CT CAPITAL

Investment Research

October 10 , 2014

Buy Recommendation

Synopsys Inc. (SNPS)

Current Price $37.98   Fair Value $ 56.78   Target Price $56.78

Earnings Release: Dec. 3 (unconfirmed)

Table of Contents

BACKGROUND

"Clearly, from a technical point of view, Moore's Law is alive and well, and Synopsys is central in driving it forward," Aart de Geus, Synopsys Chairman and Co-CEO.

Synopsys (SNPS) creates tools under which technology manufacturers can create integrated circuit and electronic systems, including sensors and computer chips. Their products aid in the design and manufacturing as well as the software that help run the chips,[1] including more recent technologies developed in cooperation with Samsung, Global Foundries and Intel.[2]

SNPS products are used by the world's leading semiconductor companies, including all of the top 20. The firm states they are the leader in chip implementation needed for semiconductor manufacturers in the design of small chips.

Admittedly, I do not have an intricate knowledge of technology. But neither did I in Apple, Google, or other parallel industry firms which have hence multiplied in their market valuation. The basis of the recommendation is the firm's ability to consistently produce superior results with high prospect such returns and associated metrics will continue, as was the case in both cited firms. Upon application of a fair cost of equity, our conclusion is reached.

SNPS has recently diversified thru its purchase of privately held Coverity ($75MM in revenues, projected 20% growth). Coverity provides testing platforms to "help developers create and

[1] For its latest (August 2014) investor presentation, see http://www.synopsys.com/Company/InvestorRelations/Documents/synopsys-coporate-overview-investors.pdf

[2] Prominent is FinFET architecture, see http://www.synopsys.com/Company/Publications/SynopsysInsight/Pages/Art2-finfet-challenges-ip-IssQ3-12.aspx and http://phys.org/news/2014-06-samsung-14nm-finfet-technology-ecosystem.html

deliver better software faster, by automatically testing source code for defects that could lead to product crashes, unexpected behavior, security breaches or catastrophic system failure."[3]

As software can involve millions of lines of code (Table 1), Coverity tools have become an integral part of the process, as "bugs" are costly to fix and embarrassing, and often results in loss of market share for the affected. Almost all large software firms, including 9 of the 10 largest, use Coverity products. With the purchase, Synopsys is now the market leader in software quality and security. Though the purchase does not meet the definition of a value-adding acquisition, the investment should help preserve the golden goose of Synopsys' major lines. The CEO states it will add incrementally to cash flows and GAAP by the end of 2015.

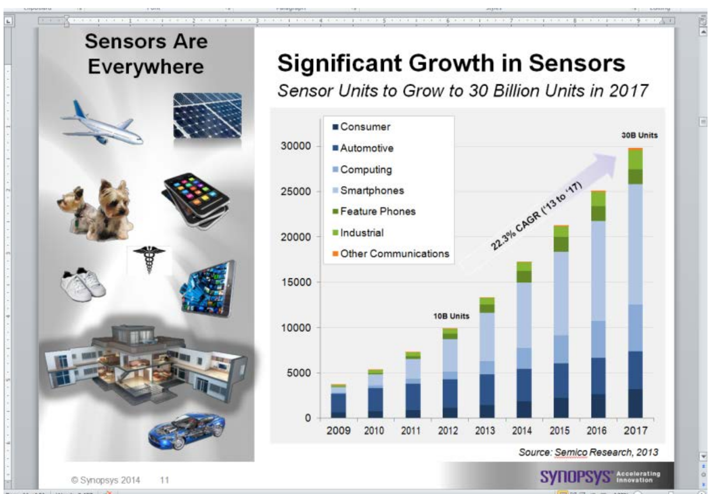
TABLE 1 LINES OF CODE IN "SMART" PHONES

	LINES OF CODE
1970	100k
1990	1MM
2010	100MM

Source: Synopsys

As the internet and devices requiring complex chip design grow-from computers, phones, tablets, watches, refrigerators, cars and whatever the future holds (Figure 1), Synopsys should benefit.

FIGURE 1GROWTH IN SENSORS



Source: Synopsys

Backing up Synopsys products is a wealth of intellectual property which is licensed on a non-exclusive basis. Fees are typically charged on a per-design or royalty basis. SNPS may also offer to indemnify customers if the licensed products infringe on a third-party's intellectual rights.

[3] From Coverity press release. The firm does have a very impressive client list including many of the world's largest software developers. See http://www.coverity.com/customers/

Synopsys' financial metrics are similar to many large market value "defensive" capitalization industry firms. For example, its sales and cash flow stability are on a par with Campbell's Soup and Eli Lilly, and lower than Kraft.

The sole year SNPS did not show free cash flow using the standard and commonly utilized definition was FY 2002, **but** that was due to balance sheet changes (deferred tax assets largely related to insurance premiums paid versus accrued and reserves). Cash actually increased that year despite $171MM in treasury purchases with the sole financing offset being $119MM in stock sales. Thus, free cash flow after making appropriate adjustments was actually positive. That year they entered into the $830MM stock acquisition of Avant, and so reflecting Board confidence the negative cash flow from operations was an anomaly, rather than a trend, and borne out with subsequent results.

Table 2 shows sales and stability metrics of Synopsys versus other leading firms through the coefficient of variation, $c_v = \frac{\sigma}{\mu}$. Synopsys has a similar or lower valuation multiple with similar or slightly lower growth rate to many popular institutional holdings.

Table 2 Sales and Free cash flow stability-as measured by coefficient of variation

		Stability	
	Sales	Free Cash Flow	
	C_v	C_v	
Altria	0.7	0.53	
Amazon	0.78	0.25	
Broadcom	0.42	0.46	
Campbells Soup	0.04	0.25	
Google	0.72	0.71	
Intel	0.28	0.19	
Eli Lilly	0.19	0.51	
Smucker (JM)	0.4	0.63	
Tootsie Roll	0.07	0.37	
Tyson Foods	0.11	0.62	
average	0.371	0.452	
Synopsis	0.22	0.32	
Peer Group (Selected)			
Altera	0.25	0.44	
Marvell	0.28	0.52	
Red-Hat	0.59	0.45	
KLA-Tencor	0.23	0.4	
Xlinx	0.23	0.32	

While there is a financial "gulf" in the GAAP reporting of income relative to normalized and adjusted free cash flows resulting from various items, the gap has been consistent. Later, we cite the correlation between GAAP net incomes with cash from operations and free cash flows.

Intangible assets (net), a source of that gulf, totaled $367MM as of July 2014 with its amortization accounting for a growing percentage of cash from operations (37%.) It is forecasted to grow for at least the coming three years via amortization of intangibles.

While I have no idea which technology firms will have the future winning products, or of new technology products still to evolve, the winners will need semiconductor and software-companies to provide the winning edge. And odds are, those firms will involve a Synopsys product during the initial design phase.

Very few analysts "knock" Synopsys or its ability to produce cash. My diversion with popular thinking lies with the magnitude of its free cash flows in relation to its market value when utilizing a fair estimate of its cost of equity. Cost of debt is insignificant given a financial structure that does not rely on external financings.

Synopsys has one class of stock; is a Delaware Incorporation, and is headquartered in Mountain View, California.

LICENSE FEES

The license model, which began in full earnest during 2004, has served the stability measures well and is a significant contributor to the low cost of capital, credit and equity valuation.

It is of course, Synopsys' superior technology which has, and will, remain the engine of success.

Licenses are an important aspect of the firm's value, contributing 89% of revenues with the remainder maintenance and service. In 2001, services provided half of revenues. Customers receive service as part of the license agreement, the type depending on the contract. The percentage of revenues provided by licensing has remained very steady at the 88%-89% level since adopting the licensing model.

Licenses have historically run about 3 years, as they do now, sign clients believe in Synopsys portfolio of solutions longer term. License fee revenues have risen each year since 2005, including the years prior to and coming out of the 2008-2009 worldwide credit crisis. Adjustments must be made for the inclusion of maintenance fee income which may be bundled.

