D print manufacturer, Z Corporation and 3D imaging company Vidar

Source: Citi Research, Factset, Company reports

Figure 20. 3D printing technologies

Print Process	Description	Companies	Materials	Strength	Surface Finish	Speed	Multi-material	Printer Cost	Materials Cost
Fused-deposition modeling (FDM) / Material extrusion	Thermoplastic filament is heated, liquefied and extruded through a nozzle. Process is repeated layer by layer until completion	Stratasys, 3D Systems (Cube), Most consumer desktop printers	ABS, ABSi, PLA, polycarbonate, Ultem					\$	\$
Material Jetting / Multi-jetting	Similar to 2D ink jet printers; Places droplets of photopolymers which are cured by UV light. Multi-material jetting capable	Stratasys (Connex), 3D System (Projet)	Photopolymers with plastic, rubber & wax properties					\$\$	\$\$
Stereolithography (SLA)	Liquid photopolymer is cured by an ultraviolet laser that is directed at the build platform by mirrors to control x-y axis. Requires post production curing.	3D Systems	Thermoplastic, wax, ceramics					\$\$	\$\$
Digital Light Processing (DLP)	Liquid photopolymer is cured by a projected image from high powered lamps or LEDs	Formlabs	Plastic, wax, ceramics					\$	\$\$
Powder Binding	Micro powders of sand, plastic or metal is thinly spread out then bonded by jetted liquid adhesive. Significant post production powder removal & curing	3D Systems (ZCorp), ExOne	Sand, plastic, ceramics, cement, metals					\$\$\$	\$\$
Selective Laser Sintering (SLS)	Focused laser beam melts and binds powdered plastics, waxes and/or metals	3D Systems, ExOne, EOS, Arcam	Nylon, metals, ceramics, glass					\$\$\$	\$\$\$
Sheet Lamination	Sheets of material (paper, etc) are bonded together by an adhesive and the design of the end product is shaped with carbide blades.	Mcor	Paper					\$	\$

Source: Citi Research, 3D Systems, Stratasys, EOS, FormLabs, ExOne, MCor, Arcam

Talking tech: Processes and materials

The 3D print landscape is divided by the varying approaches to the additive manufacturing process. The different print processes are typically tied to specific materials and produce varying material properties such as strength and surface finish that can better suited for certain applications. The print consumables address nearly the entire spectrum of materials currently being used in the manufacturing process with plastics, glass, paper, ceramics and even metals. Printer manufacturers market the benefits of their proprietary materials as being optimized for their systems and often bind the printer warranty to consumption of OEM materials. Refer to figure 20 for our summary table.

Fused deposition modeling (FDM) / Material extrusion

FDM is the technology most commonly used by consumer desktop printers such as Makerbot

The process involves plastic filament being forced through a heated nozzle that traces the desired shape over a build platform that is lowered as each section of the model ("slice") is completed. Layer by layer the material is extruded until the object is completed. The process typically requires the use of two materials; build and support. The support material is meant to hold up overhanging features and is easily removed during the post-production finishing process. The build materials are traditionally thermoplastic filaments such as ABS, ABSi, PLA, Ultem.

Material jetting

As the name implies, the process uses ink jet head (much like 2D printers) to deposit build materials. With material jetting, photopolymer resins are distributed onto the build platform and then immediately cured with a UV light that is positioned by the print head. Like FDM, material jetting requires the use of a secondary support material to retain structural integrity during the process. Post production finishing is required to smooth the surface area. Build materials are most commonly photopolymer plastic or wax resins that harden when exposed to UV light. Some systems allow for the jetting of multiple materials allowing for the creation of "digital materials" by combining materials.

Vat photopolymerization: Stereolithography and Digital Light Processing

Vat photopolymerization can be divided into two different processes that both use a light source to cure liquid photopolymers. Build materials are most commonly photopolymer plastic or wax resins that harden when exposed to a light source. Other materials such as glass or ceramic are often embedded to produce varying strength and surface properties.

- **Stereolithography (SLA):** SLA technology uses an ultraviolet laser guided by mirrors to cure the liquid surface. The build platform is then lowered or raised before the process is repeated again until the completed product is complete. Post production finishing is required to remove excess resins and to smooth the surface area.
- **Digital light processing (DLP):** Digital light processing adheres to many of the same principles as stereolithography. However, DLP uses a high powered lamp or LEDs instead of a laser to cure the liquid surface. The build platform is then lowered or raised before the process is repeated again until the completed product is complete. Post production finishing is required to remove excess resins and to smooth the surface area.

Powder binding

The powder binder jetting process uses an inkjet head to deposit build materials. The printer begins by spreading a thin layer of powder materials across the entire build surface. The inkjet head then pans across the surface distributing a liquid bonding agent on the surface in the desired shape. The process is repeated layer by layer until the final product is complete. Powdered plastics, sands, ceramics and metals are most commonly used for this process. Since the powder fills the entire build chamber, support materials are not necessary. Post production removal of excess powder is needed as is some extended curing time (often in an oven) to ensure proper hardening.

Selective laser sintering (SLS) / Powder bed fusion

The selective laser sintering process like powder binding uses powdered plastics, metals and sand as the build material. But instead of a liquid bonding agent, SLS uses a laser to fuse powder materials. Once the bonded surface hardens, another layer of materials is spread over the build platform and the process is repeated until the object is completed. Powdered plastics, sands, ceramics and metals are most commonly used in the SLS process.

Sheet lamination

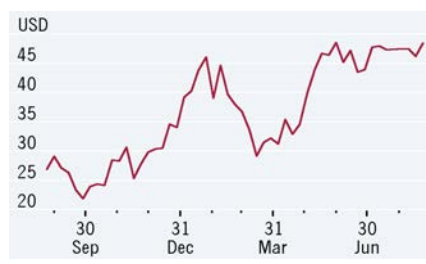
The process involves the layering of sheets of material, typically paper and wood which are then bonded with an adhesive and cut with a blade to form the desired shape. As with traditional 2D printers, the systems offer a wide range of colors. Post production sanding is needed to smooth the surface finish. Coating the final object with a lacquer is often applied to harden and seal end product.

Company Focus

■ Initiation of Coverage

Buy	1
Price (23 Aug 13)	US\$48.44
Target price	US\$60.00
Expected share price return	23.9%
Expected dividend yield	0.0%
Expected total return	23.9%
Market Cap	US\$4,922M

Price Performance
(RIC: DDD.N, BB: DDD US)



3D Systems (DDD)

Product Portfolio Addresses Broadest Range of Applications; Increasing Materials Revenue Mix Drives Profitability

- **Best positioned to capture new market opportunities** — We believe the additive manufacturing market is beginning to see heightened customer awareness and interest translate into real business demand. Although customers have long used the technology for prototyping, we believe adoption is still very early. Additionally, we expect to see much broader adoption upstream in production applications and downstream into the consumer market. We believe DDD's diverse product line ranging from full metal sintering (Phenix) at the high end to a \$1,000 desktop device (Cube) for the consumer is best positioned to capture the expanding market opportunity.
- **Growth of recurring revenue mix will boost margin profile** — As is the case with traditional 2D printer manufacturers, materials generate significantly higher gross margins (~70%) than system sales (~40%). Sales of materials accounted for 29% of revenue in 2012 and we expect this ratio to increase to 35% by FY15. Additionally, DDD is seeing increased adoption of higher-margin integrated materials which carry gross margins closer to 80%. 3D System's growing software portfolio (~90%) will also bolster the company's margin outlook.
- **Valuation still has some headroom** — Current valuation of 36x CY14E earnings appear inflated, however we believe current multiples are justified due to sustainable earnings growth north of 30% over the medium term. Additionally, we believe investors will start to emphasize EV/EBITDA over P/E to better account for the capital investments needed to expand the growing services component of the business. Through the lens of EV/EBITDA, DDD is trading at 19x CY14 estimates with EBITDA growth expected to be ~40% by our forecast. Additionally the company is growing its mix of higher-margin recurring revenue which has the dual effect of evening out lumpy printer sales and increasing revenue visibility. Lastly, with limited assets to choose from in the 3D printing sector, we recommend investors interested in adding exposure to this market minimize risk by targeting a market leader with proven track record.
- **Key risks** — The company has been investing heavily to bolster its service bureau footprint which carries a negative margin impact in the short term and we worry an uptick in this activity could stunt the margin story. While we feel DDD offers greater upside attached to new markets (DDM and consumer), there is heightened risk that a more protracted time horizons on those opportunities could impact growth trajectory.

EPS	Q1	Q2	Q3	Q4	FY	FC Cons
2012A	0.17A	0.27A	0.32A	0.39A	1.25A	0.83A
2013E	0.21A	0.20A	0.25E	0.32E	0.98E	1.02E
Previous	na	na	na	na	na	na
2014E	0.27E	0.32E	0.35E	0.40E	1.35E	1.30E
Previous	na	na	na	na	na	na
2015E	na	na	na	na	1.67E	1.52E
Previous	na	na	na	na	na	na

Source: Company Reports and dataCentral, Citi Research. FC Cons: First Call Consensus.

Best Positioned For Long-term Growth; Clear Path To Margin Expansion

We are initiating coverage of 3D Systems with a Buy rating and \$60 price target. We believe 3D Systems is one of the best positioned companies to take advantage of the rapidly growing additive manufacturing / 3D printing sector. 3D Systems is a leading provider of print systems, materials and custom print services. The company sells a wide range of product catering to the high end (manufacturing) and the low end (consumer) of the customer spectrum. 3D Systems offers printers based on stereolithography, powder binding, laser sintering and material extrusion processes.

