Growing Via New or Existing Customers?

Marketing Accountability Standards Board (MASB)
Summer Summit 2025:
"Marketing Opportunities in the Era of Economic Uncertainty"

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Agenda

Introduction to the Problem

Theory & Framework

Development of Approach to Derive Non-Disclosed Metrics

Evaluation of Approach in a Simulation Study & Real-World Settings

Empirical Study

Summary, Conclusion & Implications

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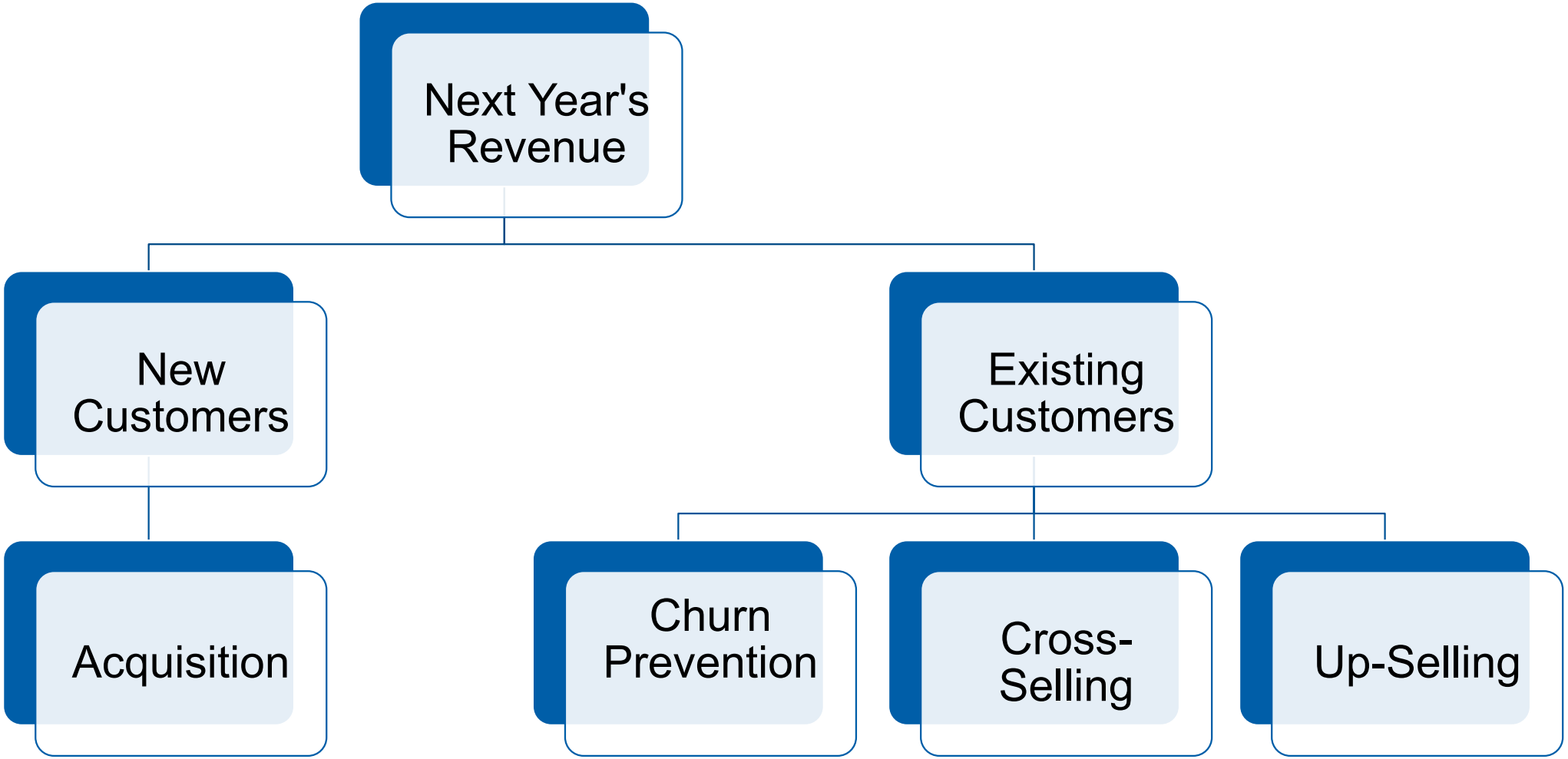
Where Does Next Year's Revenue Come From?



Aim & Research Questions

Aim:
Understand how firms grow

- RQ1: Which metric identifies each path?
- RQ2: How can we identify the path if companies do not disclose much information?
- RQ3: Which of the two paths do firms pursue, and does it change over time?
- RQ4: Which path yields higher growth?

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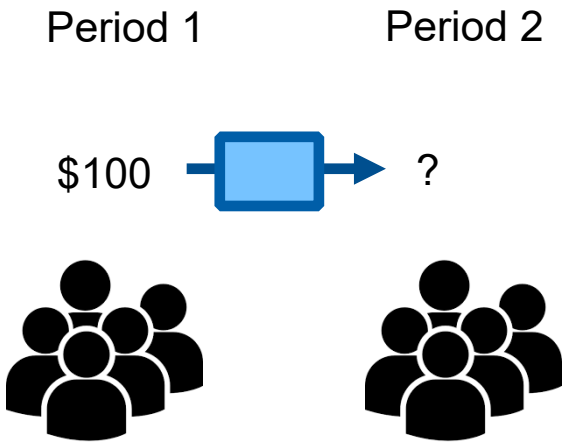
How can Firms Grow? Looking at a Group of Customers

The Start of All Revenue: New Revenue

- A firm acquires new customers
- Group new customers into cohorts:
  - Group of customers who purchase for the first time during the same observation period

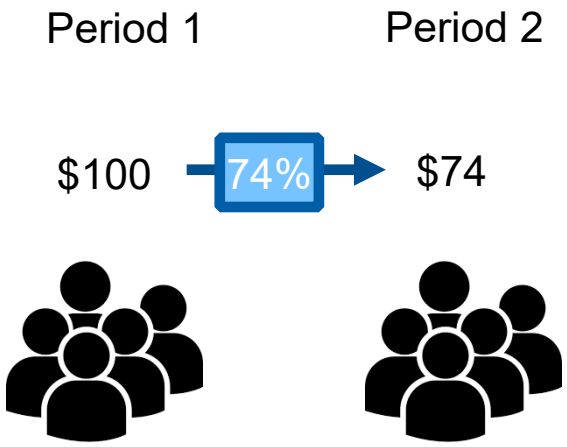


Revenue Cohort Table

Cohort \ Period	2024-01	2024-02
1	100	?
Total	**100**	

Definition of Revenue Retention Rate (RRR) For A Group of Customers

- Percentage of revenue from a group of (existing) customers that a firm retains in the next period