During conference calls and investor meetings, management makes the point the signing of licenses, including renewals, can impact short-term earnings. The same is true for cash flows.

Revenue recognition occurs as payments are due (time-based) and upon signing as shipment is made (upfront payment license), with the latter accounting for just 6% of revenues.

CREDIT

SNPS has remained a strong credit throughout its history as a public concern. The sole minor blip in total debt was associated with the acquisition of Coverity in March. The acquisition included $266MM in non-tax deductible goodwill and $102MM intangible assets (technology, customer lists, trademarks, etc.) and just $21.2MM in deferred revenue. During the second quarter the firm also made two other acquisitions totaling $34.3MM. The debt was repaid during the third quarter from cash flows. In fact total balance sheet debt has been reduced during the current fiscal year.

Management has outlined three uses of its excess cash:

1-Acquisitions

2-Share repurchases

3-Debt reduction

Presumably, debt reduction will be tied to future acquisition activity given current underleverage and net cash. The pecking order is no great revelation given debt is minor.

Although goodwill ($2.26B) accounts for 75% of equity, it becomes less a credit concern for SNPS due to minimal debt on revolver and term loan, lack of capital intensity, and strong consistent cash from operations. However, lack of capital intensity is not to be viewed lightly given the importance of a strong research budget for leading-edge technology firms. *Research is these firms capital spending as patent protection is only as important as the technology it protects.*

The transactions which resulted in the use of the AOCI have not historically resulted in a credit issue nor are now a pending concern, not uncommon with low cost of capital firms. The largest item under watch is currency and derivatives tied thereto. The strength of the dollar has had AOCI lift to $41.5MM from a prior two year average, $22.1MM, currency translation being $36.5 of the current total.

Derivatives have not been cause of credit concern to date, having a minimal impact on revenues, expenses or cash flows the past three fiscal years, with impact running thru AOCI and little crossing to the income statement. Currency hedges are designated as both cash flow and non-cash flow hedges having on average 21 month duration.

The largest hedges are dollar versus Japanese yen (40%), Euro (12%), Taiwan dollar (11%) and Indian rupee (9%). Notional value of currency derivatives was $747MM at FYE 2013 vs $620MM at FYE 2012.

It is conceivable the recent dollar strength has left the firm somewhat unprotected and could impact GAAP, and therefore the firm could come under earnings estimates the upcoming quarter. While a possibility, given the build in AOCI, it would not interfere with our long-term recommendation even should additional cash be required to settle some trades. We do not believe any contracts would have a material impact to cash flows over the intermediate term, although some impact, including translation (including thinner margins), is possible. Foreign currency negatively impacted equity by $12.7MM for FY 2013, and $9.5MM for the 9 months of 2014.

There are no apparent looming issues to be resolved nor are expected that could impair credit. One lawsuit, discussed in the cost of capital section, could impact cash flows some, yet credit standing should be unscathed and unlikely to result in a credit downgrade by our models.

Neither deferred compensation nor workman's compensation issues are at the forefront which could challenge credit. Debt principal spacing is acceptable and is a small percentage of cash on hand.

The firm has no significant off-balance sheet arrangements, commitments, or guarantees (moral or otherwise).

Credit facilities are more than adequate resulting from their 2012 agreement which provided for a $350MM unsecured revolver and additional $150MM unsecured term loan. Both expire in 2016.The term loan may be increased thru October 13, 2015 (no announcement yet made on this). As of July, $82.5MM principal balance remained on the $200MM which was drawn to finance the Coverity purchase. Interest on the term loan is at LIBOR + 1.125%, and the revolver at between .15% and .3% depending on the firms' leverage ratio (not defined as it is based on the "daily amount of the revolver commitment.").

We do not expect, save an acquisition, for Coverity to employ the credit facilities.

Balance sheet cash ($903MM) draws little interest, averaging 16 basis points.

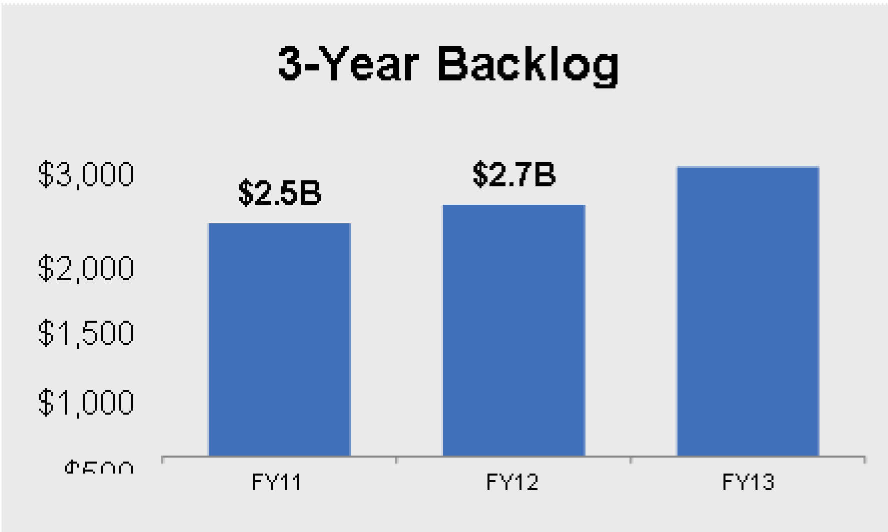
The Coverity deal was financed with cash and $200MM in debt, as noted above. Some of that cash was derived from quick receivable collections and deferred revenue license fees resulting in a greater than normalized boost to CFO. As a result we see the debt repayment on the term loan as well as a $34MM increase (net) in stock held in treasury (Table3).

TABLE 3 FINANCING ACTIVITIES 9 MOS. ENDED

Cash flows from financing activities:	9 mos 2014	9 mos 2013
Proceeds from credit facility	200,000	0
Repayment of debt	(223,239)	(22,975)
Acquisition of non-controlling interests	0	(44,004)
Issuances of common stock	45,336	90,529
Purchases of treasury stock	(79,747)	(69,999)
Other	(5,008)	(5,781)
Net cash used in financing activities	(62,658)	(52,230

Synopsys has a non-cancellable $3.1B backlog (Figure 2), which the firm claims to be larger than the next two peers combined.

FIGURE 2-BACKLOG-CURRENTLY AT $3.1B



Deferred taxes (Table 4) account for account for 8.2% of equity; $303MM in deferred tax assets as of its Q3 (July) of which $99.2MM is current. They also list $18.2MM in current income tax receivables almost offsetting the $20.7MM accrued income taxes as current. As such there is no reason to believe the firm's estimate of a 20% tax rate to be inappropriate, considering its average 19% rate (Table 15).

Valuation allowance has been averaging $30MM and deferred liabilities $106MM. Additional credits have been assumed with M&A activity, which should keep the cash rate low for the next several years.

The R&D credit (state, US Federal, and foreign) has been of particular value to the firm in the past year and three-quarters as well as the low rate on foreign sales. Other foreign credits and domestic tax assets also serve to reinforce the cash rate at around 20%.

The foreign R&D credit, which in many countries SNPS does business is more generous and come with greater assurance than in the US, has added significant value to the firm's fair value. Domestically, the R&D credit has not been extended for the current year though Congress is expected to do so, with perhaps being made permanent as a solution is sought against the lower rates overseas, including the UK's 21% rate and 10% patent box rate. SNPS also had three consecutive years of credits resulting from tax settlements which are not fully explained in the statements.

Going into 2014, SNPS listed $164MM in Federal and state (mostly California) loss carryforwards. The California credit was $112.2MM. These credits have long-lives and high probability of utilization, given backlog and growth.

