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U.S. Software

The Metrics Handbook – A Guide To Analyzing Software

What To Look For When Analyzing Software Vendors: Judging the attractiveness of a software company requires more than just looking at revenue, profit, and cash flow. Our sector is very diverse, in terms of business and revenue models, and hence, differentiation and a more comprehensive tool set is needed. In this report, we show the most important metrics to focus on and also show how our coverage companies line up for these. This report will be relevant for our upcoming TMT conference (December 9th and 10th), which will see a record number of software vendors in attendance, but will also be a great summary for PMs, or investors new to the exciting software space, in the years to come. Software has been exciting this year (IGV +45% vs. S&P 500 +14.5%), but will likely continue to be in focus in the future given all the structurally positive changes. Hence, we believe this report will have a long shelf life.

Top-line Performance: Arguably the most important group of metrics for investors, as these seek to measure business growth in a sector predicated on structural growth. Additionally, due to subscription transitions and the impact of ASC 606, metrics here are the most impacted by software-specific accounting nuances. In this section, we dive deeper into measures like Billings, Bookings, and Annualized Recurring Revenue (ARR), as well as look at more traditional metrics like, Revenue and Professional Services Mix.

Customer Dynamics: Due to the relative stickiness and recurring nature of a software customer, an understanding of customer dynamics reveals a great deal about the business model. This section includes a number of customer performance metrics to come out of the Silicon Valley, for software companies specifically, including Retention rates and CAC metrics. Additionally, we outline some measures of customer base demographics, such as SMB Exposure and Customer Concentration.

Profitability Measures: At the end of the day, it is not enough to value a company merely on revenue growth, and the time comes to weigh profitability, per the Rule of 40 (discussed later), especially as companies reach maturity. Hence, we provide a breakdown of tools for profitability analysis across the three financial statements. Metrics covered in this section span operating expense efficiencies like S&M Margin and the Magic Number, and cash flow generation, like Free Cash Flow Margin and Cash Conversion, to provide a wide variety of tools for profitability analysis.

INDUSTRY UPDATE

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TOP-LINE METRICS

Top-Line Metrics Summary Sheet

Software Revenue Background

Deals in software can come from either new customers or existing customers of the business. Therefore, revenue can come into the business in various ways: net new deals, existing customer renewals (when a deal is renewed), and existing customer upsells (when additional product offerings or services are added to deals). The major types of software revenue streams are listed here:

- **Subscription:** One of the most desired contract types now. Customers pay a fixed price at regular intervals for access to the software. The contract terms can vary for each deal, but these are typically structured on a per-user basis.
- **Term License:** Customers purchase access to a software offering for a specified time period. This access expires after the set time period. There can typically be a component of maintenance associated with these deals.
- **Perpetual License:** Customers purchase access to a software offering for an indefinite time period. This access does not expire as it is indefinite. Usually an annual maintenance fee is paid.
- **Maintenance:** Fees collected that are associated with the continued updates and optimization of software once it has been delivered. These payments are usually fixed and structured ahead of time.
- **Professional Services & Other:** This revenue is collected from the development and implementation, training, and later optimizing the customer's use of the product.
- **Consumption:** Typical in models focused on data compute and transfer, revenue is recognized as customers consume a contracted capacity of resources.

Metrics in Focus

- **Billings** = Revenue + Sequential change in Deferred Revenue
- **Bookings** = Revenue + Sequential change in RPO
- **Short Term (ST) Bookings** = Revenue + Sequential change in cRPO
- **Annualized Recurring Revenue (ARR)** = Recurring TCV / Average Duration
- **Professional Services Mix** = Professional Services Revenue / Total Revenue

Others Discussed

- **Total Contract Value (TCV):** The total value of the software contract
- **Annual Contract Value (ACV):** The annual value of the software contract, or (TCV / Duration)
- **Remaining Performance Obligation (RPO):** Aggregate of all the remaining TCV that is left on the contract.
- **Current Remaining Performance Obligation (cRPO):** The portion of the RPO that is expected to be recognized in the near-term. Typically, this is over the next twelve months.
- **Duration:** The total agreed upon length of the contract.

Revenue

Our top-line analysis begins with revenue, which is by far the most universal and simplistic metric that we will look at here. Revenue is defined as the amount of income that can be recognized from the performance of normal business activities in the fiscal period. The operative phrase here is "can be recognized", because although it is the most universal, we will explore why revenue is often not the optimal metric.

Benefit of Revenue

- **Universal Applicability:** The greatest advantage to using revenue as a metric is that every company has revenue that can be analyzed. Especially with younger companies, metrics further down the income statement can be negative, or sporadic, as the business scales. In either case, there is a lack of a reliable basis for year over year comparison. Applying revenue, a figure that is always reported and positive, corrects for this issue. Take the example of the three companies in the table below, as it would be impossible to compare them on the two metrics outside of revenue. As such, revenue is a metric that can be applied for analysis throughout our coverage.

FIGURE 1
Revenue Exists for All Companies

	Company A	Company B	Company C
Revenue	$300	$300	$300
Operating Profit	$200	$100	($50)
Net Income	$100	($50)	($150)

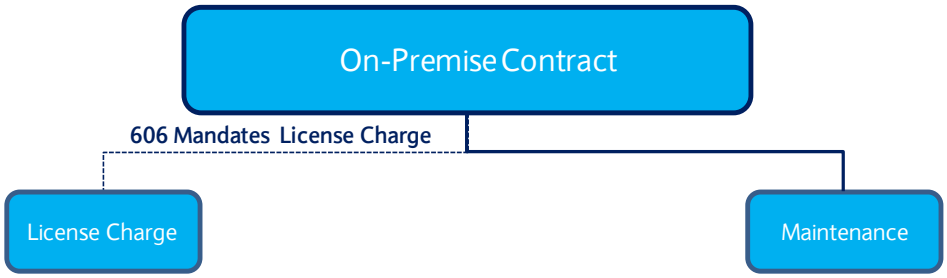
Source: Barclays Research.

Shortcomings of Revenue

Despite its applicability advantage, revenue suffers from several flaws, as it is often removed from the present and future cash flows from the business. Some other top-line metrics that we will discuss later in this section seek to adjust for these issues.

ASC 606 Creates Revenue Recognition Disconnect: The recent ASC 606 accounting standard created some additional nuances surrounding revenue recognition of term licenses. As illustrated in the figure below, the new standard mandates a license charge, which varies from company, that is taken up front, instead of ratably. This can create lumpiness and misalignment with cash flows, which will be shown on the next page. Notably, open source companies take a smaller license charge than proprietary software.

FIGURE 2
Term License Revenue Under 606



Source: Barclays Research.

In the table below, we suppose a hypothetical term license deal worth $300 over 3 years. The contract is billed annually and its value is equally divided ($150 each) between license and annual maintenance. We assume, for illustrative purposes, that 100% of the license revenue is required to be taken as an upfront charge. When looking at revenue, the first year includes the entire $150 license charge and the annual $50 maintenance. The following 2 years only reflect the annual maintenance. However, if we assume annual invoicing in equal parts, $100 in physical cash will be received each period. Thus, revenue is recognized ahead of the actual receipt of payment. This disconnect can not only distance revenue from actual cash flow and make revenue lumpier, but can make comparisons between companies less reliable if one sells term licenses and the other does not.

FIGURE 3

Mismatched Revenue and Cash Flows

	Year 1	Year 2	Year 3
Revenue	$200	$50	$50
Invoiced Amount	$100	$100	$100
Physical Cash Received	$100	$100	$100

Source: Barclays Research.

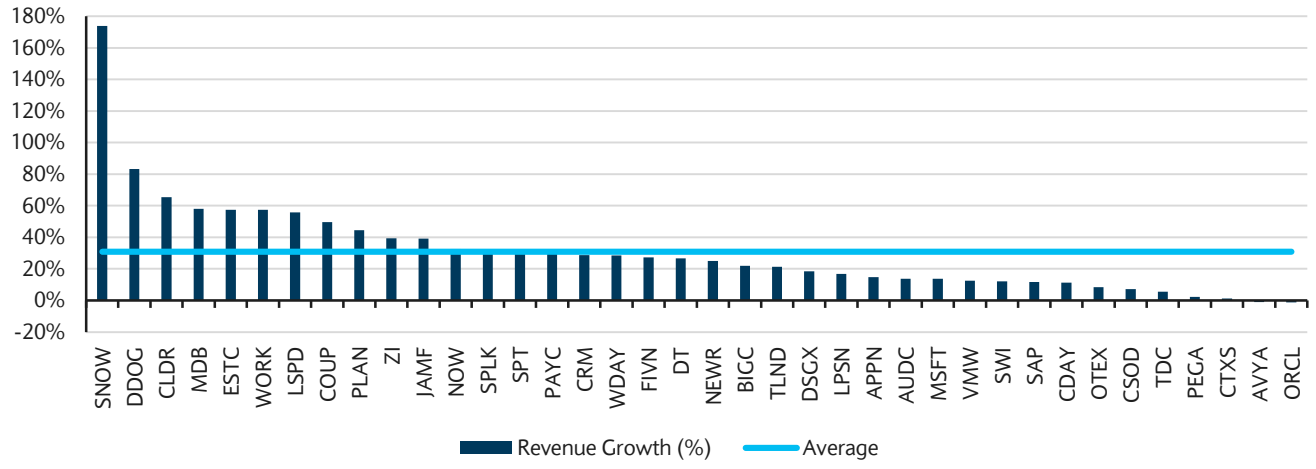
Revenue Lags Behind: Due to the nature of the invoicing behind multi-period software deals, a significant sum of revenue comes from existing balance sheet accounts. For example, a typical contract will create a component of deferred revenue because it is invoiced up-front, but cannot be recognized right away. Here, the revenue will be pulled from this existing deferred revenue balance when it is recognized. Therefore, much of the revenue for a quarter is trailing as it is reflecting prior business dealings and so, revenue is not an optimal proxy for future performance.

Revenue Growth in Our Coverage

Here we take a look at our coverage through the revenue growth metric. For this, we looked at revenue for each of our companies in their last reported full fiscal year and took the year-over-year growth from the year prior.

FIGURE 4

Revenue Growth Across Our Coverage

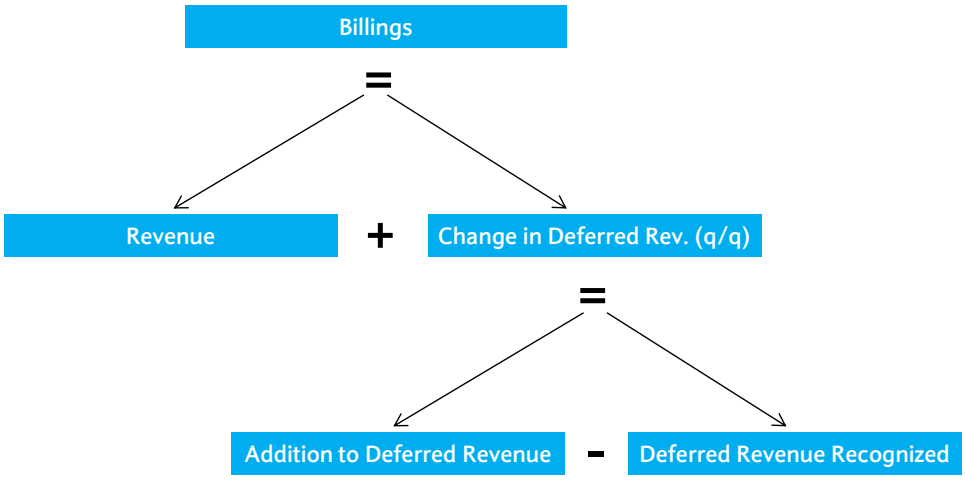


Source: Barclays Research, Company Data.
*CLDR and COUP numbers impacted by meaningful acquisitions in the period

Billings

Our top-line metrics takes a step forward with billings, which was architected to compensate for some of the discussed revenue shortfalls. As companies started selling more subscriptions, the metric gained more popularity as a greater proportion of revenue began to come from the existing deferred revenue balance. The rise of subscriptions made revenue even more of a trailing figure or essentially just confirmation of previously conducted business. Billings is calculated as the revenue in the period plus the change in the deferred revenue from the period before. A simpler way to think of this is the total invoiced business. The calculation is illustrated in the figure below.

FIGURE 5
How to Calculate Billings



Source: Barclays Research

Benefits of Billings

As the software industry shifted toward more subscription-based business models, revenue growth became a lagging KPI for the underlying top-line performance of companies and was less in-tune with the true cash flow. Thus, investors began to turn toward billings.

Billings as a Leading Indicator: When compared to revenue, billings can be seen as a more accurate proxy to the true top-line health of the business because revenue defers much of value until a service is provided and can misstate the actual value of the customer. Below, we walk through an example scenario to show the disconnect.

FIGURE 6
Illustration of Billings vs. Revenue

	Year 1			
	Q1	Q2	Q3	Q4
Billings	$100	$0	$0	$0
Revenue	$25	$50	$75	$100

Source: Barclays Research.

In the above example, we assume that a 3-year, $300 contract is billed annually for a quarterly subscription. From this contract, the company will recognize $100 in the fiscal year. With billings, we know this is in the first quarter when the $100 is billed. Revenue lags and the $100 value is not fully recognized until the fourth quarter, in the example. Thus, billings is a leading indicator into the value that a contract provides a business and offers timelier visibility into the underlying top-line performance than revenue does.

Closer to Cash Flow: Additionally, billings is more closely tied to the actual cash flow of the business. Where recognized revenue is only the amount that a business earns on performance, billings also links to movement in deferred revenue. In the example, the business receives the $100 when it is billed at the start of the first quarter. Out of this, $75 is placed into deferred revenue and therefore, only $25 is recognized as revenue for the quarter. Billings takes the $25 in revenue recognized and adds the change in deferred revenue for the period ($75) and hence, it matches the $100 in real cash flow.

Shortcomings of Billings

While billings provides some better visibility into a company's underlying performance vs. revenue, we show it has some flaws as a leading KPI for investors.

Billings Doesn't Reflect Total Booked or Contracted Revenue: For an investor looking to understand a company's quarterly performance, billings growth doesn't provide the complete picture. Total booked or contracted business (discussed later) is the comprehensive measure of business momentum, and billings represents only the invoiced portion of the total booked business. Hence, an investor is unable to form a complete opinion of the underlying quarterly performance of the company from billings. In the example below, we assume a $300 three-year contract that is invoiced annually and show the breakdown of bookings, billings and revenue.

FIGURE 7
Billings Shows Only Invoiced Revenue

	Year 1	Year 2	Year 3
Bookings	$300	$0	$0
Billings	$100	$100	$100
Revenue*	$100	$100	$100

Source: Barclays Research. * Assumes deal signed on Jan 1 and hence, full year of revenue recognized in Year 1.

Here, the billings of $100 in Year 1 doesn't fully capture that the company signed a multi-year deal with contracted revenues through Year 3. As such, an investor looking at billings growth will be unable to fully understand the true momentum of the business.

Volatility from Invoicing Terms: Another pitfall of billings is the volatility and optics from different invoicing durations. In the example, the billings trajectory will be different if the contract was billed upfront despite revenue recognition and bookings staying the same, as shown in the figure below. Hence, volatility is one of the primary reasons that many software companies choose not to discuss billings with investors and avoid providing guidance on deferred revenue or billings.

FIGURE 8
Invoicing of Impact on Billings

	Year 1	Year 2	Year 3
Bookings	$300	$0	$0
Billings	$300	$0	$0
Revenue	$100	$100	$100

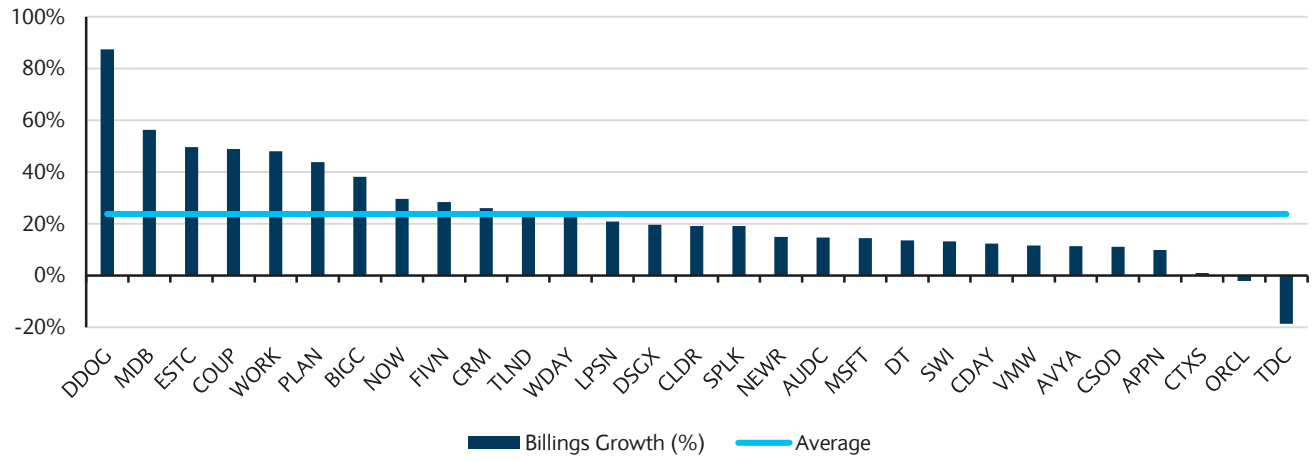
Source: Barclays Research

Billings Growth in Our Coverage

Despite its shortcomings, we decided to take a look at our coverage through the billings growth metric. For this, we looked at billings for each of our companies in their last reported full fiscal year and took the year-over-year growth from the year prior.

FIGURE 9

Billings Growth Across Our Coverage



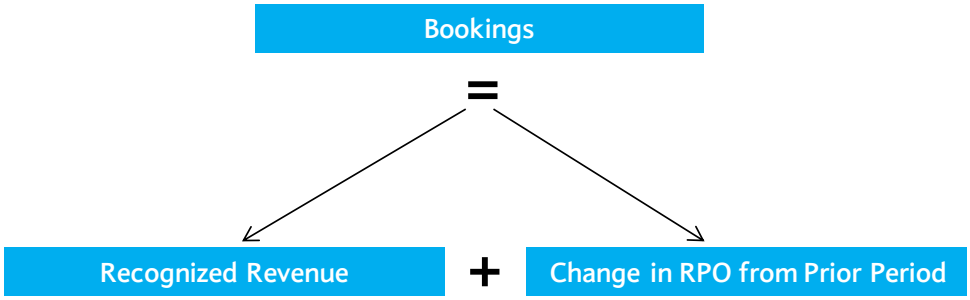
Source: Barclays Research, Company Data.