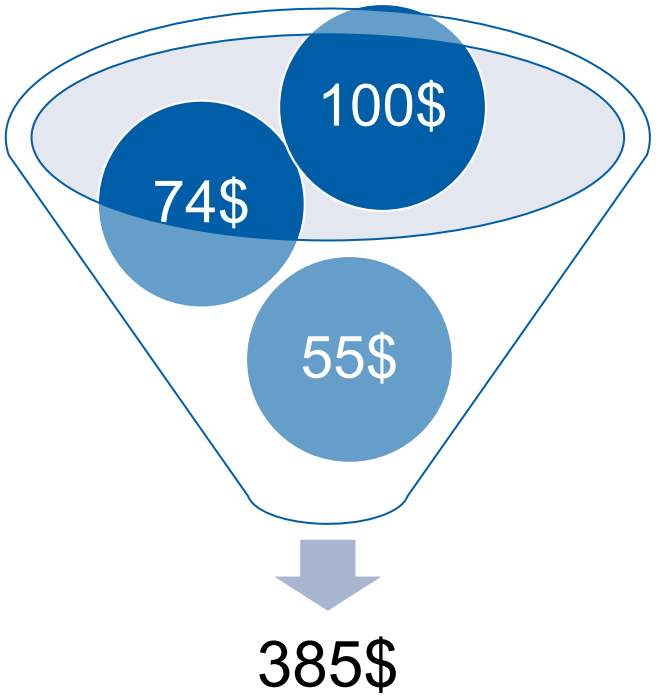


Revenue Retention Rate Cohort Table

Cohort \ Period	2024-01	2024-02
1	100%	74%
Total	**100%**	**74%**

Intuition Behind Revenue Growth: Starting Point

- A group of customers spends in the first period 100$, in the second 74$, the third 55$ and so on
  - Formular for Cumulative Revenue: $100\$ \times \sum_{t=0}^{\infty}(\frac{74}{100})^t = 385\$$
    - For sake of simplicity: no discounting

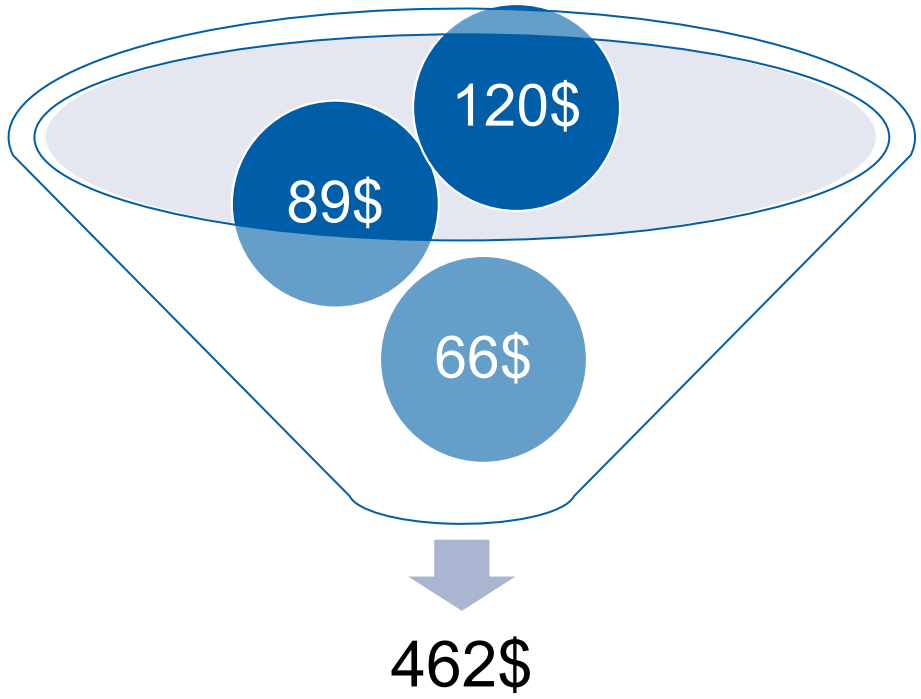


Which Change Yields Higher Growth?

	Current Revenue Retention Rate: 74%	Increased Revenue Retention Rate: 89% (+20% increase)
Current Revenue in Acquired Period ($100)	$385	?
Increased Revenue in Acquired Period ($120, +20%)	?	

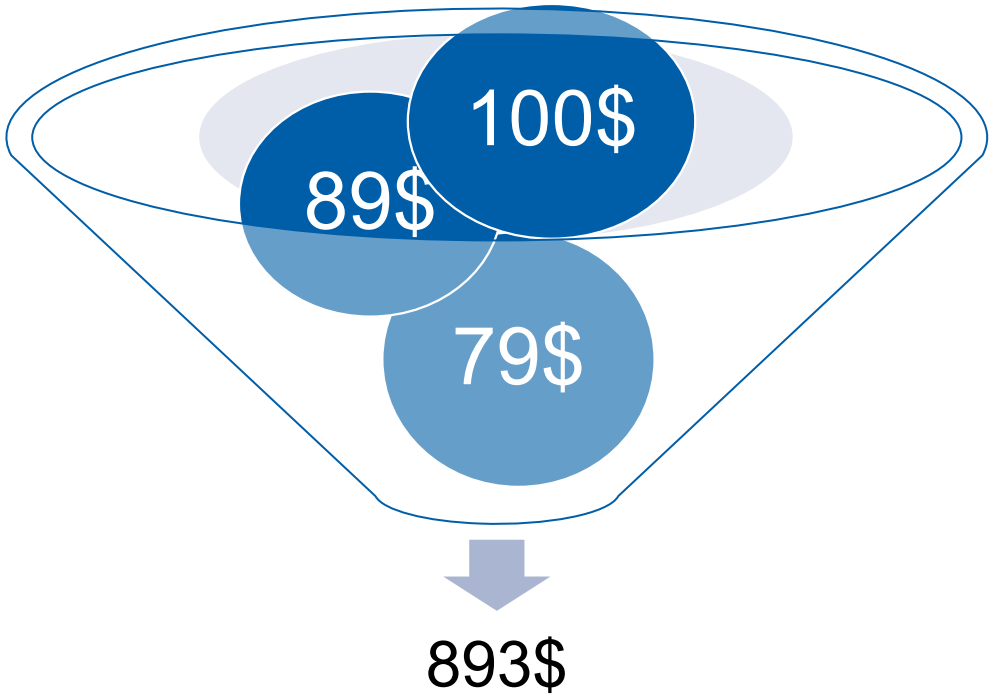
Increasing Revenue Acquisition By 20% (120$ instead of 100$)

- A group of customers spends in the first period 120$, in the second 89$, the third 66$ and so on
  - Formular for Cumulative Revenue: $120\$ \times \sum_{t=0}^{\infty}(\frac{74}{100})^t = 462\$$



Increasing Revenue Retention Rate (RRR) By 20% (89% instead of 74%)

- A group of customers spends in the first period 100$, in the second 89$, the third 79$ and so on
  - Formular for Cumulative Revenue : $100\$ \times \sum_{t=0}^{\infty}(\frac{79}{100})^t = 893\$$



Comparison of Results for "+20% Change"

Acquisition \ Revenue Retention Rate	74%	89% (+20%)
$100	385	893 (+132.1%)
$120 (+20%)	461 (+20.0%)	1,071 (+178.6%)

Starting Point Changes (20% Revenue Retention Rate instead of 74%)