We expect adoption of 3D printing to extend beyond the existing rapid prototyping market and *slowly* replace application for advance manufacturing. Additionally, contrary to current expectations, we believe the consumer market will develop rapidly with 3D printers fulfilling consumers' appetites for the next "it" gadget. We feel the company's product portfolio and strong market position uniquely qualify 3D Systems to address all three market opportunities. Finally we believe 3D Systems could deliver upside to out-year earnings estimates as high-margin recurring consumables revenue becomes a much bigger mix of total revenue.

We see continued improvement in capabilities, speed, build volumes and price of its ProJet line, the company can now better serve the advance manufacturing capability with the recent acquisition of direct metal manufacturer Phenix. With its low-priced Cube machine, 3D Systems is also primed to realize the potential of the fast growing consumer/hobbyist market sparked by the Maker movement. 3D Systems is less prevalent in in the area of prototyping, but we believe the long-term TAM for this segment is meaningfully smaller than the opportunity in advance manufacturing and consumer.

Estimates biased higher in FY14 and beyond

Our revenue estimates are slightly ahead of the street in FY13 although we are forecasting lower earnings in what we believe to be a systems "seeding" year. We have a more bullish trajectory of both the professional and consumer 3D printer markets and expect to see a revenue tailwind and a gross margin headwind from higher systems sales. We also anticipate that shares will react positively on reports of higher system sales but lower margins as investors should recognize that this dynamic helps set the table for future material sales.

Figure 21. DDD: Citi vs. Consensus

	FY13		FY14		FY15	
	Citi	Consensus	Citi	Consensus	Citi	Consensus
Total revenue	\$510	\$503	\$637	\$621	\$765	\$745
- Product	\$355	\$345	\$450	\$429	\$548	\$533
- Services	\$154	\$158	\$187	\$192	\$217	\$212
Gross margin %	53.3%	53.7%	57.0%	56.1%	58.5%	58.1%
EPS	\$0.98	\$1.02	\$1.35	\$1.32	\$1.67	\$1.54

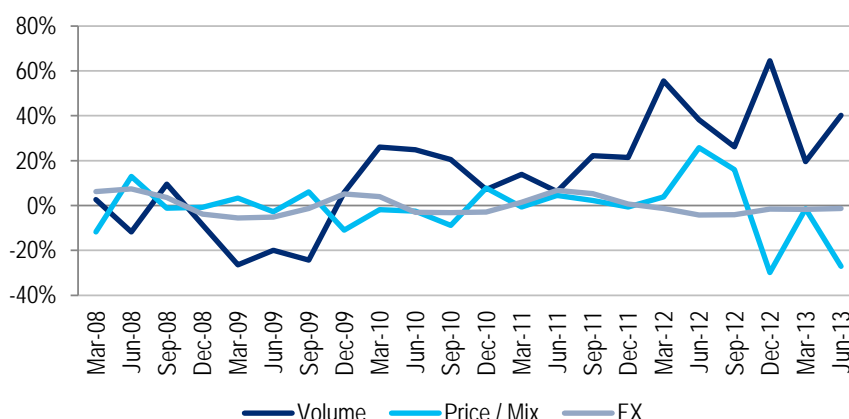
Source: Citi Research, Factset

Margins set to expand as revenue mix trends towards materials and software

Looking out to FY14 and beyond (which is how we believe investors are currently valuing the sector), we believe street forecasts are biased higher as current estimates are underestimating the gross margin benefits of a growing recurring consumables base.

We view FY12 and FY13 thus far as a systems “seeding” period with the spike in interest helping to drive printer sales. The growth of the install base will help drive future consumable sales which have already started to show in results. Consumables revenue growth that is generated by volume has jumped up considerably in the past 12-18 months. Since the start of 2012, volumes on average have accounted for 40% of the increase in materials revenue compared to 18% in 2010 and 2011.

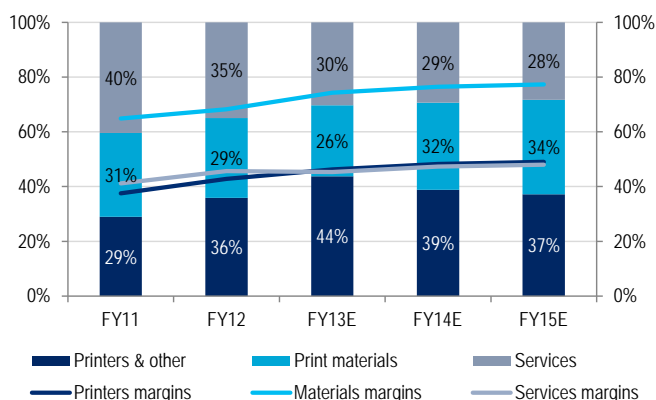
Figure 22. Materials revenue growth: Impact of price, volume and FX



Source: Citi Research, Company reports

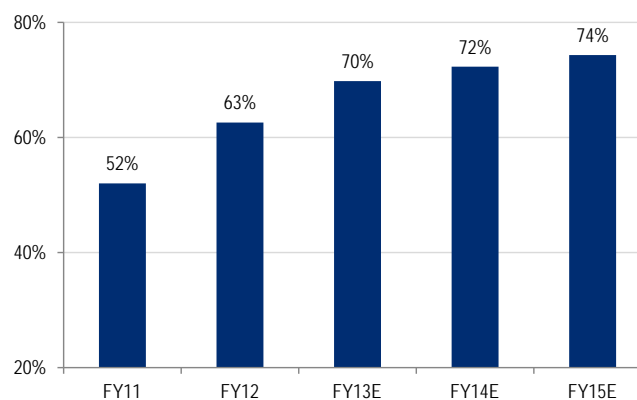
We model the revenue contribution from materials to increase from 29% in FY12 to 34% by FY15 and integrated materials to account for 74% of consumable sales. We expect this combined transition to boost materials gross margins to from 68% in FY12 to 77% in FY15.

Figure 23. Higher revenue mix from materials will drive margins



Source: Citi Research, Company reports

Figure 24. Mix of higher priced specialty materials continues to grow



Source: Citi Research, Company reports

Channel expansion will have long-term benefits

The company has been aggressive in expanding their channel capacity to capitalize on the growing opportunity. The company nearly tripled the number of reseller partners from 167 in FY11 to 438 at the end of FY12. The company has indicated that it takes roughly a year to get a new partner fully productive which is apparent from the significant decrease in sales productivity per channel partner. Between FY11 and FY12, we have seen revenue per partner slip from \$822K (system + material) to \$525K. We expect that over the company quarters the company will start to really see the benefits from the increase in sales capacity put into place at the throughout 2012.

Company

3D Systems is the leading provider of print systems and materials based stereolithography technology as well as laser sintering systems and FDM technology. The company's core product line is based on stereolithography, a process which selectively cures photopolymer resins with a UV laser until a final end product is created. 3D Systems laser sintering technology focuses a laser beam on a finely spread layer of powdered plastics, waxes and metals bonding the materials before repeating the process until a finished product is produced. The company's acquisition of Z Corporation at the start of 2012 gave 3D Systems the capability to offer printers based on multi-jetting which jets a bonding liquid from an inkjet onto a bed of powder materials in the shape of the object design.

Management

3D Systems has a seasoned management team which has a long history with the company and has a solid understanding of the sector.

Abe Reichental, President and Chief Executive Officer – Abe has served as president and CEO since 3Q03. Prior to 3D Systems, he was at Sealed Air Corporation for over 20 years in a variety of roles most recently serving as vice president of the shrink packaging division.

Damon Gregoire, Senior Vice President and Chief Financial Officer – Damon has been with 3D Systems since 2007. Before he came to 3D Systems he was the CFO at Infor Global Solutions.

Charles Hull, Co-Founder, Executive Vice President, Chief Technology Officer – Charles is the founder of the company and the inventor of several of DDD's print engines.

Key risks

- **Market demand:** We believe the risks to our Buy rating hinge on the industry maintaining current demand to be able to generate sustainable 20%+ revenue growth. The pace of adoption could slow significantly and stunt the development of the consumer market and significantly prolong the advance manufacturing opportunity.
- **Recurring revenue mix:** A key tenant of our positive thesis is based on the assumption that the company can increase the mix of recurring revenue to drive up gross margins. To the extent that end users do not increase utilization of existing and future print systems, the company could fall short of earnings expectations.

- **Competitive environment:** The current competitive environment remains relatively benign with 3D printer manufacturers typically focused on specific print processes and materials. Over time as the industry consolidates, we believe there will be significantly greater product overlap creating a more intense competitive environment.

Q2 results: Uptick in demand offset by higher spending

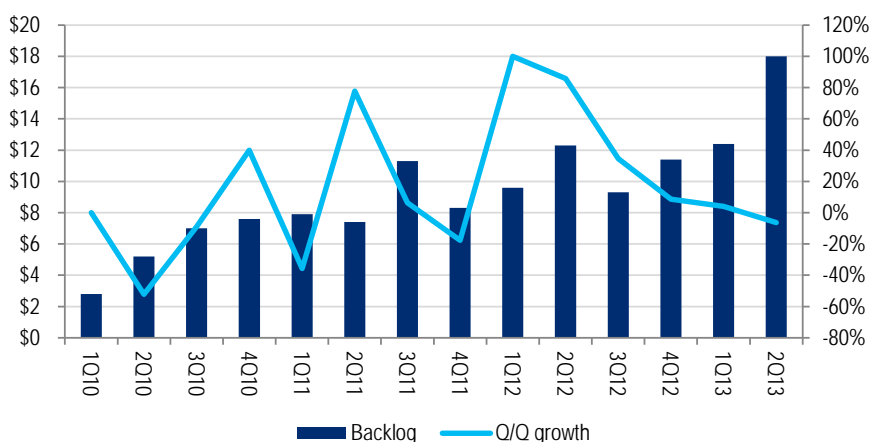
3D Systems reported topline and bookings activity better than expected. Reported revenue of \$121M (30% organic growth) was well ahead of expectations of \$115 driven by strong systems (108% Y/Y), materials and services contributing to the upside. Additionally, backlog spiked to record levels surging 60% sequentially to \$20M.

