THE SUBSCRIPTION ECONOMY INDEX™

MARCH 2019

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INTRODUCTION

The Subscription Economy Index™ report (or SEI) is based on anonymized, aggregated, system-generated activity on the Zuora service, a comprehensive platform for subscription-based businesses. This index reflects the growth metrics of hundreds of companies around the world, and spans a number of industries including SaaS, IoT, media, telecommunications, and corporate services. Because the SEI data goes back to 2012, it reflects seven years of growth of the Subscription Economy®. This edition of the Subscription Economy Index report (SEI) features new results from the second half of the 2018 calendar year.

The breadth and depth of the data analyzed in this study speak to the rapid ascent of the Subscription Economy. IDC predicts that by 2020, 50% of the world's largest enterprises will see the majority of their business depends on their ability to create digitally enhanced products, services, and experiences. Gartner predicts that by 2023, 75% of organizations selling direct to consumers will offer subscription services. And in its Digital Commerce State of the Union survey, Gartner found that 70% of organizations have deployed, or are considering the deployment of, subscription services. This is a broad, secular shift.

Recurring revenue-based business models have exploded over the last decade owing to digitally enabled, pay-as-you-go services. As globalization has placed increasing margin strains on manufacturing and product sales, subscription-based businesses have benefited from stable and predictable revenue projections, data-driven insights from direct consumer relationships, and large economies of scale owing to relatively small fixed costs.

The companies that have been featured in this survey for the past seven years have seen their sales grow by more than 300%. While those growth rates may fluctuate, and are susceptible to broader market trends, recurring revenue models offer sustained and predictable returns that largely avoid the volatility of traditional "boom or bust" product cycles.

This study was conducted by Zuora's Chief Data Scientist, Carl Gold.

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KEY FINDINGS

- **Subscription companies have grown more than 300% in the past seven years.**

  An average company in the Subscription Economy has grown its revenue by 321% since the launch of the index in January 2012, a compound annual growth rate of 18.1%. In addition, the Subscription Economy Main Index, in calendar year 2018, crossed 300 percent growth for the first time in Q3 and ended Q4 at 321.

- **Overall, subscription businesses are growing revenues about 5 times faster than S&P 500 company revenues and U.S. retail sales.**

  Subscription companies grew 18.1% versus a 3.6% average for both the S&P 500 and U.S. retail sales in the seven years from January 1, 2012 to December 31, 2018. The long-term historical average growth rate of the SEI level is 18.1%, and 2018 ended with an above average growth rate of 19.8%.

- **The Subscription Economy Index growth rate correlates with GDP.**

  The SEI data demonstrated a consistent pattern with broader economic trends. In 2017, the SEI companies led the way into a period of high growth in Q1, one quarter before GDP growth accelerated in Q2. In the first half of 2018, growth in the SEI level peaked in Q1, one quarter before the peak of GDP growth in Q2. And in the latter part of 2018, the Subscription Economy led the way again, slowing in Q2 while GDP growth began slowing in Q3 and is still slowing now while the SEI level is on the rise.

- **Revenue growth was driven by subscriber acquisition as opposed to average revenue per account.**

  Average subscriber growth was 14% in 2018, up from 11.7% in 2017. Subscriber acquisition was fueled by moderate price increases: Average Revenue Per Account (ARPA) rose by just 8% in 2018, compared to 11.3% in 2017.

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- **B2C churn has fallen, and B2C growth has exceeded B2B growth.**

  In 2018, the B2C churn rate was 24% in comparison to the long term average B2C churn of 32%, and below the 2018 B2B churn rate of 28%. Also in 2018, B2C growth beat B2B growth by 23% to 20%. In 2017, B2B growth exceeded B2C (24% to 21%) and B2B churn was lower than B2C (26% to 29%).
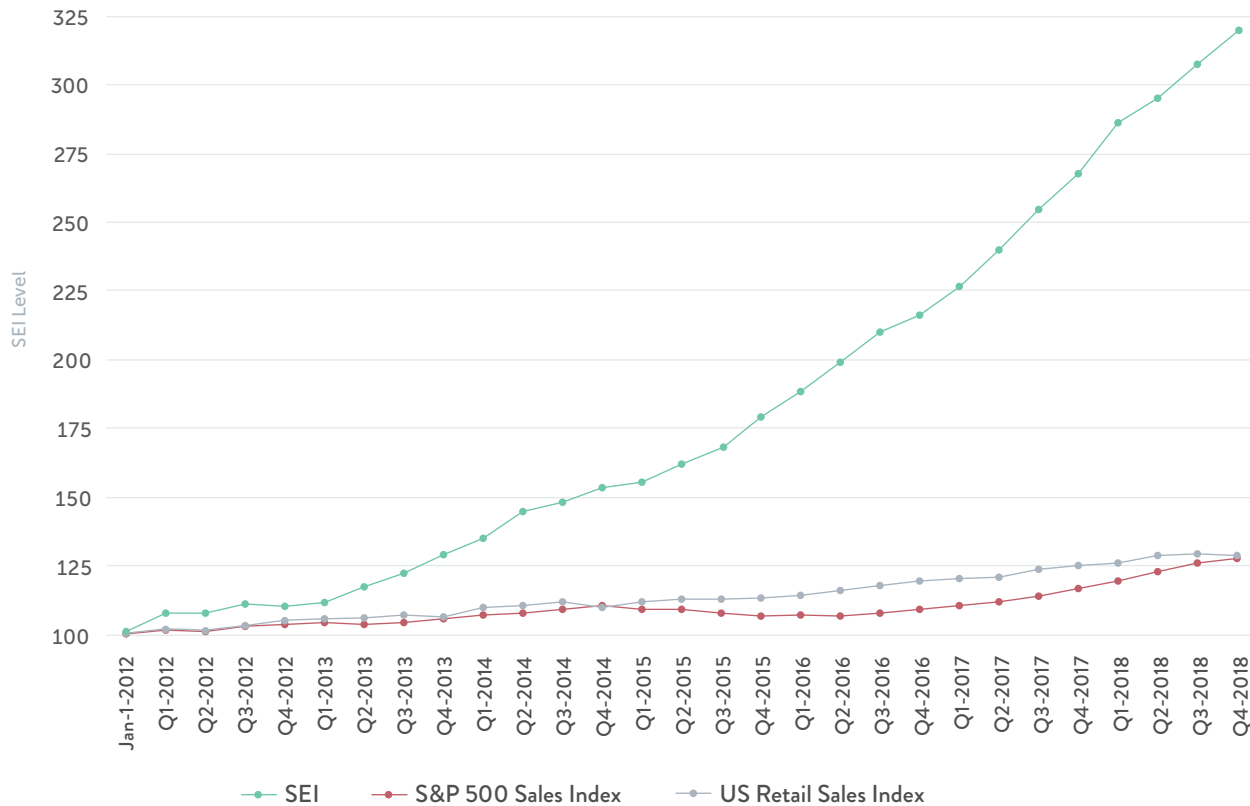
- **European subscription growth surpasses North America.**

  Europe is now trending well ahead of North America with cumulative growth of 64% over the course of 2017 and 2018, compared to 48% growth for North America over the same two years. Overall, EMEA subscription companies saw a CAGR of 25.6% and North American companies saw a CAGR of 21.6%.

- **Asia-Pacific (APAC) Subscription Economy growth exceeds sales growth in regional stock market indices by a wide margin.**

  The APAC SEI level rose around 16% over the year 2018, giving APAC subscription companies almost ten times the growth of ASX index (Australia) sales per share index, four times the growth of NZX index (New Zealand) sales per share, and 2.5 times the growth of the Nikkei index (Japan) sales per share.

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THE SUBSCRIPTION ECONOMY INDEX LEVEL VERSUS S&P 500 AND RETAIL SALES GROWTH

SEI Level

325
300
275
250
225
200
175
150
125
100

Jan-1-2012, Q1-2012, Q2-2012, Q3-2012, Q4-2012, Q1-2013, Q2-2013, Q3-2013, Q4-2013, Q1-2014, Q2-2014, Q3-2014, Q4-2014, Q1-2015, Q2-2015, Q3-2015, Q4-2015, Q1-2016, Q2-2016, Q3-2016, Q4-2016, Q1-2017, Q2-2017, Q3-2017, Q4-2017, Q1-2018, Q2-2018, Q3-2018, Q4-2018

— SEI   — S&P 500 Sales Index   — US Retail Sales Index

Quarterly values of the Subscription Economy Index (SEI) level, in comparison to indices of the S&P 500 Sales per Share and U.S. Retail Sales. All indices take a base value of 100 on January 1, 2012, and grow in proportion to the quarterly increase in the one year trailing total sales that they measure. Over a period of 7 years (January 1, 2012 to Dec 31, 2018), the SEI companies grew at an average annual rate of 18.1%. The SEI level is now at nearly 325, indicating that the average Subscription Economy company revenue has more than tripled over these 7 years. The S&P 500 Sales per Share Index and U.S. retail sales both grew at an average annual rate of 3.6%. As a result total growth in sales for the traditional economy is just above 25% for the entire 7 years.