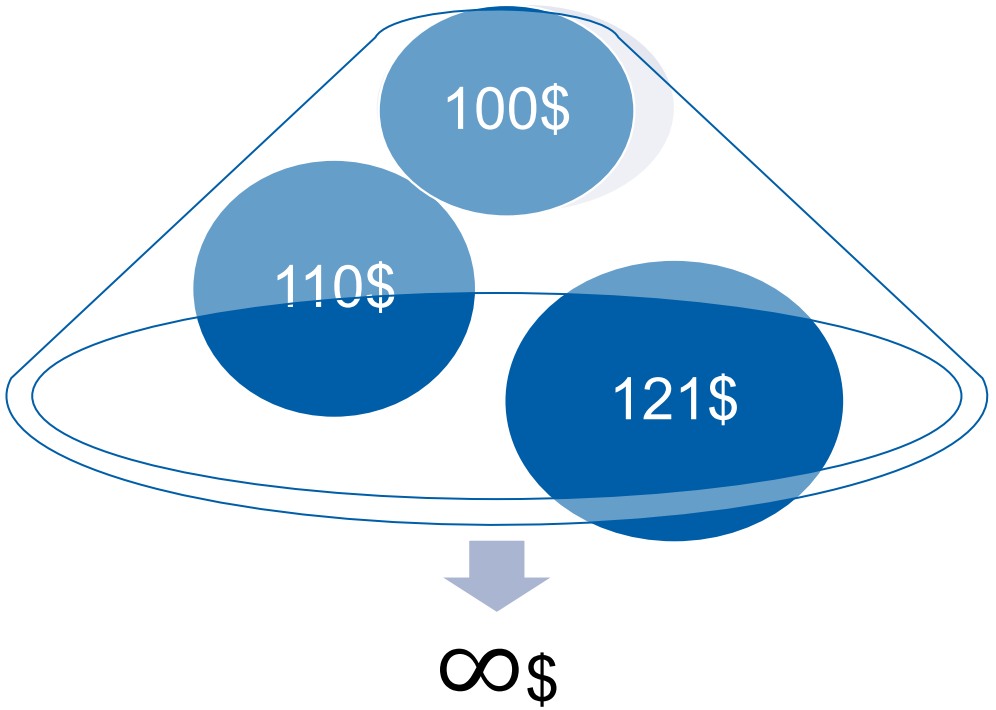
Acquisition \ Revenue Retention Rate	20%	24% (+20%)
$100	125	?
$120 (+20%)	?	

Comparison of Results for "+20% Change" ("low revenue ret. rate")

Acquisition \ Revenue Retention Rate	20%	24% (+20%)
$100	125	132 (+5.6%)
$120 (+20%)	150 (+20.0%)	158 (+26.4%)

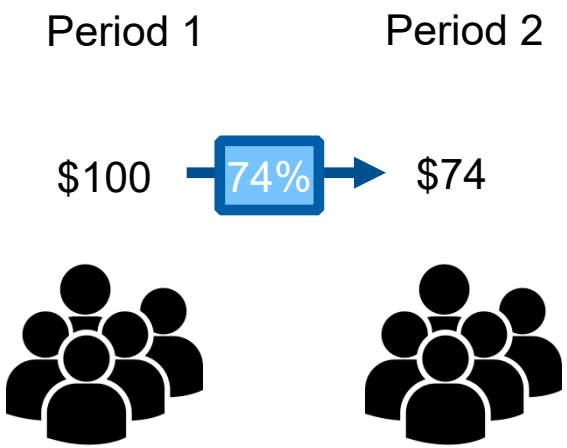
Unlimited Growth if Revenue Retention Rate > 100%

- A group of customers spends in the first period 100$, in the second 110$, the third 121$ and so on
  - Formular for Cumulative Revenue: $100\$ \times \sum_{t=0}^{\infty}(\frac{110}{100})^t$



RQ1: Which metric identifies the pursuit and development of each growth path?

One Cohort



Revenue Retention Rate Cohort Table

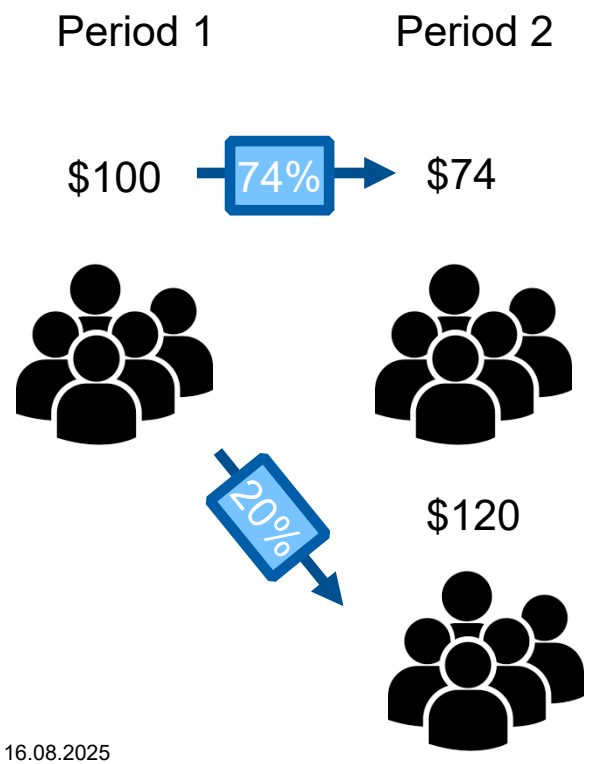
Cohort \ Period	2024-01	2024-02	2024-03
1		74%	
2			
3			

Revenue Cohort Table

Cohort \ Period	2024-01	2024-02	2024-03
1	100	74	
2			
3			
Total	**100**		
Revenue growth			

Two Cohorts: Revenue Acquisition

- Every new period, a firm acquires a new cohort of customers
- A firm can grow through
  - new customers
  - retained customers
  - $Revenue = Revenue_{new} + Revenue_{retained}$