TABLE 4-DEFERRED TAXES

SYNOPSYS INC	Deferred Tax Asset Current	Deferred Tax Asset LT	Deferred Taxes-Federal	Deferred Taxes-Foreign
Oct08	133.609	177.386	38.223	(26.732)
Oct09	73.453	205.396	38.368	5.397
Oct10	73.465	268.759	(25.156)	(12.272)
Oct11	58.536	281.056	(7.160)	15.524
Oct12	74.712	239.412	22.506	2.377
Oct13	92.058	243.066	4.969	(13.207)

The firm has been subject to several IRS and out of country examinations throughout the years, all of which have either been decided in the company's favor or not proved material.

The firm also has $60MM in excess tax deductions related to stock options which will be credited to equity when realized, in accordance with 123(R).

Table 7 displays various balance sheet debt metrics as of July. In our credit analysis we also add $145.9MM in our computation of total debt, representing the present value (at 8%) of the operating leases. We would include, if applicable, other obligations, such as workman's compensation claims due, litigation settlements which await payment, payments for derivatives, etc. It is the total debt we employ when calculating leverage, economic profit and ROIC.

Regarding the firm's contractual obligations (Table 5), principal payments including that of capital leases are spaced and below balance sheet cash, the latter building with each quarter. As such, SNPS' credit rating is strong with slight leverage, strong interest rate cover, more than adequate financial flexibility given the credit facility, and very consistent cash from operations.

The property plant and equipment account is unsurprisingly small in relation to equity, market value, and cash flows. All real estate, except for 2 buildings in Taiwan and two in Oregon are leased, with its principal office lease running thru this coming February 2015 (400,000 square feet) and at such time the new building should be complete (also leased).

TABLE 5 CONTRACTUAL OBLIGATIONS

	Total	Fiscal 2014	Fiscal 2015/ Fiscal 2016	Fiscal 2017/ Fiscal 2018	Thereafter	Other
			(in thousands)			
Lease Obligations:						
Capital Lease	$ 2,418	$ 2,418	$ —	$ —	$ —	$ —
Operating Leases(1)	$ 402,750	$ 46,492	$ 71,440	$ 61,875	$ 222,943	$ —
Purchase Obligations(2)	95,345	30,131	63,366	1,848	—	—
Term Loan(3)	105,000	30,000	75,000	—	—	—
Other Long-Term Obligations(4)	3,190	1,568	1,622	—	—	—
Long term accrued income taxes(5)	53,064	—	—	—	—	$ 53,064
Total	$ 661,767	$ 110,609	$ 211,428	$ 63,723	$ 222,943	$ 53,064

Table 5 is redacted from the 2013 10-K. During the past quarter SNPS repaid $200MM of principal payments related to the Coverity draw and $7.5MM under the revolver and term loan. Of the $82.5MM balance, $52.5MM is long-term.

TABLE 6 BALANCE SHEET DEBT

QUARTERLY	Revenues	Net Income	Interest Expense	Long Term Debt	Current Debt	Total Liabilities to Assets	Debt to Capital	Debt to Shldr's Equity	Curr Debt/ Tot Debt	YOY Total Debt	YOY Liabilities Growth	Financial Leverage
Jul12	443.7	75.7	0.7	112.5	30.0	38.2%	4.49%	4.7%	21.1%	@CF	18.5%	1.59
Oct12	454.2	29.1	0.5	105.0	30.0	38.7%	3.96%	4.2%	22.2%	@CF	26.7%	1.60
Jan13	475.1	69.9	0.5	97.5	30.0	35.3%	3.61%	3.7%	23.5%	@CF	25.8%	1.61
Apr13	499.3	68.7	0.5	90.0	30.0	34.2%	3.23%	3.3%	25.0%	-52.0%	-3.8%	1.60
Jul13	482.9	52.3	0.4	82.5	30.0	36.2%	2.93%	3.0%	26.7%	-21.1%	5.0%	1.58
Oct13	504.9	56.9	0.4	75.0	30.0	36.0%	2.62%	2.7%	28.6%	-22.2%	-2.1%	1.56
Jan14	479.0	67.7	0.4	67.5	30.0	32.7%	2.34%	2.4%	30.8%	-23.5%	-3.5%	1.54
Apr14	517.7	63.3	0.6	60.0	230.0	36.0%	2.01%	2.1%	79.3%	141.7%	17.2%	1.54
Jul14	521.8	65.7	0.7	52.5	30.0	34.1%	1.72%	1.8%	36.4%	-26.7%	-0.2%	1.54

Synopsys has been a careful acquirer (Table 7) and within their current financial boundaries. They have not shown themselves willing to leverage the balance sheet and credit to undergo a business combination.

TABLE 7 ACQUISITION ACTIVITY

SYNOPSYS INC		
	Acquisitions	
Sep99	46.493	
Oct00	14.474	
Oct01	0.000	
Oct02	168.311	
Oct03	167.744	
Oct04	60.138	
Oct05	174.498	
Oct06	41.142	
Oct07	57.500	
Oct08	184.700	
Oct09	53.358	
Oct10	500.829	
Oct11	41.015	
Oct12	970.089	
Oct13	0.000	
9 mos. Jul '14	373.500	
Total	2,853.791	
Total 2012-2014	1,343.589	

There are no remaining outstanding credit issues which we needed to consider for Synopsys which might meaningfully impair credit or cost of capital, although given the dollar strength we would not rule out additional payments or costs on currency hedging activities. In the calculation of cost of capital, many additional risks are considered

CASH FLOWS

The free cash flows of Synopsys are remarkably stable, emanating from fees garnered under licensing contracts and slow but steadily growth of its client list. A superior research effort in conjunction with new product development, some developed in joint cooperation with clients has resulted in a wealth of intellectual property from which future cash flows should spring.

You may recall Table 2 at the beginning of this report, which brings home the point that sales and free cash flow stability are comparable to other high profile technology firms as well as other firms in “defensive” industries most investors associate with stability.

Stability in the table is measured as these firms 10 (if available) year coefficient of variation around its mean value. For the very stable firm, both sales and cash flow stability will be low and close. For example, Merck has a ten year free cash flow coefficient of variation of .34 vs. .32 for SNPS although Merck has a very slightly higher growth rate in sales of 7.3% versus 6.7% for SNPS over the past decade. Merck's free cash flow valuation multiple is also 18% higher than SNPS while Synopsys free cash flow yield as a percentage of enterprise value is 36% higher, 9.1% versus 6.7%.

Yet, not all investors seek out firms having low free cash flow and credit stability when anticipated growth is desired. If, on the other hand, an investor were looking for a financial deal, a firm with existing and prospective high free cash flows in relation to its enterprise value would very much be a key metric if associated with anticipated low stability and associated cost of capital.

As seen in Figure 3, the relationship between market value and normalized free cash flows is strong, yet can breaks often occur from time to time due more so to confidence in the industry or stocks in general than SNPS ability to produce excess cash.

Additionally, as shown in Table 8, SNPS has seen a steady climb in free cash flows.