Subscription business sales have grown substantially faster than two key public benchmarks—S&P 500 Sales and U.S. retail sales. Overall, the SEI data reveals that subscription businesses grew revenues about 5 times faster than S&P 500 company revenues (18.1% versus 3.6%) and U.S. retail sales (18.1% versus 3.8%) from January 1, 2012 to December 31, 2018.

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THE SUBSCRIPTION ECONOMY INDEX GROWTH RATE AND GDP GROWTH
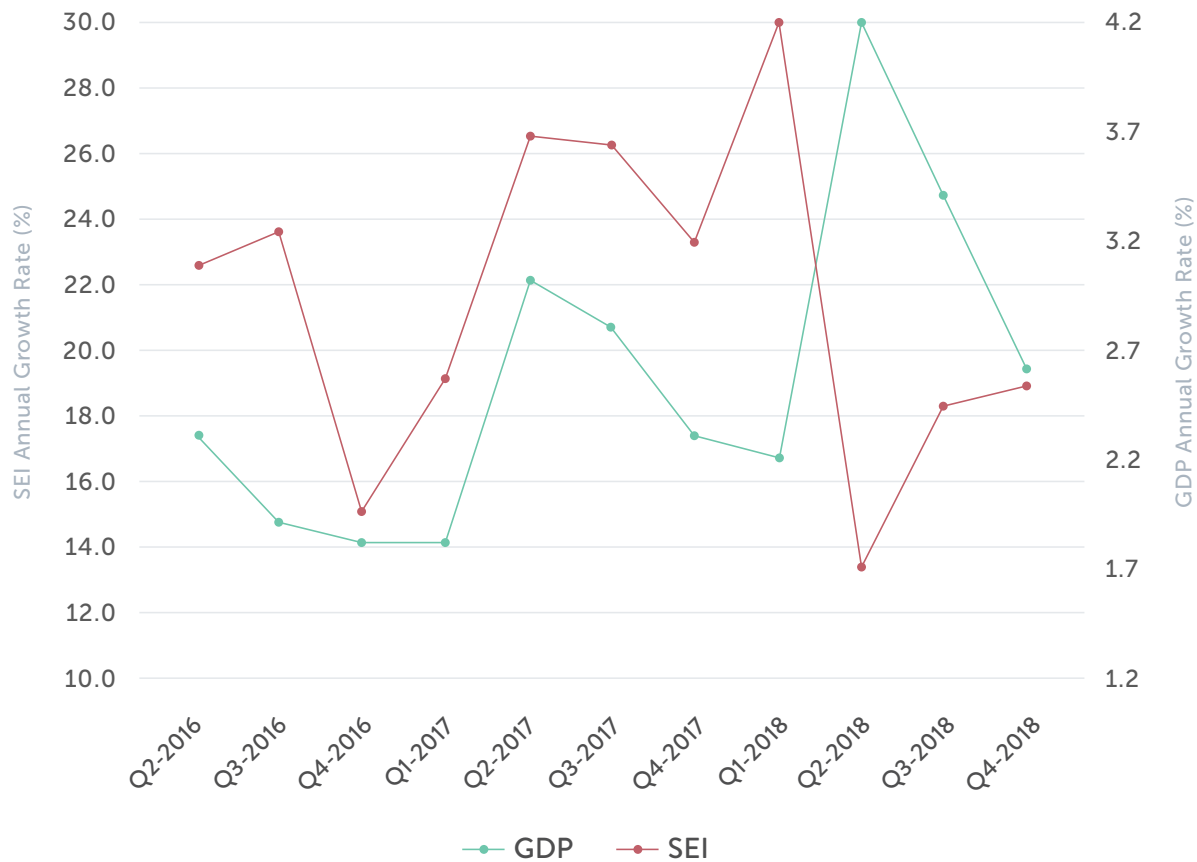
Recent years have shown increasing correlation between the trends in the Subscription Economy and in the traditional economy. This started back in late 2016 and early 2017, when growth slowed in the latter part of the year. Growth then recovered later in 2017, with Subscription Economy growth beginning to recover in Q1 and GDP growth following in Q2. This period of heightened growth lasted for about a year, with Subscription Economy growth slowing in Q2 of 2018. GDP growth began to fall Q3 2018, and then fell precipitously in Q4. Subscription Economy growth meanwhile has already begun to recover, though it remains to be seen if 2019 will see a return to 2017 growth rates.

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TWO SUBSCRIPTION ECONOMY GROWTH LEVERS: ARPA AND NET ACCOUNTS

AVERAGE SUBSCRIPTION GROWTH COMPARED TO ARPA AND ACCOUNT GROWTH
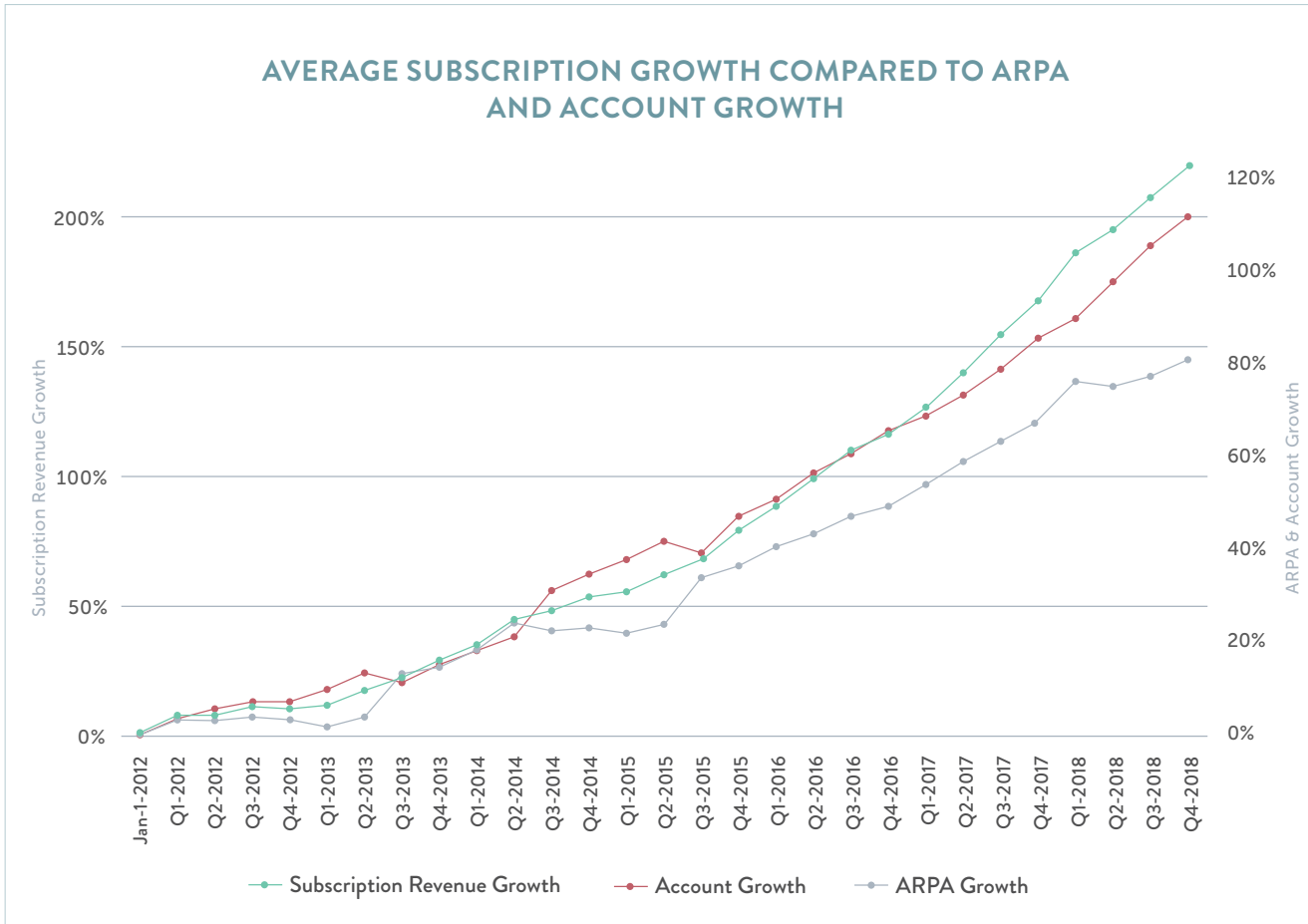
Recurring revenue grows through either charging subscribers more (Average Revenue Per Account (ARPA)) or charging more subscribers (Accounts). The green line and the left axis show cumulative growth of the SEI companies in percentage terms. The grey and red lines show the cumulative percentage changes in ARPA and Accounts respectively, both scaled on the right axis. Accounts have grown more or less continuously over the measurement period, while there have been times when ARPA growth slowed and even reversed.