Higher-than-expected OPEX resulted in a \$0.04 shortfall to EPS (relative to street expectations) dampening top-line performance somewhat. However, management reiterated full-year guidance for both revenue and earnings (\$485-510M / \$1.05-1.20) easing concerns around the bottom line, but also setting the bar for a much tougher second half.

Record backlog points to strong pipe

Management noted on the recent Q2 earnings call that backlog spiked 60% sequentially to the highest level in company history giving us additional conviction that demand is accelerating and will continue to feed the pipeline.

Figure 25. Backlog 45% above historical high



Source: Citi Research, Company reports

Valuation

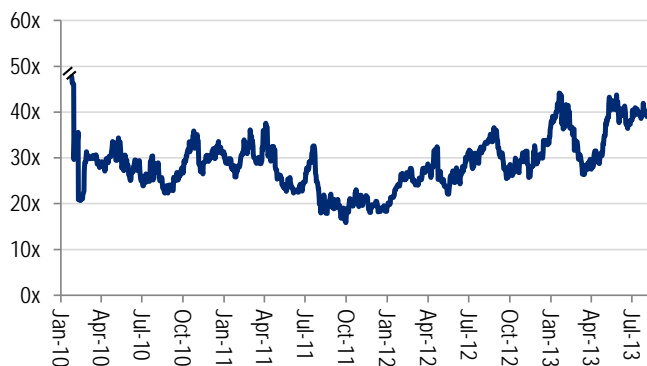
Shares have rallied higher over the past 12 months (+35%) on strong quarterly results and higher investor conviction of long-term adoption across advance manufacturing and the consumer sectors. While current valuations may seem inflated on the surface, we believe current multiples are justified due to sustainable earnings growth through FY15. Additionally, we believe investors will start to emphasize sector valuations from the perspective of EV/EBITDA instead of P/E due to the growing capital investments needed to expand services component of the business. Through the lens of EV/EBITDA, we believe current multiples are still

20% from recent highs of 25x. Additionally, EV/EBITDA based PEG ratio of 0.75 suggests that there is some headroom to valuation.

Having spent considerable time following the software sector, we would note that subscription-based valuation in the software sector warrants a premium with investors willing to “overpay” for a higher quality revenue stream.

Lastly, there are limited assets to choose from in the 3D printing sector and we recommend investors interested in adding exposure to this market buy shares of a leading franchise with a strong history of performance.

Figure 66. DDD: Historical EV/EBITDA



Source: Citi Research, Factset

Figure 277. DDD: Historical P/E



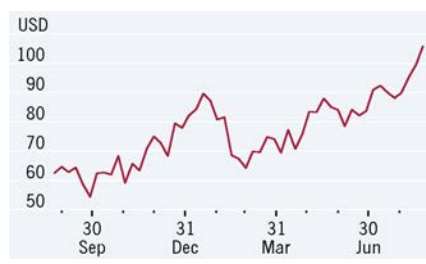
Source: Citi Research, Factset

Company Focus

■ Initiation of Coverage

Buy	1
Price (23 Aug 13)	US\$105.82
Target price	US\$125.00
Expected share price return	18.1%
Expected dividend yield	0.0%
Expected total return	18.1%
Market Cap	US\$4,137M

Price Performance
(RIC: SSYS.O, BB: SSYS US)



Stratasys Ltd (SSYS)

Market Leader *Layering In* Impressive Earnings Growth With Strong Sales Outlook

- **Accelerated adoption of 3D printing, channel expansion will drive >20% revenue growth** — With the largest installed base of printers to sell into, we believe the recent uptick in the additive manufacturing market will have the greatest near-term benefit for Stratasys. Although the prototyping market is the most mature, we believe it is still early and the recent spike in interest will drive consumption. Additionally, we expect to see much broader adoption of 3D printers in the consumer market and the company's recent Makerbot acquisition puts Stratasys in the pole position. Lastly, the Objet acquisition doubled Stratasys' channel footprint which only recently completed cross-sell training. We expect increased leverage from resellers to also contribute to accelerated growth.
- **Expect margin expansion from growing usage of print material** — The 3D printer market plays off of the razor/razor blade model where consumables generate significantly higher gross margins than system sales. We estimate consumable sales accounted for around 26% of product revenue in 2012 and we expect this ratio to increase to mid-30% by FY15. >20% top-line growth coupled with sustainable margin expansion will help deliver earnings growth north of 30%.
- **Looking through the lens of EV/EBITDA is more appropriate** — We view current multiples (40x CY14E EPS) are justified due to the scarcity of 3D print assets and being able to generate sustainable earnings growth north of 30% over the medium term. More importantly, we believe investors will start to emphasize EV/EBITDA over P/E to better account for the capital investments needed to expand the growing services component of the business. Through the lens of EV/EBITDA, SSYS is trading at 17x our CY14 estimates with EBITDA growth expected to be ~30% by our forecast. Additionally the company is growing its mix of higher-margin recurring revenue which has the dual effect of evening out lumpy printer sales and increasing revenue visibility. We recommend investors interested in adding exposure to this market minimize risk by targeting market leaders (DDD, SSYS) with proven track records.
- **Key risks** — We see some potential for integration risk following the merger with Objet in 4Q12 and the closure of Makerbot in mid-August. Stratasys has a product gap at the high end of the market (no metals) and we see the potential for another dilutive acquisition. We would note that acquisitions in the sector as a whole have been viewed favorably by investors.

EPS	Q1	Q2	Q3	Q4	FY	FC Cons
2012A	0.28A	0.32A	0.40A	0.39A	0.94A	1.49A
2013E	0.43A	0.45A	0.44E	0.57E	1.89E	1.86E
Previous	na	na	na	na	na	na
2014E	0.57E	0.61E	0.69E	0.77E	2.65E	2.55E
Previous	na	na	na	na	na	na
2015E	na	na	na	na	3.76E	3.19E
Previous	na	na	na	na	na	na

Source: Company Reports and dataCentral, Citi Research. FC Cons: First Call Consensus.

Market Leader *Layering* In Impressive Earnings Growth With Strong Sales Outlook

We are initiating coverage of Stratasys with a Buy rating and \$125 price target. Stratasys is the clear market leader (deployed systems) accounting for more than half of the current install base of system and we believe that in the near term, the company is one of the best positioned companies to take advantage of the accelerated interest and adoption of additive manufacturing technology. With the largest installed base of printers to sell into, we believe the increased usage patterns will have the greatest immediate benefit for Stratasys.

We also expect adoption of 3D printing to extend beyond the existing rapid prototyping market and *slowly* replace application for advance manufacturing. Additionally, contrary to current expectations, we believe the consumer market will develop rapidly with 3D printers fulfilling consumers' appetites for the next "it" gadget. The company's recent Makerbot acquisition puts Stratasys in the pole position to capitalize on the "Maker" movement. Lastly, the Objet acquisition doubled Stratasys' channel footprint which only recently completed cross-sell training. We expect increased leverage from resellers to also contribute to accelerated growth.

Estimates have headroom

Our revenue estimates are largely in line with consensus in FY13. We expect greater leverage from both the channel and the operating model to drive higher top line and earnings in FY14 and FY15. The company has thus far embedded limited synergies from the Objet and Makerbot acquisitions. Considering Stratasys has the largest installed base of customers, we believe there is a significant opportunity to cross-sell new products into that base.

Figure 28. SSYS: Citi vs. Consensus

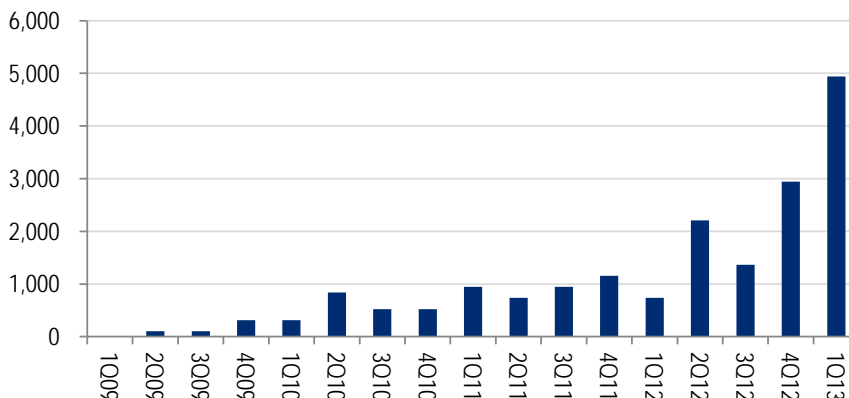
	FY13		FY14		FY15	
	Citi	Consensus	Citi	Consensus	Citi	Consensus
Total revenue	\$463	\$460	\$627	\$609	\$780	\$755
- Product	\$393	\$395	\$544	\$532	\$682	NA
- Services	\$69	\$66	\$83	\$77	\$98	NA
Gross margin %	58.3%	57.1%	58.3%	56.7%	59.4%	61.3%
EPS	\$1.89	\$1.86	\$2.65	\$2.51	\$3.76	\$3.52

Source: Citi Research, Factset

***Makerbotting* a big splash in the consumer market**

Despite the entire "Maker" movement being built on the sweat of Stratasys' expired IP, the company did not have a presence in the market for desktop consumer 3D printers. With the Makerbot acquisition, Stratasys essentially leapfrogged competitors with a market-leading solution. The companies estimate that 35-40K consumer desktop printers were sold in 2012 and we believe Makerbot accounted for a disproportionate share (~25% by our estimates).