*CLDR and COUP numbers impacted by meaningful acquisitions in the period

Bookings

Next, in an effort to give even more useful top-line metrics, the 606 accounting standard requires the periodic reporting of RPO or remaining performance obligation. RPO is the total amount of contracted revenue (deferred revenue on the balance sheet + contracted unbilled revenue). In a similar spirit to billings, bookings is calculated as the recognized revenue for a period plus the change in RPO. We illustrate this in the figure below. Bookings gives investors insight into the total amount of present and future business agreed upon in the period and ignores the invoicing volatility from billings. Bookings has a timelier complement called Short-term Bookings, which we will discuss in greater detail in the next section.

FIGURE 10
How to Calculate Bookings



Source: Barclays Research

Benefits to Bookings

Bookings is further along in our evolution of top-line metrics and its advantages expand upon the issues that billings attempts to solve and seeks to correct some flaws of billings.

- **The Best Leading Indicator:** Bookings has the inherent benefit of being a more leading indicator when compared to revenue, or even billings, because it accounts for total contract value. This is because bookings is the total amount of present and future business that is agreed upon by the business and its customers. As such, bookings does not adhere to revenue recognition policies or deferred revenue billing timings.
- **No Impact from Invoicing Differences:** Bookings is agnostic to billing terms, as shown in the example below, where we suppose a 3-year/$300 contract is signed and look at the impact to top-line metrics for both annual and upfront invoicing terms. In addition to capturing the total contracted amount much sooner (bookings reflects the full $300 before revenue), bookings ignores the invoicing terms of the contract. This can be seen in the figures below as the metric stays the same in each respective period, irrespective of the contract being invoiced on an annual or upfront basis. Hence, bookings allows the investor to look past noise around invoicing terms and better understand the true performance of the quarter, a shortcoming of the billings metric discussed prior.

FIGURE 11
Annual Billing Terms

	Year 1	Year 2	Year 3
Bookings	$300	$0	$0
Billings	$100	$100	$100
Revenue	$100	$100	$100

Source: Barclays Research.

FIGURE 12
Upfront Billing Terms

	Year 1	Year 2	Year 3
Bookings	$300	$0	$0
Billings	$300	$0	$0
Revenue	$100	$100	$100

Source: Barclays Research.

Shortcomings of Bookings

One of the biggest shortcomings of bookings, as well as short-term bookings, which we discuss in the next section, is the lack of a strong history of data. These are relatively new metrics and disclosures were only recently mandated by ASC 606. Besides this, we analyse a more mechanical issue with bookings here.

- **Lack of Adjustment for Duration:** Bookings does not normalize for contracts of differing length. Two contracts with the exact invoicing terms and annualized contract values will have different total bookings amounts if they are signed for a different number of periods. The tables below illustrate this issue with an example. We consider two contracts that both have upfront annual billing and a $100 annual contract value (ACV). The key difference is that one is a 3-year contract and that the other is a 2-year contract. In the tables below, we see that the contracts have a different bookings values for the first year. Total bookings for the 2-year deal is $200 in Year 1 and $0 in year two because no further business is agreed upon. For the 3-year agreement, bookings is $300 in Year 1 which reflects the total contract value (TCV) for that deal.

  We note that RPO falls victim to the same problem as well. For the 2-year deal, RPO for Year 1 is the remaining $100 because $100 was already recognized in revenue and there is no RPO for Year 2 as the whole contract has been recognized at that point. The 3-year deal has RPO that is $100 higher in each of the first two periods, which is due to the TCV of the contract being $100 more originally. Thus, neither bookings or RPO have the power to adjust for differing durations and can yield optical volatility. ST bookings and cRPO, discussed on the next page, provide and answer for this.

FIGURE 13
Two-Year Contract

	Year 1	Year 2
Bookings	$200	$0
RPO	$100	$0
Revenue	$100	$100

Source: Barclays Research.

FIGURE 14
Three-Year Contract

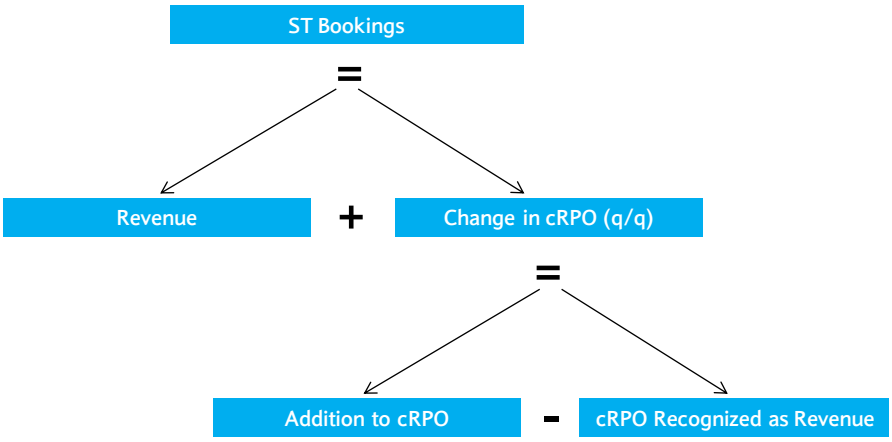
	Year 1	Year 2	Year 3
Bookings	$300	$0	$0
RPO	$200	$100	$0
Revenue	$100	$100	$100

Source: Barclays Research.

Short-Term Bookings

Building off of bookings, short-term bookings (ST bookings) is the total amount of contracted revenue that is expected to be recognized in the near term. Under 606, companies must report a portion of RPO that is expected to be recognized as revenue in the near term. This near-term portion of RPO is called current RPO, or cRPO. From this cRPO disclosure, we can compute ST bookings, which is revenue for the period plus the change in cRPO. Additions to cRPO include new contract signings or an existing piece of RPO becoming current and subtractions occur when revenue is recognized from the existing cRPO balance. This math is broken out more in the figure below.

FIGURE 15
How to Calculate ST Bookings



Source: Barclays Research

Added Benefit of ST Bookings

Along with the total bookings benefits of being a leading indicator and normalizing for invoicing, ST bookings brings another powerful advantage to the table.

- **Adjustment for Contract Duration:** Unlike bookings, cRPO and ST bookings adjust for contract duration in their calculations. Here, we take the same prior duration example of the 2- and 3-year, $100 ACV contracts and include their ST bookings and cRPO values. Again, bookings and RPO fail to normalize for the different durations. However, using the formula above, the ST bookings and cRPO values remain the same for both of the two contract duration scenarios in Year 1. Thus, cRPO and ST bookings can both be used to adjust for differing contract durations while looking at RPO and total bookings alone does not provide this upside to the investor.

FIGURE 16
2 – Year Contract

	Year 1	Year 2
Bookings	$200	$0
RPO	$100	$0
ST Bookings	$200	$0
cRPO	$100	$0
Revenue	$100	$100

Source: Barclays Research.

FIGURE 17
3 – Year Contract

	Year 1	Year 2	Year 3
Bookings	$300	$0	$0
RPO	$200	$100	$0
ST Bookings	$200	$100	$0
cRPO	$100	$100	$0
Revenue	$100	$100	$100

Source: Barclays Research.

Shortcoming of ST Bookings

Again, with both varieties of bookings, there is downside in the fact that they are relatively new metrics for many names. This means a lack of a strong history for year over year comparison. Additionally, we show another challenge specific to ST bookings here:

- **ST Bookings – Differing cRPO Definitions:** As mentioned at the beginning of this section, the percent of RPO that is recognized as cRPO can differ tremendously from one company to another. Notice, for example, the difference in the percent of total RPO that is current for OpenText (46%) and Datadog (100%) in the figure below. While this doesn't create too many headaches for investors, it is important to know that this is a nuance that must be understood and accounted for while using cRPO to model out the future performance of a company.
- **Cloud Transitions:** An on-premise deployed software will recognize a license charge (sometimes as much as 80% of Total Contract Value). When moving to a Cloud deployment, upfront revenue recognition is limited and the backlog does not all show up in cRPO if the contract length is longer in nature (3,5,10 years deals).

FIGURE 18
Latest cRPO Disclosures

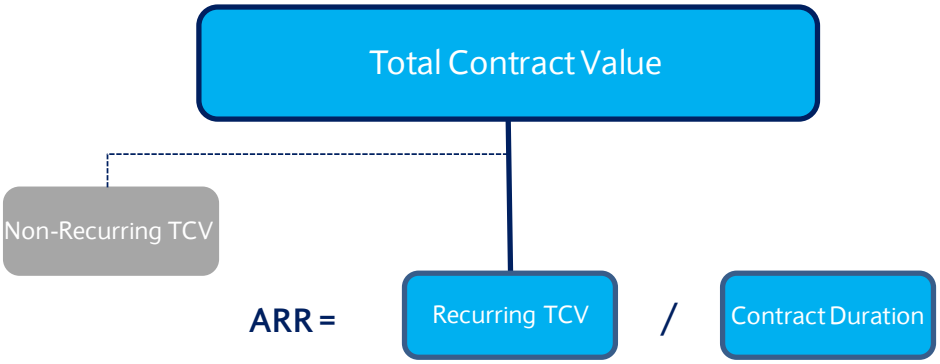
Company	cRPO (% of Total RPO)	cRPO Definition	cRPO y/y Growth	cRPO % Revenue
APPN	87%	24 Months	nm	59%
AVYA	57%	12 Months	-14%	48%
CDAY	100%	36 Months	nm	102%
CLDR	67%	12 Months	13%	74%
COUP	75%	24 Months	45%	140%
CRM	49%	12 Months	26%	88%
CSOD	66%	18 Months	10%	110%
CTXS	94%	<1-3 Years	14%	78%
DDOG	100%	24 Months	92%	67%
DT	58%	12 Months	nm	91%
ESTC	83%	24 Months	44%	104%
FIVN	80%	24 Months	65%	39%
MDB	54%	12 Months	24%	27%
MSFT	50%	12 Months	nm	39%
NEWR	92%	24 Months	30%	100%
NOW	50%	12 Months	35%	95%
ORCL	62%	12 Months	2%	59%
OTEX	46%	12 Months	46%	21%
PEGA	59%	12 Months	23%	54%
PLAN	50%	12 Months	41%	94%
SPLK	55%	12 Months	23%	42%
SPT	92%	12 Months	nm	38%
TDC	50%	12 Months	15%	60%
TLND	75%	12 Months	17%	63%
VMW	54%	12 Months	16%	51%
WDAY	66%	24 Months	23%	151%
WORK	57%	12 Months	nm	30%

Source: Barclays Research, Company Data.

Annualized Recurring Revenue (ARR)

Companies have steadily moved away from the traditional, license-heavy business model in software and instead moved towards subscription-based models. The result is that, overall, a much greater portion of revenue is recurring. The Annualized Recurring Revenue (ARR) metric is a product of this trend because, as the name suggests, it seeks to annualize recurring revenue to create a like-for-like metric. It is computed as the recurring total contract value (TCV) divided by the contract duration, as shown in the figure below.

FIGURE 19
How to Calculate ARR



Source: Barclays Research.

Benefits of ARR

The main benefits of ARR revolve around how it normalizes various contracts for divergent accounting treatments and mismatched durations. We illustrate this with examples below.

- **Normalizing for 606 Revenue Recognition:** The 606 accounting standard creates some nuances for software contracts that ARR can neutralize. In the example below, we take a look at revenue and ARR for a $300/3-year license contract. We outline two scenarios; one with the contract being a cloud license and the other being an on-premise license. The cloud license is billed annually. For the on-premise license, we assume 50% of the TCV ($150) is recognized upfront and the remainder ($50 each year) is collected annually as maintenance revenue. We assume the contracts are renewed in year 4.

  Due to 606 accounting, revenue for these contracts can differ dramatically as the on-premise license revenue is recognized upfront, when it is considered delivered. This leaves only the $50 maintenance to be recognized in the other years. As shown below, ARR negates this as the recurring TCV/duration of these contracts is always $100.

FIGURE 20
ARR Normalizing for Revenue Recognition

Contract Type	Metric	Year 1	Year 2	Year 3	Year 4
3-Year Cloud License	Revenue	$100	$100	$100	$100
	ARR	$100	$100	$100	$100
3-Year On-Premise License	Revenue	$200	$50	$50	$200
	ARR	$100	$100	$100	$100

Source: Barclays Research.

- **Adjusting for Contract Durations:** Another key advantage of ARR is that it normalizes for different contract lengths. That is, as long as the Annual Contract Value (ACV) is the same, the ARR will match for both contracts. We explore this in the example below.

  Here, we take the same $300/3-year on-premise deal and compare it to a $600/6-year on-premise deal with the same dynamics (50% license charge, $50 annual maintenance, etc.). Again, we see that revenue is a bit messy due to the on-premise recognition treatment under 606. Regardless, ARR remains steady for every period and neutralizes the duration issue as the recurring TCV divided by duration is always $100.

FIGURE 21
ARR Adjusting for Contract Duration

Contract Type	Metric	Year 1	Year 2	Year 3	Year 4
3-Year On-Premise License	Revenue	$200	$50	$50	$200
	ARR	$100	$100	$100	$100
6-Year On-Premise License	Revenue	$350	$50	$50	$50
	ARR	$100	$100	$100	$100

Source: Barclays Research.

Shortcomings of ARR

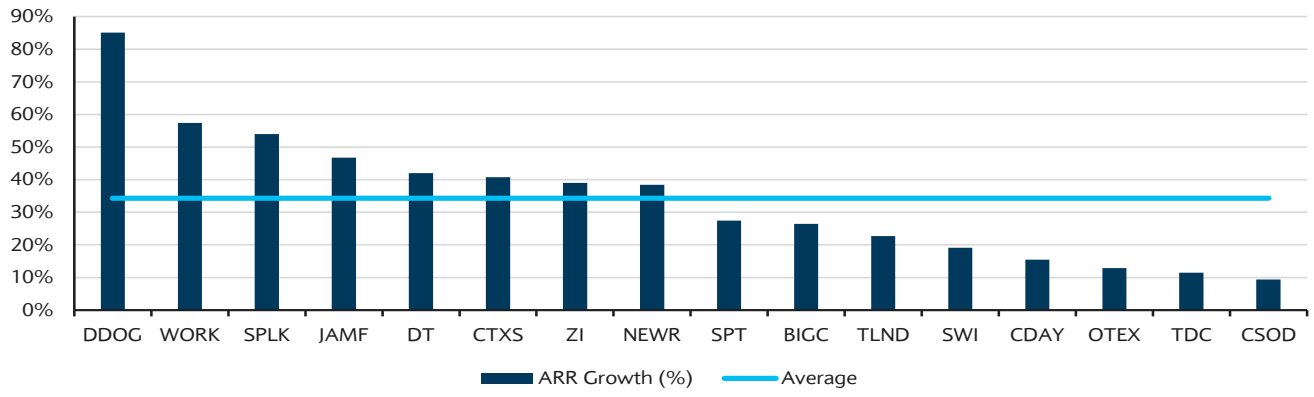
Despite ARR holding advantages over other top-line metrics, that does not mean that it is without its flaws. Here we examine what can make ARR a less useful metric for analysis.

- **Ignores Non-Recurring Revenue**: The single greatest issue with ARR is that it only captures revenue that is recurring. Thus, it fails to account for sales that are non-repeatable, like perpetual licenses and any professional services associated with deals. Although the industry is trending to be more recurring, some companies still rely on other revenue streams.
- **Can Be a "Black Box":** Though ARR is seen as a cleaner metric, it places trust in the company's calculation of it, as a non-GAAP item. Investors need to pay careful attention to disclosures on how companies compute ARR, if given.

ARR Growth Across Our Coverage

We decided to take a look at our companies through the lens of ARR by analysing the year-over-year growth in ARR for the last reported full fiscal year.

FIGURE 22
ARR Growth in Our Coverage

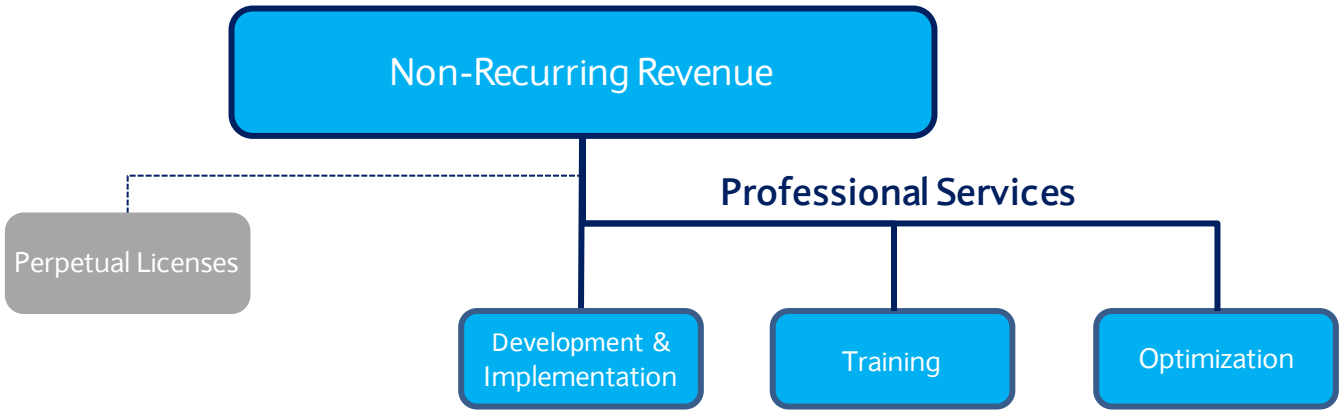


Source: Barclays Research, Company Data.

Professional Services Mix

In contrast to recurring revenue, professional services is a non-recurring revenue component. It typically comprises development and implementation, training, and later optimizing the customer's use of the product, but this can vary by company. Investors can use professional services mix, or professional services revenue divided by total revenue, in their top-line analysis.