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This figure demonstrates two primary levers of growth in the Subscription Economy—ARPA and net account growth. If the total billings number of a company goes up, that means at least one of two things must have happened—either the number of accounts being billed went up, or the amount each account was billed went up.

Note that while the SEI level has grown more or less continuously over the last five years, there have been periods when ARPA growth has slowed, and even reversed. There were two discrete periods when companies prioritized net account growth ahead of ARPA growth: 2012-2013, and late 2014 to mid-2015. At these times, the total number of accounts grew rapidly, but revenue per account stagnated or sank.

Each of those periods was followed by a correctional phase when the net new accounts decreased, but the average revenue per account increased. Pricing in the

Subscription Economy is a flexible, iterative process. Companies frequently experiment with a combination of set fees and usage-based models as they seek to "land and expand." Strategies prioritizing net new account growth will frequently drive growth with competitive pricing, and then later "switch levers" and attempt to drive ARPA with usage-based billing and by up-selling into larger accounts.

Overall, 2018 was another phase in which revenue per account took a backseat to growth in the total number of accounts: ARPA growth slowed after Q1 and was only around 8% for the year, compared to 11% in the previous year; meanwhile the number of accounts grew at an accelerated rate: 14%, the fastest rate of subscriber growth since 2014.

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SUBSCRIPTION REVENUE GROWTH BY COMPANY TYPE

The following figure shows the relative growth of different parts of the Subscription Economy through the use of sub-indices. For easy comparison of recent trends, each sub-index is shown starting from a value of 100 on January 1, 2017.

BUSINESS MODEL

BUSINESS MODEL GROWTH COMPARISON

Legend: B2B · SEI Main · B2C · B2Any · S&P 500 Sales
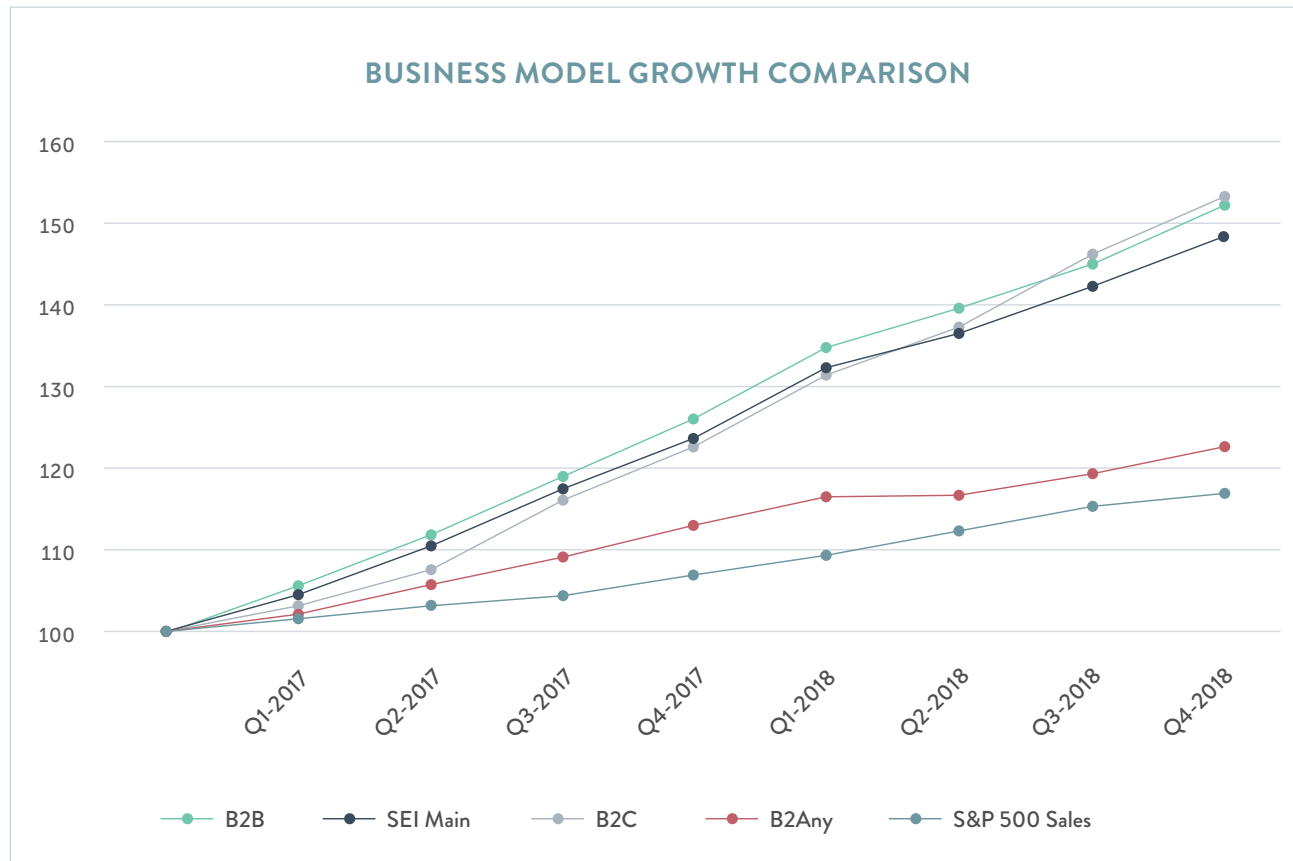
B2B and B2C have grown approximately equally since 2017: B2B grew faster in 2017, but B2C finished strong and caught up and just exceeded B2B at the end of 2018. B2A has been slower over the entire period, and bore the brunt of the decreased growth rates in Q2 of 2018.

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For B2B companies, growth rate is the leading indicator of a company's success. In the software sector, for example, a company that grows less than 20% annually has a 92% chance of failure (McKinsey). Successful B2B companies must scale sales teams, add new product editions and upsell paths, pursue international markets and larger enterprise accounts, and optimize their business models by taking on usage-based pricing. Their biggest challenges include system constraints and conflicting systems of record. In the earlier years of the Subscription Economy, B2B companies grew the fastest, and this trend continued through the first quarter of 2018; but B2B growth rates cooled in the later quarters of 2018.

For B2C companies, net user growth is the key metric. Successful B2C companies increase subscriber acquisition rates with rapid pricing experimentation, increase retention and ARPA by tailoring offerings based on behavioral insights and willingness to pay, and increase capture rates by taming the complexity of electronic payments. Their challenges include relatively high churn rates (owing to poor pricing and packaging decisions and fickle consumer behavior) and/or lost revenue (owing to poor payment and acquisition systems). B2C companies were a close second behind B2B in terms of growth, and were less affected by the slowdown in 2018—as a result they made up for lost ground against B2B and ended the year by exceeding B2B in cumulative growth over the prior two years.

B2Any companies sell products and services to both consumers and businesses. These companies have grown the slowest since 2017, and they were most severely affected by the slowdown in 2018. This could be a result of the inherent challenges involved in selling to two markedly different sets of customers.