Revenue Retention Rate Cohort Table

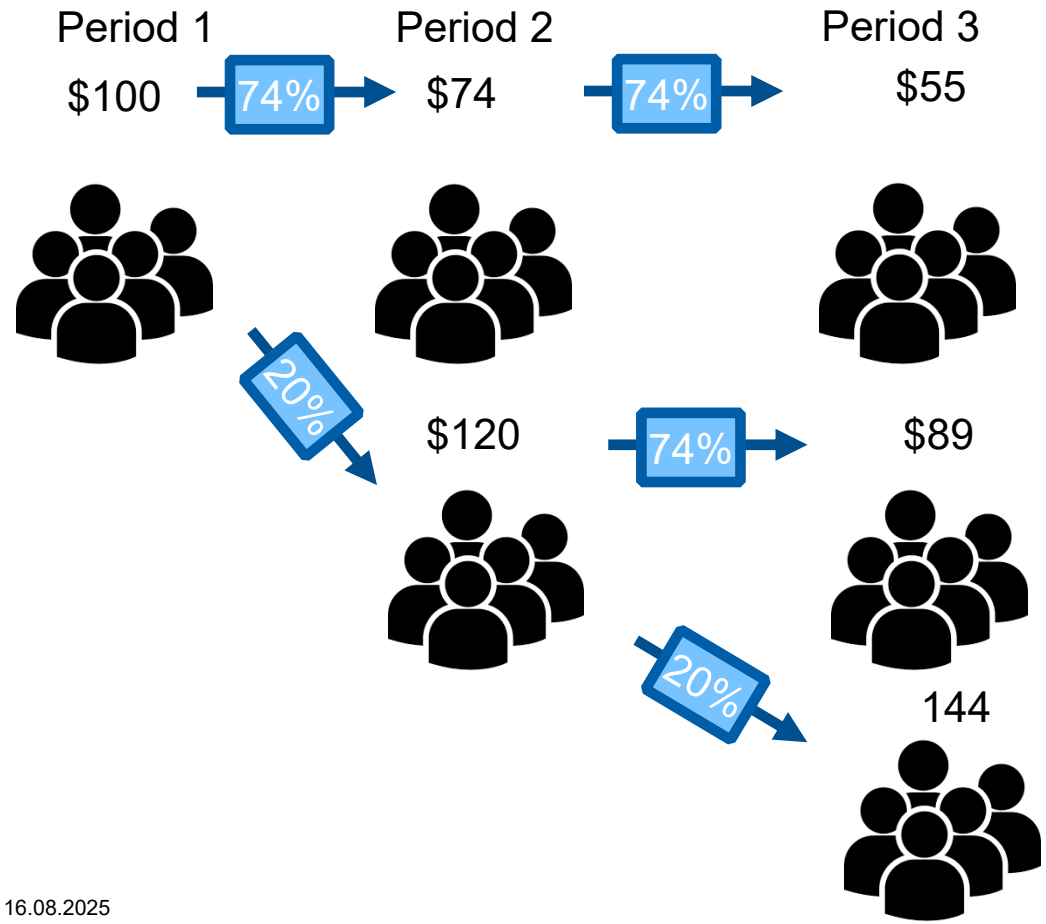
Cohort \ Period	2024-01	2024-02	2024-03
1		74%	
2			
3			

Revenue Cohort Table

Cohort \ Period	2024-01	2024-02	2024-03
1	100	74	
2		120 (+20%)	
3			
Total	**100**	**194**	
Revenue growth		**94%**	

Revenue Growth

- Revenue growth occurs because of:
  - Development of a cohort's revenue over time (i.e., customers' duration with the firm)
  - Revenue of acquired (new) customers (i.e, new cohort's revenue)



Revenue Retention Cohort Table

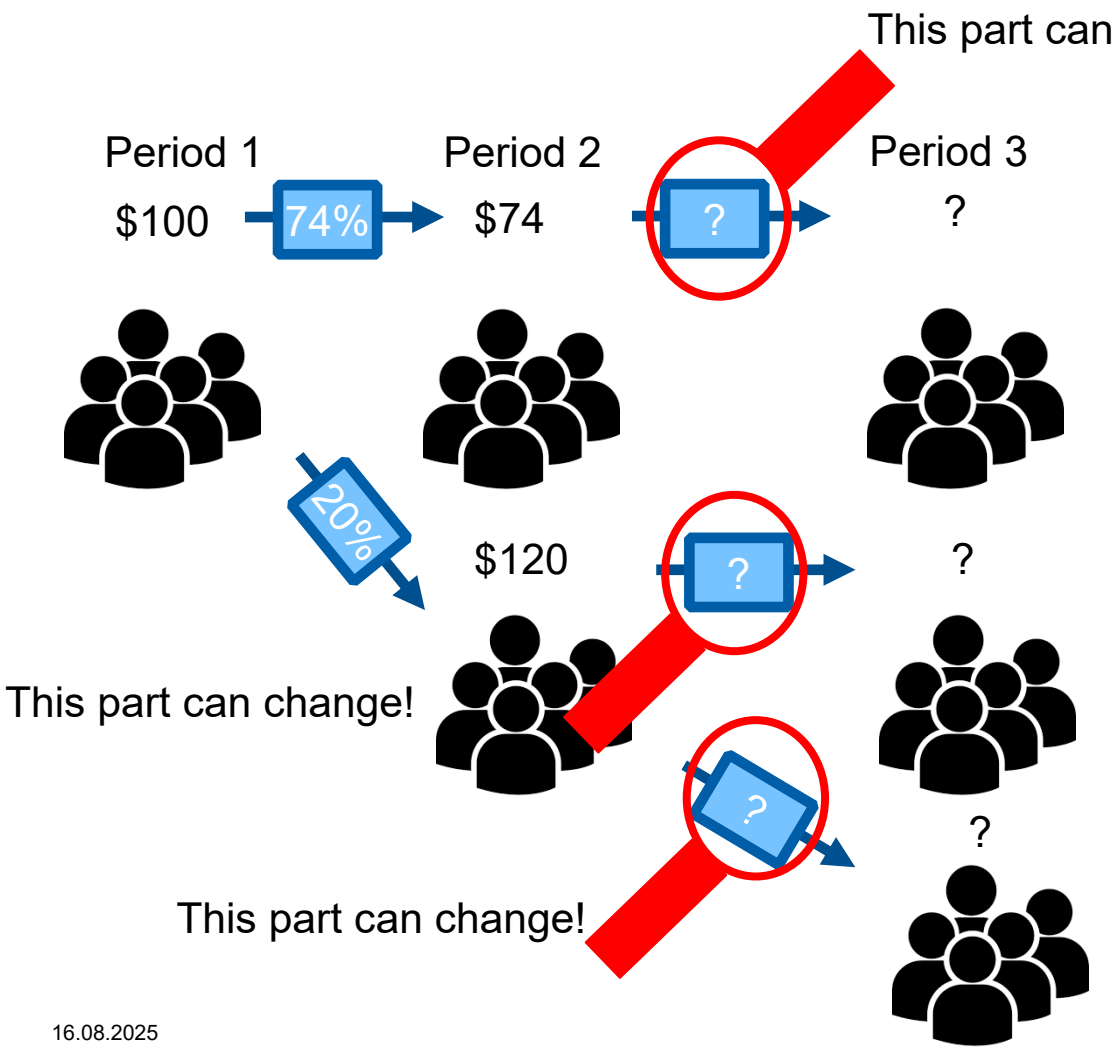
Cohort \ Period	2024-01	2024-02	2024-03
1		74%	74%
2			74%
3			

Revenue Cohort Table

Cohort \ Period	2024-01	2024-02	2024-03
1	100	74	55
2		120 (+20%)	89
3			144 (+20%)
Total	**100**	**194**	**288**
Revenue growth		**94%**	**48%**

Dynamic Cohorts

Each Cohort is dynamic



Revenue Retention Rate Cohort Table

Cohort \ Period	2024-01	2024-02	2024-03
1		74%	?
2			?
3			

Revenue Cohort Table

Cohort \ Period	2024-01	2024-02	2024-03
1	100	74	?
2		120 (20%)	?
3			?
Total	**100**	**194**	**?**
Revenue growth		**94%**	**?**

How can Firms Grow?
Looking at Several Cohorts:
Modeling Revenue Acquisition & Development

Revenue (Retention Rate) Cohort Table: Base Effect

Revenue Retention Rate Cohort-PeriodTable

Cohort \ Period	2024-01	2024-02	2024-03	2024-04
1		74% →	74% →	74%
2				
3				
4				

Revenue Cohort-Period Table

Cohort \ Period	2024-01	2024-02	2024-03	2024-04
1	100 →	74 →	55 →	41
2		100		
3			100	
4				100

Total

- Revenue retention rate cohort-period table
  - Revenue retention rate per cohort and period
- Revenue cohort-period table
  - Revenue per cohort and period