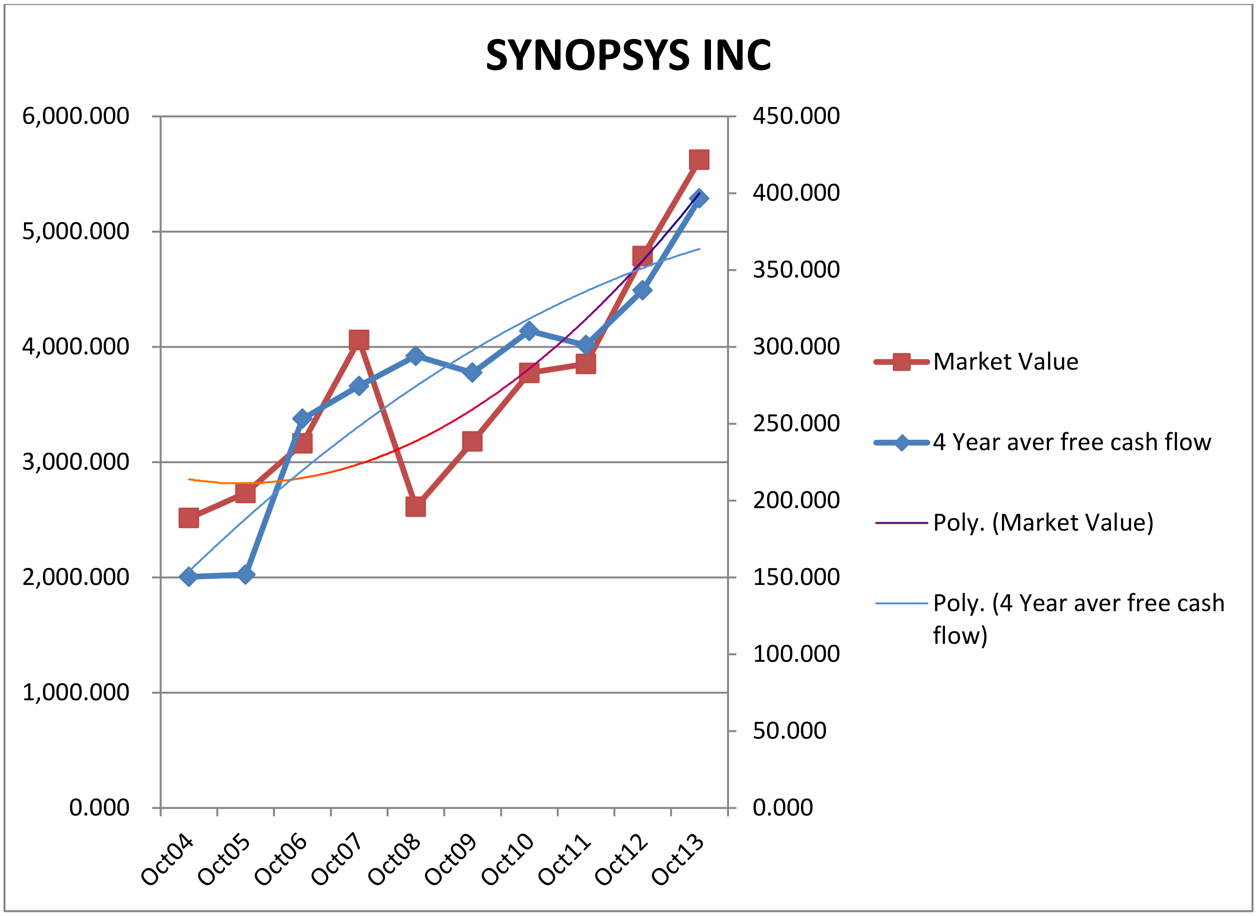
TABLE 8 GROWTH IN FREE CASH FLOWS

SYNOPSYS INC		
	Free Cash Flow	
Oct04	219.032	
Oct05	246.668	
Oct06	198.241	
Oct07	433.816	
Oct08	297.507	
Oct09	203.145	
Oct10	306.609	
Oct11	396.942	
Oct12	440.349	
Oct13	441.909	
growth rate	8.111%	

So, is the 8.1% shown in Table 8 the return we should consider as fair going forward, or are there other factors we need to take into consideration?

We believe the close relationship between SNPS's historical relationship between its free cash flows and market value (Figure 3) are tied to two factors; its historic cost of capital and its growth rate in revenues. We believe the former will be falling over the coming years while the latter will be rising. Thus, in our estimate of fair value, we utilize a lower prospective rate of free cash flow growth.

FIGURE 3 SYNOPSYS RELATION OF FREE CASH FLOWS TO MARKET VALUATION



We have seen Synopsys' metrics show a firm having low volatility of both revenues and free cash flows and that its free cash flows (normalized) are closely aligned with its change in market value. This derives from the consistency of the firms cash from operating activities, which, while not seeing the growth we would like, makes up for it via the risk profile.

As for cash from operating activities (OCF), it has been growing at a slower rate than free cash flows. For the current year, the firm forecasts at least $500MM in CFO compared to $497MM during FY 2013. Yet, OCF can be volatile from year to year depending on the timing of contracts, many of which are large due to the impact of larger several world-class customers.

Research has been, aside from salaries and related expense, the central use of cash collections from revenues. In Table 9 we see, for all 185 firms in SNPS's GICS-Sub-Industry, expenditures of R&D as percentage of revenues. Synopsys' R&D budget is vastly larger than many firms its size, including Autodesk, Citrix, Dassault, Open Text, Salesforce.com, and Splunk,and just 10% below the $24.3B market capitalization Intuit.

TABLE 9 R&D AS % OF SALE GIC-SUB INDUSTRY

		Market Value	R&D/Sales
Average		1,265.000	22.6%
Median		183.100	16.5%
Synopsis		6695.4	34.1%

Synopsys pays cash bonuses to many of its engineers in research for meeting strict quantitative hurdles, and has been responsible for boosting the budget. Yet, a review of popular social media employment sites shows Synopsys to be a highly regarded employer where teamwork is needed in the building of complicated chips and software. Stock incentive plans appear to be fair and reasonable for such a high technology firm.

In its last year, shareholders approved an increase in the firm's equity incentive plan to 7.5% of shares outstanding. Given the superiority of the firm's products and financial metrics, I do not find this unreasonable.

Shares outstanding have increased 5.6% while having purchased $120.7MM in shares (net) since 2009 (Table 10) as a result of the various incentive plans. The Board has in place a $500MM share repurchase program. Yet, as we see, shares for treasury have not been, nor or expected to be a priority use of cash.

TABLE 10 SHARE REPURCHASE ACTIVITY VERSUS ACTUAL SHARES OUTSTANDING

SYNOPSYS INC

	Sale of Common	Purchase Com	Net	Shares Outstanding
Oct09	71.918	0.000	(71.918)	147.400
Oct10	145.329	184.699	39.370	149.300
Oct11	162.180	401.836	239.656	144.200
Oct12	175.896	40.000	(135.896)	151.200
Oct13	131.914	145.016	13.102	154.300
Jul-14	43.336	79.747	36.411	155.800
Sum	730.573	851.298	120.725	

Incentive and bonus plans claim of pay for performance appears to be mostly borne out. Despite a chart in the proxy showing just 21% of compensation for NEO's to be base salary with the balance performance, a drop in growth *rates* of many key metrics the past year did not impact most named officers as there was not a reduction in the growth *rate* in their salaries. For example, Mr. Chan's salary grew 14% last year. All in all, total compensation is fair for a firm of this size and performance (Table 11).

TABLE11 COMPENSATION TABLE

Name and Principal Position	Year	Salary ($)	Bonus ($)	Stock Awards ($)(1)	Option Awards ($)(1)	Non-Equity Incentive Plan Compensation ($)	All Other Compensation ($)	Total ($)(2)
Aart J. de Geus	2013	$ 500,000	$ —	$ 1,725,854	$ 1,189,504	$ 1,500,000(3)	$ 2,500(4)	$ 4,917,858
Co-Chief Executive Officer	2012	$ 500,000	$ —	$ 1,844,255	$ 1,515,100	$ 1,500,000(5)	$ 2,646(6)	$ 5,362,001
and Chairman of the Board of Directors	2011	$ 500,000	$ —	$ 1,771,552	$ 1,436,660	$ 1,500,000(7)	$ 1,500(8)	$ 5,209,712
Chi-Foon Chan	2013	$ 500,000	$ —	$ 1,725,854	$ 1,189,504	$ 1,500,000(3)	$ 1,500(8)	$ 4,916,858
Co-Chief Executive Officer	2012	$ 450,000	$ —	$ 1,291,255	$ 1,060,570	$ 1,500,000(5)	$ 1,680(9)	$ 4,303,505
and President	2011	$ 450,000	$ —	$ 1,017,248	$ 826,080	$ 1,450,000(7)	$ 1,500(8)	$ 3,744,828
Brian M. Beattie	2013	$ 400,000	$ —	$ 592,554	$ 408,892	$ 900,000(3)	$ 2,800(10)	$ 2,304,246
Chief Financial Officer	2012	$ 400,000	$ —	$ 505,995	$ 416,653	$ 935,000(5)	$ 2,742(11)	$ 2,260,390
	2011	$ 400,000	$ —	$ 486,048	$ 395,082	$ 860,000(7)	$ 2,050(12)	$ 2,143,180
Joseph W. Logan	2013	$ 380,000	$100,000(13)	$ 647,600	$ 446,064	$ 1,033,000(3)	$ 1,500(8)	$ 2,608,164
Executive Vice President,	2012	$ 357,200	$ —	$ 505,995	$ 416,653	$ 1,035,880(5)	$ 1,500(8)	$ 2,317,228
Worldwide Sales and Corporate Marketing	2011	$ 357,200	$ —	$ 486,048	$ 395,082	$ 942,800(7)	$ 1,500(8)	$ 2,182,630
Brian E. Cabrera(14)	2013	$ 353,000	$ —	$ 349,704	$ 439,161	$ 447,000(3)	$ 1,500(8)	$ 1,590,365
General Counsel	2012	$ 353,000	$ —	$ 323,505	$ 265,143	$ 462,077(5)	$ 1,500(8)	$ 1,405,225
	2011	$ 325,000	$ —	$ 286,848	$ 233,457	$ 400,000(7)	$ 1,500(8)	$ 1,246,805