GROWTH RATES BY BUSINESS MODEL

|	B2C	B2B	B2Any
2017	21%	24%	12%
2018	23%	20%	8%

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INDUSTRY

INDUSTRY GROWTH COMPARISON
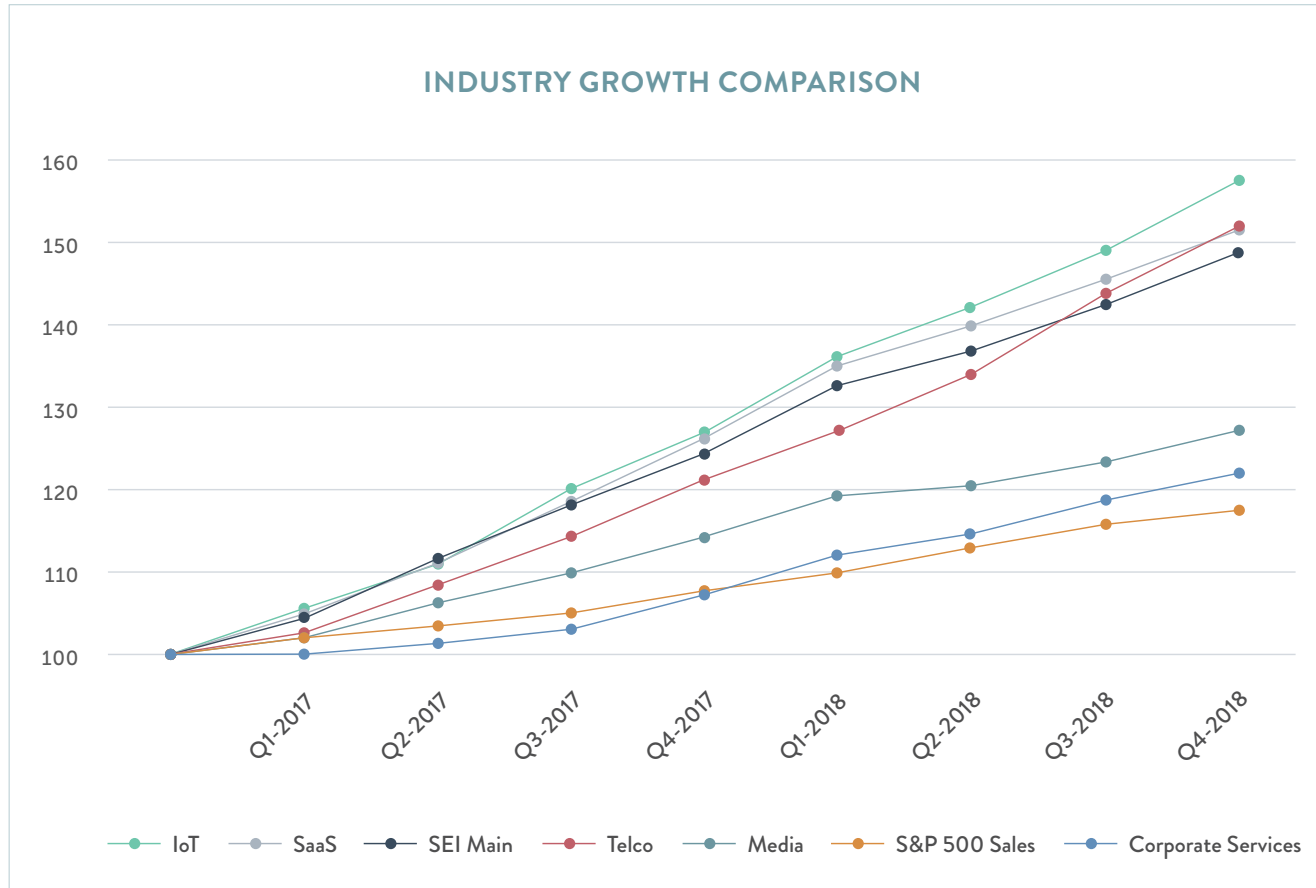
Which industries are thriving in the Subscription Economy? As a subscription billing and finance SaaS company based in Silicon Valley, Zuora has a significant customer base of other software vendors—both SaaS natives and on-premise vendors switching to recurring revenue models. Historically, SaaS has been one of the fastest growing sub-indices in the Subscription Economy. But since a sub-index was created for IoT companies, this sector has seen remarkable growth. IoT beat SaaS over this period. In this study, we define IoT companies as OEMs (Original Equipment Manufacturers) who are taking advantage of sensors and connectivity in order to diversify their revenue mix with digital services. SaaS also saw stiff competition from Telecommunications which surged to catch up in the end of 2018.

GROWTH RATES BY INDUSTRY

	Corporate Services	IoT	Media	SaaS	Telecommuni-cations
2017	7%	24%	13%	23%	19%
2018	13%	22%	11%	19%	23%

SaaS was the fastest growing sector beginning in January 2017. But once the IoT sub-index was introduced in mid-2017, this new IoT sub-index grew even faster. The only sector unaffected by the slowdown in 2018 was Telecommunications: Telecommunications accelerated in 2018 and ended up equal to SaaS for growth in this two-year period.