FIGURE 23
Professional Services Components



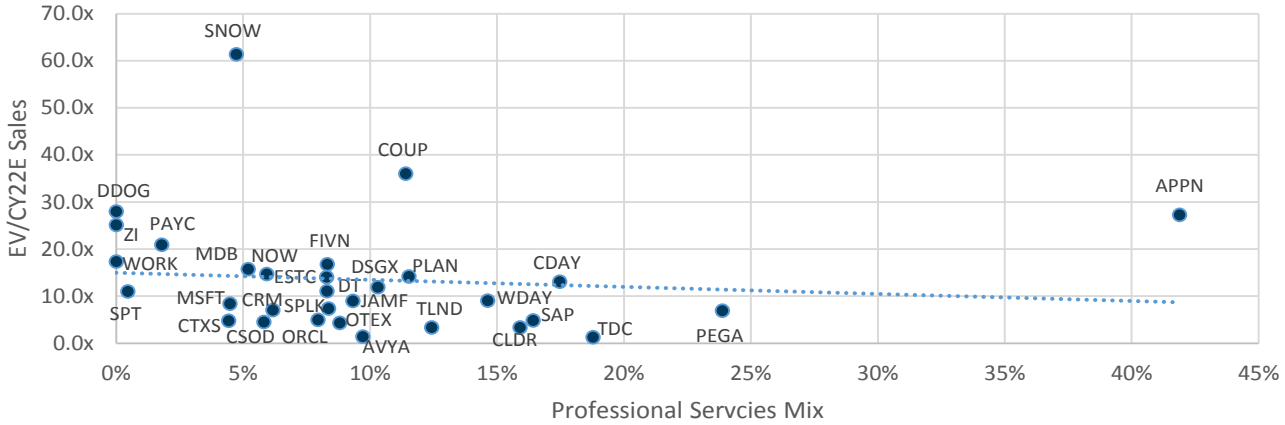
Source: Barclays Research.

Benefits of Professional Services Mix

For many companies, narrowing in on the professional services mix of total revenue can provide meaningful insight into the quality of revenue and resiliency of the business.

- **Better Revenue Gives Higher Multiples:** In general, professional services are lower-margin (typically 0-40%) and thus, less meaningful to the bottom line. Consequentially, companies with a greater mix of professional services tend to trade at lower multiples. This can be seen by the downward sloping trend line in the figure below. Barring some outliers (which we will explore later), the professional services mix provides correlation to the revenue multiple demanded for a company by the analyst.

FIGURE 24
Professional Services Mix vs. EV/CY22E Sales Multiple



Source: Barclays Research, Company Data, Bloomberg.

- **Perspective into Resiliency:** As mentioned, professional services revenue is, for the most part, a non-recurring item. For many companies, this is the largest component of their non-recurring portion of revenue. In times of economic uncertainty, more recurring models are rewarded for being more defensive, as less of their revenue is reliant on executing one-time deals. Therefore, analysis of professional services mix can provide some insight to the resiliency of the business model in times of concern.

Shortcomings of Professional Services Mix

- **Lack of Applicability:** The greatest disadvantage of using professional services for analysis is simply that some companies don't even have it as a line item. Reasons behind the decreased reliance on professional services are: (1) as companies scale larger, they tend to leverage system integrators for much of this work, and (2) much of the software is "lighter" now, and requires less heavy lifting around implementation. Therefore, only about 70% of our coverage has professional services as a revenue segment.

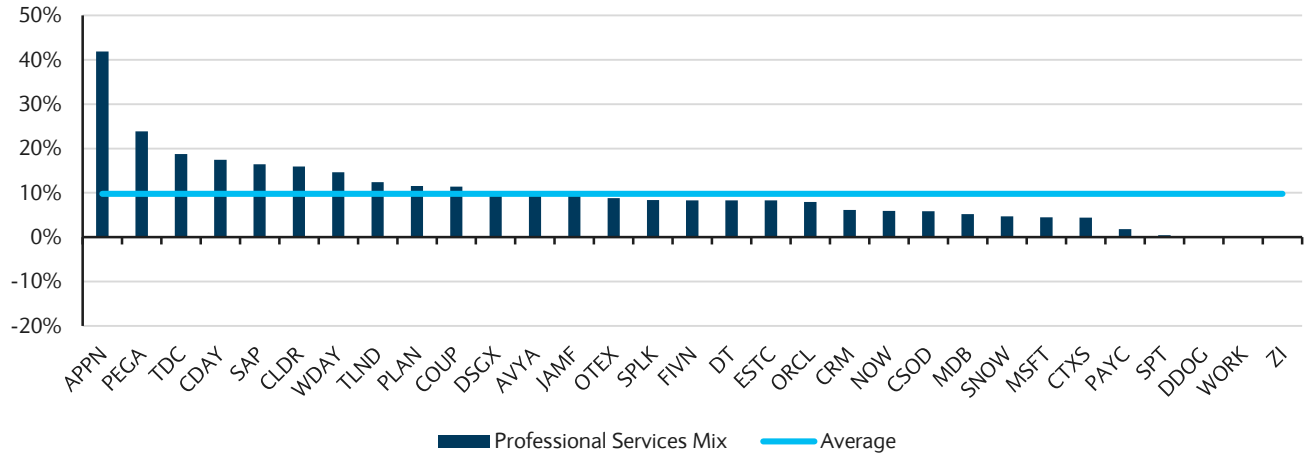
- **Company-Specific Nuances:** For certain companies, having a strong professional services business can be leveraged to further drive growth in a higher-value subscription business. A textbook example of this is a company like Appian, which has the greatest services mix in our coverage, as seen in the figure below at 42%. The more custom nature of Appian solutions requires heavier emphasis on development. Additionally, the company is not yet large enough to have a robust and competent partner network. Thus, it can be argued that Appian's higher mix of professional services is justified as it is required to fuel growth in higher-quality revenue segments. Their richer valuation above the trend line on the previous page supports this claim.

Professional Services Mix in Our Coverage

We looked at our companies through their professional services mix by analysing the percent of professional services of total revenue for the last full fiscal year.

FIGURE 25

Professional Services Mix Across Our Coverage



Source: Barclays Research, Company Data. Data as of respective last year ends of companies.

CUSTOMER METRICS

Customer Metrics Summary Sheet

Software Customers Background

Software metrics can be split into customer performance and demographics figures. A customer is constantly faced with the choice to expand, renew, or downgrade contracts, or depart the customer base entirely. Customer performance metrics consider these scenarios. Customer demographics look at the descriptive characteristics of the customer base. See Figure 26 for an overview of these metrics and their characteristics.

FIGURE 26
Insights Gained from Each Metric Discussed

Metric	Customer Churn	Upgrades / Downgrades	New Customers	Element of Time	Customer Demographics
Customer Retention	X	X*			
Net Dollar Retention	X	X			
LTV to CAC	X		X		
CAC Payback			X	X	
Customer Concentration					X
New Business Dependency			X		x
SMB Exposure					X

*Only Net Customer Retention considers upgrades/downgrades.
Source: Barclays Research.

Metric Formulas

- **Gross Customer Retention (%)** = (Beg. Customers - Customers Lost) / Beg. Customers
- **Customer Churn (%)** = 1 – Gross Customer Retention
- **Net Customer Retention (%)** = Total Ending Customers / Beg. Customers
- **Net Dollar Retention (%)** = (Beginning Revenue + Up-Sells – Down-Sells – Churn) / Beginning Revenue
- **LTV to CAC =** [(Net New Revenue * Gross Margin) / Churn] / (Prior S&M * % Direct S&M Assumption)
- **CAC Payback Period** = (Prior S&M * % Direct S&M Assumption) / (ARPC * Gross Margin)
- **Customer Concentration =** # of customers accounting for X% of revenue
- **New Business Dependency =** New Customer vs. Existing Customer Revenue Growth
- **SMB Exposure =** SMB Revenue / Total Revenue

Customer Retention Rates and Churn

Beginning as a way to monitor successful business growth in start-ups, some of the most intuitive and widely-used customer metrics are customer retention rates. The first, gross customer retention, looks at the number of existing customers from the beginning of the period that remain as customers at the end of the period. The inverse of this is churn, which looks at the ratio between lost customers and existing customers. Finally, net customer retention expands upon gross retention as it accounts for customer adds in the period. We take a deeper dive into these metrics with examples below.

Gross Customer Retention

Perhaps the most basic of these calculations is gross customer retention. It is formally calculated as: (beginning customers - customers lost) / beginning customers. We give examples of the calculation for three hypothetical companies below. Note that the churn rate is always the inverse of the metric (or, 1 – gross retention).

FIGURE 27
Gross Customer Retention Example

	Company A	Company B	Company C
Beginning Customers	1000	1000	1000
Customers Lost	10	50	100
Churn Rate	**1%**	**5%**	**10%**
Gross Retention	**99%**	**95%**	**90%**

Source: Barclays Research.

Net Customer Retention

The net customer retention rate seeks to improve upon the prior metric by including customer adds in its calculation. It is therefore calculated as: (total ending customers / beginning customers). These metrics, at times, can yield very different results. In the example below, notice how the gross retention rate is deteriorating in every period but the net retention rate is consistently 120% (showing positive customer growth). Stepping away from the specific metrics, the overall trend is that the number of customers of the business is growing every period. The gross customer retention rate, and thus the churn rate as well, fail to reflect this trend while the net retention rate adequately captures it. As such, the net customer retention rate is especially important for companies in high growth stages.

FIGURE 28
Gross vs. Net Customer Retention

	Year 1	Year 2	Year 3
Beginning Customers	1000	1200	1440
Customers Lost	10	50	100
Customers Added	210	290	388
Total Customers	1200	1440	1728
Churn Rate	**1%**	**4%**	**7%**
Gross Retention	**99%**	**96%**	**93%**
Net Retention	**120%**	**120%**	**120%**

Source: Barclays Research.

Benefits of Customer Retention Rates

Customer retention rates can provide meaningful insight into the present and future health of a business. We further explore some advantages to using the metrics here.

- **Leading Indicator of Future Revenue:** Customers are a particularly important asset as they provide immense value to a business beyond just this current fiscal period. Customers who see value in a solution can choose to do business with a vendor for decades and grow their usage of the product over time. Since existing customers tend to be a large basis for future sales, a company's ability to retain these customers can be a barometer for future revenue. Thus, company revenue models can be built using a customer retention rate as a major driver.

- **Straightforward Customer Satisfaction Measure:** Customer retention metrics can simplistically measure how well the business's solution can meet the expectations of its customers. While it is possible that a high churn rate for a quarter could be caused by something like a sales disruption, excessive customer attrition can point to a larger problem in the underlying products of the business. As such, customer retention metrics can be used to reveal issues in the ability of the business to meet customer demands, relative to the competition.

Shortcomings of Customer Retention Rates

However, using customer retention rates without context can be misleading at times because the metrics often cannot provide a complete scope of business performance alone.

- **Assumes Identical Customer Value:** The most debilitating feature of customer retention rates is that they inherently treat all customers the same. This is illustrated in the example below. Here, we assume three hypothetical customers who tend to re-sign contracts with very different terms. Customer C presents much greater importance to the business, as the typical ACV of their deal is significantly higher than the other two. Despite this, failing to retain any of the customers in the scenario would have the same impact on the customer retention rate. As such, a major disadvantage of using customer retention rates is that they fail to discriminate between customers based on the value they provide the business.

FIGURE 29

Hypothetical Customer Value Scenario

	Customer A	Customer B	Customer C
TCV	$100	$600	$1,000
Duration (years)	1	5	4
ACV	$100	$120	$250

Source: Barclays Research.

- **Natural Customer Churn Nuance:** In a similar vein, there should be some context considered with respect to the types of customers when looking at churn. There is some degree of natural churn that occurs as customers go out of business or opt for cheaper home-grown alternatives. SMB customers tend to have a much higher churn rate because that segment has a higher frequency of natural churn. Natural churn makes for somewhat inaccurate comparisons for companies selling at different ends of the market. If we look at the quotes on the following page, we see that companies experienced a greater amount of churn from SMB customers during the recent macroeconomic jolt caused by COVID-19.

Customer Retention Metrics in Our Coverage

Due to disclosures around exact churn numbers being limited, we decided to provide instances of management commentary about churn impacts from the recent pandemic, as an example of how gross churn could be used in practice.

FIGURE 30

Customer Churn Commentary Related to COVID-19

"It is still too early to know the impact COVID could have on the road. Because of that, and given the macro uncertainty, it is prudent to expect delay of some new cloud migration projects as well as some impact on churn."

- Olivier Pomel, CEO of Datadog, 5/11/20

"I'd like to spend a moment on the expected impact from COVID-19 and how we have factored it into guidance. We are fortunate that Slack enables remote work... However, there are potential headwinds to our business. We estimate that about 1/4 of our business is derived from companies with less than 100 employees. Within this SMB base, we saw churn trend a bit higher than historical norms in March and April, albeit off a low base."

- Allen Shim, CFO of Slack, 6/4/20

"New business demand and churn all fell below our typical range, with churn specifically dropping below 1 standard deviation from our norms, measured against the 90-day period pre-COVID. Fortunately, we've seen those metrics return within the expected ranges with some exceeding prior ranges on the demand side beginning the week of April 6."

- Justyn Howard, CEO of Sprout Social, 5/6/20

"So we've absolutely assumed in our outlook that we're going to see some attrition of customers because they're going to simply cease to exist. We think if they stay in business, they're going to continue to be our customers."

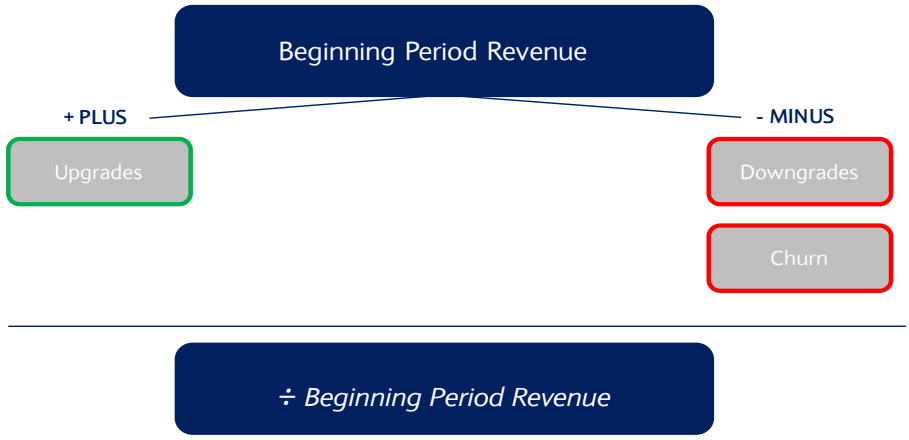
- Kevin Thompson, CEO of SolarWinds, 4/30/20

Source: Barclays Research, Company Data, AlphaSense.

Dollar Net Retention Rate

As companies begin to scale, a greater focus is placed on the hard dollars brought in the door as opposed to just customer count. As such, dollar retention rates were devised to correct some of the shortcomings of the customer retention rates from the previous section and put a value on the business a customer brings. This metric accounts for additions to business like up-sells to existing customers and also subtracts lost business from the existing customer base like down-sells and customer churn. Formulaically, net dollar retention is (Beginning Revenue + Up-Sells – Down-Sells – Churn) / Beginning Revenue.

FIGURE 31
How to Calculate Dollar Net Retention



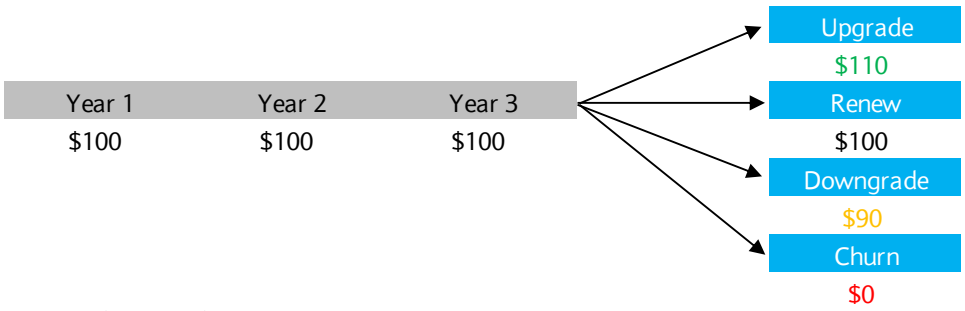
Source: Barclays Research.

Benefits of Dollar Net Retention

The main advantage of using the net dollar retention rate is that it provides much more information than customer retention metrics like churn.

- **Considers All Actions of Existing Customers:** As opposed to customer retention metrics, which measure whether a customer remains a customer, net dollar retention captures all potential customer actions. In the figure below, we go back to our 3-year SaaS deal. At the end of year 3, the customer has a variety of actions to choose from: raise spend by increasing usage or adding new solutions (upgrade), keep the same contract (renew), sign a deal with fewer features or users (downgrade), or move to a competitor (churn). Net dollar retention weighs the aggregate customer actions from all of these scenarios.

FIGURE 32
Customer Decision Tree



Source: Barclays Research.

- **Focus on Hard Dollars:** This advantage corrects for one of the biggest shortcomings of customer retention metrics. Recall the example in the previous section that showed three very different customers who had the same impact on customer retention. While those metrics focus only on the number of customers, net dollar retention places the emphasis on the dollar amount of business that a company is able to retain or grow. This becomes much more relevant as a business scales and investors care more about financial operations, rather than ability to grow customer count.

Shortcomings of Dollar Net Retention

While it includes more relevant information, just like customer retention metrics, net dollar retention still lacks the proper inputs to be used on a stand-alone basis.

- **Need for Context:** While net dollar retention has the advantage of quantifying revenue brought in by customers, it loses the ability to reveal customer dynamics. In other words, there is a trade-off when customer count is replaced by revenue. Consider the example below which shows a business over four years. Net dollar retention is consistently growing and over 100% in every period. Looking at this metric alone, the investor would assume this is a very strong business. However, when considering churn, there are issues discovered in the customer dynamics. The churn rates for Years 3 and 4 should be a warning as they are abnormally high. Here, the business is seeing very strong growth in the average amount spent per customer (average ACV), but a potentially alarming number of customers are leaving. While net dollar retention tells more of the story, it still does not encompass all of the customer trends for the investor.

FIGURE 33

Dollar Net Retention Can Downplay Customer Churn

	Year 1	Year 2	Year 3	Year 4
Beginning Revenue	1000	1050	1150	1275
Change in Exisiting Revenue	50	100	125	150
Ending Revenue	1050	1150	1275	1425
Total Customers	1000	1000	900	765
Net Dollar Retention	**105%**	**110%**	**111%**	**112%**
Churn Rate		**0%**	**10%**	**15%**
Avg ACV per Customer	**$1.05**	**$1.15**	**$1.42**	**$1.86**

Source: Barclays Research.