Stock based compensation accounted of 16.7% of CFO and 19.5% of adjusted CFO (accounting for normalized changes in the balance sheet of working capital in relation to changes in revenues) for the past 7 years. For the 9 months ended July, stock based compensation amounted to 15.4% of OCF, slightly lower than expected given the strength in the stock and employment levels. Stock based compensation runs about $20MM/quarter. Employees have grown from 5,196 to 8,573 since 2007.

SNPS has not recorded excess tax benefits (financing activity) in fiscal periods 2013, 2012 and 2011. At July 31, they reported $155.6MM of unamortized stock based compensation with a 2.7 year weighted average. One can surmise given its stable history of the account (Table 12), and the firm's financial metrics, stock based compensation will continue to be an important part of adjusted OCF for which the Board of Directors will offset (at a minimum) thru repurchases. For this reason, we have penalized free cash flows a portion of those buyback (financing activities), as it is doubtful they would be able to retain the talent base without the incentive.

TABLE 11 STOCK BASED COMPENSATION

SYNOPSYS INC
TICKER:
SIC:
GICS:

	Stock Compensation Exp	Oper Activ-Net Cash Flow	OCF adj for B/S changes	Sale of Com. Stock	Purchase Com. Stock	Stk based comp as % OCF	as % of adjsuted OC
Oct07	62.011	433.478	269.937	208.484	151.620	14.3%	23.0%
Oct08	65.474	331.088	205.304	79.181	220.053	19.8%	31.9%
Oct09	56.934	239.159	255.226	71.918	0.000	23.8%	22.3%
Oct10	59.988	341.036	317.372	145.329	184.699	17.6%	18.9%
Oct11	56.414	440.316	435.418	162.180	401.836	12.8%	13.0%
Oct12	71.414	486.068	456.495	175.896	40.000	14.7%	15.6%
Oct13	67.511	496.705	561.983	131.914	145.016	13.6%	12.0%
Average	62.821					16.7%	19.5%

In the following table 13, we look at Synopsys research budget both as a percentage of revenues as well as its rate of growth compared to sales growth. We see here as well, the firm is likely overspending, as despite a 61% rise in revenues over the past 7 fiscal years, R&D has grown 75%, or an annual growth rate of 9.8% versus 8.4%. It is for these reasons, and the budget's sheer size, our worksheet captures 40% *of the excess*. If R&D had grown in proportion to growth in sales, R&D spending for 2013 would be near $616MM, still a hefty allocation and greater in both respects than its peer group. Thus, the difference, or $21.32MM is adjusted in our free cash flow worksheet.

One can't help but contemplate the stark contrast between SNPS and IBM which places barely 6% of its revenues into R&D. In process R&D for Synopsys is minimal ($3MM) and has indefinite life under GAAP until written off.

The growth rate in R&D is if anything understated some given acquisitions owing to purchased R&D.

TABLE 12 R&D COMPARED TO SALES

SYNOPSYS INC				
	Sales-Net	R&D Expense	R&D % Sales	
Oct07	1,212.469	382.421	31.5%	
Oct08	1,336.951	399.547	29.9%	
Oct09	1,360.045	422.108	31.0%	
Oct10	1,380.661	449.229	32.5%	
Oct11	1,535.643	491.871	32.0%	
Oct12	1,756.017	581.628	33.1%	
Oct13	1,962.214	669.197	34.1%	
Growth Rate	8.35%	9.77%		

The primary reason for a possible pickup in the growth rate of free cash flows, allowing for further upside to our target price would be motivated by two factors: greater demand for the firms products and recent and ongoing acquisition policy enhanced by its financial flexibility and desire to engage in such activity. The firm's management has made clear it is not interested in paying a cash dividend and will use its free cash flows for the repurchase of shares and engage in value-adding deals. There is no credible evidence given its operating history the firm will not be successful in rewarding shareholders as they have in the past as they add lines in complimentary businesses. Yet future transactions are always fraught with risk, especially in technology which is shrouded in high failure rates resulting from a variety of factors. HPQ, which this week announced a split with its printing division, is a good example involving many poor acquisitions, most notably Compaq and EDS.

Yet, for many firms, acquisitions have proven to be an essential element in growth of shareholder value.

Synopsys management believes its most recent acquisition of Coverity adds value to its core, allowing the firm to continue to produce its consistently large free cash flows[4]. Coverity does for software what Synopsys does for chip design: makes it easier for developers to create and write code. This is similar to Apple developing a product that may not be as successful as hoped (perhaps watches) but if it helps extend the life –and cash flows--of the iPhone, it will prove an

[4] See http://news.synopsys.com/2014-02-19-Synopsys-Enters-Software-Quality-and-Security-Market-with-Coverity-Acquisition

erstwhile expenditure. SNPS would be wise to buy businesses the Board believes can help improve its competitive position, IP, or strengthens its capabilities while not in and of itself value-adding in the short-term. The safe spread between return on, and cost of, capital, makes such spending value-adding to shareholders over the cycle even though investors may fret at near-term earnings disappointments.

This year's acquisition of Coverity, despite appearances of a value-destroying acquisition at least initially, appears to fit the mold of a purchase that might make sense over time. Synopsys and Coverity share many clients and cross-selling could very well make this deal a logical, low risk combination.

Acquisitions completed over the past three years appear to have been responsible for between 5%-10% of the firm's current revenues, and therefore not been a large influence. It is likely Synopsys will continue to embark on acquisitions should additional consolidation in the semiconductor space accelerate. Consolidation in that space has been going on for decades, and it seems, for each announcement, a new company is formed.

The strength of the dollar, as discussed under the credit section, could force the firm to further hedge and result in greater cash flow instability. It is an area we monitor and a matter the firm must continue to address in its shareholder reporting.

Although "cash" taxes paid (Table 14), and the associated cash rate (Table 15) are not discretionary expenditures, the below statutory cash payment rate and ability to use various credits have been beneficial to cash flows and valuation. SNPS is associated with a small tax worksheet adjustment given the stability metrics which has continued through the worksheet date. Contrarily, as a matter of practice we normalize the cash payment by deducting a normal payment given the end of certain tax benefits of the firm, while still remaining in a low cash and statutory rate, and such is seen for the nine months in the worksheet, but again the adjustment is small.