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REVENUE BAND

REVENUE BAND GROWTH COMPARISON

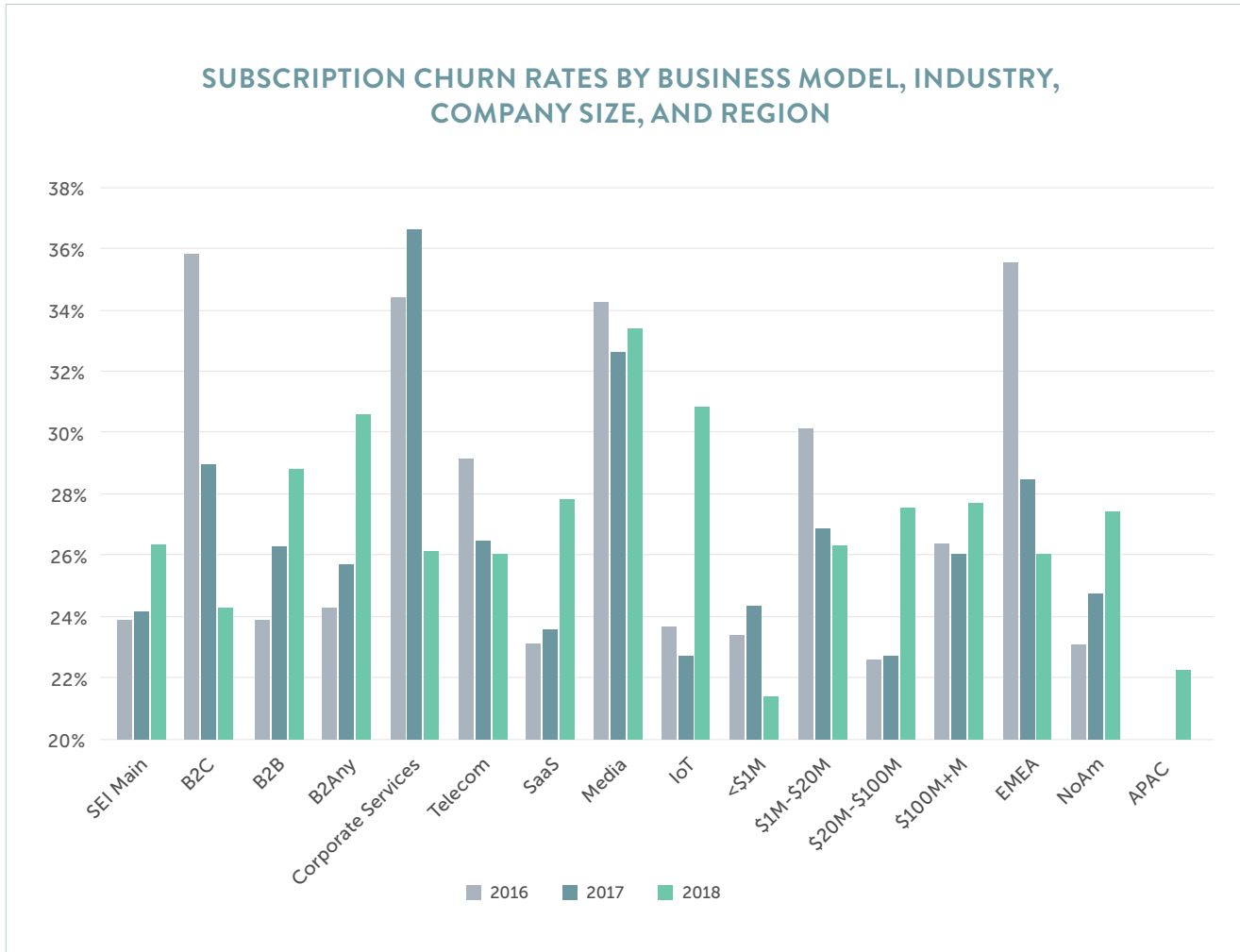

Legend: SEI Main · <$1M · $1M-$20M · $20M-$100M · $100+M
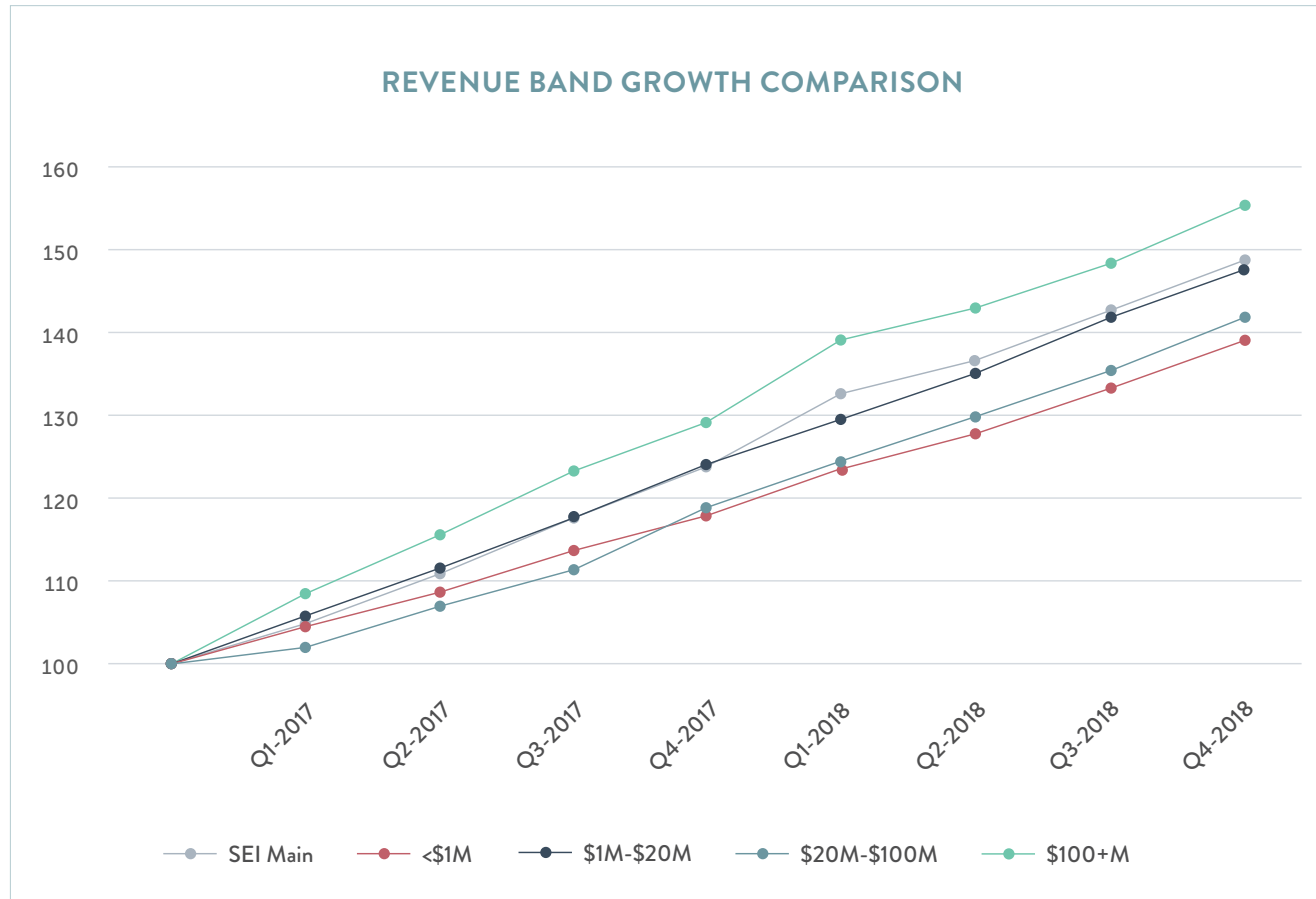
Large companies have an advantage in the Subscription Economy. The sub-index made up of $100M+ constituents has been the highest performing since its inception in 2014, and that trend continued in 2018. In contrast to start-ups, enterprises have more resources, more distribution, more new acquisitions, and more channels to grow. As a result, they benefit from the network effects mentioned earlier in this study.

GROWTH RATES BY REVENUE BAND

	<$1M	$1M-$20M	$20M-$100M	$100M
2018	17%	22%	17%	26%
2017	17%	18%	18%	19%

Large companies, those with more than $100M+ in revenue, have grown the fastest throughout this period.

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SUBSCRIPTION CHURN RATES BY BUSINESS MODEL, INDUSTRY, COMPANY SIZE, AND REGION

SUBSCRIPTION CHURN RATES BY BUSINESS MODEL, INDUSTRY, COMPANY SIZE, AND REGION

Categories (x-axis): SEI Main, B2C, B2B, B2Any, Corporate Services, Telecom, SaaS, Media, IoT, <$1M, $1M-$20M, $20M-$100M, $100M+M, EMEA, NoAm, APAC

Legend: ■ 2016 ■ 2017 ■ 2018

Comparison of average annualized churn rates from the SEI subindices for the years 2016 through 2018. Overall, churn has increased in the past year, particularly for SaaS products, IoT and Business to Business (B2B). Churn decreased in the last year for Telecommunications, Corporate Services, and Business to Consumer (B2C) products.

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At its most basic level, churn refers to the proportion of total subscribers who leave during a given time period. Churn can result from any number of reasons: weak customer service, a poorly upgraded product, a better offer from the competition, business failure, etc.

In order for recurring revenue to increase over time, customers must renew at a rate that outpaces churn. Therefore, reducing churn by investing in high-quality services, sticky features, and customer success is fundamental to every subscription-based business strategy. In addition, reducing churn rates is an imperative not only because of the initial lost revenue, but because of cohort opportunity costs—successful accounts grow larger over time. Average annual churn rates in the companies in the SEI are generally between 20 and 30 percent and overall 2018 saw a moderate increase in the average churn rate from 24% to 26%.

Among the business models, churn used to be highest for B2C and lowest for B2B companies. But 2018 witnessed a surprising reversal in which B2C churn actually fell below the level of churn in B2B companies. In fact, the reduction in B2C churn rates has been gradual over the last three years since 2016, and the current B2B churn rate around 28% is nowhere near the high value of the B2C churn rate at 36% back in 2016. This shift in churn is a development that we will continue to track and investigate in future SEI report. Possible explanations include improved efforts to retain customers at consumer companies and increased consumer spending.

For industries, historically churn has been highest in Media and Corporate Services and lowest in SaaS. 2018 saw a modest increase in churn for SaaS companies and decreases in churn at Corporate Services and Telecommunications companies. 2019 also saw a reversal in the position of EMEA and North American companies: Historically, North American companies had the lowest churn rates and EMEA companies had higher churn. But steady improvement in EMEA churn rates and a modest increase in North American churn leaves EMEA with a better (lower) churn rate at the end of 2018.