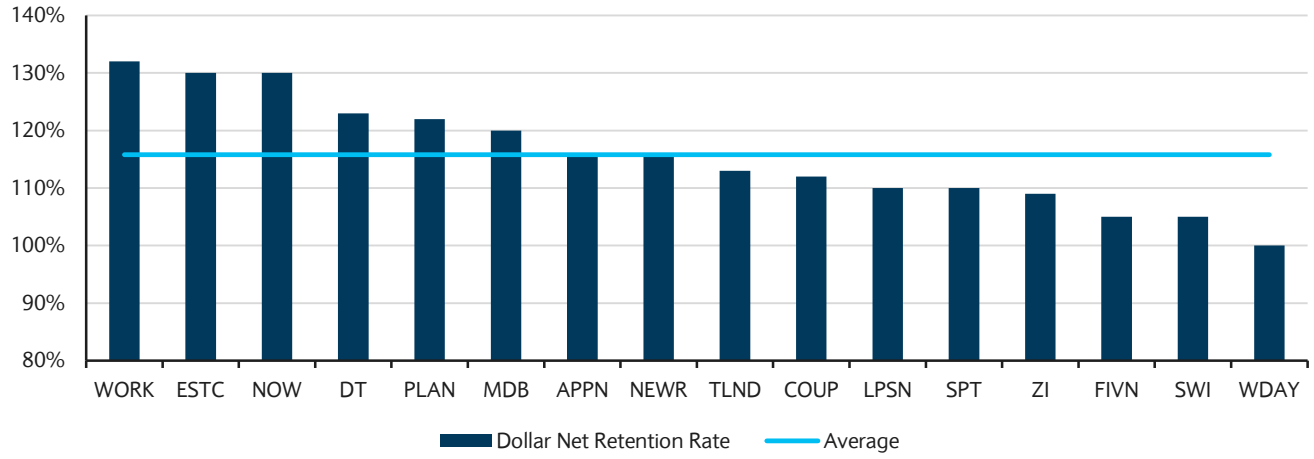
- **No Accounting for New Customer Activity:** One of the biggest downsides to net dollar retention also happens to be an issue with retention rates in general. In this calculation, there is not a single input that measures actions by new customers. This is an issue in that new customers can make up a significant portion of the business growth for many companies in our coverage. For instance, Five9 draws roughly 82% of its business growth from new customers. Additionally, the way a business acquires new customers plays into its business model and can have an impact on its net retention rate. If a business is modelled on high growth in customers and heavy, low-cost transactional volume, it should theoretically have a much lower retention rate as it is reliant on growing through customer acquisition versus expansion. We discuss customer acquisition metrics further in the coming few sections.

Dollar Net Retention in Our Coverage

We decided to take a look at our companies through the lens of dollar net retention by examining disclosures around the metric for the last FY and displaying this in Figure 34. We note some of the numbers are more qualitative (ex. Retention was above 130%).

FIGURE 34

Dollar Net Retention Across Our Coverage

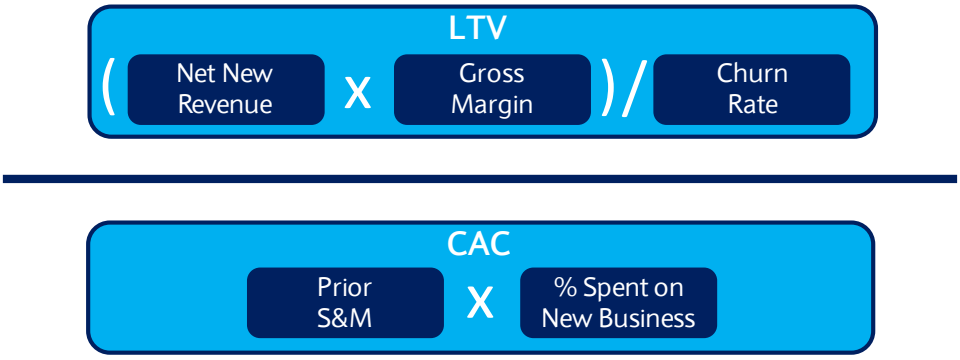


Source: Barclays Research. Company Data. Data as of respective last year ends of companies.
* Last Disclosures from NOW (>130%), MDB (>120%), WDAY (>100%) in "above x%" format

LTV to CAC

Moving the focus to analysing new customers, the LTV to CAC ratio is a metric that attempts to measure the economic benefit a customer brings in relation to the amount it costs to prompt them to buy. The numerator, Lifetime Value (LTV) seeks to quantify the worth of a customer. As in the Figure below, it is calculated by multiplying new revenue by gross margin and dividing this by the churn rate. While the denominator, Customer Acquisition Cost (CAC), measures the cost of obtaining the customer by multiplying Sales and Marketing expense (S&M) by an assumption of the proportion of S&M directed at new business. This is a powerful metric as it essentially determines if a salesforce is creating business value by operating. Most in the industry use an LTV to CAC of 3.0 as a benchmark.

FIGURE 35
How to Calculate LTV to CAC



Source: Barclays Research.

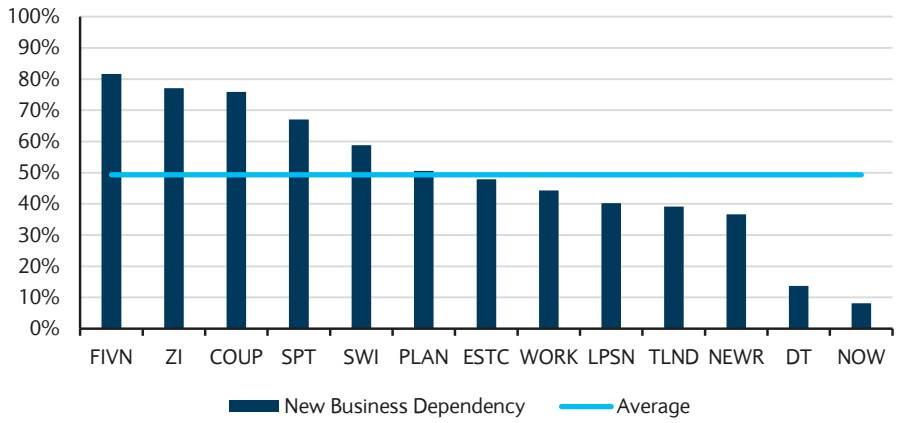
Benefits of LTV to CAC

Advantages to using LTV to CAC are plentiful as it reveals a great deal about what is going on with the business. This is thanks to its many inputs.

- **Proxy for Sales Efficiency:** One key insight gained by using this metric is the effectiveness of a company's sales operations in acquiring customers. Intuitively, LTV to CAC creates a ratio of how much business value a new customer brings into the business compared to how much it costs the company to acquire said customer. Thus, the metric assesses how effective the department in charge of bringing in customers (sales and marketing) is at performing their role. As mentioned above, an LTV to CAC of 3.0 is one that many experts use as a benchmark to evaluate companies. At this level, the sales and marketing operations are tripling their investments made to pull in new customers. Therefore, an LTV to CAC below 1.0 means that the salesforce is destroying company value by operating.

- **Insight into New Customer Activity:** Another major positive of the LTV to CAC metric is that, unlike the retention rates from earlier, it focuses on new customer dynamics. This is evidenced by both the "net new revenue component" in the numerator and the denominator. Net new revenue makes it so the metric is only analysing the benefit brought in by new customers to the firm. The entire denominator (CAC) is geared towards new customers as the "% of S&M on New Business" assumption narrows in on the cost of acquiring new customers only. As mentioned in the previous section, many companies in our coverage pull a significant portion of revenue from customers that are new to the firm. On the next page, we plot the % of revenue growth coming from new business for companies in our coverage with available information (new business dependency – discussed later). New customers generate ~50% of growth on average.

FIGURE 36
Percent of Revenue Growth from New Customers



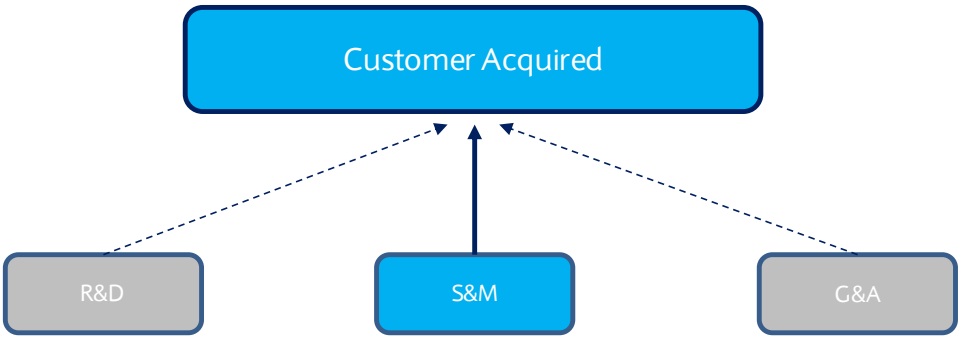
Source: Barclays Research, Company Data. Data as of respective last year ends of companies.

Shortcomings of LTV to CAC

The shortfalls of LTV to CAC are primarily related to the assumptions made in its calculation.

- **CAC Ignores Other Opex:** In the LTV to CAC equation, the only operating expense that is included is sales and marketing (S&M). While this is the most directly attributable to and the most expensive part of acquiring a customer, other expenses usually factor in. For example, there could be research and development (R&D) that goes into a new feature that ultimately entices the customer to make a purchase decision. Additionally, general and administrative (G&A) can encompass costs like corporate employee events and some ancillary acquisition expenses that all indirectly play into any sale. As shown in the Figure below, the CAC formula assumes S&M is the only relevant expense, which is a serviceable, but not complete representation of the cost needed to bring a customer in.

FIGURE 37
LTV to CAC Only Includes S&M



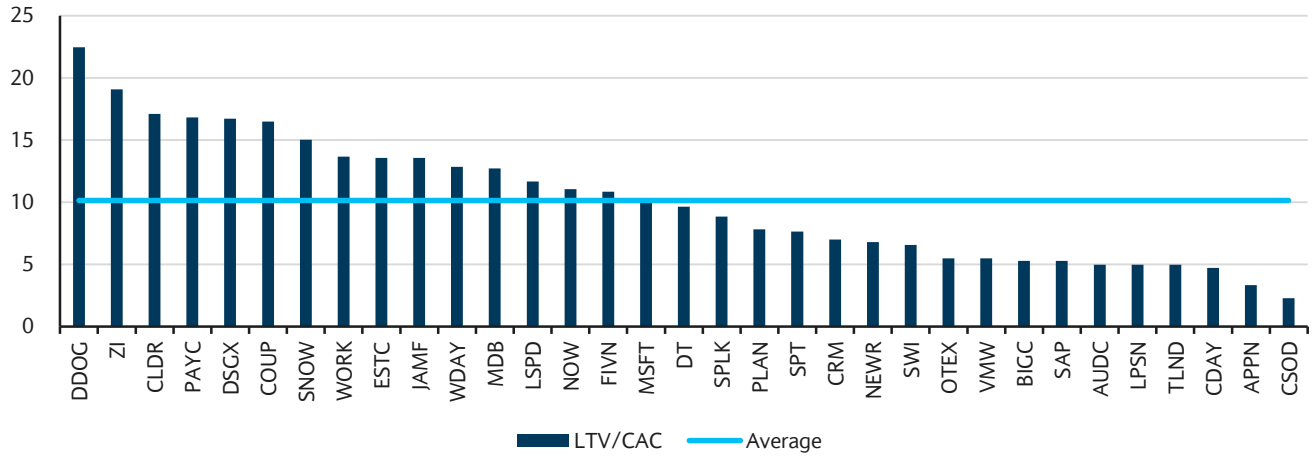
Source: Barclays Research.

- **LTV Assumes Constant Inputs:** One of the greatest challenges with this metric is that the numerator assumes an unchanging state for inputs that tend to move. For example, churn and gross margin can fluctuate greatly between time periods for a variety of reasons. Churn can move in tandem with outside economic factors and gross margins can improve as a business achieves more scale. Therefore, the LTV calculation is predicated on business assumptions that can differ greatly throughout the entire lifetime of the customer.

LTV to CAC in Our Coverage

We applied the LTV to CAC formula to our coverage and sorted the results. For this, we assume 80% of S&M is directed to new customers and an 8% churn rate. We use the change in revenue from the prior FY as a proxy for net new revenue and multiply that by gross margin % to find the incremental gross profit.

FIGURE 38
LTV to CAC Across Our Coverage

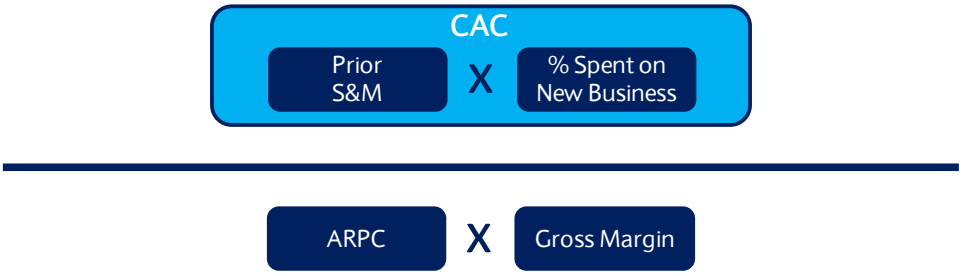


Source: Barclays Research, Company Data. Data as of respective last year ends of companies.
*CLDR and COUP numbers impacted by meaningful acquisitions in the period

CAC Payback Period

The CAC Payback Period expands our prior metric of LTV to CAC in order to add some perspective around timing. One of the most elementary and crucial tenets in finance is time, more specifically, the value of time. In a similar fashion to corporate finance analysts projecting when an investment will yield a return, the CAC payback approximates when a business will see a return on its investment in a customer. In its calculation, CAC is divided by the product of annual revenue per customer (ARPC) and gross margin, as detailed in the Figure below. This yields the amount time it takes the business to recoup its CAC.

FIGURE 39
How to Calculate CAC Payback



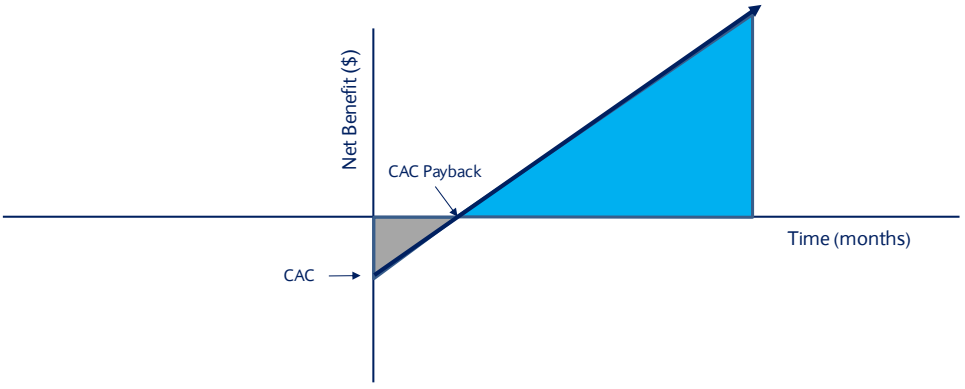
Source: Barclays Research.

Benefits of CAC Payback

By transforming CAC into a specific measure that yields a result in a time unit, the metric is more easily understood and can help with cash flow planning.

- **Added Element of Time:** Placing CAC against the backdrop of time adds a layer of perspective into the calculation that makes it more relevant. As stated before, everything in finance is understood on the concept of time. With CAC payback, we now have an exact measurement as to how long it will take the business to pay off the cost of acquiring customers. This is perhaps better visualized in the graphic below. Here, the added layer of time can be seen on the x-axis. The customer starts their journey at the CAC point at t = 0 and gradually spends with the business. The CAC payback is, graphically, the point where the customer spend crosses the x-axis and net benefit is 0.

FIGURE 40
CAC Payback Considers Time



Source: Barclays Research.

- **Provides Insight into Cash Flow Needs:** Another advantage of the addition of time is it provides color into the degree of working capital requirements for the company. If a business has a shorter CAC payback period, then that means the business needs less of a working capital investment relative to its top-line growth potential. Simply put, a business needs to replenish its CAC before it can begin to acquire more customers and fuel further top-line growth. CAC can either be paid back by the operations of the business, or another funding source (debt or equity offerings for example). An accurate understanding of a business's CAC payback can thus shed light into the working capital requirements that are needed to continue to feed the go-to-market engine. A shorter CAC payback period places a smaller burden on business growth.

Shortcomings of CAC Payback

Despite the position impacts from the inclusion of time, CAC payback is somewhat constrained by the large number of assumptions and any potential customer segmentation.

- **Reliance on Assumptions:** One of the greatest points of contention on the reliability of the CAC payback is how much it is dependent on assumptions. Two major underlying assumptions that hinder the metric are (1) disregard for churn and (2) lack of a discount rate. Not accounting for churn would technically inflate a business's ability to pay back its CAC as the assumption is that 100% of the customers stay customers. We know that this is often not the case. By not applying a discount rate, the metric is ignoring the time value of money and similarly CAC payback is likely overstated.
- **Can Vary Greatly by Customer Segment:** More so than any previously discussed metric, customer makeup needs to be considered in conjunction with CAC payback. As illustrated in the Figure below, the relevant components of CAC payback can differ significantly between enterprise and freemium customer bases. A business with a large portion of freemium customers can skew the S&M input and artificially help CAC for the overall business. In reality, the CAC payback for each segment of the customer base can diverge substantially. It would be beneficial to compute a CAC payback value for each customer segment, but specific data surrounding the S&M spend directed to an individual segment is unlikely to be disclosed. Rather than make another artificial assumption here, we should instead keep in mind the customer makeup of companies while comparing based on this metric.