TABLE 13 "CASH" TAX STABILITY

Company Name: SYNOPSYS INC | **Industry Avg:** 62.034 PREPACKAGED SOFTWARE

	Cash Taxes Paid	% Change	Downside Volatility Only	% Change	Upside Volatility Only	% Change
Y13	31.326	(0.363)	31.326	(0.363)		
Y12	49.208	0.345			49.208	0.345
Y11	36.577	0.959			36.577	0.959
Y10	18.673	(0.688)	18.673	(0.688)		
Y09	59.904	0.167			59.904	0.167
Y08	51.312	0.413			51.312	0.413
Y07	36.319	0.886			36.319	0.886
Y06	19.255	(0.083)	19.255	(0.083)		
Y05	21.003	(0.542)	21.003	(0.542)		
Y04	45.867	0.272			45.867	0.272
Y03	36.055				36.055	
Standard Deviation	**14.517**	**0.559**	**5.924**	**0.260**	**9.085**	**0.333**
Averag	36.944					
Std Dev/	0.393					

TABLE 14 "CASH" TAX RATE

SYNOPSYS INC	
	"Cash" Tax Rate
Oct07	0.219
Oct08	0.234
Oct09	0.257
Oct10	0.094
Oct11	0.167
Oct12	0.245
Oct13	0.114
Average	0.190

There have been several disputes with the IRS, including that related to transfer pricing and litigation expense regarding purchased firms.

Management has estimated the effective rate for 2014 to be around 20%, a rate in line with historical payments as evidenced by the table 15, and one implicit in our estimate of fair value.

SNPS, in its reporting cost of sales, includes those items directly related to licensing, maintenance, and amortization of intangible related assets, the latter which we exclude in Table 19. Amortization of intangible assets has been of growing significance in its GAAP reporting of cost of sales, rising yearly from 2007's $23.5MM to 2013's $104.3MM, a factor in the gulf between GAAP valuation metrics and cash flow.

For the 9 months July, SG&A was flat with the prior period at 29.3% of sales with the gross dollar amount rising $29.3MM. Depreciation included in SG&A is also considered by our models and x'ed out as possible. Thus the worksheet recovers no excess as our model makes comparison to the seven year SG&A growth rate of 47% being less than that of the growth rate in sales (Table 16). In its last conference call, the firm spoke of additional hiring in its Q4 which would impact SG&A in the short-term. It is therefore conceivable the stock could react to an earnings shortfall, not a concern of ours.

Cost of sales, which for SNPS includes direct costs of licenses, maintenance and services, continued to fall for the 9 months to 17.1% from the period 17.5%. Capitalized software costs are minimal (about $3.6MM) and included in cost of license revenue. No excess cash recapture was needed there as well, given the firm continues to gain efficiency while placing large resources into research. Also shown again for comparison, is the growth in R&D.

TABLE 15 VARIOUS EXPENDITURE GROWTH

SYNOPSYS INC

	Sales-Net	Capital Expenditures	R&D Expense	SG&A	"Cash" Tax Rate	Income Taxes Paid	Cost of Sales	SG&A/Sales	Cost of Sales/Sales	R&D/Sales
Oct07	1,212.469	44.690	382.421	451.130	0.219	36.319	210.778	0.372	0.174	0.315
Oct08	1,336.951	38.869	399.547	438.631	0.234	51.312	235.570	0.328	0.176	0.299
Oct09	1,360.045	39.199	422.108	443.224	0.257	59.904	240.988	0.326	0.177	0.310
Oct10	1,380.661	39.223	449.229	454.646	0.094	18.673	244.991	0.329	0.177	0.325
Oct11	1,535.643	57.345	491.871	475.878	0.167	36.577	285.631	0.310	0.186	0.320
Oct12	1,756.017	54.191	581.628	573.088	0.245	49.208	311.418	0.326	0.177	0.331
Oct13	1,962.214	65.459	669.197	569.773	0.114	31.326	349.248	0.290	0.178	0.341
Growth Rate	8.354%	6.568%	9.775%	3.968%	-10.361%	-2.435%	8.781%	-4.048%	0.393%	1.311%
average		48.425	485.143		0.190	40.474		0.326	0.178	0.320

Discretionary Expenditures	2007-2003	9 months
Cost of Sales/Sales	0.178	0.172
SG&A/Sales	0.326	0.293
R&D/Sales	0.320	0.348

For the 9 months, there were slight adjustments to several working capital items, none of which are material. For prior years, working capital growth items A/R and A/P (including accrued liabilities) have also not been a significant factor, as normalized. The collection period has remained fairly constant.

Our free cash flow worksheet follows.

Our methodology excludes dividends and acquisitions, factors which might cause our free cash flows to differ from other analysts or investment services[5], in addition to our adjustments. We also normalize and reclassify items, as is shown, although we make more adjustments subsequent to the filing of the 10-K than is shown here using quarterly data. Annual adjusted free cash flow data appears elsewhere, including our return on capital.

Under GAAP, the statement of cash flows ties to the changes to cash, requiring the need to include all cash spending such as dividends. Our estimate of free cash flow is intended to portray the maximum amount of cash the firm could distribute while leaving harmless its normalized growth rate in revenues, or units of production. Using our measure, the Board could, and we would hope would, use such cash for value-adding ventures, rather than share buybacks or dividends.

The worksheet makes adjustments for the changes in working capital items. As seen, working capital usage for the past (2013) year, unlike the prior fiscal, used more cash than normalized, and our model adjusts for a normalized, including seasonal amount of working capital to support a given level of sales. For SNPS, changes (or lack of) in deferred revenue is a contributing factor from quarter to quarter, although as seen in Table 17 deferred revenues has grown somewhat slower than GAAP sales. We would not read too much into this at the moment yet will monitor. For the 9 months, the adjustment is small. Other adjustments to working capital are shown on the worksheet and they too are small in relation to OCF and free cash flow.

[5] For example, Capital IQ defines free cash flows as cash from operating activities minus dividends and capital spending. They make no adjustments to normalize items in CFO or other expenses, or misclassification.

In its 10-Q the firm shows a gain $4MM included in other income of $6.4MM from the sale of a security, with the gain reversed under CFO, we adjust for the small difference.

TABLE 16- DEFERRED REVENUE AND SALES GROWTH COMPARISON

SYNOPSYS INC

	Deferred Revenue	Sales-Net
Oct07	577.295	1,212.469
Oct08	604.718	1,336.951
Oct09	553.990	1,360.045
Oct10	600.569	1,380.661
Oct11	703.555	1,535.643
Oct12	834.864	1,756.017
Oct13	827.554	1,962.214
9 Mos	857.300	1,518.460
Growth Rate (2007-2013)	6.2%	8.4%

Because several of the working capital items are expected to reverse in Q4 (Table 18), some higher labor expense, and the firm's normal bias' during the final quarter, we have estimated free cash flows to approximate $83MM in its Q4. This would be about equal to two years ago and considerably lower than its year ago Q4.

Given management comments regarding full year OCF being "at least $500MM," and the firm at $378MM for the 9 months, implies at least $112MM for Q4. We have estimated $120MM OCF under which $83MM in free cash flow appears reasonable, if not conservative.

TABLE 17 VARIOUS WORKING CAPITAL ITEMS VS GROWTH

SYNOPSYS INC

	Accounts Payable	Accrued Expenses	AP+Acc Exp	Receivables-Total	Sales-Net	AP+Acc Exp as % Sales	AR as % Sales
Oct07	11.611	234.598	246.209	166.425	1,212.469	20.3%	13.7%
Oct08	23.168	266.601	289.769	197.224	1,336.951	21.7%	14.8%
Oct09	10.136	240.421	250.557	178.201	1,360.045	18.4%	13.1%
Oct10	16.331	293.808	310.139	199.527	1,380.661	22.5%	14.5%
Oct11	6.956	295.220	302.176	228.669	1,535.643	19.7%	14.9%
Oct12	29.855	353.238	383.093	292.668	1,756.017	21.8%	16.7%
Oct13	8.575	349.622	358.197	256.026	1,962.214	18.3%	13.0%
Growth Rate			6.4%	7.4%	8.4%	-1.8%	-0.8%

Under the firm's reporting of financing activities the ($5MM)is presumably partially related to the payback of its $200MM draw on its credit facility (Coverity acquisition), which we partially reverse in the worksheet. There was a financing related use of cash the prior year of similar size and was partially reversed to arrive at normalized free cash flows. For fiscal years 2008- 2012 there is no "other" entry in its 10-K's under financing activities.