Total Revenue = New Revenue + Retained Revenue

Revenue Retention Rate Cohort-Period Table

Cohort \ Period	2024-01	2024-02	2024-03	2024-04
1		74% →	74% →	74%
2			74% →	74%
3				74%
4				

Revenue Cohort-Period Table

Cohort \ Period	2024-01	2024-02	2024-03	2024-04
1	100 →	74 →	55 →	41
2		100 →	74 →	55
3			100 →	74
4				100
Total	**100**	**174**	**229**	**264**

- Revenue per period
  - Sum of revenues of all cohorts in respective period
  - Revenue stems from new & retained revenue

Revenue Retention Over Cohort's Lifetime: Age Effect

Revenue Retention Rate Cohort-Period Table

Cohort \ Period	2024-01	2024-02	2024-03	2024-04
1		78% →	82% →	86%
2				
3				
4				

Revenue Cohort Table

Cohort \ Period	2024-01	2024-02	2024-03	2024-04
1	100 →	78 →	64 →	55
2				
3				
4				

Total

- Define age as $\mathrm{p} - c$ (i.e., $Period - Cohort$)
- Cohort 1 has an age effect of 4 percentage points (pp)

Revenue Retention Between Cohorts: Cohort Effect

Revenue Retention Rate Cohort-Period Table

Cohort \ Period	2024-01	2024-02	2024-03	2024-04
1		77%		
2			80%	
3				83%
4				

Revenue Cohort-Period Table

Cohort \ Period	2024-01	2024-02	2024-03	2024-04
1	100	77		
2		100	80	
3			100	83
4				100

Total

- A cohort table tracks each cohort's
  - Starting revenue
  - Retained revenue
- Cohorts have a $cohort$ effect of 3pp on revenue retention rate

Cohort-Period Revenue Retention Rate

Revenue Retention Rate Cohort-Period Table

Cohort \ Period	2024-01	2024-02	2024-03	2024-04
1		81% →	85% →	89%
2			84% →	88%
3				87%
4				

Revenue Cohort-Period Table

Cohort \ Period	2024-01	2024-02	2024-03	2024-04
1	100 →	81 →	69 →	61
2		100 →	84 →	74
3			100 →	87
4				100
Total	**100**	**181**	**253**	**322**

- Cohort-period revenue retention rate („per cell“)
  - Ratio of revenue from retained customers in a period and revenue of all customers of the same cohort in the previous period

- $Revenue\ Retention\ Rate(c,p) = \frac{Retained\ Revenue(c,p)}{Revenue(c,p-1)} =$

  $(Base\ Effect\ + Cohort\ Effect\ * Cohort + Age\ Effect * Age) =$

  $(0.74 + 0.03 * Cohort + 0.04 * Age)$

Acquisition Effect

Revenue Retention Cohort-Period Table

Cohort \ Period	2024-01	2024-02	2024-03	2024-04
1		74%	74%	74%
2			74%	74%
3				74%
4				

Revenue Retention Cohort-Period Table

Cohort \ Period	2024-01	2024-02	2024-03	2024-04
1	100	74	55	41
2		120 (+20%)	74	55
3			144 (+20%)	74
4				173 (+20%)
Total	**100**	**194**	**273**	**337**

- Firms can increase their revenue by acquiring (new) customers
  - Acquisition effect is +20%

RQ1: Which metric identifies the pursuit and development of each growth path?

Acquisition Effect & Revenue Retention Rate

Problem: Firms Hardly Disclose Cohort Tables

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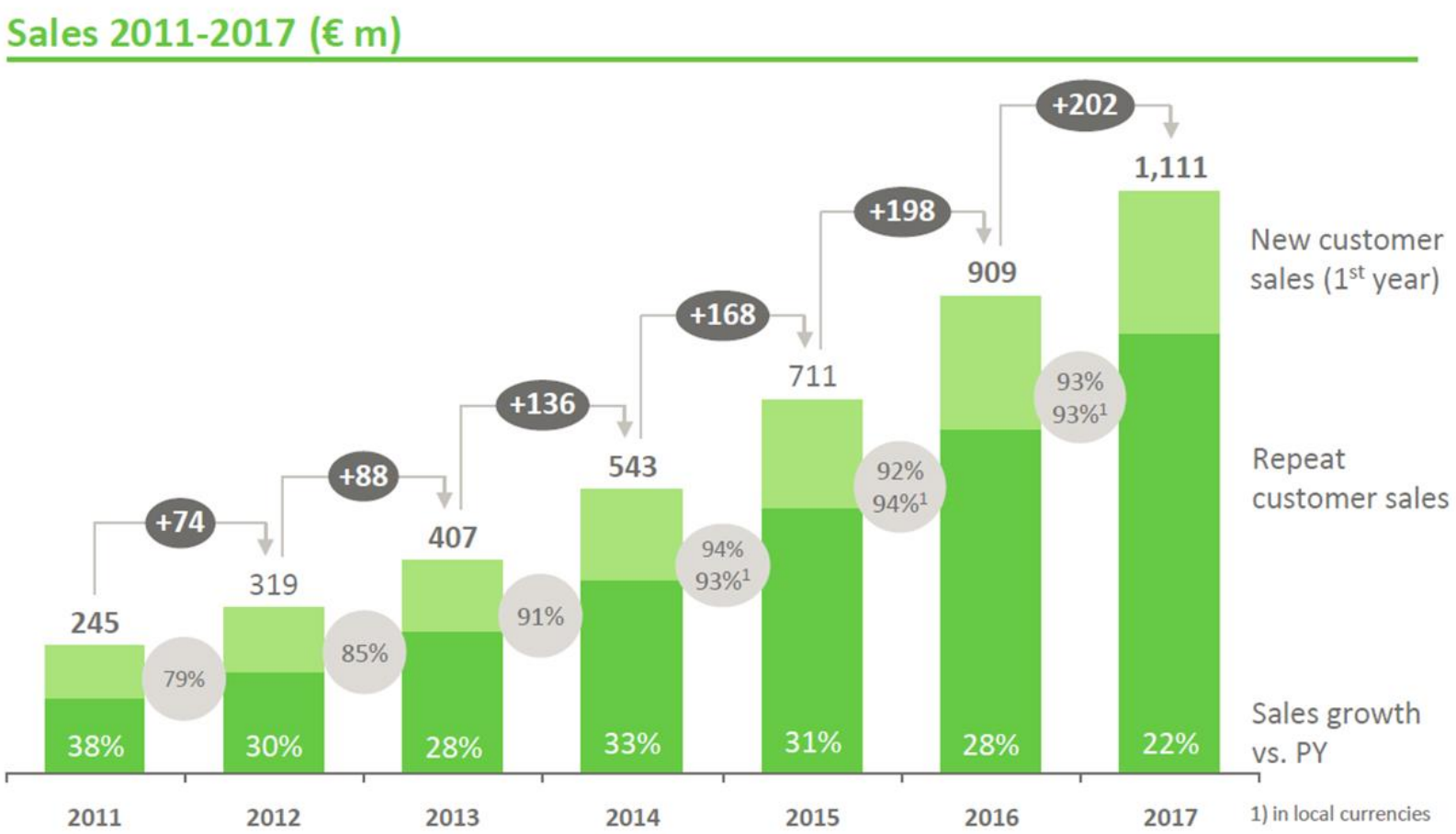
RQ2: How to identify the pursuit & development if companies do not disclose these metrics?