Figure 29. Makerbot printer sales



Source: Citi Research, Company reports

We do not expect much integration risk around this transaction as Stratasys is already very familiar with the technology (FDM) since it is based on their own IP. While Makerbot is being run as a separate company for the time being, we expect to see a good deal of cost synergies. In R&D, Makerbot will be able to take Stratasys' FDM know-how and bring it downstream. The company will also be able to cross-sell into its significant install base and leverage the Stratasys channel.

We believe the bigger obstacle is figuring out how the company wants to move forward with pricing as Makerbot's pricing has fluctuated from being on the low end of the consumer spectrum to the high end. With 3D Systems expected to launch a \$500 Cube printer in the back half of the year, we believe maintaining competitive pricing will be critical to maintaining mind share and capturing market share.

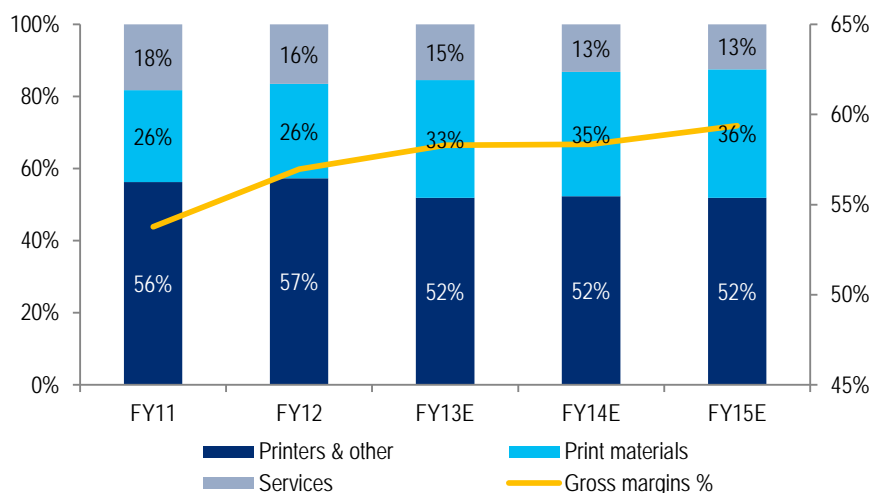
In addition to an established 3D printer and brand, the Makerbot acquisition also delivered Thingiverse (3D design library), Makerware (Simple design software), and the MakerBot Digitizer scanner. The acquisition also provides Stratasys with the complete "system" stack that we feel will be necessary to address the less technical consumer audience.

Growing usage print material consumption will boost margin profile

The 3D printer market plays off of the razor/razor blade model where consumables generate significantly higher gross margins than system sales. We estimate consumable sales accounted for around 35% of product revenue in 2012 and we expect this ratio to increase to 40% by FY15. >20% topline growth coupled with sustainable margin expansion will help deliver earnings growth north of 30%.

Stratasys does not disclose its revenue mix, but piecing together past commentary with growth trends we estimate that the revenue contribution from materials was around 25% in FY12. We expect the mix to increase to mid-30s by FY15 as customers increase due to broader adoption and higher utility of machine post-recession. The integration of Objet, which had a significantly higher attached consumable revenue to system sales, will also help to pull up the corporate average. We expect this combined transition to boost company gross margins from 57% in FY12 to 59.5% in FY15.

Figure 30. Revenue mix (FY11 to FY15E)



Source: Citi Research, Company reports

Company

Stratasys Limited was formed after the 2012 merger of Stratasys Inc. with Objet Ltd. The company has the largest install base of print systems with more than 25K sold cumulatively. Stratasys' core print technology is based on fused-deposition modeling (FDM) which entails the extrusion of plastic materials through a heated print head in ultrathin layer to "print" a final object. FDM is the underlying technology that is being used by the recent wave cheap consumer desktop printers, including Stratasys' recent acquisition Makerbot.

The company's Objet technology is based on material jetting technology whereby photopolymer resins are deposited by an inkjet head (similar to 2D printers) then cured with a UV lamp that is attached by the print head. The system is capable of printing with dual materials and can be used to create "digital materials" by jetting two materials at once with varying concentrations to arrive at unique material properties.

Management

The recently completed merger with Objet resulted in a restructuring of upper management with Objet CEO, David Reis and CFO, Erez Simha Stratasys assuming the positions for the newly formed Stratasys Ltd. Former Stratasys CEO, Scott Crump remains with the company as chairman. We noted that the reorganization of top level management brings a heightened level of integration risk. We would also point out that the new team has executed well in the two quarters since the close which alleviates some concern.

David Reis, Chief Executive Officer – He has been the CEO of Stratasys since the merger closure in December 2012. He served as CEO of Objet from 1Q09 until he was appointed CEO of Stratasys. Prior to Objet, he was CEO of MUR Macroprinters from 2006-08.

Erez Simha, Chief Financial Officer and Chief Operations Officer – Prior to Stratasys, he was chief financial officer of Objet since November 2011. He was with Orbotech in a variety of roles, most recently as CFO from July 2009 to March 2011.

Lawrence M. Doerr, Engineering, Chief Operating Officer (N. America) – Larry has been with Stratasys since 2007. Prior to Stratasys, he has VP of Manufacturing Operations at Minnesota Diversified Industries and VP of Operations at Nilfisk-Advance

Key risks

- **M&A integration:** We believe there is the potential for some integration risk with the acquisition of Makerbot following so soon after the merger with Objet in 4Q12. The Objet acquisition also brought along a new management team based in Israel. While Stratasys was successful integrating Solidscape and a variety of smaller acquisitions, none were on the same scale as Objet (revenue wise) and Makerbot (acquisition value). However, we have already seen two quarters of sound execution from CEO David Reiss and CFO Erez Simha reassuring us that any execution issues that could have surfaced is likely in the rear view.
- **More dilutive acquisitions:** We also believe the likelihood of seeing another dilutive acquisition is above average. Stratasys has a product gap at the high end of the market (no metals) and we would expect the company to address this need at some point in the future. While we feel the long-term opportunity in advance manufacturing is the largest, we also recognize that it is also likely the most distant and thus there is no immediate need. We would note that acquisitions in the sector as a whole have been viewed favorably by investors with the view that the market presents significant greenfield and thus support for the acquisition of "TAM."
- **Market demand:** We believe the risks to our Buy rating hinges on the industry maintaining current demand to be able to generate sustainable 20%+ revenue growth. The pace of adoption could slow significantly and stunt the development of the consumer market and significantly prolong the advance manufacturing opportunity.
- **Competitive environment:** The current competitive environment remains relatively benign with 3D printer manufacturers typically focused on specific print processes and materials. Over time as the industry consolidates, we believe there will be significantly greater product overlap creating a more intense competitive environment.

Q2 results: Momentum building with top-line acceleration and uptick in deal activity

Stratasys reported a strong second quarter with accelerating revenue growth topping consensus estimates. The company saw contributions across all business segments with consumables and Redeye business the clear outperformers delivering 23% and 34% Y/Y growth respectively. Management indicated the cross-training of the combined reseller channel is complete and should start to bear fruit. Costs were largely held in check with gross margin inching higher to 59.2% driven by better services margins. Operating margins were consistent with consensus at 20% and earnings of \$0.45 were a penny better than street expectations.

The company highlighted a large multi-million dollar order from a Fortune 500 company that is expected to close in 2H. We believe the deal validates the momentum that the sector has been seeing. Commentary from management as well as disclosures around uptick in customer lead (recently installed CRM)

suggests these types of discussions with large customers has picked up dramatically.

Valuation

Shares have rallied higher over the past 12 months (+30%) on strong quarterly results and higher investor conviction of long-term adoption across advance manufacturing and the consumer sectors. At first glance, current valuations (40x CY14E EPS) may seem inflated, but we believe current multiples are justified due to sustainable earnings growth >30% through FY15.

We believe investors will start to emphasize sector valuations from the perspective of EV/EBITDA instead of P/E due to the growing capital investments needed to expand services component of the business. SSYS is trading at 17x our CY14 estimates with EBITDA growth expected to be ~30% by our forecast. EV/EBITDA based PEG ratio of 0.75 suggests that there is some headroom to valuation. Through the lens of EV/EBITDA, we believe current multiples are still 25% from recent high of 25x.