ABLE 18 FREE CASH FLOW WORKSHEET-9 MOS. 2014

CT Capital LLC: Cash Flow Analysis
Synopsys (SNPS)

Synopsis (SNPS)	Adjusted Free Cash Flow (AFCF) ($US, 000)	
	9 Mos July 31, 2014	9 Mos. July 31, 2013
Cash Flow From Operating Activities (as reported)	378.04	305.37
		0.00
Special Item Adjustments		
Nonrecurring expenses or revenue:	0	0
Bad debt (excess unusual-cash basis)	0	1
Legal (excess unusual):	0	0
Tax Holidays	0	0
Other tax benefits	-2.1	1.7
Gain on sales of securities	-0.2	0.0
Committments-excess	0	0
Total benefit from special items:	-2.5	2.7
Balance Sheet Adjustments:		
Inv	0.0	0.0
A/R	-3.3	-0.2
A/P:	7.1	11.2
Deferred Revenue :	-3.8	4.0
Other assets and liab.:	0.0	0.0
Deferred rent	0.0	0.0
Other:	2.9	3.4
Total benefit from balance sheet:	**2.9**	**18.4**
Reclasification Adjustments:		
Taxes:	0.0	0.0
Dividends received-other	0	0
Guarantees:	0	0
Payments to Non-Controlling (net of contributions):	0	0
Interest:	0	0
Repayment of prinicpal on capital leases:	0	0
Other reclassifacations(property sales):	0	0
Sales gains classified as operating activity	0	0
Stock Based Compensation-Excess tax benefit-reverse fin activity	0	0
Costs related to repayment of crfedti facility	5	6
Stock based compensation-normalize	0	0
Capitalized leases (principal reduction)	0	0
Total benefit from reclasification adjustments:	**5**	**6**
Other Adjustments:		
Pension catch-up contributions vs normal:	0	0
Derivatives:	0	0
Legal settlement:	0	0
Exchange Rates		
Warranty Costs	0	0
Total benefit from other adjustments:	**0**	**0**
Income statement items:		
Marketing	0	0
C.O.G.S.	0	0
Advertising:	0	0
S.G. & A.	0	0
R&D	21.3	14.7
Interest	0	0
other	0	0
Total benefit from income statement Items:	**21.3**	**14.7**
Footnote items:		
Pension-funding policy vs. market	0	0
Other Claims:	0	0
Other payments:	0	0
Self-insurance	0	0
Total benefit from footnote items:	**0**	**0**
Investing activities:		
Net capital spending:	-58.1	-47.6
Capitalized software	4	3
Capital Expenditures(excess):	1.4	0.9
Other capitalized items(normalized):	1	1
Other (normalized):	0	0
Sale of PPE(incl reverse gain):	0	2
Total adjusted investing Activities:	**-52.1**	**-40.8**
Financing activities:		
Purchases of Treasury Stock	-21.2	-7.2
Financing Fees -incremental	2.5	2.8
Adjusted proceeds from stock options (normalization):	0	0
Receivables or payables shown as Fin. Activity (normalized):	0	0
Reversal of other items-ie, prepaid debt fees	0	0
Total benefit from financing activities:	**-18.7**	**-4.4**
Adjusted Free Cash Flow 9 Mos:	**334**	**302**
Adjusted Estimated FY 2014 Annualized Free Cash Flow Yield:	**6.66%**	**7.08%**

COST OF CAPITAL

Although SNPS has a beta in the range of .55-.62, an inspection of its true cost of equity is still required, as oftentimes the differences can have future significance relative to the capital asset pricing model.

Even if the beta, as computed by various financial services, shares commonality with our current cost of equity, the composition leading to the result must be understood as even though cost of equity tends to remain stable over many periods, a revision in a specific metric can result in a substantial shift in the result. Changes in the component metrics impact firms differently; for example if a firm (or its customers) required access to the credit markets for financing, an event impacting: interest rates, Federal Reserve and regulator policy, derivative markets, sovereign risks which might be expected to affect credit markets, could impact cost of capital more greatly and would need to be built into such firms cost of equity.

SNPS may offer to indemnify customers if the licensed products infringe on a third-party's intellectual rights. We have raised cost of capital slightly for the possibility.

Stability of revenues is good, with a 10 year coefficient of variation of .22. This is similar to Cadence, KLAC and Mentor and considerably lower than others such as Marvel, Dassault, and Red Hat.

Helping to moderate cost of equity is the consistent and safe spread between cost of equity and return on capital, shown in Table 20.

Given the importance of intellectual property to the firm's sales and resulting cash flows, defending against infringements is always a concern, especially in countries where the court system is not as evolved or as equitable as the US. Such suits, even if meritless, can impact customers who might shy away from a firm fearing a negative outcome. This has caused us to raise cost of capital by 40 basis points. Given the firm's continuing large investment in R&D and growth in sales, alongside an expanding client list, it would appear our mark to be fairly estimated, if not conservative.

The possibility of a competing technology, although not an overriding past factor, has caused us to raise cost of capital by 30 basis. This has not proved to be a major concern for the firm thus far, although one always present for the industry. SNPS is currently involved in a lawsuit which came as part of an acquired company (EVE). The fact the firm was acquired does not lessen the outcome, if negative. This is certainly known to firms in the asbestos trade, many which entered bankruptcy despite a requirement of the Federal government to include the harmful material in manufactured product (i.e. Armstrong).

Typically, industry lawsuits, if they were to go against SNPS would require a cash payment and/or a royalty agreement. For example, in 2002, Synopsys reached settlement with Cadence, paying them $265MM.

One potentially damaging lawsuit (going back to 2010) relates to a Mentor Graphics filing against Emulation & Verification Engineering, which was purchased by SNPS in 2012 for $213MM. This is not the first case relating to a Synopsys acquisition. In 2001 SNPS bought Avanti which was then being sued by Cadence Design, and which was settled for $265MM plus interest. The amount of any judgment, if any, related to the Mentor suit is undetermined, but I do not believe it would cause greater than 3% change to our fair value, given EVES revenues. More concerning is SNPS willingness to undertake litigation risk in making acquisition decisions.

SNPS later counterclaimed, attempting to challenge Mentor's patents, which failed, and is now on appeal. The two firms, meanwhile, continue to do business together. It is possible, given Carl Icahn owns 14% of Mentor, that SNPS would make a deal to buy the competitor. That would serve to reduce our fair value, the amount dependent on the terms. MENT is currently returning a little over $100MM a year in free cash flows.

Legal proceedings, current and potential, prompted us to raise cost of capital by 55 basis points, although there is just one potentially significant lawsuit pending. Although not a significant issue historically, the value of the firm's patents and other intellectual property, including related goodwill, would be threatened should the firm lose an important suit.

Synopsys most important clients include Intel and Samsung and would view any break in those, or any major relationship, as significant. On the other hand, as clients expand, it is positive for SNPS, as history has shown such events translate into additional business opportunities.

There exists the possibility Samsung will attempt to buy the company given they need an "edge" in their fight with Apple regarding market share. Meanwhile Samsung's microprocessor business, previously a good profit center, could use a lift as it too is having difficulties. Their recent announcement of a new $14.7B chip plant would appear to be a positive development for Synopsys.[6]

On the other hand is the Board's stated use of acquisitions as a first order cash priority, after research and other operating expenses. We have raised cost of capital by 45 basis points from such risk and the tarnished history of technology acquisitions.