Zooplus Disclosing Revenue From New & Retained Customers

Loyal customers are the core base of zooplus growth path



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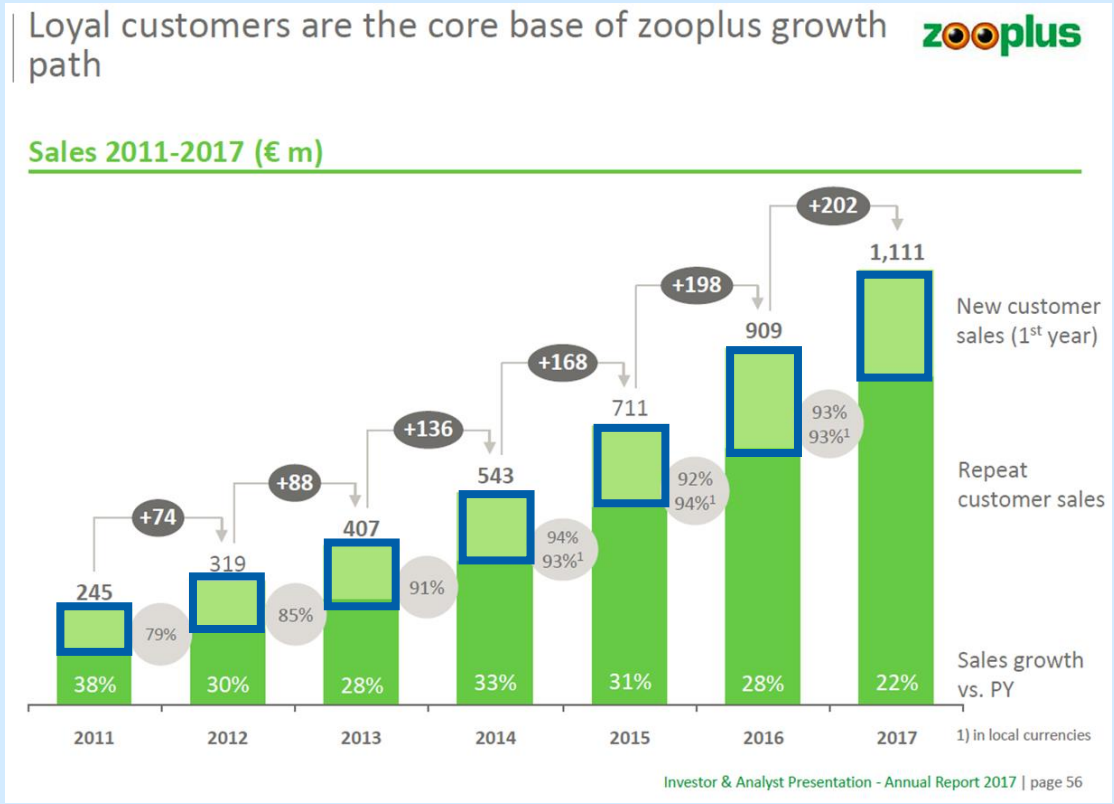
Step 1: Creating Cohorts

Revenue Cohort Table

Cohort \ Period	2024-01	2024-02	2024-03	2024-04
1	100			
2		100		
3			100	
4				100
O.New Revenue	100	100	100	100
O.Retained Revenue				
E.Retained Revenue				

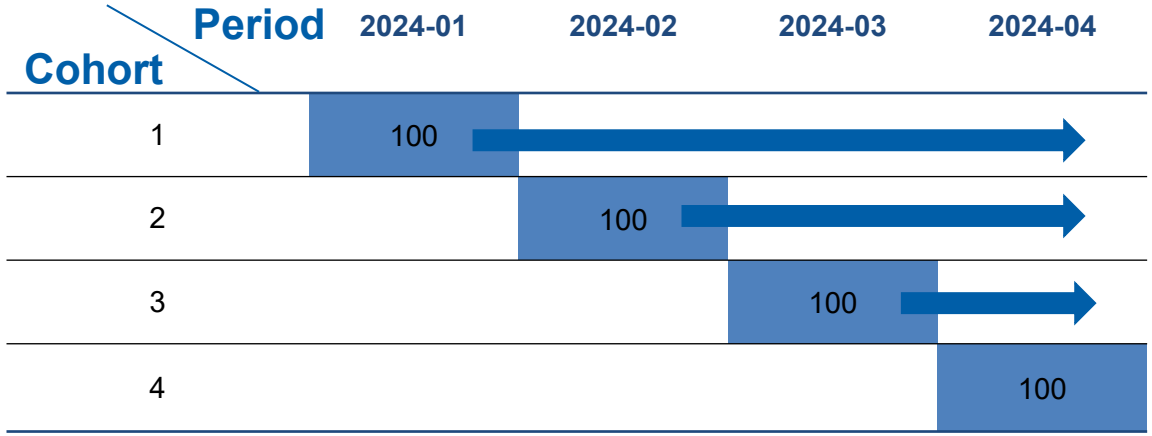
- New revenue results from new cohort



What is the Cohort Development?

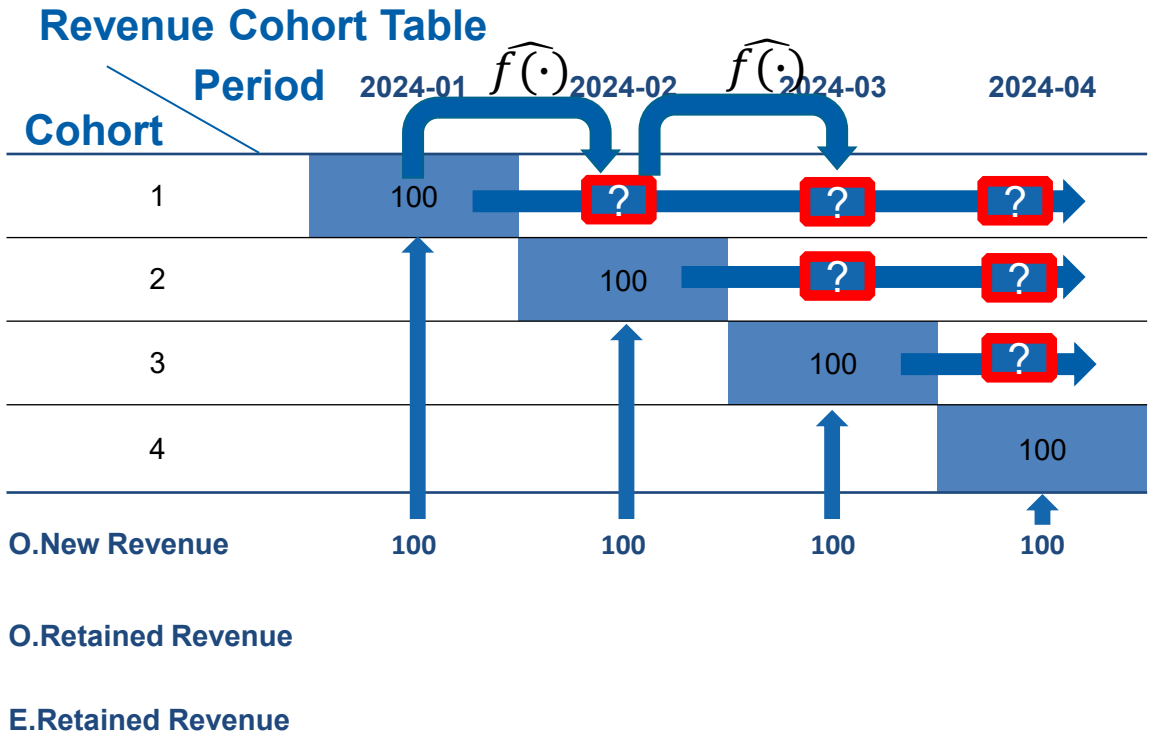
Revenue Cohort Table

Cohort \ Period	2024-01	2024-02	2024-03	2024-04
1	100			
2		100		
3			100	
4				100
O.New Revenue	100	100	100	100
O.Retained Revenue				
E.Retained Revenue				