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EMEA SEI AND COMPARABLE GROWTH INDICES
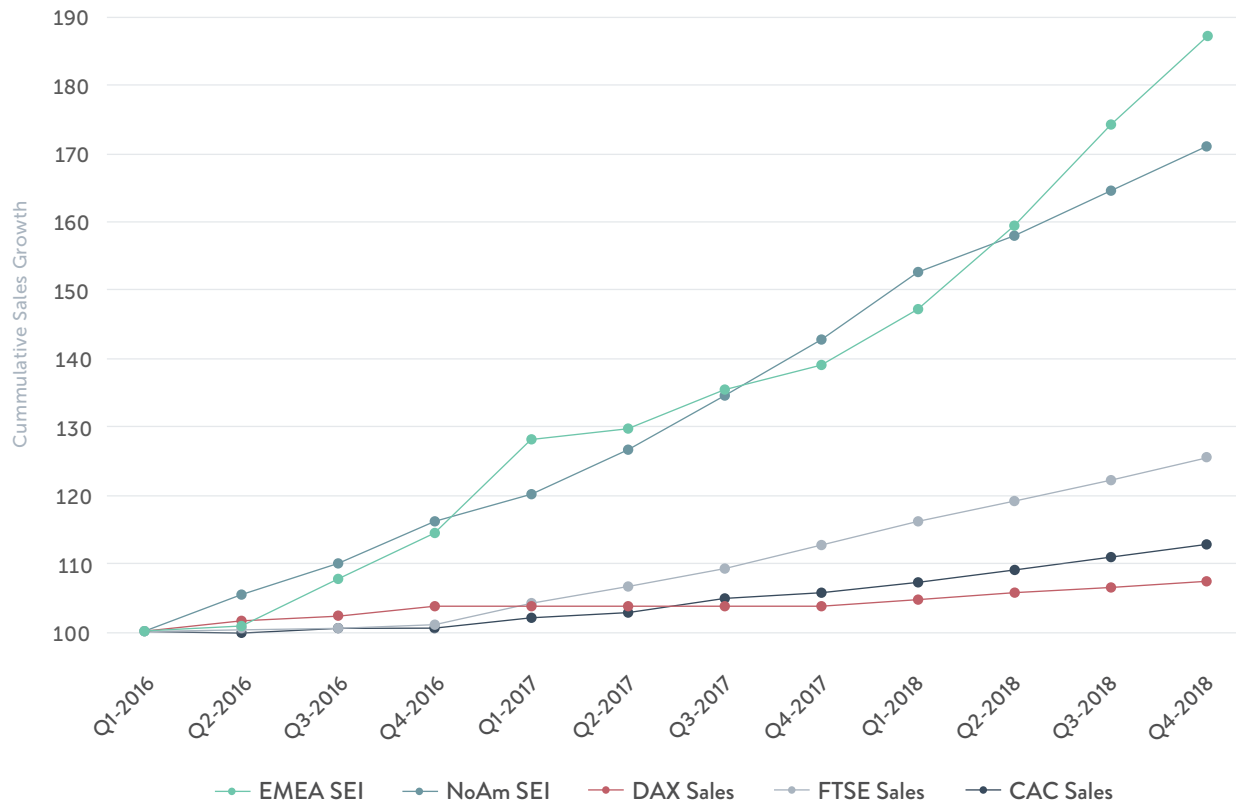
The figure shows the relative growth in recurring revenue for the EMEA Sub-Index of the SEI report (Green) and the North America Sub-Index of the SEI report (Blue). In each quarter, the index is increased by the same percentage as the percentage growth in each region. Starting from a base value of 100 at the end of Q1 2016 the EMEA index has grown to 187 and the North America index has grown to 171. Over the years North America took turns having faster growth, but then EMEA accelerated decisively to surpass a slowing North America in 2018. Also shown are the cumulative growth in sales per share for companies of the major European stock market indices: The FTSE index, the CAC 40 (Cotation Assistée en Continu; France) Index, and the DAX index (Deutscher Aktienindex; Germany). The EMEA index had more than ten times the sales growth of the DAX index, seven times the sales growth as the CAC index, and more than three times the sales growth as the FTSE Index.

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The Subscription Economy Index report has included an EMEA sub-index with history dating back to Q1 2016, which has seen 187% growth since then. Since then, the EMEA and North America indices repeatedly exchanged places as the fastest growing region: EMEA growth starting slowly in Q2 2016 but accelerated ahead of North America in 2017. North America pulled ahead again in late 2017 and early 2018, but then Q2 of 2018 was the faster quarter on record for EMEA SEI growth, at the same time as North America was slowing. Now EMEA is clearly ahead of North America, having had 87% growth over this time period in comparison to just 71% for the North American SEI level.

In short, the Subscription Economy in Europe is clearly on the ascent. Over the past 33 months, European subscription companies have even bested their American counterparts' annual growth rate of around 20% with an even faster rate of 23% (CAGR of 25.6% and 21.6% respectively). This is remarkable because European economic growth rates overall have lagged behind North American growth rates for much of the past decade.

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(NEW) GROWTH BY REGION: APAC

This is the first SEI report to release a new Asia-Pacific (APAC) sub-index with sales growth data for 2018. For the Subscription Economy Index report, the APAC region consists of Australia, New Zealand, and Japanese subscription-based companies. While subscription companies have existed in these countries for decades, we now have enough cohort data to accurately profile them. The APAC index rose from a base value of 100 to just under 116 for the year, meaning that the average subscription company in the APAC region saw sales increase by 16% in 2018. The growth of the Subscription Economy in the APAC region was much faster than sales growth for the companies in the major stock market indices in the region, as shown in the Figure.

APAC SEI & COMPARABLE SALES GROWTH INDICES
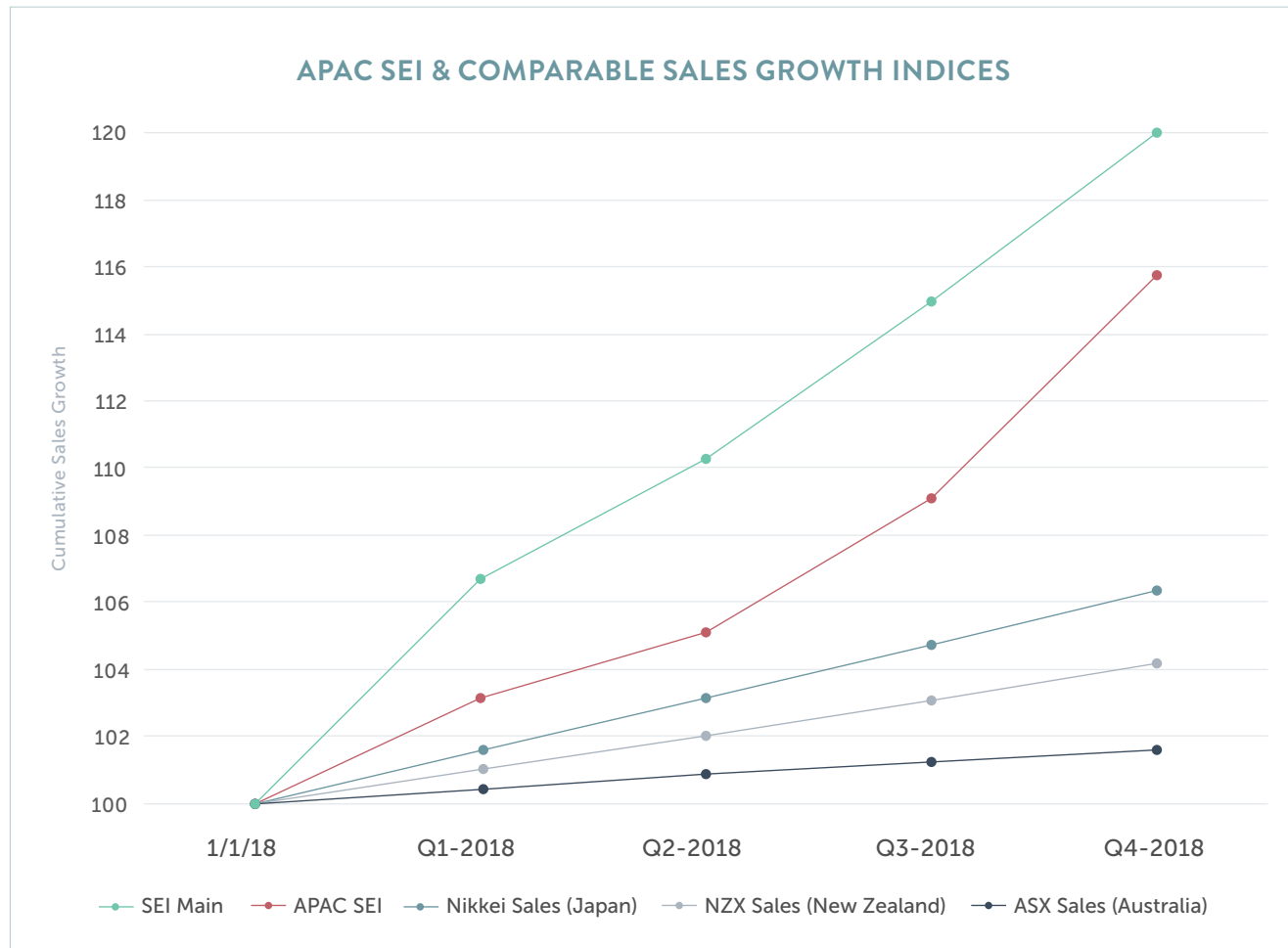
The figure shows the relative growth in recurring revenue for the APAC Sub-Index of the SEI level (Red) and the Global SEI level (Green), starting from a base value of 100 on January 1,2018. The APAC SEI level rose around 16% over the year, meaning the average company in the index had 16% sales growth during the year. Also shown are the cumulative growth in sales per share for companies of the major regional stock market indices: The ASX index (Australia), the NZX index (New Zealand), and the Nikkei index (Japan). The APAC SEI index level had almost ten times the sales growth of the ASX index, four times the sales growth of the NZX index, and 2.5 times the sales growth of the Nikkei index.