Figure 80. SSYS: Historical EV/EBITDA



Source: Citi Research, Factset

Figure 31. SSYS: Historical P/E



Source: Citi Research, Factset

Figure 32. 3D Systems Income Statement (in 000s)

	FY11A	Mar 12A	Jun 12A	Sep 12A	Dec 12A	FY12A	Mar 13A	Jun 13A	Sep 13E	Dec 13E	FY13E	FY14E	FY15E
Product	136,946	49,397	52,275	59,551	68,757	229,980	68,452	83,465	93,994	109,417	355,328	450,447	548,120
% Revenues	59.4%	63.4%	62.5%	65.8%	67.7%	65.0%	67.1%	69.1%	70.1%	71.7%	69.7%	70.7%	71.7%
% Change Y/Y	21.1%	69.5%	60.3%	79.1%	63.9%	67.9%	38.6%	59.7%	57.8%	59.1%	54.5%	26.8%	21.7%
Seasonality		21.5%	22.7%	25.9%	29.9%		19.3%	23.5%	26.5%	30.8%			
Services	93,476	28,523	31,335	30,981	32,814	123,653	33,627	37,322	40,126	43,118	154,193	186,803	216,816
% Revenues	40.6%	36.6%	37.5%	34.2%	32.3%	35.0%	32.9%	30.9%	29.9%	28.3%	30.3%	29.3%	28.3%
% Change Y/Y	99.9%	52.1%	39.2%	27.5%	17.5%	32.3%	17.9%	19.1%	29.5%	31.4%	24.7%	21.1%	16.1%
Total revenue	230,422	77,920	83,610	90,532	101,571	353,633	102,079	120,787	134,120	152,535	509,521	637,249	764,937
% Change Y/Y	44.1%	62.7%	51.7%	57.3%	45.4%	53.5%	31.0%	44.5%	48.1%	50.2%	44.1%	25.1%	20.0%
% Change Q/Q		11.5%	7.3%	8.3%	12.2%		0.5%	18.3%	11.0%	13.7%			
Cost of revenues	(121,101)	(39,020)	(40,592)	(43,553)	(49,021)	(172,186)	(48,543)	(58,138)	(61,998)	(69,345)	(238,024)	(274,219)	(317,646)
Gross profit	109,321	38,900	43,018	46,979	52,550	181,447	53,536	62,649	72,122	83,190	271,497	363,030	447,291
Gross margin %	47.4%	49.9%	51.5%	51.9%	51.7%	51.3%	52.4%	51.9%	53.8%	54.5%	53.3%	57.0%	58.5%
Research and development	(14,331)	(4,933)	(4,921)	(5,543)	(7,806)	(23,203)	(6,504)	(9,598)	(8,598)	(8,098)	(32,798)	(31,692)	(34,392)
% Revenues	6.2%	6.3%	5.9%	6.1%	7.7%	6.6%	6.4%	7.9%	6.4%	5.3%	6.4%	5.0%	4.5%
Sales, general and administrative	(48,905)	(17,016)	(19,399)	(19,024)	(20,352)	(75,791)	(21,282)	(25,542)	(22,800)	(24,406)	(94,030)	(109,883)	(130,002)
% Revenues	21.2%	21.8%	23.2%	21.0%	20.0%	21.4%	20.8%	21.1%	17.0%	16.0%	18.5%	17.2%	17.0%
Total operating expenses	(63,236)	(21,949)	(24,320)	(24,567)	(28,158)	(98,994)	(27,786)	(35,140)	(31,398)	(32,504)	(126,828)	(141,575)	(164,394)
% Change Y/Y	22.4%	51.3%	65.0%	43.0%	67.5%	56.5%	26.6%	44.5%	27.8%	15.4%	28.1%	11.6%	16.1%
Operating income	46,085	16,951	18,698	22,412	24,392	82,453	25,750	27,509	40,724	50,686	144,669	221,456	282,896
Operating Margin %	20.0%	21.8%	22.4%	24.8%	24.0%	23.3%	25.2%	22.8%	30.4%	33.2%	28.4%	34.8%	37.0%
Other income	(2,056)	(1,722)	(2,816)	(1,504)	(2,647)	(8,689)	(1,884)	1,161	(2,579)	(2,579)	(5,882)	(10,317)	(10,317)
Pre-tax income	44,029	15,229	15,882	20,908	21,745	73,764	23,866	28,670	38,144	48,107	138,787	211,139	272,579
Provision for income taxes	(3,247)	(2,050)	(1,935)	(2,752)	839	(5,898)	(5,016)	(9,719)	(13,351)	(16,837)	(44,923)	(73,898)	(95,403)
Tax rate %	7.4%	13.5%	12.2%	13.2%	-3.9%	8.0%	21.0%	33.9%	35.0%	35.0%	32.4%	35.0%	35.0%
Net Income	40,782	13,179	13,947	18,156	22,584	67,866	18,850	18,951	24,794	31,269	93,864	137,240	177,177
% Revenues	17.7%	16.9%	16.7%	20.1%	22.2%	19.2%	18.5%	15.7%	18.5%	20.5%	18.4%	21.5%	23.2%
% Change Y/Y	94.5%	61.7%	43.5%	99.2%	63.6%	66.4%	43.0%	35.9%	36.6%	38.5%	38.3%	46.2%	29.1%
Diluted shares outstanding	50,723	77,589	52,620	56,564	57,453	54,482	91,822	96,248	97,692	99,157	96,230	101,661	105,789
Pro-forma EPS	\$0.80	\$0.17	\$0.27	\$0.32	\$0.39	\$1.25	\$0.21	\$0.20	\$0.25	\$0.32	\$0.98	\$1.35	\$1.67
% Change Y/Y	79.9%	1.4%	40.1%	81.1%	46.5%	54.9%	20.9%	-25.7%	-20.9%	-19.8%	-21.7%	38.4%	24.1%

Source: Company reports, Citi Research

Figure 33. 3D Systems Balance Sheet (in 000s)

Assets	FY11A	Mar 12A	Jun 12A	Sep 12A	Dec 12A	FY12A	Mar 13A	Jun 13A	Sep 13E	Dec 13E	FY13E	FY14E	FY15E
Cash and cash equivalents	179,120	60,027	158,501	183,931	155,859	155,859	110,543	349,255	400,009	458,342	458,342	704,874	1,051,818
Accounts receivables	51,195	61,143	63,901	69,750	79,869	79,869	89,558	111,459	115,663	126,524	126,524	155,259	196,574
Inventories	25,283	34,940	39,994	41,281	41,820	41,820	44,018	49,771	49,771	49,771	49,771	49,771	49,771
Prepaid expenses, other	2,241	2,536	2,766	2,570	4,010	4,010	5,074	4,883	4,883	4,883	4,883	4,883	4,883
Deferred tax asset	3,528	5,937	7,413	3,969	5,867	5,867	6,748	6,780	6,780	6,780	6,780	6,780	6,780
Restricted cash	13	13	12	13	13	13	13	13	13	13	13	13	13
Other current assets	0		0	0	0	0	0	0	0	0	0	0	0
Total Current Assets	261,380	164,596	272,587	301,514	287,438	287,438	255,954	522,161	577,119	646,313	646,313	921,579	1,309,839
Property, plant and equipment, net	29,594	33,817	35,705	34,187	34,353	34,353	35,994	36,466	36,960	37,794	37,794	40,274	44,201
Intangible assets, net	54,040	96,261	99,156	96,902	108,377	108,377	121,492	139,629	134,044	128,682	128,682	113,921	100,854
Goodwill	107,651	204,365	217,275	220,465	240,314	240,314	277,690	297,938	297,938	297,938	297,938	297,938	297,938
Deferred tax asset	3,195	552	460	636	107	107	149	316	316	316	316	316	316
Other assets	7,114	7,591	7,155	6,814	6,853	6,853	6,375	7,855	7,855	7,855	7,855	7,855	7,855
Total Assets	462,974	507,182	632,338	660,518	677,442	677,442	697,654	1,004,365	1,054,232	1,118,898	1,118,898	1,381,884	1,761,003
Liabilities and Shareholders' Equity													
Industrial development bonds / Debt													
Capitalized lease obligations	163	160	157	159	174	174	178	179	179	179	179	179	179
Accounts payable	25,911	33,113	34,225	26,730	32,095	32,095	29,779	35,126	43,170	54,312	54,312	57,110	66,550
Accrued liabilities/other payables	16,816	23,171	19,254	33,636	24,789	24,789	29,257	29,208	42,559	59,396	59,396	133,294	228,697
Customer deposits	3,398	3,647	3,785	2,755	2,786	2,786	4,043	4,789	4,789	4,789	4,789	4,789	4,789
Deferred Revenues	11,260	15,541	15,659	15,935	15,309	15,309	18,540	20,848	25,523	31,143	31,143	75,190	162,071
Other current liabilities	0					0		0	0	0	0	0	0
Total Current Liabilities	57,548	75,632	73,080	79,215	75,153	75,153	81,797	90,150	116,219	149,820	149,820	270,562	462,286
Capitalized lease obligations	7,609	7,574	7,534	7,494	7,443	7,443	7,395	7,343	7,343	7,343	7,343	7,343	7,343
Convertible senior notes, net	131,107	131,942	132,798	123,561	80,531	80,531	43,090	24,719	24,719	24,719	24,719	24,719	24,719
Deferred tax liability	3,656	20,967	23,627	22,091	23,142	23,142	22,590	22,455	22,455	22,455	22,455	22,455	22,455
Other long-term liabilities	8,266	6,950	11,226	11,667	10,840	10,840	10,133	10,717	10,717	10,717	10,717	10,717	10,717
Total Liabilities	208,186	243,065	248,265	244,028	197,109	197,109	165,005	155,384	181,453	215,054	215,054	335,796	527,520
Total Shareholders' Equity	254,788	264,117	384,073	416,490	480,333	480,333	532,649	848,981	872,778	903,844	903,844	1,046,088	1,233,483
Total Liabilities & Shareholders' Equity	462,974	507,182	632,338	660,518	677,442	677,442	697,654	1,004,365	1,054,232	1,118,898	1,118,898	1,381,884	1,761,003

Source: Company reports, Citi Research

Figure 34. 3D Systems Cash Flow (in 000s)