- Each cohort develops over its lifetime
- Revenue retention rate captures development of revenue

Step 2: Model Development of Revenue Retention Rate

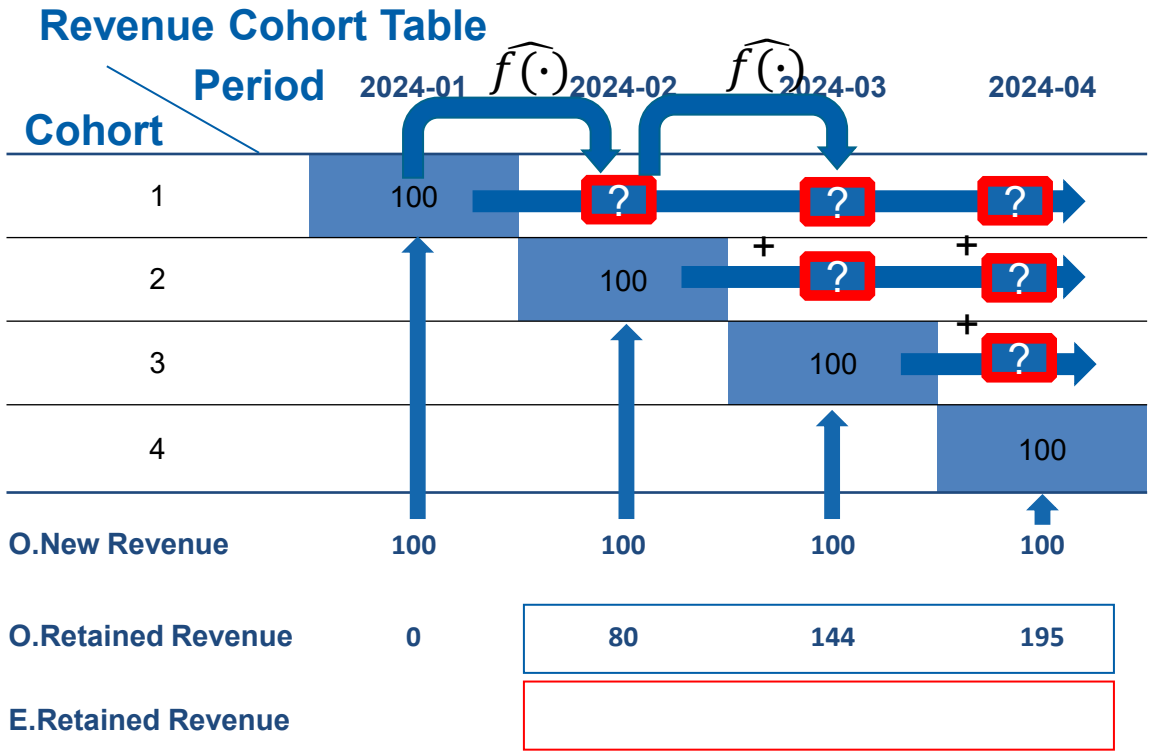


- Model RRR with $\hat{f}(\cdot)$ and its parameters
- Assumption:
  1. one functional form for all cohorts
  2. same effects occur for all cohorts
- Our model:

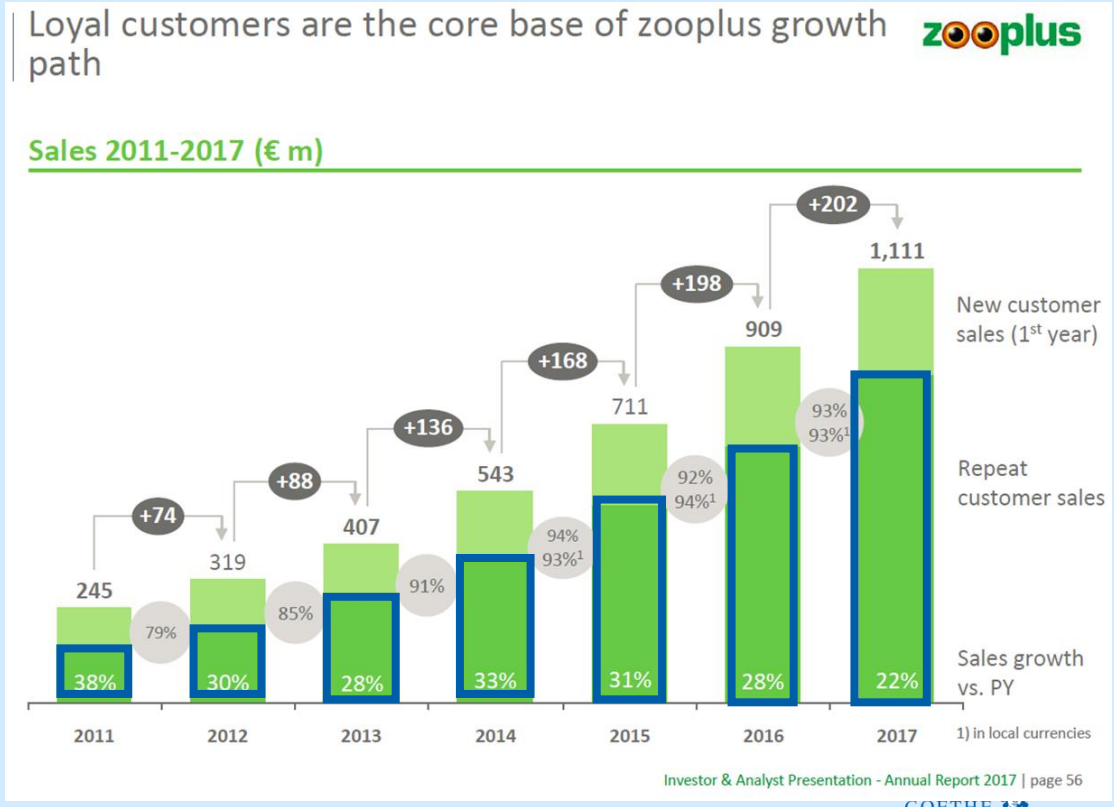
$$Revenue\ Retention\ Rate(c,p) =$$
$$(Base\ Effect + Cohort\ Effect * Cohort + Age\ Effect * Age)$$