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SEI CONCLUSION

While Subscription Economy businesses are not guaranteed to succeed, companies with recurring revenue models tend to enjoy growth rates higher than the rest of the global market, enabled in part by the ability to extend average customer lifetimes, maximize ARPA and net account growth while minimizing churn rates, and take advantage of usage-based billing.

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SUBSCRIPTION ECONOMY INDEX™ METHODOLOGY

Introduction

The Subscription Economy Index (SEI) measures the growth in the volume of business for subscription based products and services. The SEI is based on anonymized, aggregated, system-generated activity on the Zuora billing service,and is intended to be indicative of the direction of the subscription economy as a whole. The SEI includes not only the main index but also set of explanatory metrics that provide insight into the sources of growth (Growth Factors), as well as specialized indices focusing on particular business segments (Sub-Indices).

The index itself is an indicator that increases (or decreases) at the same percentage rate as the average volume of activity observed in tenants on the Zuora service. Such tenants are known as constituents of the index, for reasons that will be made clear below. Like many financial and economic indicators, the precise value of the index is nominal and defined by convention. In particular, the SEI is defined to have a value of 100 on the historical date January 1st, 2012. After that time, each percentage change in the index corresponds to the same percentage change in the activity volume of an average constituent. So when the index climbed from 100 to 105, it means that on average the constituents of the SEI had increased their activity volume by 5% over that time. When the index later climbs from 110 to 115, that corresponds to only 115/110 = 4.5% growth.

The SEI as a Measure of Organic Growth

As will be described in detail below, the SEI is designed so that it measures the organic growth of the constituents in the index and not the growth in the number of constituents. At its simplest, that means that the addition of constituents to the SEI does not make it go up, in and of itself. Because the index grows at a rate that is the weighted average of the growth rates of the constituents, adding constituents to the SEI only dilutes the weight

assigned to all the other constituents. For that reason, adding constituents only makes the index go up if the new constituents growth rates are higher than the average growth rate of the pre existing cohort. Similarly, when constituents leave the SEI that does not necessarily cause the index to go down. A constituents leaving the pool may be associated with contraction in that constituent prior to departure if the tenant leaves the Zuora service due to business failure at the owner company, but that is not necessarily the case.

The SEI also removes the impact of non-organic growth in the system activity. Non-organic growth, for these purposes, means any increase in the activity in the Zuora service that is not reflective of the changes in the underlying fundamentals of the company owning the tenant in question. The most common cases of non-organic changes in activity are account migration from another billing system to the Zuora service and voluntary decommissioning of a tenant by a company that was using the billing service. In contrast, declines in activity resulting from business failure remain part of the index calculation. These issues will be described in more detail below.

Criteria for Index Constituents

Borrowing a term from stock market indices, a tenant on the Zuora service that produces activity used for calculating the SEI is referred to as an index constituent. Not every tenant on the Zuora billing system will be an index constituent at any given time. The criteria for inclusion is simply a minimum length of time that a tenant must have been live on the Zuora billing system: The main purpose of this minimum is removing the effect of non-organic activity growth from the index calculation, as described above. Other considerations are removal of seasonality, and ignoring high rates of activity growth from insignificant base

values. As described below, most companies using the Zuora billing service become index constituents after approximately two years live on the system. A total of 353 constituents met the criteria and were used to calculate the SEI when it was first released in 2016.

Burn-In Period

In order to remove the effect of account migration from other billing systems, a minimum burn in period of one year is applied to every tenant on the Zuora billing system. That means that the first year of system activity for a constituent is simply ignored and never used as part of any calculation. The one year burn-in period also removes whatever growth comes immediately after a new company launch, when Zuora is the original billing system for a new product. This is sensible because high growth rates measuring growth from an insignificant base level are usually not sustainable in the long run. The burn-in period for a constituent may be longer than one year whenever there is known or suspected to be significant account migration from other systems even after this time. Note however that Zuora does not have perfect information about these events, and some migration of accounts from another billing platform may not be excluded (however, any extreme outliers will be removed as an outlier, as described below.)

Calculation Period

As will be described in more detail below, revenue for the SEI is measured in a one year rolling window. The purpose of the one year window is to remove the impact of seasonality. After the burn-in period, the next year of system activity for a constituent is used to establish the baseline for the measurement of future growth. As a result, a typical tenant using the Zuora service is first used as an index constituent when their one quarter growth

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is calculated two years and one quarter after they went live on Zuora system.

Removal of Index Constituents

Decommissioning of tenants and the causes are tracked in the Zuora CRM system. System activity for a tenant is suspended from the SEI calculation beginning in whatever quarter their decommissioning is noted, and whenever the reason is other than business failure. Business failure decommissionings are allowed to remain in the SEI throughout the decommissioning as this reflects organic contraction on the tenant activity, while voluntarily decommissioning tenants are removed as that is a case of non-organic change in the activity. Note that this may fail to exclude migration of accounts from the Zuora system that preceded the acknowledgement of decommissioning; such migration off the Zuora system would appear as negative growth and may influence the SEI calculation (however, any extreme points will be removed as an outlier, as described below.)

Post-Live Invoice Conversion

Usually the migration of accounts and invoices from another billing system to Zuora occurs before or immediately after a tenant goes live on the platform. Occasionally a company converts accounts and invoices to the system at a later date. Whenever such a conversion is known to occur, the corresponding quarter(s) of system activity will be removed from the SEI calculation for those companies. The data points for those companies will be filled as necessary with the average of the quarters before and after the conversion. Note that Zuora does not always have complete information about these events and it possible that some post-live revenue conversion may go into the index calculation and would appear as growth (however, any extreme points will be removed as an outlier, as described below.)

Multi-Tenant and Multi-Entity

In cases where a single parent company operates either multiple entities or multiple tenants in the Zuora system, the system activity for each entity or tenant is treated as if it were a separate constituent for purposes of SEI calculations including burn-in, calculation and churn. A separate tenant is the specific case of multiple entities operating with fully separate product catalogues, databases etc. The base date for beginning the burn in period on a tenant or child entity is the later of the customer go-live date and the earliest date for which system activity for the tenant or entity is first processed.

Calculating Constituent Growth

Once a tenant on the Zuora service becomes an index constituent its activity is calculated every quarter with a one year rolling window. Many subscription businesses' activity are subject to seasonality, although the precise nature of the seasonal effect varies significantly. Using a one year window for SEI calculations removes the effect of seasonality. This means that if the SEI increases (or decreases) over any quarter it is because that quarter was better (or worse) than the same quarter one year prior; not the quarter immediately preceding it.

The activity measure for SEI calculation is the one year prior total of Invoice Item amounts generated from recurring and usage Rate Plan Charge objects in the Zuora object model database . One time charges are excluded from the calculation, as the SEI is intended to reflect the growth in recurring activity. Whether Invoice Items are for recurring, usage or one time activity is given by the Rate Plan Charge object linked to the Invoice Items in the model. Note also that any activity a constituent makes that is outside the Zuora system is ignored by the SEI calculation. A consequence of this is that in cases where a division of a large corporation uses Zuora for a single product line then that constituent is treated as if it were a small company, independent of the larger organization.

Once the activity of a tenant in the SEI has been calculated, the growth calculation for the SEI is the quarterly change in the one year trailing activity expressed as a percentage. That is, the quarterly growth for a constituent is calculated as:

$$G^{Q}_{constituent} = \frac{A^{Q}_{constituent}}{A^{Q-1}_{constituent}} - 1$$

where A^{Q} represents the one year trailing activity ending with the quarter denoted Q and A^{Q-1} is the same but for the year ending with the prior quarter.

Average Growth and Updating the Index

The increase/decrease of the SEI over any period in time is the average of the growth in activity for constituents who make up the SEI at that time. However, the average growth used is not the simple average (or mean) – rather it is amount weighted average, subject to certain constraints.

Outlier Removal

The first step taken in calculating the average is to remove outliers, those constituents in the SEI having the largest increases or decreases in activity for each quarter. Outliers are defined as the top and bottom 5% of companies in the SEI. The actual number to remove is rounded up to the nearest whole number, so for example if there were 100 constituents in the index then the top and bottom 5 companies are removed, but if there are 101 in the index then the top and bottom 6 companies would be removed. Removing outliers serves two purposes: First, the movement of the SEI is meant to represent what happens to typical constituents in the SEI. However, averages can be unduly influenced by the presence of very large values. Also, as noted above, the SEI calculation does not contain perfect information about non-organic changes in activity (e.g. conversions, decommissioning of tenants voluntary churn, etc.) Removing outliers helps to insure that even if such companies' system activity remains in the SEI and do in fact do have extreme changes in their activity, then those changes will not influence the index.