	FY11A	Mar 12A	Jun 12A	Sep 12A	Dec 12A	FY12A	Mar 13A	Jun 13A	Sep 13E	Dec 13E	FY13E	FY14E	FY15E
OPERATING ACTIVITIES													
Net income	35,420	6,188	8,324	13,517	10,912	38,941	5,883	9,343	20,444	27,252	62,923	126,313	168,272
Deferred tax assets	(5,140)	628	673	1,640	(3,602)	(661)	(3,543)	(938)	0	0	(4,481)	0	0
Depreciation and amortization	11,093	5,391	5,287	5,126	5,425	21,229	5,992	7,336	7,773	7,579	28,681	22,495	21,413
Provisions for doubtful accounts	1,731	331	573	1,465	670	3,039	601	0			601		
Stock option based compensation	2,637	1,176	1,304	1,176	1,462	5,118	2,221	3,125	3,353	3,813	12,512	15,931	19,123
Disposition of property and equipment	256	9	(463)	(177)	(43)	(674)	63	(60)			3		
Deferred interest income													
Loss on conversion of convertible debt	0	0	0	1,245	5,776	7,021	5,715	3,538			9,253		
Accounts receivable	(12,090)	(1,255)	(3,725)	(6,290)	(7,976)	(19,246)	(8,785)	(18,016)	(4,204)	(10,861)	(41,866)	(28,735)	(41,315)
Inventories	(2,608)	(4,097)	(5,356)	(1,129)	(1,643)	(12,225)	(3,320)	(6,580)	0	0	(9,900)	0	0
Prepaid expense and other assets	45	239	(219)	217	(1,031)	(794)	(440)	182	0	0	(258)	0	0
Accounts payable	(3,457)	2,305	1,806	(8,599)	4,250	(238)	(755)	1,008	8,044	11,143	19,439	2,798	9,440
Accrued liabilities	141	4,309	(4,180)	14,169	(5,217)	9,081	5,418	1,236	13,351	16,837	36,842	73,898	95,403
Customer deposits	857	(330)	50	(1,067)	11	(1,336)	1,284	771	0	0	2,055	0	0
Deferred revenue	525	397	321	97	349	1,164	1,798	2,271	4,675	5,620	14,364	44,046	86,882
Other operating assets / liabilities	(2,159)	(424)	174	262	(1,263)	(1,251)	(1,853)	(437)	0	0	(2,290)	0	0
Cash flow from operations	27,660	15,827	5,551	22,633	9,033	53,044	10,746	3,065	53,436	61,384	128,631	256,746	359,217
												42	42
INVESTING ACTIVITIES													
Investment in property, plant, and equipment	(2,870)	(755)	(797)	(350)	(1,322)	(3,224)	(2,295)	(1,456)	(2,682)	(3,051)	(9,484)	(10,215)	(12,272)
Additions to license and patent costs	(336)	(231)	(158)	(146)	(194)	(729)	(177)	(1,136)			(1,313)		
Sales of securities	174	0	0	0	0	0	4	1,878			1,882		
Cash paid for acquisitions, net of cash	(92,677)	(134,918)	(12,593)	(767)	(35,423)	(183,701)	(52,949)	(33,250)			(86,199)	0	0
Other investing activities							0	(1,500)			(1,500)		
Cash flow from investing	(95,709)	(135,904)	(13,548)	(1,263)	(36,939)	(187,654)	(55,417)	(35,464)	(2,682)	(3,051)	(96,614)	(10,215)	(12,272)
FINANCING ACTIVITIES													
Issuance of Ordinary Shares	62,054	0	106,912	(22)	(1)	106,889	0	272,081			272,081	0	0
Options Exercised	2,764	782	115	3,685	(182)	4,400	302	133			435	0	0
Repayment of debt / capital lease	(221)	(36)	(45)	(40)	(42)	(163)	(38)	(57)			(95)	0	0
Restricted cash	12	0	1	(1)	0	0	0	0			0	0	0
Cash disbursed related to stock split	0	0	0	0	0	0	(177)	0			(177)		
Cash flow from financing	209,975	746	106,983	3,622	(225)	111,126	87	272,157	0	0	272,244	0	0
Foreign exchange adjustment	(155)	238	(512)	438	59	223	(732)	(28)			(760)		
Change in cash and cash equivalents	141,771	(119,093)	98,474	25,430	(28,072)	(23,261)	(45,316)	239,730	50,754	58,333	303,501	246,531	346,945
Free cash flow (Equity)	24,790	15,072	4,754	22,283	7,711	49,820	8,451	1,609	50,754	58,333	119,147	246,531	346,945
Free cash flow (Firm)	26,694	16,562	7,227	23,589	10,460	57,814	9,939	842	52,430	60,010	123,125	253,238	353,651

Source: Company reports, Citi Research

Figure 35. Stratasys Income Statement (in 000s)

	FY11A	Mar 12A	Jun 12A	Sep 12A	Dec 12A	FY12A	Mar 13A	Jun 13A	Sep 13E	Dec 13E	FY13E	FY14E	FY15E
Product	127,476	37,546	41,444	41,318	59,461	179,768	81,810	90,213	98,803	121,841	392,667	543,920	681,890
% Revenues	81.8%	83.5%	83.9%	83.1%	83.6%	83.5%	83.3%	84.6%	85.5%	85.6%	84.8%	86.8%	87.5%
% Change Y/Y	31.5%	33.6%	35.2%	27.1%	64.2%	41.0%	117.9%	117.7%	139.1%	104.9%	118.4%	38.5%	25.4%
Seasonality		20.9%	23.1%	23.0%	33.1%		20.8%	23.0%	25.2%	31.0%			
Services	28,418	7,418	7,962	8,406	11,690	35,476	15,397	16,272	16,811	20,458	68,938	82,725	97,616
% Revenues	18.2%	16.5%	16.1%	16.9%	16.4%	16.5%	15.7%	15.3%	14.5%	14.4%	14.9%	13.2%	12.5%
% Change Y/Y	12.0%	14.4%	11.7%	13.0%	58.6%	24.8%	107.6%	104.4%	100.0%	75.0%	94.3%	20.0%	18.0%
Total revenue	155,894	44,964	49,405	49,723	71,151	215,244	98,222	106,684	115,614	142,299	462,819	626,645	779,506
% Change Y/Y	27.5%	30.0%	30.7%	24.5%	63.3%	38.1%	118.4%	115.9%	132.5%	100.0%	115.0%	35.4%	24.4%
% Change Y/Y (organic)	20.8%	20.2%	30.7%	24.5%	25.0%	25.2%	31.0%	36.3%	33.7%	78.9%	48.7%	35.4%	24.4%
% Change Q/Q		3.2%	9.9%	0.6%	43.1%		38.0%	8.6%	8.4%	23.1%			
Cost of revenues	(72,057)	(21,573)	(22,810)	(21,260)	(26,980)	(92,623)	(40,313)	(43,566)	(48,977)	(60,211)	(193,067)	(261,037)	(316,198)
Gross profit	83,837	23,391	26,595	28,463	44,171	122,621	57,909	63,118	66,637	82,088	269,752	365,608	463,308
Gross margin %	53.8%	52.0%	53.8%	57.2%	62.1%	57.0%	59.0%	59.2%	57.6%	57.7%	58.3%	58.3%	59.4%
Research and development	(14,360)	(4,352)	(4,157)	(4,067)	(6,095)	(18,671)	(9,890)	(9,491)	(10,291)	(11,291)	(40,963)	(48,964)	(52,764)
% Revenues	9.2%	9.7%	8.4%	8.2%	8.6%	8.7%	10.1%	8.9%	8.9%	7.9%	8.9%	7.8%	6.8%
Sales, general and administrative	(36,569)	(9,780)	(11,941)	(11,370)	(20,705)	(53,795)	(27,717)	(31,917)	(34,684)	(42,690)	(137,008)	(181,927)	(212,042)
% Revenues	23.5%	21.8%	24.2%	22.9%	29.1%	25.0%	28.2%	29.9%	30.0%	30.0%	29.6%	29.0%	27.2%
Total operating expenses	(50,929)	(14,132)	(16,098)	(15,436)	(26,800)	(72,467)	(37,607)	(41,408)	(44,975)	(53,981)	(177,971)	(230,891)	(264,806)
% Change Y/Y	23.1%	20.2%	26.7%	17.6%	100.9%	42.3%	166.1%	157.2%	191.4%	101.4%	145.6%	29.7%	14.7%
Operating income	32,908	9,259	10,497	13,027	17,371	50,154	20,302	21,710	21,662	28,107	91,782	134,718	198,501
Operating Margin %	21.1%	20.6%	21.2%	26.2%	24.4%	23.3%	20.7%	20.3%	18.7%	19.8%	19.8%	21.5%	25.5%
Other income	516	296	59	163	870	1,388	514	138	740	1,116	2,508	6,503	10,637
Pre-tax income	33,424	9,555	10,556	13,191	18,241	51,542	20,816	21,848	22,402	29,223	94,289	141,220	209,138
Provision for income taxes	(11,177)	(3,419)	(3,553)	(4,466)	(2,367)	(13,805)	(3,143)	(3,243)	(3,360)	(4,383)	(14,130)	(21,183)	(31,371)
Tax rate %	33.4%	35.8%	33.7%	33.9%	13.0%	26.8%	15.1%	14.8%	15.0%	15.0%	15.0%	15.0%	15.0%
Net Income	22,247	6,136	7,003	8,724	15,874	37,737	17,673	18,605	19,042	24,839	80,160	120,037	177,768
% Revenues	14.3%	13.6%	14.2%	17.5%	22.3%	17.5%	18.0%	17.4%	16.5%	17.5%	17.3%	19.2%	22.8%
% Change Y/Y	66.3%	38.2%	38.8%	41.8%	140.1%	69.6%	188.0%	165.7%	118.3%	56.5%	112.4%	49.7%	48.1%
Net income (non-controlling interest)		0	0	0	(332)	(332)	(93)	(39)					
Consolidated net income	22,247	6,136	7,003	8,724	15,542	37,405	17,580	18,566	19,042	24,839	80,160	120,037	177,768
Diluted shares outstanding	21,653	21,802	21,834	22,008	40,327	39,970	41,057	41,146	43,203	43,851	42,314	45,350	47,249
Pro-forma EPS	\$1.03	\$0.28	\$0.32	\$0.40	\$0.39	\$0.94	\$0.43	\$0.45	\$0.44	\$0.57	\$1.89	\$2.65	\$3.76
% Change Y/Y	62.3%	37.3%	38.5%	38.8%	28.5%	-8.1%	52.9%	41.0%	11.2%	43.9%	100.6%	39.7%	42.1%