FIGURE 41
CAC Payback by Customer Segment

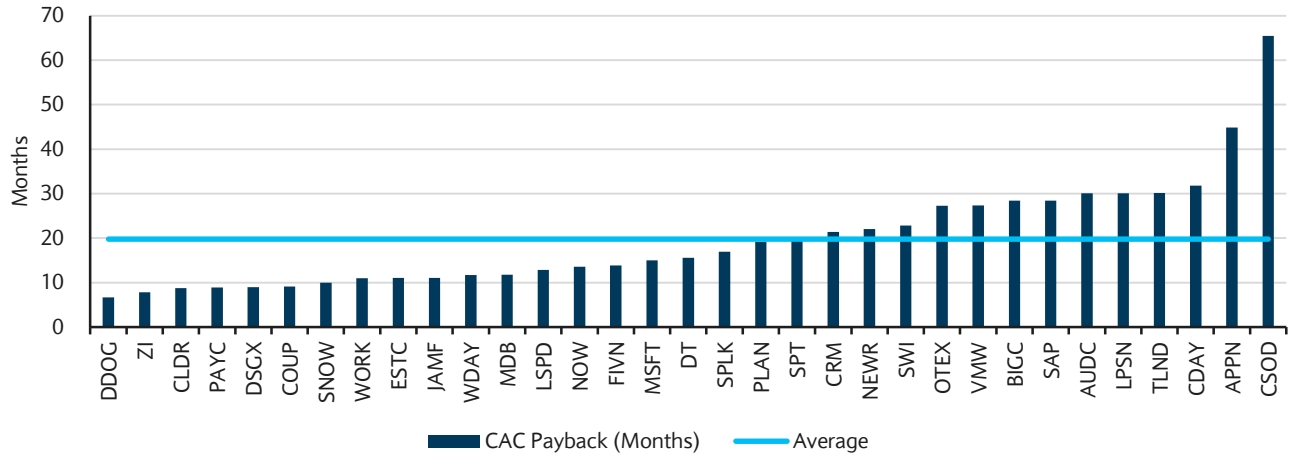
	Freemium	SMB	Enterprise
CAC	Very Low	Low	High
Annual Spend	Low	Med	High
CAC Payback	**Short**	**Med**	**Long**

Source: Barclays Research.

CAC Payback in Our Coverage

On the next page, we take a look at our coverage through the lens of CAC Payback. Due to disclosures around APRC being very scarce, we take a more streamlined approached in our calculation. For this, we divide the prior FY S&M spend going to new business (same 80% assumption applies) by the incremental gross profit (change in revenue from prior period * gross margin %) to find CAC payback in years. We then convert this metric to be in months by multiplying by 12. CTXS, PEGA, and ORCL were taken out as outliers due to low or negative revenue growth.

FIGURE 42
CAC Payback Across Our Coverage



Source: Barclays Research, Company Data. Data as of respective last year ends of companies.
*CLDR and COUP numbers impacted by meaningful acquisitions in the period

Customer Concentration

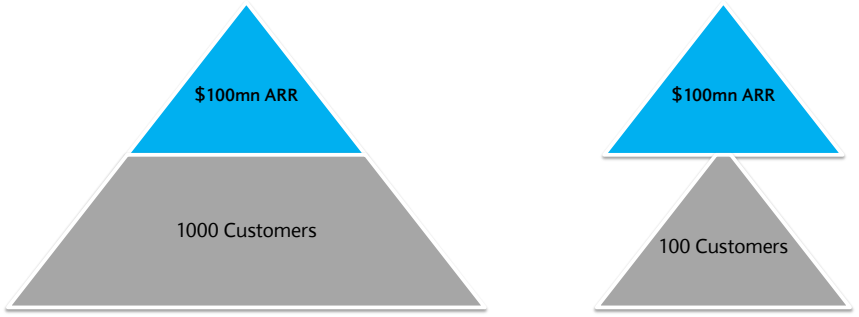
Switching focus to customer demographics, customer concentration is a figure about the customer base that helps investors understand the resiliency and scale of the business. While disclosures regarding customer concentration come in many forms, usually they are discussed on earning calls or in SEC filings as such, "we have no customer that represents more than X% of our annualized revenue". The purpose of this metric is to determine the business's dependency on a few large customers. This also has some correlation to the scale of the company as better-scaled companies typically have more large customers.

Benefits of Customer Concentration

Customer demographic metrics are very precise and specific as to what they tell an investor about the business. In the case of customer concentration, the metric provides insight into the risk of dependency on a few larger customers.

- **Barometer for Risk:** By interpreting management disclosure on this metric, the investor has a much better idea of the customer base makeup. As shown in the Figure below, consider the annualized recurring revenue as a structure supported by 100 individual customers. The hypothetical diverse customer base (left) has the $100mn ARR supported equally by all 100 customers. Hence, the management team could disclose "No customer makes up more than 1% of our ARR". Conversely, with the concentrated customer base (right), 5 large customers contribute 10% of the revenue with the balance coming from the other 95 customers. Thus, the concentrated customer base is at higher risk of losing more ARR should one of these large customers churn. The metric also therefore provides helpful context for churn numbers. Customer Concentration can be used to gauge the resiliency of a business in a serious downturn where churn is higher as customers cut budgets and bankruptcies rise.

FIGURE 43
Illustrating a Diverse and Concentrated Customer Base



Source: Barclays Research.

Shortcomings of Customer Concentration

As mentioned above, customer demographic metrics tend to only focus on isolated aspects of the entire business and additionally, customer concentration relies on management disclosure as it cannot be calculated. We outline a more mechanical flaw to the metric here.

- **Rewards Consumer and SMB Models:** A major downside of this metric is that it could make consumer and SMB-focused businesses look better optically. These businesses tend to have a larger proportion of customers to ARR, because of smaller contract sizes. As such, fewer customers typically make up a large portion of the annualized revenue. While this is a positive for business resiliency optically, remember that SMB businesses

usually experience higher churn. Therefore, less revenue would be at least by one customer leaving, but more customers usually leave. The bottom line here is that context on customer type should also be considered with customer concentration.

Customer Concentration in Our Coverage

As a result of customer concentration being a less widely disclosed and rather descriptive metric, we decided to provide some commentary from management, in lieu of a more quantitative chart.

FIGURE 44

Recent Customer Concertation Commentary

"We have a large and diverse client base comprised of more than 2,000 organizations as of December 31, 2019, with no single client representing more than 10% of our revenues in 2019, 2018 or 2017. Our client base spans organizations of all sizes across multiple industries, including banking and financial services, business process outsourcers, consumer, healthcare and technology."

- Five9, 10-K, 2/27/20

"As of September 30, 2020, we had one customer, a channel partner, that represented 21 % of our accounts receivable balance and no customers that individually exceeded 10% of our total revenues in any of the periods presented. "

- ServiceNow, 10-Q, 10/29/20

"For the three months ended September 30, 2020, no customer represented more than 10% of total revenue. For the nine months ended September 30, 2020, Customer F (in the government operating segment) represented 11% of total revenue. For the three and nine months ended September 30, 2019, Customer D (in the commercial operating segment) represented 12% and 13% of total revenue, respectively. "

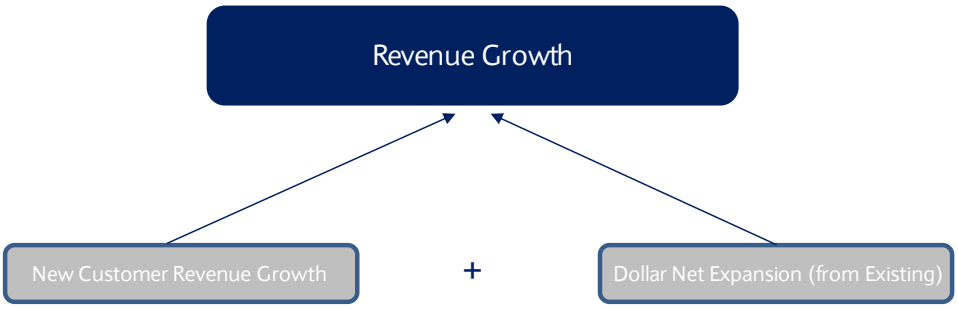
- Palantir (PLTR, Not Covered), 10-Q, 11/13/20

Source: Barclays Research, Company Data, AlphaSense.

New Business Dependency

Moving along with another customer demographic metric, here we consider the split of revenue growth that comes from new versus existing business. As it is often not specifically disclosed, new business dependency can be calculated by taking the revenue growth minus the dollar net expansion. The remainder, as shown in the figure below, should be the revenue growth from new customers, or new business dependency. As it considers the split between new and existing customer growth, it can explain a great deal about business dynamics and scale. This metric, like the prior, can also be used as a measure of businesses resiliency in times of economic downturn as new business would likely be hard to attract.

FIGURE 45
Method for Calculating New Business Dependency



Source: Barclays Research.

Benefits of New Business Dependency

In addition to also being a gauge of the risk to the business in a downturn, new business dependency provides valuable insight into the sales dynamics of a business.

- **Insight into Sales Motion:** New business dependency provides color into how exactly the company is achieving its top-line growth. Operating under the assumption that overall revenue growth is strong to begin with, a greater new business dependency means that a larger portion of the addition to revenue is coming from new customers. While at a certain level, this could be a positive sign of success in the marketplace for some sub segments, too much of a skew toward new customer business could signal underwhelming up-sell capability. The complement of new customer growth in the figure above is growth from existing customers. Hence, a notable dependency on new customer revenue could mean a company is struggling to up-sell its solution to existing customers. New customer dependency gives a great look into the dynamics of this balance.

Shortcomings of New Business Dependency

As with most customer demographics metrics, new business dependency captures only a small piece of the total business, and as such requires context when using it.

- **Business Model Context is Key:** There are certain scenarios where companies need to be more focused on new customer growth to drive the top line, and we consider two of them here. (1) Best of suite offerings, in the case of many HR solutions, have little upsell potential because these products are more horizontal. This could explain why even a more scaled vendor like Workday (see chart on next page), has a higher dependency on new business. (2) Specialist solutions that are either needed by a customer or not. Here, names like LivePerson and Five9 come to mind as upsell capability is capped by a more binary need from the customer. To credit the three companies mentioned, they have announced intentions to move to tangential markets (planning/financials for Workday,

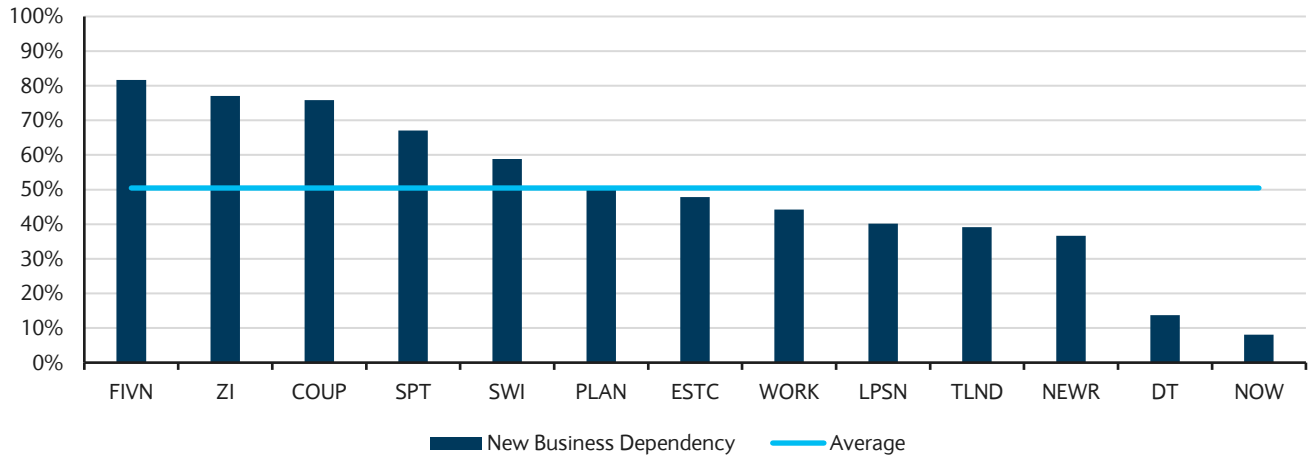
payments for LivePerson, WFO for Five9), which should help to improve their figures here. Still, context into the business model is essential with this metric.

New Business Dependency in Our Coverage

As this is a seldom-discussed metric, we calculated new business dependency in the cases where companies disclosed the necessary input to the formula on the prior page. All calculations were made on commentary concerning the last reported FY. This was also shown in the LTV to CAC section to underscore the importance of new business to our companies.

FIGURE 46

New Business Dependency Across Our Coverage

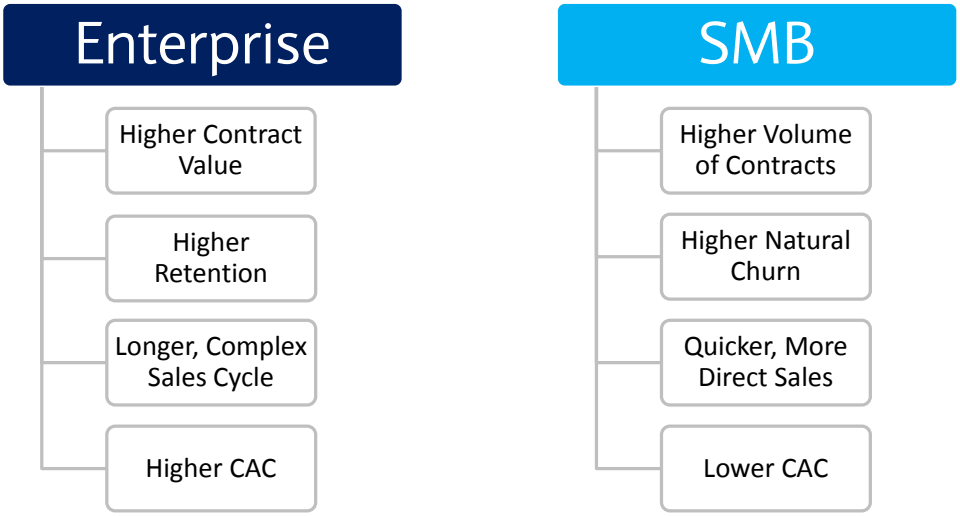


Source: Barclays Research, Company Data. Data as of respective last year ends of companies.

SMB Exposure

Our final customer metric is the SMB exposure, which is calculated as the SMB revenue divided (or, as a percent of) total revenue. This is an important piece of the puzzle in understanding the broader business. Because SMB business models behave so much differently than vendors going after larger enterprises, many of the other metrics discussed so far could be skewed by a higher exposure on the SMB side. The table below outlines some key differences between the two models that help explain the effects that bleed over into other performance metrics. SMB models tend to be quicker moving and lighter overall when compared to enterprise as the number of customers (rather than size) is prioritized.

FIGURE 47
SMB vs. Enterprise Models



Source: Barclays Research.

Benefits of SMB Exposure

The main highlight and argument for the use of SMB exposure as a metric is the content that it provides into understanding the rest of the investment case.

Fortifies Accuracy of Insights from Other Metrics: Most of the time, SMB exposure is used to strengthen and frame the other performance metrics discussed so far. As shown above, SMB models have key divergences from enterprise with respect to the sales motion. For example, due to a higher propensity for natural business failures, SMB companies have higher churn. For this reason, dollar net retention on SMB-focused models should be lower and hence, SMB exposure should be considered when evaluating companies on these metrics.

Shortcomings of SMB Exposure

One of the biggest weaknesses of the SMB exposure metric is that it does not reflect the whole story of the company as a high exposure may be intentional. Additionally, SMB definitions can vary massively (Five9's definition of <50 users is very small) and cause some issues when trying to compare vendors like-for-like.

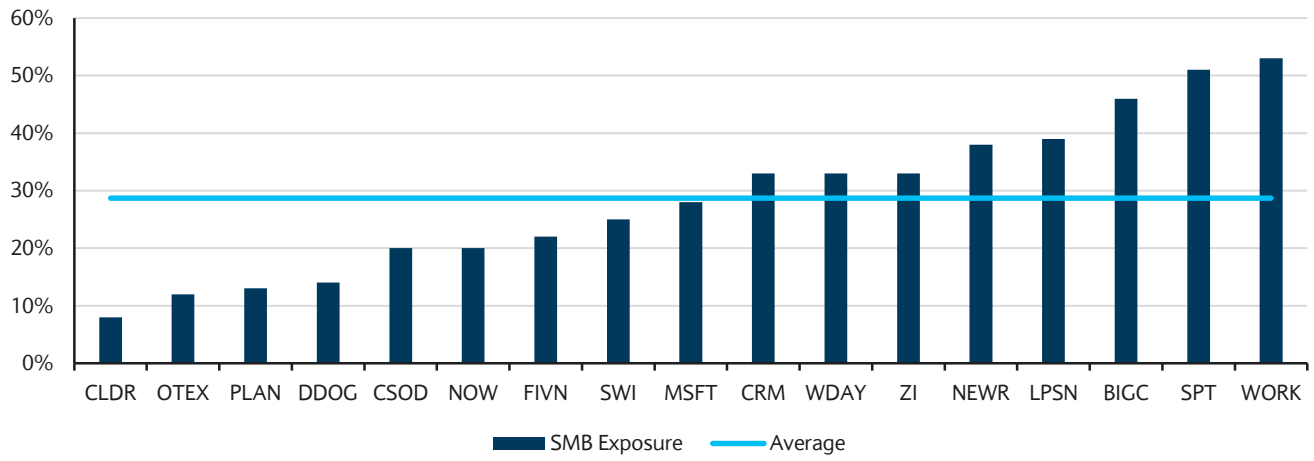
Context Needed on Market Dynamics and Maturity: While it certainly seems like the goal of any SaaS company is to achieve a high level of enterprise penetration, there may be reasons for a high SMB exposure. First, the vendor may be actively trying to move upmarket and thus, the SMB mix could be rapidly shrinking. Also, there could be a large

SMB/prosumer opportunity (Slack), which weighs on metrics, but is too great of an economic opportunity to ignore. Slack has historically had a large SMB/prosumer presence, but is also able to serve larger enterprises, for example. For these reasons, it may be better to look at metrics, like net retention rate, only on a segment basis (enterprise net retention), rather than looking at the overall rate in conjunction with SMB exposure.

SMB Exposure in Our Coverage

While not a metric given by every company, most disclose some sort of figure around the SMB levels of the business. In the figure below, we map out the latest SMB exposure levels in our covered companies.