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Weighting by Volume of Activity

In addition to reflecting what happens to a "typical" constituent, the SEI is meant to reflect the amount of growth in the overall Subscription Economy outside of the Zuora service and the opportunities that are available to creators of and investors in Subscription Economy companies. For this reason, the weighted average used in the SEI growth calculation is weighted by the total amount of activity each tenant has, so that companies with higher activity take more weight in the average. (Note the weighting is by the baseline amount of activity for each constituent, but not the growth in activity that is being averaged.) This is similar to the way that stock market indices are weighted by the market capitalization of their constituents and for the same reason: the indices are meant to represent the overall size of the market and the opportunity available to investors, so it is weighted more towards larger entities.

However, complete reliance on amount weighting may fail to reflect what is typical if a few very large constituents dominate the activity measured by the SEI. For this reason the weight of any single constituent in the weighted average is limited to 5% of the total. In case any constituent would take more than 5% of the average weight in the SEI (or an SEI sub-index) based on their total amount of activity, then that weight is capped at 5% and the remaining weight is distributed proportionally to the other constituents in the pool; the process is iterated until all constituent weights are at or below 5%.

Minimum Number of Constituents

Taken together, the outlier removal and weighting method determine the minimum number of constituents for calculating the SEI or any sub-index of the SEI (for which the same rules apply.) Capping weights at 5% implies there must be no less than twenty constituents. However, the twenty constituents must be available after outlier rejection, described above. The number of constituents to remove for the top and bottom 5 percentiles is rounded up to the nearest whole number, so that for more than twenty constituents the two highest and two lowest activity growth numbers are removed from the average. This means the minimum possible number of constituents to calculate the SEI or one of its sub-indices according to these rules is twenty four, and the SEI uses a minimum of twenty five for simplicity.

Index Update

Given the growth of all constituents over the prior quarter and the weights to use in the average, the average growth is simply the sum of all the constituents' growth rates multiplied by their weight (note that all the weights add up to one, so this is a proper weighted average.) One plus the average growth rate is then multiplied by the prior index level to arrive at the new index level. That is,

$$SEI^Q = SEI^{Q-1} \times (1 + \overline{G^Q})$$

where SEI^Q is the new index level, SEI^{Q-1} is the index level after the last quarterly update, and $\overline{G^Q}$ is the average constituent growth over the most recent quarter.

Growth Factors

The SEI measures the amount of growth in the Subscription Economy, but a single indicator does not give insight into what is driving it. A related set of metrics help to explain the sources of that growth. These metrics are called the Growth Factors of the SEI. Like the percentage change in activity used in the SEI calculation, the Growth Factors are averages of percentage changes in other activity based measurements. Unlike the SEI, the Growth Factors are not used to update an index – they are simply provided as explanatory information each quarter. The growth factors use a simple two step decomposition to explain why the SEI went up (or down) in any given quarter.

ARPA and Net Account Growth

If the total amount of a company's activity go up that means at least one of two things must have happened: Either the number of accounts generating the activity went up, or the amount of activity for existing accounts went up. The total of Invoice Item amounts is analogous to the accounting measure of revenue, so it is referred to using the accounting term Average Revenue Per Account or ARPA. This is the first level of the SEI Growth Factor decomposition: overall activity growth is decomposed into growth in ARPA and growth in the number of accounts. The latter is referred to as Net Account Growth, to distinguish it from specifically new (added) accounts. Changes in ARPA are closely related to upsells and downsells: If ARPA is growing, then upsells and price increase must be outweighing downsells and discounts.

To calculate the growth factors for ARPA and Net Account growth, the number of accounts with activity in the past year is measured on each quarter end date for all the constituents. ARPA is calculated simply as annual activity divided by the number of accounts. Next, the quarterly percent changes in ARPA and the number of accounts is calculated for all constituents (similar to the calculation for quarterly percent change in overall annual activity, described above.) Finally, the averages of ARPA growth and Net Account Growth are calculated using the same weights as the SEI (overall activity weighting, subject to constraint.) These averages are the Growth Factors for ARPA and Net Account Growth. When combined with the SEI change for any time period, these show whether SEI growth (or declines) was driven by increases/decreases in activity on existing accounts or by changes in the overall number of accounts, or both.

Note that for a single tenant in the SEI the following relationship holds exactly:

$$(1 + G^Q) = (1 + G^Q_{ARPA}) \times (1 + G^Q_{\#of\ Accounts})$$

where G indicates the percentage growth of the measurement indicated for some quarter. Also, for low levels of growth it is approximately true that:

$$G^Q \approx G^Q_{ARPA} + + G^Q_{\#of\ Accounts}$$

Meaning, when the growth is small the total growth is close to the

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sum of the two components. However, the SEI growth factors are averages over many constituents and the multiplicative relationship shown above will only be approximately correct. This is because an average of a product of two sets of measurements is not the same as the product of the averages of the same two sets of measurements – the relationship is nonlinear. The additive relationship is even less accurate for the Growth Factors, as it involves one more level of approximation. So the growth of the SEI is not simply the sum of the ARPA and Net Account Growth Factors, though it will often be close. And comparing these two Growth Factors still gives a powerful explanation into what caused the SEI to grow in any given quarter.

Account Growth and Churn

The net change in the number of accounts can be further decomposed into two components: addition of new accounts, and loss or churn of existing accounts. These additional growth factors provide insight into what is driving net changes in the number of accounts. This extra level of decomposition is important because new account additions and losses to churn are driven by two different processes: New additions are the result of marketing and sales efforts; while churns are driven by satisfaction/dissatisfaction of the existing customer base.

Companies calculate growth and churn of accounts in many different ways. The SEI growth factors use a simple calculation that makes results comparable across the wide variety of companies in the SEI, and is consistent with the calculation of the SEI main index and the other Growth Factors. The definition are as follows:

1. New account additions are defined as any account that had activity in the last quarter, but had no activity the prior year (the prior four quarters.)

2. The Account Growth rate is defined as the number of new accounts added in a quarter divided by the number of accounts at the start of the quarter.

3. Churns are defined as an account that has had no activity in the last year (4 quarters), but last had activity in the quarter prior to that. To explain churn another way, suppose an account had activity in Q2 some year; if Q2 of the next year passes and the account has not had activity again at all in that year, then the account is considered a churn at in Q3 (up to one year and one quarter after the last activity.)

4. The churn rate is defined as the number of churns in a quarter divided by the number of accounts at the start of the quarter.

Many companies use different definitions for these metrics, and those choices are often made based on the typical customer lifespan, re-signup behavior etc. Naturally, any definition applied to a diverse pool of companies will not be perfectly suited to every type of tenant in the zuora service. The SEI definitions were chosen to remove the effects of seasonality and for consistency with the annual activity calculations used by the SEI.

Relationship to Revenue based Retention

Many subscription companies report revenue based retention and churn, and it is also common to include the impact of upsells in this metric. This is useful because this one metric captures much about the health of the existing customer base. To calculate an amount that is analogous to revenue based retention including upsells from the SEI Growth Factors start by noting that account based retention is simply 100% minus account based churn. So the SEI analog to revenue based retention including upsells is calculated by multiplying the account based retention by one plus ARPA growth. That is:

$$R = (1.0 - C) \times (1 + G_{ARPA})$$

where C is the churn rate and G_{ARPA} is the ARPA growth rate as described above.

Sub-Indices

In addition to providing insight about the direction of the Subscription Economy overall, it is useful to know about the differences between various categories of companies. To support this, the SEI method is also applied to specific subsets of the constituents l. Borrowing terminology from stock market indices these constituent groups and their associated measurements are known as sub-indices. Once the classifying criteria for a sub-index are defined, the same methodology is applied to that pool of constituents as is used for the main SEI. The only requirement for creating an SEI sub-index is that the category must have to the minimum number of 25 constituents, as described above.

A variety of classifications are used to define sub-indices. Examples include the Business Model, Industry, Vertical, and Revenue Band. Additional classifications may be applied in the future, or combinations of classifications. These classifications are provided by the data vendor Inside View and applied to the billings system measurements via Zuora's CRM system.