Source: Company reports, Citi Research

Figure 36. Stratasys Balance Sheet (in 000s)

Assets	FY11A	Mar 12A	Jun 12A	Sep 12A	Dec 12A	FY12A	Mar 13A	Jun 13A	Sep 13E	Dec 13E	FY13E	FY14E	FY15E
Cash and cash equivalents	20,092	24,428	26,968	27,900	133,826	133,826	65,505	148,061	223,104	284,487	284,487	452,453	736,950
Short-term investments	14,602	17,622	24,191	23,900	20,063	20,063	75,370	0	0	0	0	0	0
Accounts receivables	26,230	28,149	33,484	35,866	87,612	87,612	93,354	103,498	75,116	64,754	64,754	97,860	128,105
Inventories	22,771	21,620	22,525	32,079	67,995	67,995	66,395	64,603	64,603	64,603	64,603	64,603	64,603
Net investment in sales-type leases, net	3,295	3,847	4,747	4,249	5,134	5,134	5,082	5,687	5,687	5,687	5,687	5,687	5,687
Prepaid expenses	3,259	2,617	2,118	2,193	2,751	2,751	2,894	3,138	3,138	3,138	3,138	3,138	3,138
Deferred income tax	2,973	2,973	2,973	2,973	4,968	4,968	7,777	9,834	9,834	9,834	9,834	9,834	9,834
Other current assets	0					0	0	0	0	0	0	0	0
Total Current Assets	93,223	101,255	117,007	129,161	323,278	323,278	317,197	335,655	382,316	433,337	433,337	634,409	949,152
Property, plant and equipment, net	39,669	41,495	44,986	44,888	62,070	62,070	63,842	68,256	70,624	74,208	74,208	89,639	109,338
Goodwill	25,394	25,418	25,375	25,389	822,475	822,475	822,450	822,463	822,463	822,463	822,463	822,463	822,463
Other intangible assets	25,295	25,021	24,618	24,151	510,372	510,372	497,508	484,798	470,254	445,566	445,566	360,056	293,268
Net investment in sales-type leases, net	5,495	5,501	5,265	7,250	7,872	7,872	7,990	9,206	9,206	9,206	9,206	9,206	9,206
Long-term investments	32,581	29,905	22,257	13,916	1,634	1,634	1,634	2,844	2,844	2,844	2,844	2,844	2,844
Other assets	112	145	288	146	1,184	1,184	1,728	2,928	2,928	2,928	2,928	2,928	2,928
Total Assets	221,770	228,739	239,797	244,899	1,731,513	1,731,513	1,715,089	1,726,150	1,760,635	1,790,551	1,790,551	1,921,545	2,189,199
Liabilities and Shareholders' Equity													
Accounts payable	19,368	19,405	26,592	21,628	35,235	35,235	24,587	24,077	44,884	62,626	62,626	80,564	103,465
Accrued liabilities/other payables	0				40,179	40,179	36,964	41,116	44,476	48,860	48,860	70,043	101,414
Deferred tax liabilities	0				945	945	137		0	0	0	0	0
Unearned revenues	9,769	10,486	9,762	9,968	18,068	18,068	21,961	25,140	28,131	31,528	31,528	71,878	155,425
Other current liabilities	0					0	0	0	0	0	0	0	0
Total Current Liabilities	29,137	29,891	36,355	31,596	94,427	94,427	83,649	90,333	117,491	143,013	143,013	222,485	360,303
Employee rights upon retirement	0				4,188	4,188	4,238	4,437	4,437	4,437	4,437	4,437	4,437
Deferred tax liabilities	6,760	6,760	6,760	6,760	54,693	54,693	54,436	51,194	51,194	51,194	51,194	51,194	51,194
Unearned revenue	2,562	2,656	2,656	2,663	3,181	3,181	3,137	3,155	3,155	3,155	3,155	3,155	3,155
Other long-term liabilities	0				2,868	2,868	3,178	6,077	6,077	6,077	6,077	6,077	6,077
Total Liabilities	38,459	39,307	45,771	41,019	159,357	159,357	148,638	155,196	182,354	207,876	207,876	287,348	425,166
Convertible Subordinated Debt	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Shareholders' Equity	183,311	189,432	194,026	203,880	1,572,156	1,572,156	1,566,451	1,570,954	1,578,281	1,582,675	1,582,675	1,634,197	1,764,033
Total Liabilities & Shareholders' Equity	221,770	228,739	239,797	244,899	1,731,513	1,731,513	1,715,089	1,726,150	1,760,635	1,790,551	1,790,551	1,921,545	2,189,199

Source: Company reports, Citi Research

Figure 37. Stratasys Cash Flow (in 000s)

	FY11A	Mar 12A	Jun 12A	Sep 12A	Dec 12A	FY12A	Mar 13A	Jun 13A	Sep 13E	Dec 13E	FY13E	FY14E	FY15E
OPERATING ACTIVITIES													
Net income	20,626	4,522	3,018	5,183	(3,900)	8,823	(15,483)	(2,785)	1,546	(2,721)	(19,443)	20,190	90,860
Depreciation	5,864	1,531	1,731	2,259	2,103	7,624	3,706	2,863	3,413	3,531	13,513	15,900	19,276
Amortization	4,484	1,118	1,139	1,184	8,432	11,873	25,622	14,784	14,544	24,688	79,638	85,510	66,788
Stock option based compensation	1,587	481	(368)	1,784	6,977	8,874	5,490	5,361	5,781	7,115	23,747	31,332	38,975
Excess tax benefits (Stock options)	(2,620)	(191)	(387)	(1,729)	(12,885)	(15,192)	(986)	(122)			(1,108)	0	0
Restructuring / Other	0	0	0	2	(59)	(57)	(79)	79			0	0	0
Gain on sale of investment	(1,361)					0					0	0	0
Increase/Decrease in liabilities (Discontinued)													
Accounts receivable	(5,739)	(1,919)	(5,335)	(2,381)	(18,867)	(28,502)	(9,723)	(8,496)	28,382	10,363	20,525	(33,106)	(30,246)
Inventories	(5,846)	247	(2,055)	(10,714)	4,798	(7,724)	(7,146)	(2,560)	0	0	(9,706)	0	0
Net investment in sales-type leases, net	(2,625)	(558)	(665)	(1,487)	(1,507)	(4,216)	(67)	(1,820)	0	0	(1,887)	0	0
Prepaid expense	1,438	642	499	(75)	468	1,534	1,176	(1,176)	0	0	0	0	0
Other assets	290	(33)	(143)	142	(1,039)	(1,072)	(543)	(48)	0	0	(591)	0	0
Accounts payable	6,538	227	7,350	(3,010)	16,773	21,340	(13,768)	3,656	20,807	17,742	28,437	17,938	22,900
Unearned revenue	615	811	(723)	212	(78)	222	2,996	2,820	2,991	3,397	12,204	40,350	83,547
Cash flow from operations	23,138	6,878	4,061	(8,629)	(1,049)	1,261	(12,252)	10,052	80,823	68,499	147,122	199,298	323,473
												42	42
INVESTING ACTIVITIES													
Maturity of investments	19,927	1,500	2,512	8,486	1,802	14,300	0	20,063			20,063	0	0
Sales of investments	15,748	4,803	(0)	0	44,263	49,066	0	0			0	0	0
Purchase of investments	(18,755)	(6,806)	(1,601)	0	(0)	(8,407)	0	0			0	0	0
Purchase of short-term deposits						0	(55,307)	55,307			0	0	0
Decrease in restricted deposits						0	105	(105)			0	0	0
Property, plant, and equipment	(12,849)	(2,457)	(3,849)	(1,226)	(4,300)	(11,831)	(5,046)	(4,863)	(5,781)	(7,115)	(22,805)	(31,332)	(38,975)
Amounts funded (employee retirement)		0	0	0	(32)	(32)	(93)	93			0	0	0
Acquisition of intangible assets, other	(4,318)		(1,234)	(584)	(1,200)	(3,018)		(611)			(611)	0	0
Acquisitions, net of cash						0					0	0	0
Other investing activities	0	(706)	706	0	0	0	(252)	290			38	0	0
Cash flow from investing	(247)	(3,666)	(3,466)	6,677	40,533	40,078	(60,593)	70,174	(5,781)	(7,115)	(3,315)	(31,332)	(38,975)
FINANCING ACTIVITIES													
Options exercised	6,149	815	691	2,112	11,679	15,297	3,607	2,381			5,988	0	0
Stock option repurchases						0					0	0	0
Excess tax benefits (Stock options)	2,620	191	387	1,729	12,885	15,192	986	0			986	0	0
Cash flow from financing	8,769	1,006	1,079	3,841	24,564	30,489	4,593	2,381	0	0	6,974	0	0
Foreign exchange adjustment	63	118	(134)	44	205	233	(69)	(51)					
Change in cash and cash equivalents	31,723	4,336	1,540	1,932	64,253	72,061	(68,321)	82,556	75,043	61,384	150,781	167,966	284,497
Free cash flow (Equity)	10,289	4,421	212	(9,855)	(5,348)	(10,570)	(17,298)	5,189	75,043	61,384	124,317	167,966	284,497
Free cash flow (Firm)	9,946	4,231	173	(9,963)	(6,105)	(11,586)	(17,734)	5,071	74,413	60,436	122,185	162,438	275,456

Source: Company reports, Citi Research

3D Systems

Company description

3D Systems is the leading provider of print systems and materials based on stereolithography (SLA) technology as well as laser sintering systems and FDM technology. The company's core product line is based on SLA, a process which selectively cures photopolymer resins with a UV laser until a final end product is created. 3D Systems' laser sintering technology focuses a laser beam on a finely spread layer of powdered plastics, waxes and metals bonding the materials before repeating the process until a finished product is produced. The company's acquisition of Z Corporation at the start of 2012 gave it the capability to offer printers based on multi-jetting which jets a bonding liquid from an inkjet onto a bed of powder materials in the shape of the object design. 3D Systems is headquartered in Rockhill, South Carolina and as of December 2012 had 1,010 full-time employees.