FIGURE 48
SMB Exposure Across Our Coverage



Source: Barclays Research, Company Data. Data as of respective last year ends of companies.
*SMB definitions can vary by company

PROFITABILITY METRICS

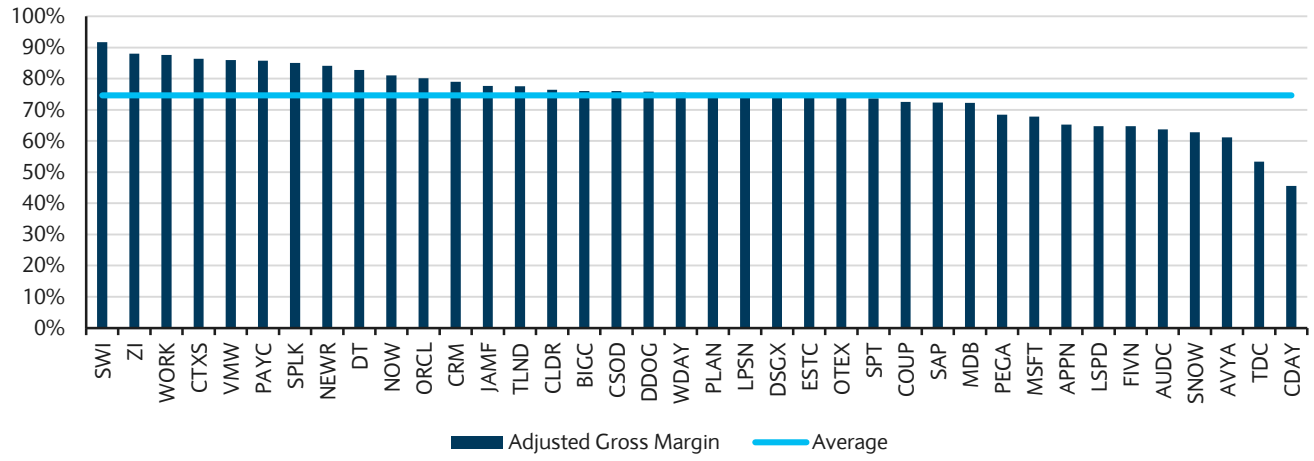
Profitability Metrics Summary Sheet

Background on Software Profitability

Profitability begins at the gross margin level and, as shown in the figure below, gross margins tend to be very high for our software coverage, outside of some players with heavy services or hardware mixes (APPN, AUDC, TDC). For this reason, we dive past this into some more pointed profitability metrics in the realm of software, with a focus on opex and cash.

FIGURE 49

Adjusted Gross Margins Across Our Coverage (Last FY)



Source: Barclays Research, Company Data.

Metrics in Focus

- **Free Cash Flow (FCF)** = Operating Cash Flow - Capex
- **Unlevered Free Cash Flow (uFCF) =** Operating Cash Flow – Capex + Interest Expense
- **FCF or uFCF Margin=** FCF or uFCF / Revenue
- **Rule of 40** = Top-line Growth + Profitability Margin
- **Cash Conversion =** FCF / Adjusted EBITDA
- **S&M Margin** = Sales and Marketing Expense / Revenue
- **Magic Number** = [(Current Revenue – Prior Revenue) * 4] / Prior S&M Expense
- **ROIC** = [EBIT *(1-Tax Rate)]/ (Total Equity + Total Debt – Cash and Equivalents)

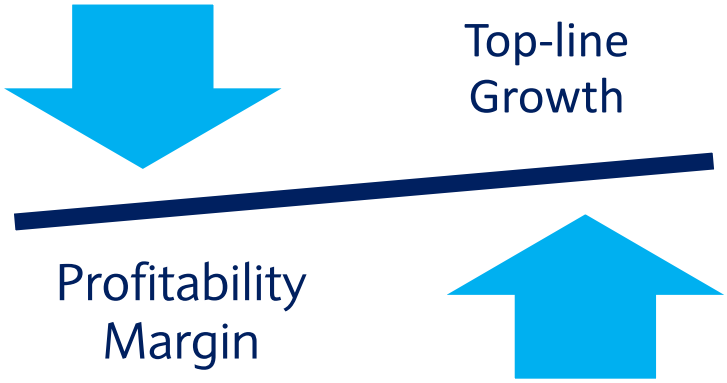
Others Discussed

- **EBITDA:** Earnings Before Interest, Tax, Depreciation and Amortization (as Adjusted)
- **Operating Margin:** Operating Profit (also called EBIT) / Revenue
- **Net Income:** EBIT – Interest Expense - Taxes
- **Operating Cash Flow (OCF):** Net Income – Positive Working Capital Change - Capex
- **Weighted Average Cost of Capital (WACC):** [(% Equity) (Cost of Equity)] + [(% Debt) (Cost of Debt) (1-Tax Rate)]

Rule of 40

The Rule of 40 provides an excellent bridge into the profitability section as it considers both top-line growth and profitability in its calculation. Conceptually, the Rule of 40 adds the top-line percent growth of a business (revenue, ARR, billings growth etc.) and the percent profitability margin (operating, FCF, EBITDA, uFCF margins). The rule states that this summation should be greater than or equal to 40 (hence the name). This is an especially powerful metric as it blends growth and profitability, which are the two greatest focuses for software companies and why most of our coverage is valued on either EV/Sales or EV/FCF.

FIGURE 4
Rule of 40 Balances Growth and Profitability



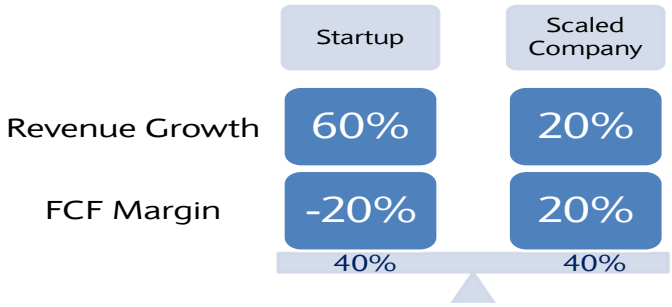
Source: Barclays Research.

Benefits of Rule of 40

The greatest advantages of the Rule of 40 metric is the broad applicability and flexibility of use, given the ability to sub out the metrics used in summation.

Near Universal Gauge for Holistic Performance: Due to the metric combining both top-line growth and profitability, there is a broad appeal for its use. Essentially, a SaaS start-up with 60% growth and -20% cash burn is treated as equal to a more mature software company with 20% growth and a 20% FCF margin (see below). This makes sense as a young company needs to invest to fuel growth and a mature company would likely trade off some growth for stronger profitability. The metric appreciates and normalizes for regular difference in scale, making it nearly universal.

FIGURE 50
Normalizing for Maturity



Source: Barclays Research.

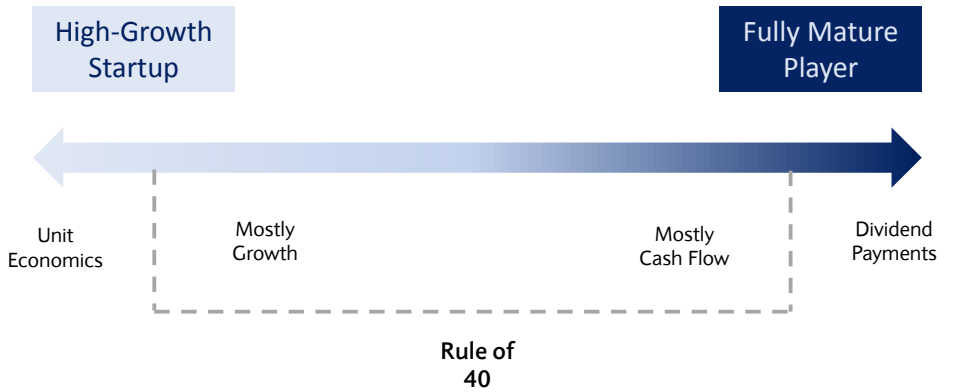
Flexibility on Exact Chosen Metrics: Something else that adds to the broad use of the Rule of 40 is the ability to choose the metrics in the computation that make the most sense. This is allowed because there is no cut and dry formula for it, and it is more reliant on the concept of growth and profitability combining together, than one specific formula. For example, ARR growth can be used to normalize for a company going through a subscription transition or unlevered FCF could be used to adjust for one company with a large debt component.

Shortcomings of Rule of 40

The metric can fall short of perfect in regards to a few extreme scenarios. We often see this in the case of companies with truly unique financial profiles and those at extreme end of maturity in the business lifecycle.

- **Still Plenty of Outliers:** Although the Rule of 40 is a near universal metric that mostly normalizes for growth, there are just some companies with truly unique financial profiles that make this metric less useful. Two such similarly named companies in the space come to mind in ZoomInfo and Zoom Video (ZM, not covered). In the case of ZoomInfo, the company was able to achieve such a differentiated level of profitability pre-IPO and boasted a Rule of 40 of approximately 92 at the time. This could be the case with more companies early on as more companies are staying private for longer and scaling. With Zoom Video, the company is currently guiding for 314% y/y growth in revenue for 2021, which would still beat the Rule of 40 with a -273% profitability margin.
- **Scale Could Prioritize Other Metrics**: As shown below, investors emphasize different performance goals at different points in a company's life. At the beginning, venture investors prioritize unit economics (LTV/CAC, Churn, etc.) and this could skew toward more of a growth-at-any-cost course. At the far other extreme, the most mature companies care about dividend returns and tend to mostly disregard the top line. The Rule of 40, as shown below, caters most to the vast majority of investors that fall between these two polar ends of the spectrum. However, the Rule of 40 may not be applicable for early startups or fully mature companies.

FIGURE 51
Maturity Could Yield Other Performance Priorities

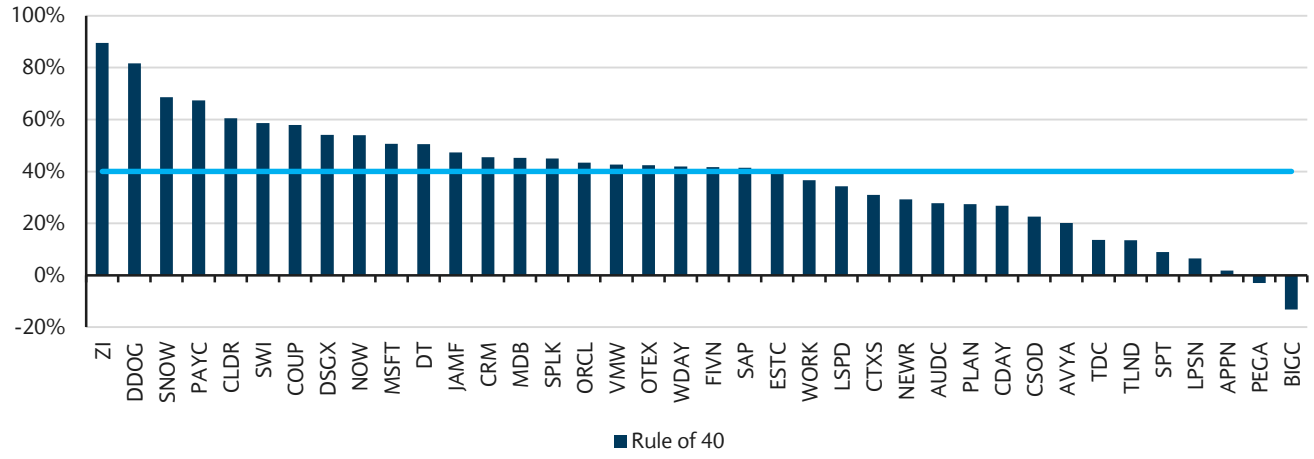


Source: Barclays Research.

Rule of 40 in Our Coverage

In the figure on the next page, we calculate and map out the latest Rule of 40 levels in our covered companies. For this, we use the last reported full year GAAP revenue growth rate and the Non-GAAP operating margin as our profitability metric.

FIGURE 52
Rule of 40 Across Our Coverage

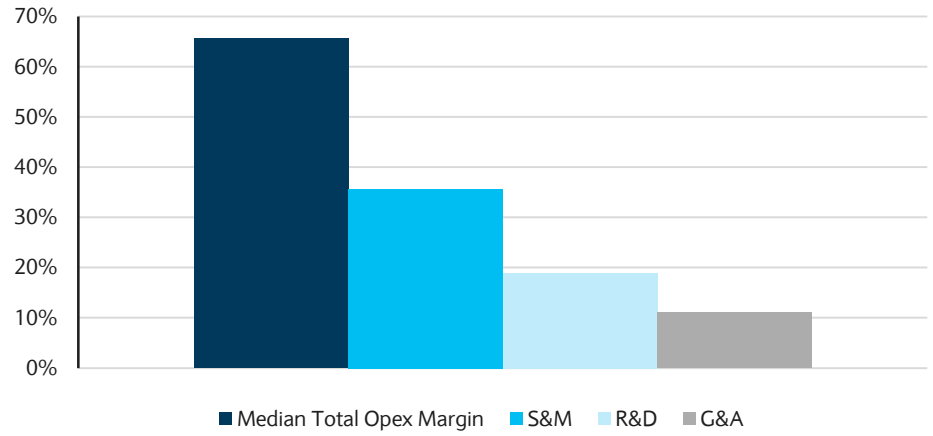


Source: Barclays Research, Company Data, Bloomberg. Data as of respective last year ends of companies.
*CLDR and COUP numbers impacted by meaningful acquisitions in the period

Sales and Marketing (S&M) Margin

Out of the three operating expenses line items (sales and marketing, research and development, and general and administrative), sales and marketing (S&M) is the one most used for analysis. This is for two main reasons. First, for most companies in our coverage, as shown below, S&M is by far the largest piece of total operating expenses and thus, the most important. Also, the S&M margin could provide quick and useful color into the underlying customer dynamics and unit economics.

FIGURE 53
S&M Constitutes the Majority of Operating Expenses



Source: Barclays Research, Company Data.

Benefit of S&M Margin

For some of the reasons listed above, S&M margin is a widely used metric for performing a high level overview into the sales efficiency of a company.

- **Quick and Easy Proxy:** Adjusted Sales and Marketing and Revenue (the two inputs for the calculation) are reported by virtually every company in our universe. Additionally, the S&M margin is a commonplace line item in most financial models. This makes S&M margin a convenient metric when comparing the sales efficiency and profitability between two companies. Some other metrics that accomplish a similar goal, like any of those involving CAC, require some additional knowledge around customer figures. This gives S&M margin the advantage when simply needing to perform either a broader or quicker analysis.

Shortcomings of S&M Margin

Despite the relative ease of use, the major stumbling points of the S&M margin as a metric revolve around the limited insights provided,

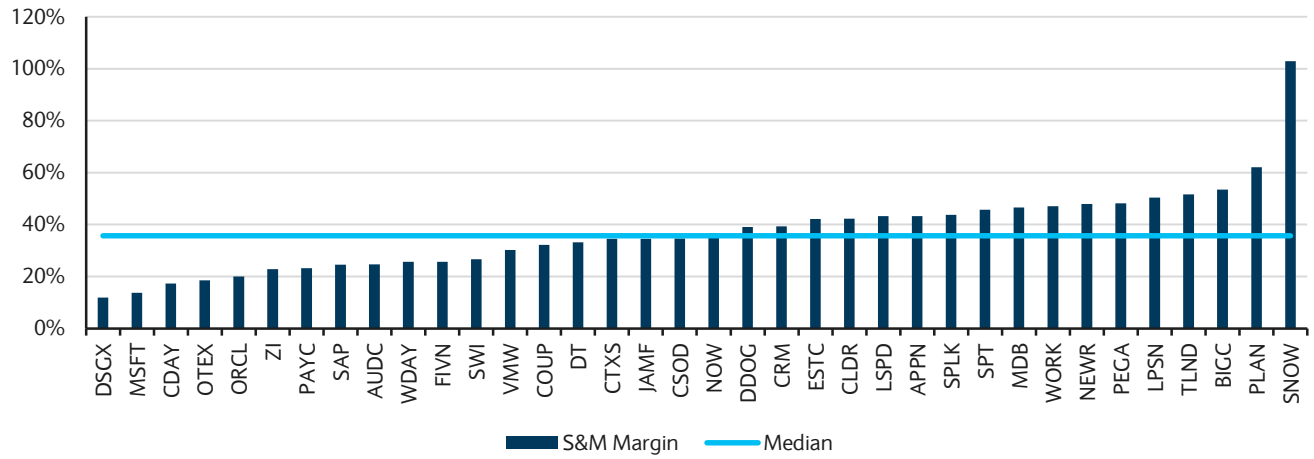
- **Does Not Tell the Whole Story:** True, the sales and marketing expense line is typically the largest component of operating expenses overall for a company, shown above. Despite this, there are still some companies with almost equally large R&D expenses and sales and marketing could fluctuate greatly when large acquisitions come into the mix. Due to this, it is not enough to simply look at a sales and marketing margin and make a broader claim about the overall profitability of a business. Other operating expenses need to be considered when judging overall profitability, because S&M margin is quite literally only one piece of the puzzle.

- **Lag in Converting to Growth:** Perhaps the greatest downfall of the metric is the fact that S&M spend contributes very little to the revenue in the same period. Investments into S&M are just that, investments, which take a while to bear fruit. Therefore, many investors rightfully feel the need to lag revenue when analysing go-to-market efficiency. This dynamic comes to light while computing several customer metrics in from the previous section, like CAC, and also in our next metric, the Magic Number.

S&M Margin in Our Coverage

The luxury of S&M margin being such a widely reported and calculable metric makes it easy for us to analyse it across the software universe. In the chart below, we took the last reported full year S&M margin in our coverage.

FIGURE 54
S&M Margin Across Our Coverage



Source: Barclays Research, Company Data, Bloomberg. Data as of respective last year ends of companies.

Magic Number

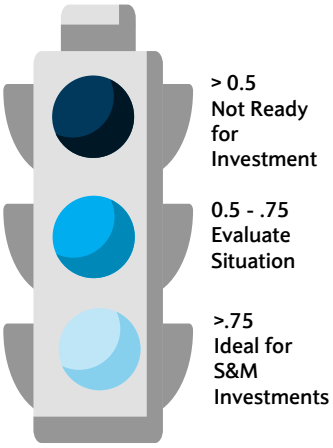
The magic number is an important metric for both investors and company management alike. It is a profitability metric that seeks to judge the S&M efficiency of a business by looking at how prior S&M spend translates to a change in the annualized revenue (see calculation on left. For investors, it is a mostly accurate assessment of how well a business can drive new revenue from S&M investment. From a corporate perspective, the decision rules around the magic number (see graphic on right) can help to determine whether or not now is a good time to invest in the sales and marketing line.

FIGURE 55
Magic Number Calculation

$$\frac{\text{Current Quarter Revenue} - \text{Previous Quarter Revenue}}{\text{Previous Quarter S\&M}} \times 4$$

Source: Barclays Research.

FIGURE 56
Magic Number Decision Rules



Source: Barclays Research.