It seems each year the shares of SNPS get caught in the whirlwind of technology spending and investor confidence. Our models penalize cost of capital for firms with low valuation multiples as it becomes more costly for them to raise capital. Customer, employee, venture partners, and supplier confidence levels often erode with share price declines whether warranted or not. As such, we have placed a qualitative penalty to its cost of equity of 35 basis points above the risk

[6] See http://finance.yahoo.com/news/samsung-electronics-invest-14-7-011001272.html

free rate. Thus, its GICS industry, by itself, has required us to raise cost of equity due to its impact on the valuation multiple.

There is no apparent tax issues that need to be resolved, although low rate firms like SNPS are always subject to scrutiny, especially given the benefit of foreign low taxation. The mark-up for sovereign risk (48% of sales are US, 25% Asia, Pacific) reflect the bases of many of its manufacturing clients, and required a 20 basis point mark-up over the risk free rate. The low tax rate, although stable, requires a boost above the risk free rate on the possibility low rates do not stay there forever. Changes to the tax code for US firms will be very much on the table in the coming year.

Operating leases represent the largest component of debt at $146MM as the firm is basically a renter of office space, as described. It adds little to cost of capital given the financial structure, $900MM+ in cash, average historical license agreement period, strong history of cash generation, and continued emphasis on research in spite of its already industry leading position.

I view the entirety of the cost of capital penalties our model imposes to be minor except as stated. Productivity has declined due to the large growth in the research budget and slowing growth in revenues (per employee). For the 9 months, sales grew just 4.1% versus the 7 year average 8.35%. The year slowdown is most likely due to the timing of the signing of contracts as well as some temporary secular factors.

Other factors adding to cost of equity include strategic risk, and reliance on short-term low cost financing.

Given the above, SNPS remains a firm operating under a sound financial structure, more than adequate credit facilities, very consistent cash from operations as well as free cash flows, a consistent backlog, strong customer allegiance and confidence evidenced with a historically stable license period at over 3 years, and emphasis on maintaining leadership R&D, and as such, we estimate the firm's cost of equity at 7.65%. Given a 2.4% 10 year treasury rate, it would also intuitively fit a 525 basis point mark-up to be more than adequate given the firms risks to its prospective free cash flows.

ECONOMIC PROFIT/ROIC

Although we focus on economic profit for service and technology firms which normally operate with a low capital base, often substituting R&D in its place, a good portion of our investment case rests on a full complement of metric consistency, and so we show return on invested capital using our adjusted and normalized free cash flow as a base from which interest income is deducted. In Table 20, we show the consistency of the spread between ROIC and the cost of capital. Also, notice the consistent annual reduction in cost of equity, a vital metric in acquisition analysis, which overcomes the reduction in the return on capital.

TABLE 19 ROIC AND COST OF EQUITY

SYNOPSYS INC				
	Return on Invested Capital	Cost of capital		Spread
Oct07	28.412	8.480		19.932
Oct08	18.078	8.360		9.718
Oct09	10.428	8.210		2.218
Oct10	14.342	8.010		6.332
Oct11	18.790	7.940		10.850
Oct12	16.638	7.710		8.928
Oct13	15.429	7.650		7.779

Given the lack of capital intensity, we now look towards economic profit as a base from which to provide a measure of fair value and management skill[7].

Economic profit is defined as the company's free cash flows exclusive of interest income minus a capital charge, with the latter defined as the company's weighted average cost of capital multiplied by its *operating* invested capital. We include the present value of the operating leases ($146MM) in our capital determination. SNPS's after tax cost of debt, at a 20% cash rate, one year LIBOR at 58 basis, and the revolver at average 22 basis. Interest expense for the second quarter was just $.71MM and averaged less than $1.5MM for the past 3 years; hence, given the financial structure, cost of equity is the chief determinant of WACC. We can compare the computation of economic profit to any number of factors, such as sales, employees, or research budget.

Estimated Economic profit

= ((417-2))-((.022*.03) + (.0765*(.97)*))

= (417-2)-.0725(2,321)

=415-168.3

=246.69MM

SNPS economic profit as percentage of revenues is 12%. As a percentage of R&D, economic profit is about a third, again reflective of its magnitude of spending in that division. The stability of SNPS economic profit (not shown) as a percentage of enterprise value is superior to the

[7] Of course, if SNPS management can continue to expand the capital base and earn a safe return above a 7.65% cost of equity on the investment, shareholders would benefit. If external financing were utilized, in all probability (depending on the deal), cost of equity would rise.

majority of its peers and to many higher valuation multiple firms. This reflects the stability of its free cash flows and growth rate (Table 8), its weighted average cost of capital, and financial structure.

FAIR VALUE ESTIMATE

The firm maintains it is committed to high single digit earnings growth, although 7% appears more reasonable given its historical 8.35% annual growth in revenues and slowdown to 11.7% growth over its past two fiscal years, and 4.1% revenue growth for its nine months (Yr./Yr.)

Over the past decade, the correlation between net income and free cash flows has been 60.1%, and 66.7% with cash from operations. Over shortened periods those relationships break due to the timing of contracts signed, not the continued ability of the firm to produce consistent magnitudes of excess cash. In the fair value estimate, we build a 6% growth in free cash flows (reflecting recent slowdown) for 5 years, then 4% for 5 years, then 3%. We feel this is quite conservative and allows for business, segment, macroeconomic (or other) downturns, as well as a positive surprise.

In our fair value estimate, our blended rate revolves around the 7.65% cost of equity.

Disc Rte.	Probability	FV	
7.00%	5%	$56.87	
7.25%	5%	$54.82	
7.40%	15%	$53.64	
7.65%	50%	$51.75	
7.70%	10%	$51.38	
7.90%	10%	$49.94	
8.50%	5%	$45.95	
Fair Value Cash Flow	100%	$51.93	
Net Cash/Debt		4.85	
Fair Value Per Share		$56.78	

As for the possibility of SNPS being acquired, such is always possible given the safe and consistent spread between cost of equity and both return on capital and economic profits. If the shares in Synopsys were to decline due to an event unrelated to its prospective cash flows, the firm would certainly enter the radar of activist investors. In fact, SNPS would be a prime candidate should such event unfold.

The firm's close ties with clients have yielded large strategic technological improvements to the chip design process and could be threatened if an unwanted suitor emerged. Globalfoundries, like Samsung an existing client, and reportedly in talks to buy IBM's chip businesses, might be one of the few firms that could pull a friendly deal off in a joint venture with Samsung. A sole Samsung deal, cited earlier, would be less friendly given SNPS competing clients, although stranger things have happened, as we saw with Google buying Motorola Mobility.

CONCLUSION

Synopsys is a market leader in a growth industry. Its free cash flows are deemed sustainable and, although its growth rate is just moderate, its low cost of capital, backed by a wealth of intellectual property and strong metric consistency, override the growth portion of valuation.

There has been an ongoing trend toward use of computer chips in products once thought of as mundane; the new role of watches is such an example. Chips are coming into healthcare in a big way, from letting our physicians and doctors know when a refill is needed or whether we are even taking the meds.[8] New, smarter, and smaller chips will be contained in packages of consumer goods, and everything else product developers imagine. Retail stores will require advanced technology requiring chips as consumers walk up and down the aisles. The trend is irreversible, and so, I believe, is the role Synopsys will enjoy in these chips' design.

The shares in Synopsys have performed well over the years for good reason. Yet, even though its market value has grown at a rate in excess of the change in the S&P 500, many investors, we believe, remain on the sidelines in good part due to an estimated boring rate of growth and, importantly, few analysts following the company. Over time, however, the returns have certainly been anything but boring, a trend we expect to continue.

With regard to the always important decision of market timing on purchase, there are often periods when systematic declines in technology share valuations and problems at clients or related firms drag Synopsys along. Yet, when competitors do experience softness they do not attempt to back away from future product development, as that would certainly be "the kiss of death."

Sympathetic drops involving SNPS have always concluded in the shares snapping back.

Kenneth S. Hackel, CFA

[8] For example, see http://www.deloitte.com/us/healthit?id=us:em:na::eng:lshc:091514&elq=e149b507b7ea415a97285747331614ff&elqCampaignId=2219

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