Investment strategy

We rate 3D Systems Buy. We believe the additive manufacturing market is beginning to see heightened customer awareness and interest translate into real business demand. We expect to see much broader adoption upstream in production applications and downstream into the consumer market. We believe DDD's diverse product line ranging from full metal sintering (Phenix) at the high end to a \$1,000 desktop device (Cube) for the consumer is best positioned to capture the expanding market opportunity.

As is the case with traditional 2D printer manufacturers, materials generate significantly higher gross margins (~70%) than system sales (~40%). Sales of materials accounted for 29% of revenue in 2012 and we expect this ratio to increase to 35% by FY15. Additionally, DDD is seeing increased adoption of higher-margin integrated materials which carry gross margins closer to 80%. 3D System's growing software portfolio (~90%) will also bolster the company's margin outlook.

Valuation

Our \$60 price target for DDD is based on 24x our CY14 EBITDA estimate of \$244M. On a PE basis our price target is 44x our CY14 earnings estimate of \$1.35. We emphasize EV/EBITDA over P/E to better account for the capital investments needed to expand the growing services component of the business. Average EV/EBITDA over the past 3 years has been around 25x as is current 3D printing peer group. We expect DDD to trend back towards the mean thus our mid-20s (24x) trading multiple. We also apply DCF-based valuation as a secondary measure to support our comparables-based methodology which gives a value of \$59.

Risks

Market demand: We believe the risks to our view hinge on the industry maintaining current demand to be able to generate sustainable 20%+ revenue growth. The pace of adoption could slow significantly and stunt the development of the consumer market and significantly prolong the advance manufacturing opportunity.

Slower recurring revenue mix: A key tenet of our positive thesis is based on the assumption that the company can increase the mix of recurring revenue to drive up

gross margins. To the extent that end users do not increase utilization of existing and future print systems, the company could fall short of earnings expectations.

Competitive environment: The current competitive environment remains relatively benign with 3D printer manufacturers typically focused on specific print processes and materials. As the industry consolidates, we believe there will be significantly greater product overlap creating a more intense competitive environment.

If the impact on the company from any of these factors proves to be more negative than we anticipate, the stock will likely have difficulty achieving our financial and price targets. Likewise, if any of these factors proves to have less of an effect than we anticipate, the stock could materially outperform our target.

Stratasys Ltd

Company description

Stratasys Limited was formed after the 2012 merger of Minnesota-based Stratasys Inc with Israel-based Objet Ltd. The company has the largest install base of print systems with more than 25K sold cumulatively. Stratasys' core print technology is based on fused-deposition modeling (FDM) which entails the extrusion of plastic materials through a heated print head, applied in ultrathin layers to "print" a final object. FDM is the underlying technology that is being used by the recent wave of cheap consumer desktop printers, including Stratasys' recent acquisition Makerbot. The Objet merger added multi-jetting capabilities to the company's portfolio of print systems. Stratasys also operates a custom on-demand parts service called RedEye. The combined company has roughly 260 resellers and 960 employees worldwide.

Investment strategy

We rate Stratasys Buy. We believe the market for 3D printing solutions is very early and the recent spike in interest will accelerate usage. Additionally, we expect to see much broader adoption of 3D printers in the consumer market and the company's recent Makerbot acquisition puts Stratasys in pole position. Lastly, the Objet acquisition doubled Stratasys' channel footprint which only recently completed cross-sell training. We expect increased leverage from resellers to also contribute to accelerated growth.

The 3D printer market plays off of the razor/razor blade model where consumables generate significantly higher gross margins than system sales. We estimate consumable sales accounted for around a quarter of product revenue in 2012 and we expect this ratio to increase to mid-30s by FY15. More than 20% top-line growth coupled with sustainable margin expansion should help deliver earnings growth north of 30%.

Valuation

Our \$125 price target for SSYS is based on 22x our CY14 EBITDA estimate of \$233M. On a PE basis, our price target is 47x our CY14 earnings estimate of \$2.65. We emphasize EV/EBITDA over P/E to better account for the capital investments needed to expand the growing services component of the business. Average EV/EBITDA over the past 3 years has been around 25x as is current 3D printing peer group. We expect SSYS to trend back towards the mean, but see slightly lower growth compared to peers with greater exposure to advance manufacturing, thus

our low-20s (22x) trading multiple. We also use DCF-based valuation to confirm our comparables-based methodology which arrives at a value of \$127.

Risks

M&A integration: We believe there is the potential for some integration risk with the acquisition of Makerbot following so soon after the merger with Objet in 4Q12. The Objet acquisition also brought along a new management team based in Israel which could further complicate issues.

More dilutive acquisitions: We also believe the likelihood of seeing another dilutive acquisition is above average. Stratasys has a product gap at the high end of the market (no metals) and we would expect the company to address this need at some point in the future. While we feel the long-term opportunity in advance manufacturing is the largest, we also recognize that it is also likely the most distant and thus there is no immediate need.

Market demand: We believe the risks to our view hinge on the industry maintaining current demand to be able to generate sustainable 20%+ revenue growth. The pace of adoption could slow significantly and stunt the development of the consumer market and significantly prolong the advance manufacturing opportunity.

Competitive environment: The current competitive environment remains relatively benign with 3D printer manufacturers typically focused on specific print processes and materials. As the industry consolidates, we believe there will be significantly greater product overlap creating a more intense competitive environment.

If the impact on the company from any of these factors proves to be more negative than we anticipate, the stock will likely have difficulty achieving our financial and price targets. Likewise, if any of these factors proves to have less of an effect than we anticipate, the stock could materially outperform our target.

Appendix A-1

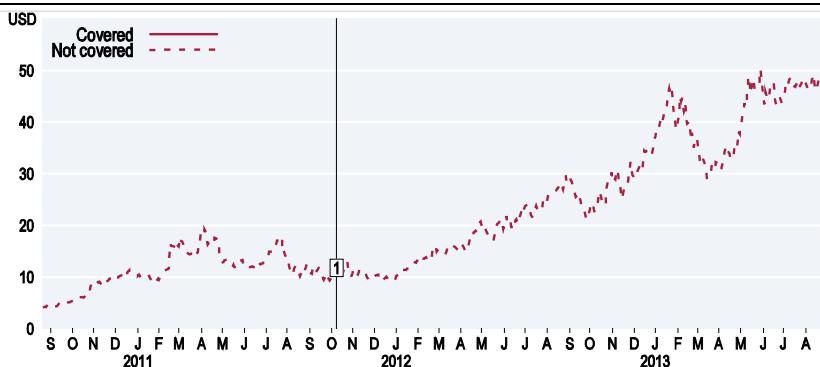
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3D Systems (DDD)

Ratings and Target Price History Fundamental Research



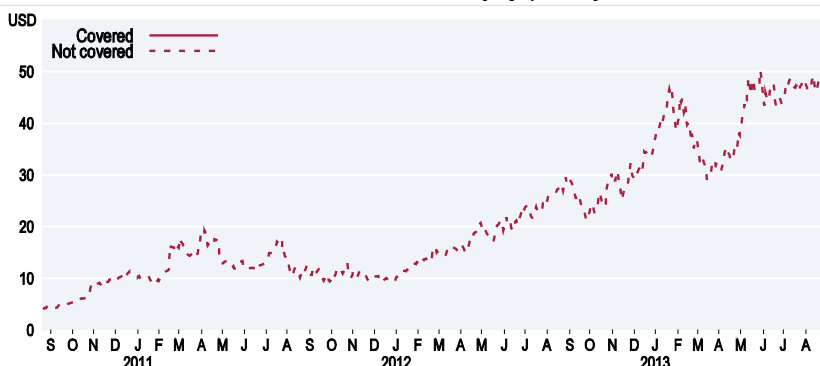
	Date	Rating	Target Price	Closing Price
1	8-Oct-11	Stock rating system changed		

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Rating/target price changes above reflect Eastern Standard Time

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Ratings and Target Price History Best Ideas Research Relative Call (3 Month)

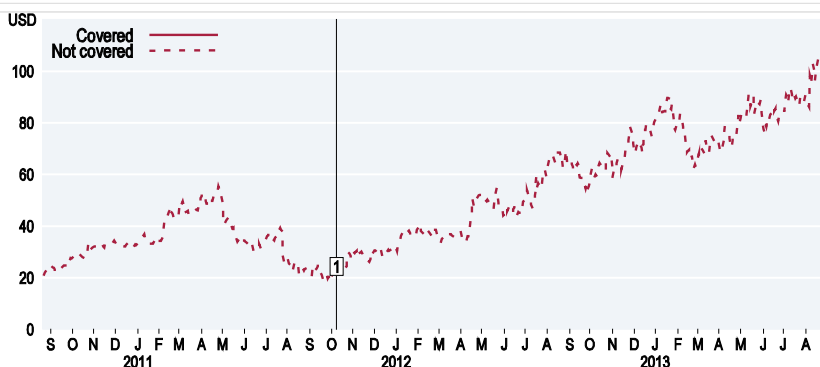


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Stratasys Ltd (SSYS)

Ratings and Target Price History Fundamental Research



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Stratasys Ltd (SSYS)
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Relative Call (3 Month)



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