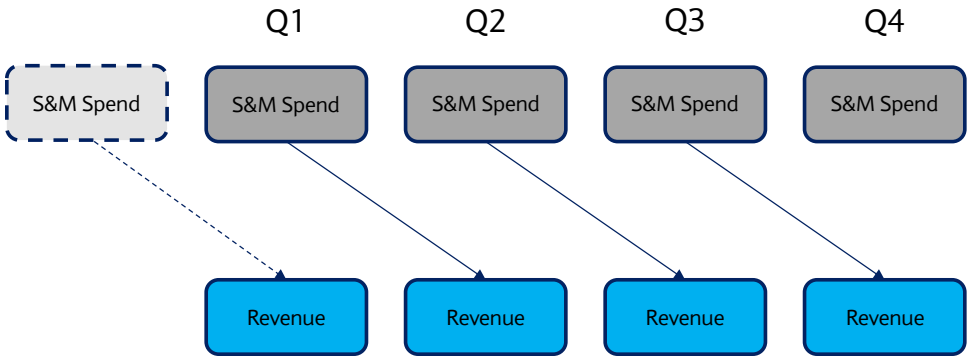
Benefits of the Magic Number

The magic number presents several key advantages for measuring the S&M efficiency of a business, especially when compared to just the S&M margin itself and other metrics with similar goals that are more focused on unit economics.

- **Focus on Annualized Revenue Added:** Foremost, the Magic Number annualizes the top-line contribution from the incremental S&M spend. Annualizing the difference between this quarter and prior quarter's revenue (by multiplying by 4) helps to frame the top-line growth in the context of ARR added for a SaaS model. As mentioned in the top-line metrics section, ARR is becoming the gold standard to judge growth because of the way it adjusts for several billing and timing hurdles created by ASC 606. Placing the top-line portion in this context helps to better align with ARR.

- **Lags S&M to Revenue Properly:** One of the most important advantages of the Magic Number is that it takes into account the lag between S&M spend and revenue dollars. As discussed with the S&M margin metric, investments into sales and marketing take a while to bear fruit. It would be unreasonable to expect a new sales rep, customer event or even the intraquarter work of a seasoned account executive to generate revenue immediately. Due to the length of sales cycles in software (6-9 months on average), these investments into the S&M bucket can take at least a quarter to come through on the top line. For this reason, we assume that there is a one quarter lag between S&M spend and revenue (for example Q1 S&M spend helps generate Q2 revenue), shown on the next page. The Magic Number takes this into account, as it divides by the previous quarter S&M spend instead of the current quarter.

FIGURE 57
S&M Drives Revenue Growth in Future Periods



Source: Barclays Research.

Shortcomings of the Magic Number

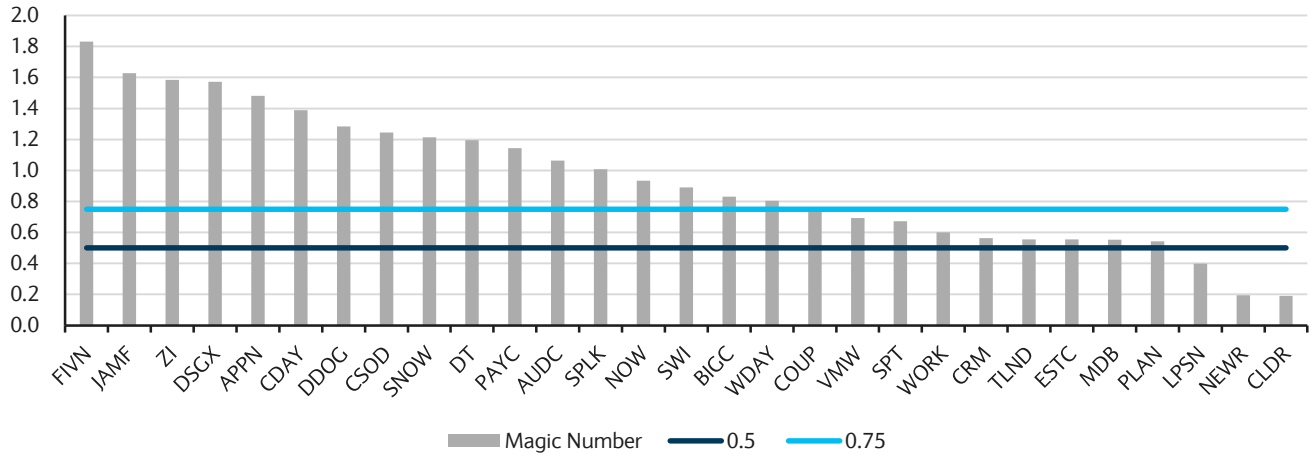
While the Magic Number is a better way to measure profitability and the return on S&M investments than something like the S&M margin alone, it is not without its flaws. The two biggest flaws are how it is prone to be skewed by one off quarters and the fact that it does not distinguish where the growth is coming from.

- **Sensitive to Quarterly Fluctuations:** The calculation of the top-line portion of the Magic Number takes the difference from the prior quarter and multiplies this by 4 to annualize it. This process has the unfortunate propensity to make one-off sequential differences on the top line much more pronounced. Consider the example of the COVID pandemic this year. For several companies, sequential revenue was impacted by the temporary degradation in the macro environment. This impact would have been compounded by 4, if using the Magic Number. If this barely pushed a company to a different decision rule area, would that mean there was a real red flag in the S&M profitability? Well, maybe, but that conclusion could not be reached by looking at the Magic Number alone.
- **Treats All Growth as Equal:** As the Magic Number just looks at overall revenue growth, it tells the whole story without revealing where that growth is coming from. Remember, from the customer metrics section, that revenue growth can come from both new and existing customers. Consider an example in which large investments in the previous quarter were made into the portion of the sales force responsible for retaining and growing customers. If revenue grew substantially on a sequential basis this quarter, and most of that came from new customers, S&M investments were not fruitful in reality, but the Magic Number would appear great optically. In a situation like this, where the investments were made into retaining customers, it would make more sense to look at the Magic Number in conjunction with something like a dollar net retention rate. A similar line of thinking follows for investments into certain geographies and verticals.

Magic Number in Our Coverage

In the chart below, we take a look at the Magic Number levels across our software universe. For the calculation, we are using the last reported quarter as the current revenue and the quarter immediately prior for the previous quarter S&M and revenue.

FIGURE 58
Magic Number Across Our Coverage

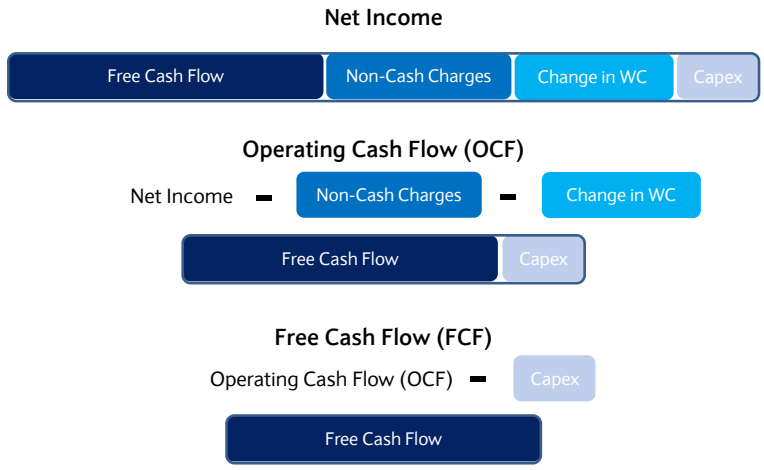


Source: Barclays Research, Company Data. Data as of respective last year ends of companies.

Free Cash Flow (FCF) Margin

Free Cash Flow (FCF) is an important metric for software and is often used as the profitability measure in Rule of 40, preferred over operating profit because it backs out non-cash charges. Due to this, mature companies, or vendors that generate steady free cash flow, are often valued on an EV/FCF basis. Free Cash Flow is the amount of cash left over for owners of the company once working capital and capex demands are satisfied. The figure below shows the process for calculating FCF from net income, but we typically just subtract capital expenditures (capex) from operating cash flow (OCF). The FCF margin is computed from this by taking FCF as a percentage of the revenue generated in the period.

FIGURE 59
Deriving Free Cash Flow (FCF) from Net Income



Source: Barclays Research.

Benefits of Free Cash Flow (FCF) Margin

The Free Cash Flow margin as a metric does a very good job of addressing what it is seeking to explain (cash left over for holders of the firm as a percent of revenue generated) in its calculation.

- **Closest Gauge to Cash Left Over for Shareholders**: When dissecting the figure above, it can be seen why FCF is the preferred profitability metric in the Rule of 40. Compared to operating income and net income, free cash flow backs out non-cash charges and adjusts for investments needed into working capital items and capex. Operating Cash Flow (OCF) does this as well, but it neglects to consider investments needed to sustain growth from a capex perspective. Thus, if the goal is to arrive at the cash generated and remaining for shareholders of the business (after operating expenses and necessary investments into working capital and capex), Free Cash Flow is the metric that will most closely accomplish this.

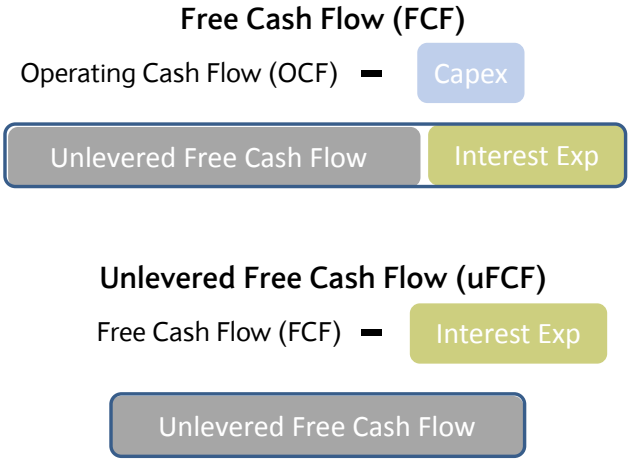
- **Percent of Revenue Gives Context**: By taking the FCF amount as a percent of the revenue generated in the quarter, two very important advantages are yielded. First, there is a normalization factor when comparing between companies or periods. For example, a smaller company that just became profitable would likely generate much less FCF than a more mature one, but probably also generates much less revenue. Thus, on a percentage basis, the difference is likely less pronounced. The same is also true when comparing across different time periods for the same company. Second, this adds the element of revenue to frame the cash generated and left over for shareholders in the context of the total revenue taken in for the period. In other words, "shareholders are entitled to X% of revenue".

Shortcomings of Free Cash Flow (FCF) Margin

Although FCF margin can be considered the best profitability metric, that is only when actual cash flow exists, and there is a slight nuance when companies carry debt.

- **Less Relevant for Growing Companies**: Generally speaking, when companies are very early on in their public lives, they tend to be unprofitable and thus have negative free cash flow values. This makes FCF margin analysis here much less applicable. In these cases, profitability discussions are usually more focused on operating margin and companies are instead valued on revenue multiples. Additionally, a company might be breakeven on FCF for a few periods, but is not generating meaningful amounts of FCF; thus, the shift to other metrics would likely occur as well. The lesson here is that FCF margin is a great metric when it makes sense to use it.
- **Need to Account for Debt:** The better part of the software universe does not carry a substantial amount of debt on their balance sheets. That being said, several do and this needs to be adjusted for in their FCF calculation. The Unlevered Free Cash Flow (uFCF) metric seeks to narrow in on the amount of FCF available to only equity holders of the firm by taking out the interest expense claimed by debtholders (see figure below). This is a slight but important nuance to the calculation and should be considered for all companies with a meaningful portion of debt in their capital structures.

FIGURE 60
The Difference Between FCF and uFCF



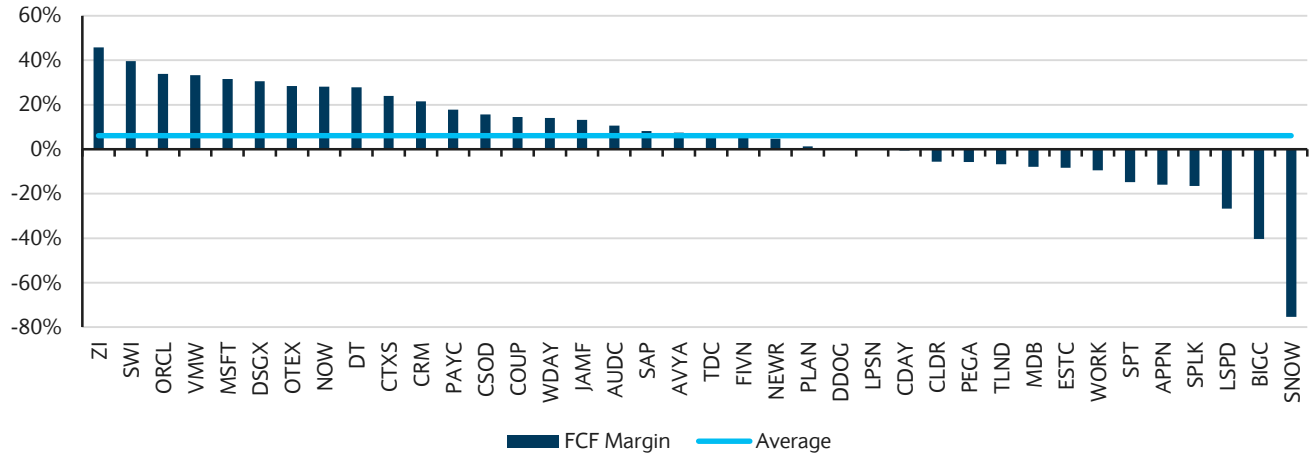
Source: Barclays Research.

Free Cash Flow (FCF) Margin in Our Coverage

In the chart on the next page, we take a look at the free cash flow margins across our software universe. For the calculation, we are using the last reported full year Free Cash Flow (uFCF when disclosed instead – noted by asterisk) as a percent of revenue generated in that same period.

FIGURE 61

FCF Margin Across Our Coverage



Source: Barclays Research, Company Data. Data as of respective last year ends of companies.
*uFCF used for AVYA, CSOD, DT, JAMF, ORCL, SWI, and ZI
**SPLK impacted by headwind to cash from transition

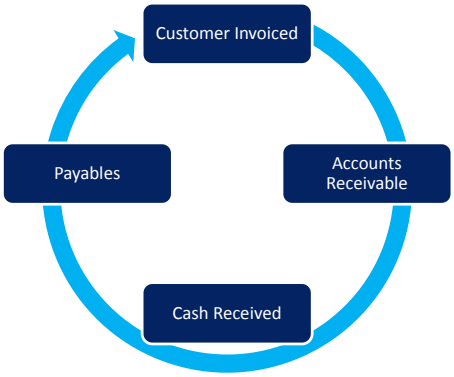
Cash Conversion

The Cash Conversion metric (defined as FCF divided by EBITDA, on left) measures the ability to convert EBITDA into cash flow available to shareholders of the business. For its analysis, it is important to consider the difference between EBITDA and FCF, which we will discuss later, and the concept of a cash cycle. The chart on the right illustrates the cash cycle where a customer is invoiced and this amount flows to account receivable until cash is received and then the business uses that cash to spend on more products and services to sell, while hitting the payables line on the way. This is important to remember as how quickly this cycle is achieved affects working capital, the biggest difference between FCF and EBITDA.

FIGURE 62
Cash Conversion Calculation

Source: Barclays Research.

FIGURE 63
Cash Cycle for a Business



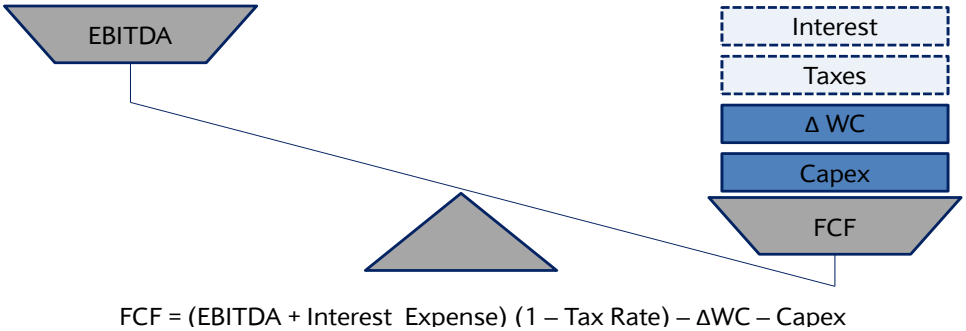
Source: Barclays Research.

Benefits of Cash Conversion

Like the FCF metric, the main advantages of this metric revolve around how well the metric satisfies the goal of it.

- **Normalized as a Percent of EBITDA:** Another strength of the Cash Conversion metric is how it uses EBITDA to adjust for differences between companies. Much like FCF margin takes a percent of revenue, Cash Conversion takes FCF as a percent of EBITDA to normalize across companies and periods. Additionally, EBITDA (as defined by earnings after interest, tax, depreciation and amortization), adjusts for differences between companies, compared to something like operating profit, as it backs out depreciation. For some companies, factors separate from operating performance, like accounting treatments and capital structure makeups, can thus be normalized by EBITDA to yield a more like-for-like-comparison.
- **Measure of Working Capital and Capex Efficiency:** There could be other minor differences between FCF and EBITDA depending on company definitions, but, we narrow in on working capital and capex as the most important (interest can be adjusted for by using uFCF and taxes are sometimes arbitrary in software – discussed later), shown on the next page. Therefore, taking FCF as a percent of EBITDA would give clarity into how well the vendor manages working capital (cash cycle) and capex efficiency. With this metric, the higher the percentage, the more efficient a company is with cash management and capex investments. A measure close to 100% would mean that almost all of the EBITDA generated (proxy for operating profit) was left over for shareholders after capex and working capital demands were satisfied.

FIGURE 64
Reconciling EBITDA to FCF



FCF = (EBITDA + Interest Expense) (1 – Tax Rate) – ΔWC – Capex

Source: Barclays Research.

Shortcomings of Cash Conversion

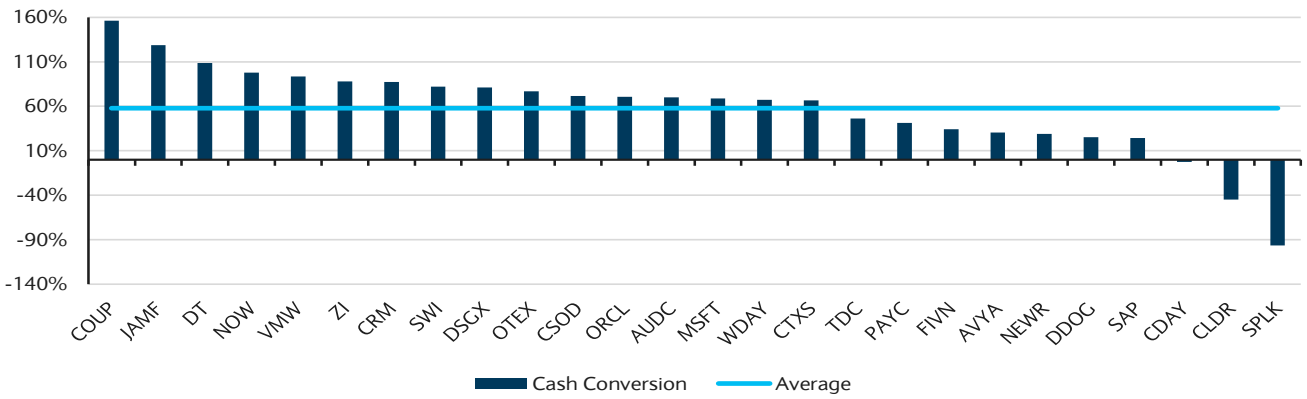
The downsides of the Cash Conversion metric are that there are times when comparing companies is not feasible (it is not computable for some) and that it needs to be used along with other metrics for total context and understanding.

- **Not Applicable to All Companies:** Unfortunately, because the metric uses FCF, it falls victim to the same shortfalls as FCF margin. It is difficult to make a comparison between companies of different scales if the younger one does not have positive FCF or it has a small FCF due to investment demands for growth.
- **No Split Between Capex and Working Capital:** Another drawback of the metric is that it does not discriminate between capex demands and working capital. For this reason, a company's strong cash conversion could be the product of under investment into capex and not successful cash management. Cash Conversion should be looked at in conjunction with capex as a % of sales for this reason.

Cash Conversion in Our Coverage

In the figure below, we calculate and map out the latest Cash Conversion levels in our covered companies. For this, we use the last full year Free Cash Flow amount and divide that by the calculated (often reported) EBITDA amount for the same full year.

FIGURE 65
Cash Conversion Across Our Coverage

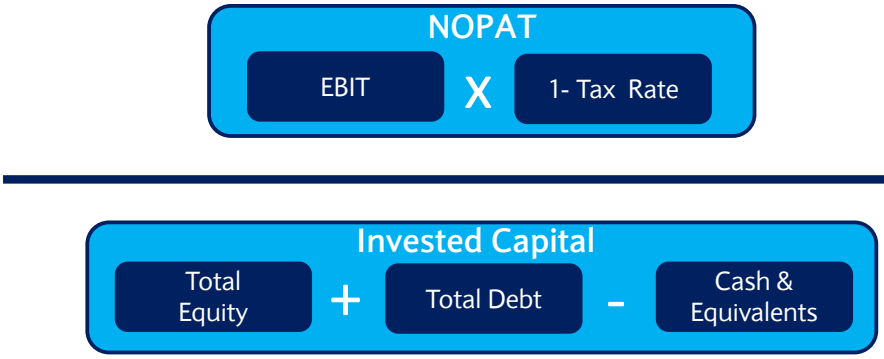


Source: Barclays Research, Company Data.
*uFCF used for AVYA, CSOD, DT, JAMF, ORCL, SWI, and ZI
**SPLK impacted by headwind to cash from transition and CLDR impacted by and acquisition

Return on Invested Capital (ROIC)

A company's Return on Invested Capital (ROIC) is a metric that has been lauded by several legendary investors, including Warren Buffett. In essence, the metric is attempting to answer the question of how efficiently the business allocates the capital it has been given to profitable means. It is often used in combination with the Weighted Average Cost of Capital (WACC) to provide context on how much it costs to acquire this capital used. We illustrate the formula for ROIC below and note that, at its simplest level, it is Net Operating Profit After Tax (NOPAT – a proxy for return) divided by the sum of invested capital. It is worth noting that the capital inputs are taken from the balance sheet at the beginning of the period and the NOPAT is computed at the end of it.

FIGURE 66
Return on Invested Capital (ROIC) Calculation



Source: Barclays Research.

Benefits of ROIC

Proponents of the ROIC metric would claim that it is the best way to judge the business's ability to create value while normalizing for individual capital structures. We take a deeper dive into both of these advantages here.

- **Proxy for Value Creation:** As mentioned before, the ROIC metric tries to answer the question of how much value the business creates given the capital supplied to it. This makes sense, when looking at the calculation, because it is dividing the profits generated by the capital available at the beginning of the period. Many investors like to use this in context of the WACC, which measures how much it costs the business to acquire capital. In this analysis, the analyst is judging how much value the business creates on its capital vs. how much it costs to acquire it. For this, a company with greater than a 2% difference is said to be a value creator and one with less than 2% is a value destroyer.

- **Ignores Capital Structure Differences:** Another important advantage about the makeup of the ROIC formula is that it normalizes for companies having different capital structures. Taking a deeper look at the denominator, we see that it is including both debt and equity into the total capital line. Due to this, companies of all different capital structures are treated as equal in its calculation. Additionally, for those who use the WACC in combination with it, the WACC also tries to adjust for this by weighting the cost of debt and equity by their percentage of the capital structure. As a side note, subtracting cash is important here, as it is not a component of invested capital that is involved in active business operations.

Shortcomings of ROIC

While champions of the ROIC metric tout its ability to give key insight into value creation, other realize the apparent shortfalls of some of the inputs. We explore these below and also feel the need to mention that EBIT is negative for a portion of our coverage, making ROIC less relevant.

- Use of Accounting Estimates for Inputs: This issue is more relevant to the numerator of the function and applies to both of the inputs in the equation. First, EBIT could be a less than perfect metric at times. Baked into adjusted EBIT could be assumptions around stock-based compensation, other non-operating expenses, and most importantly, depreciation. Here, the user is relying on the accounting practices of the company and including the impact of depreciation. Additionally, especially in software, the tax rate is a bit arbitrary, as it can be negative or artificially small for those larger companies with refined tax avoidance policies. We explored this tax issue deeper here (*U.S. Software: Raimo's Roundup: No Need to Worry about Taxes for Software*, 11/6/20).
- **Issues with Shifting Capital Structures:** The denominator, meanwhile, is not going to capture how the capital structure of a business might change over time. In the denominator, the balance sheet items are taken at a single point in time (e.g., beginning of the FY). This can create a bit of a timing issue when calculating ROIC. Consider two companies, ABC and XYZ, that are otherwise identical outside of the fact that XYZ makes a $80mn all-cash acquisition on December 31 (last day of its FY) and ABC waits until January 1. As shown in the table below, this one-day difference has a 3% delta in the ROIC line. In reality, the acquisition closing a day later has an immaterial impact on the ability to return value on the capital invested. This example may be a bit of an oversimplification, but it has to be understood that the capital structure of a business can move around quite a bit within the measured period and it is sometimes difficult to draw conclusions without adjustments here.

FIGURE 67
Capital Structure Timing Example

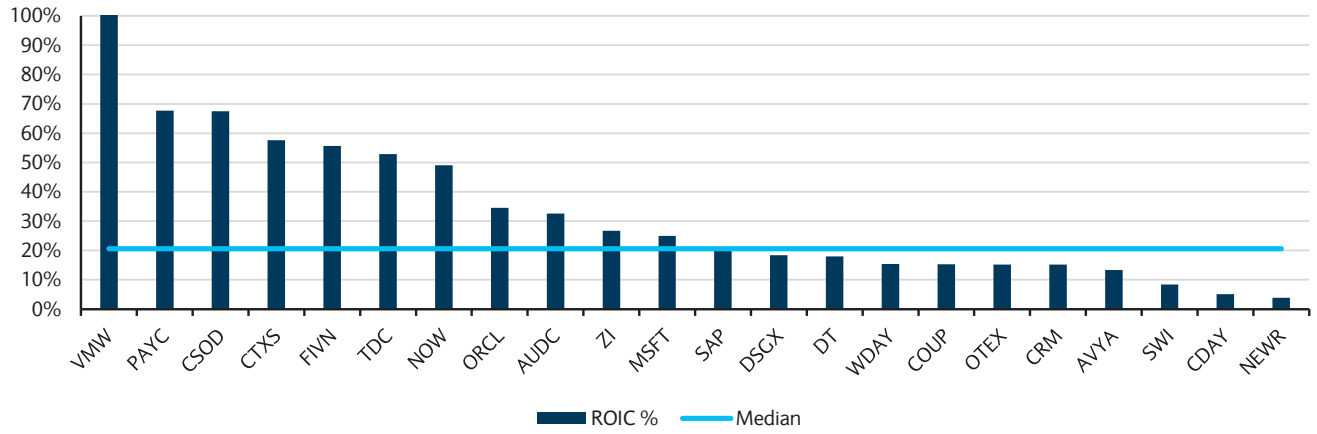
	Company	
	ABC	XYZ
EBIT	100	100
Tax Rate	25%	25%
Equity	200	200
Debt	300	300
Cash	100	20
ROIC	**19%**	**16%**

Source: Barclays Research.

ROIC in Our Coverage

In the figure on the next page, we calculate and map out the latest ROIC percentages in our covered companies. For this, we use the last full year EBIT and assume a 20% tax rate for normalization and for the denominator, we add the total equity and debt amounts as of the close of the FY prior and subtract the cash on the balance sheet at that time. We note VMW appears to be an outlier due to a large cash balance at the time of computation.

FIGURE 68
ROIC Across Our Coverage



Source: Barclays Research, Company Data. Data as of respective last year ends of companies.
*VMW skewed by a large cash balance at the time

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I, Raimo Lenschow, CFA, hereby certify (1) that the views expressed in this research report accurately reflect my personal views about any or all of the subject securities or issuers referred to in this research report and (2) no part of my compensation was, is or will be directly or indirectly related to the specific recommendations or views expressed in this research report.

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Materially Mentioned Stocks (Ticker, Date, Price)

Anaplan, Inc. (PLAN, 04-Dec-2020, USD 70.67), Equal Weight/Positive, CE/J

Appian Corporation (APPN, 04-Dec-2020, USD 151.22), Underweight/Positive, CE/J

AudioCodes Ltd. (AUDC, 04-Dec-2020, USD 28.34), Equal Weight/Positive, A/CD/CE/D/J/L

Avaya Holdings Corp (AVYA, 04-Dec-2020, USD 20.10), Overweight/Positive, A/CD/CE/D/E/FA/J/K/L/M

BigCommerce (BIGC, 04-Dec-2020, USD 80.29), Equal Weight/Positive, A/CE/D/J/L

Ceridian HCM Holding Inc. (CDAY, 04-Dec-2020, USD 97.42), Equal Weight/Positive, CE/J/K/M

Citrix Systems (CTXS, 04-Dec-2020, USD 130.53), Overweight/Positive, A/CD/CE/D/J/L

Cloudera, Inc. (CLDR, 04-Dec-2020, USD 12.41), Equal Weight/Positive, CE/J

Cornerstone OnDemand Inc. (CSOD, 04-Dec-2020, USD 44.45), Overweight/Positive, CD/CE/J

Coupa Software Inc. (COUP, 04-Dec-2020, USD 318.15), Equal Weight/Positive, A/CD/CE/D/E/J/L

Datadog, Inc. (DDOG, 04-Dec-2020, USD 101.57), Overweight/Positive, A/CD/CE/D/J/L

Descartes Systems Group (DSGX, 04-Dec-2020, USD 57.67), Equal Weight/Positive, CE/J

Dynatrace, Inc. (DT, 04-Dec-2020, USD 39.53), Overweight/Positive, A/CE/D/J/L

Elastic N.V. (ESTC, 04-Dec-2020, USD 143.28), Overweight/Positive, CE/FA/J

Five9, Inc. (FIVN, 04-Dec-2020, USD 151.53), Equal Weight/Positive, CD/CE/J

Intuit Inc. (INTU, 04-Dec-2020, USD 368.60), Rating Suspended/Positive, A/CD/CE/D/J/K/L/N

Other Material Conflicts: Barclays Bank PLC and/or its affiliate is serving as a financial advisor to Credit Karma in relation to its announced definitive merger agreement under which Credit Karma will merge with and into Intuit Inc. (NASDAQ: INTU).The rating, price target and estimates (as applicable) on Intuit Inc. (NASDAQ: INTU) previously issued by the Firm's Research department have been temporarily suspended due to this potential transaction.

Jamf Holding Corp. (JAMF, 04-Dec-2020, USD 31.48), Equal Weight/Positive, A/CE/D/J/L

Lightspeed POS Inc. (LSPD, 04-Dec-2020, USD 60.12), Overweight/Positive, A/CE/D/J/L/R

LivePerson, Inc. (LPSN, 04-Dec-2020, USD 55.57), Overweight/Positive, A/CD/CE/D/J/L

Microsoft Corp. (MSFT, 04-Dec-2020, USD 214.36), Overweight/Positive, CD/CE/J/K/M/N

MongoDB, Inc. (MDB, 04-Dec-2020, USD 277.63), Overweight/Positive, A/CD/CE/D/FB/J/K/L/M

New Relic, Inc. (NEWR, 04-Dec-2020, USD 63.60), Underweight/Positive, CD/FA/J

Open Text Corp. (OTEX, 04-Dec-2020, USD 45.81), Overweight/Positive, A/CD/CE/D/J/K/L/M

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Oracle Corp. (ORCL, 04-Dec-2020, USD 59.96), Equal Weight/Positive, CD/CE/J/K/M/N

Paycom (PAYC, 04-Dec-2020, USD 437.15), Equal Weight/Positive, CE/D/J/L

Pegasystems, Inc. (PEGA, 04-Dec-2020, USD 130.78), Equal Weight/Positive, A/CD/CE/D/J/L

Salesforce.com Inc. (CRM, 04-Dec-2020, USD 225.86), Overweight/Positive, CD/CE/J/K/M

SAP SE (SAP, 04-Dec-2020, USD 124.64), Overweight/Positive, A/CD/CE/D/J/K/L/M/N

ServiceNow, Inc. (NOW, 04-Dec-2020, USD 525.70), Overweight/Positive, A/CD/CE/D/J/L

Slack Technologies (WORK, 04-Dec-2020, USD 42.80), Equal Weight/Positive, CD/CE/E/J/L

Snowflake Computing (SNOW, 04-Dec-2020, USD 387.70), Equal Weight/Positive, A/CE/D/J/L

SolarWinds Corporation (SWI, 04-Dec-2020, USD 23.20), Underweight/Positive, CE/J

Splunk Inc. (SPLK, 04-Dec-2020, USD 161.07), Overweight/Positive, CD/CE/D/E/FB/J/L

Sprout Social, Inc. (SPT, 04-Dec-2020, USD 46.66), Overweight/Positive, A/CE/D/J/L

Talend S.A. (TLND, 04-Dec-2020, USD 38.93), Overweight/Positive, CD/CE/J/K/N

Teradata Corp. (TDC, 04-Dec-2020, USD 22.66), Underweight/Positive, CE/J

VMware Inc. (VMW, 04-Dec-2020, USD 140.23), Overweight/Positive, A/CD/CE/D/FA/J/K/L/M

Workday Inc. (WDAY, 04-Dec-2020, USD 222.18), Equal Weight/Positive, CD/CE/J

ZoomInfo Technologies Inc. (ZI, 04-Dec-2020, USD 46.11), Equal Weight/Positive, A/CE/D/J/L

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In addition to the stock rating, we provide industry views which rate the outlook for the industry coverage universe as Positive, Neutral or Negative (see definitions below). A rating system using terms such as buy, hold and sell is not the equivalent of our rating system. Investors should carefully read the entire research report including the definitions of all ratings and not infer its contents from ratings alone.

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Overweight - The stock is expected to outperform the unweighted expected total return of the industry coverage universe over a 12-month investment horizon.

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Underweight - The stock is expected to underperform the unweighted expected total return of the industry coverage universe over a 12-month investment horizon.

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Negative - industry coverage universe fundamentals/valuations are deteriorating.

Below is the list of companies that constitute the "industry coverage universe":

U.S. Software

Adobe Inc. (ADBE)	Anaplan, Inc. (PLAN)	Ansys, Inc. (ANSS)
Appian Corporation (APPN)	AudioCodes Ltd. (AUDC)	Autodesk Inc. (ADSK)
Avaya Holdings Corp (AVYA)	BigCommerce (BIGC)	Ceridian HCM Holding Inc. (CDAY)
Check Point Software Technologies Ltd. (CHKP)	Citrix Systems (CTXS)	Cloudera, Inc. (CLDR)
Cornerstone OnDemand Inc. (CSOD)	Coupa Software Inc. (COUP)	CrowdStrike Holdings, Inc (CRWD)
CyberArk Software (CYBR)	Datadog, Inc. (DDOG)	Datto Holding Corp. (MSP)
Descartes Systems Group (DSGX)	Duck Creek Technologies, Inc. (DCT)	Dynatrace, Inc. (DT)
Elastic N.V. (ESTC)	FireEye (FEYE)	Five9, Inc. (FIVN)
Fortinet, Inc. (FTNT)	Intuit Inc. (INTU)	J2 Global (JCOM)
Jamf Holding Corp. (JAMF)	Lightspeed POS Inc. (LSPD)	LivePerson, Inc. (LPSN)
Microsoft Corp. (MSFT)	Mimecast Ltd. (MIME)	MongoDB, Inc. (MDB)
nCino, Inc. (NCNO)	New Relic, Inc. (NEWR)	NortonLifeLock (NLOK)
Nuance Communications, Inc. (NUAN)	Open Text Corp. (OTEX)	Oracle Corp. (ORCL)
Palo Alto Networks (PANW)	Paycom (PAYC)	Pegasystems, Inc. (PEGA)

IMPORTANT DISCLOSURES

Ping Identity Holding Corp. (PING)	Pluralsight, Inc. (PS)	PTC Inc. (PTC)
Rapid7 (RPD)	Salesforce.com Inc. (CRM)	SAP SE (SAP)
SecureWorks (SCWX)	ServiceNow, Inc. (NOW)	Slack Technologies (WORK)
Snowflake Computing (SNOW)	SolarWinds Corporation (SWI)	Splunk Inc. (SPLK)
Sprout Social, Inc. (SPT)	Talend S.A. (TLND)	Teradata Corp. (TDC)
Tufin Software Technologies (TUFN)	Varonis Systems, Inc. (VRNS)	Veeva Systems Inc. (VEEV)
VMware Inc. (VMW)	Workday Inc. (WDAY)	ZoomInfo Technologies Inc. (ZI)
Zscaler, Inc. (ZS)		

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48% have been assigned an Overweight rating which, for purposes of mandatory regulatory disclosures, is classified as a Buy rating; 49% of companies with this rating are investment banking clients of the Firm; 73% of the issuers with this rating have received financial services from the Firm.

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