- Functional form is flexible

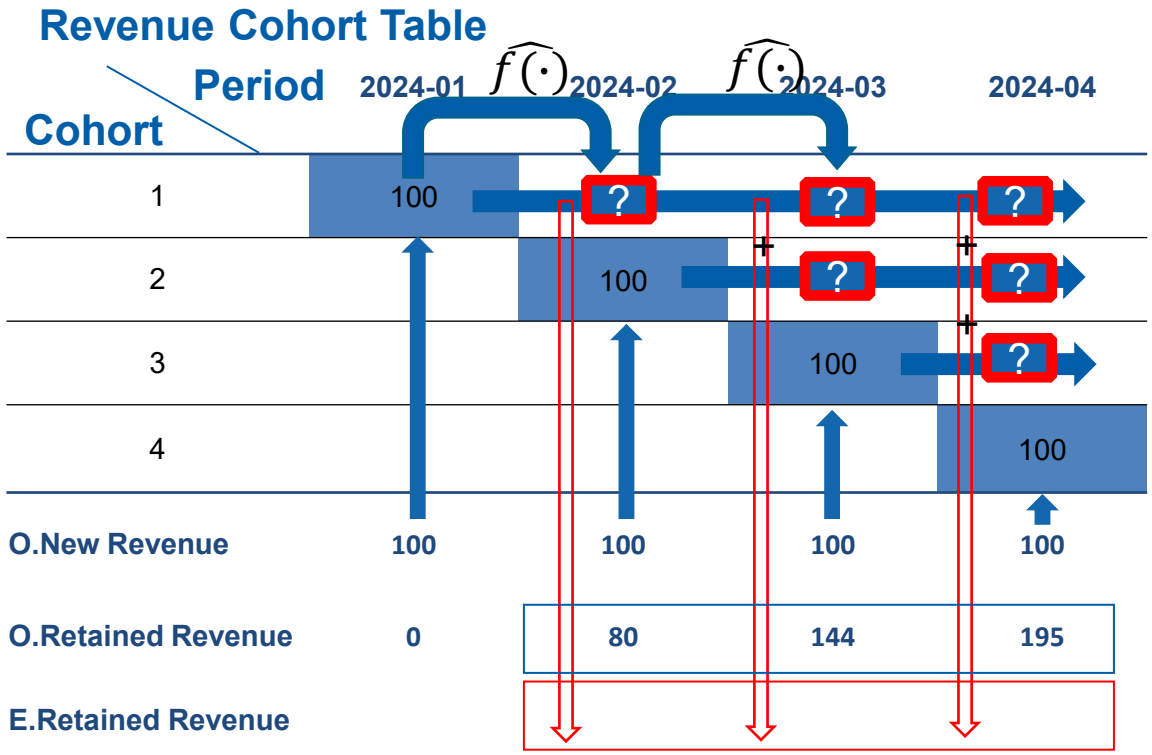
Step 3: Estimate Cohorts Retained Revenue



- Retained revenue ? is estimated through the revenue retention rate
- Sume of revenue of all cohorts and respective period equals retained revenue per period



Step 3: Derivation of Optimal Parameters



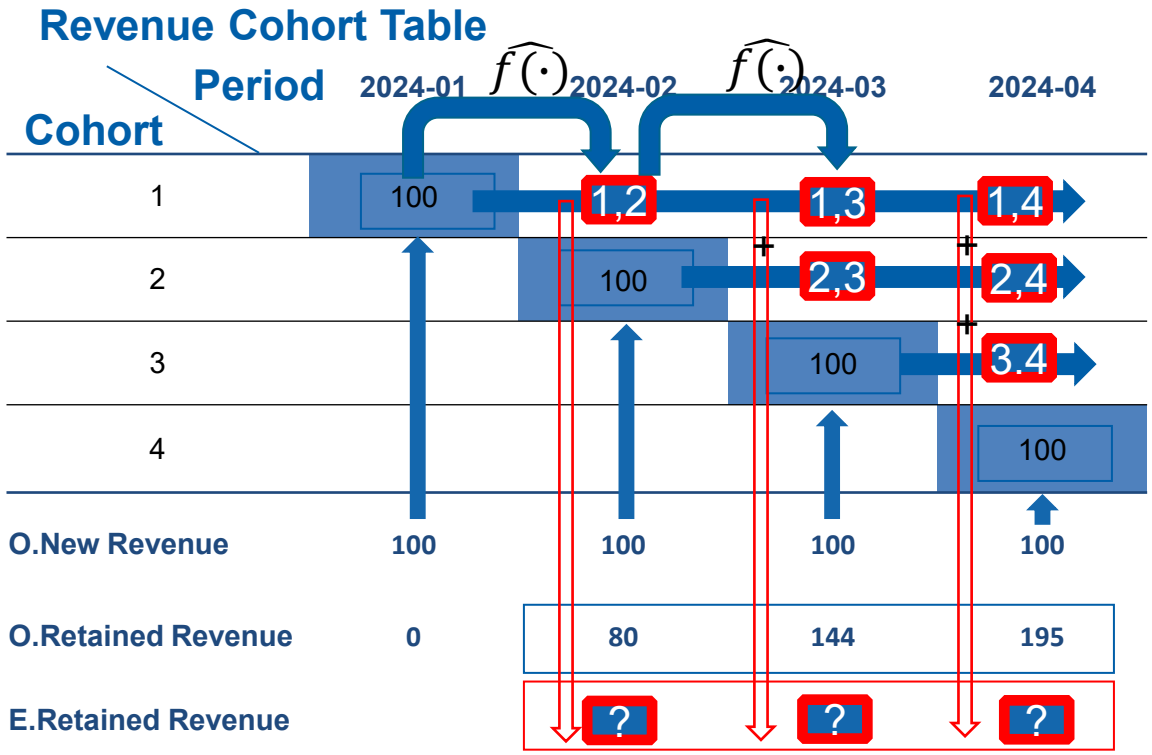
Minimize squared difference between estimated and observed retained revenue

- Over each period j:

$$Min_X Squared\ Residual_j = (Ret.Rev._{observed} - Ret.Rev._{estimated_j}(X))^2$$

- Over all periods: Minimize sum of squared residuals

Step 3: Recursive Form



Minimize squared difference between estimated and observed retained revenue

- Over each period j:

$$Min_X Squared\ Residual_j = (Ret.Rev._{observed} - Ret.Rev._{estimated_j}(X))^2$$

- Over all periods: Minimize sum of squared residuals through the three model parameters

$$1,2 = 100 \times RRR(1,2) \approx 80$$

$$1,3 + 2,3 = 1,2 \times RRR(1,3) + 2,3 \approx 144$$

$$1,4 + 2,4 + 3,4 = = \approx 195$$

Modeling Acquisition Effect

- Compound Annual Growth Rate (CAGR) of new revenue growth
  - $CAGR = \left(\frac{Final\ Value}{Starting\ Value}\right)^{\frac{1}{Periods}} - 1$

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RQ3: Which of the two paths do firms pursue and can they improve over time?

Two Data Sources

- Firms' Reports
  - Revenue Cohort Tables

- Financial Data Provider („Second Measure“)
  - Credit Card Data
    - Subset of a U.S. consumer
      - Includes 20+ million consumers
    - Available yearly from 2017
  - Splits revenue into
    - New revenue
    - Retained revenue

Empirical study

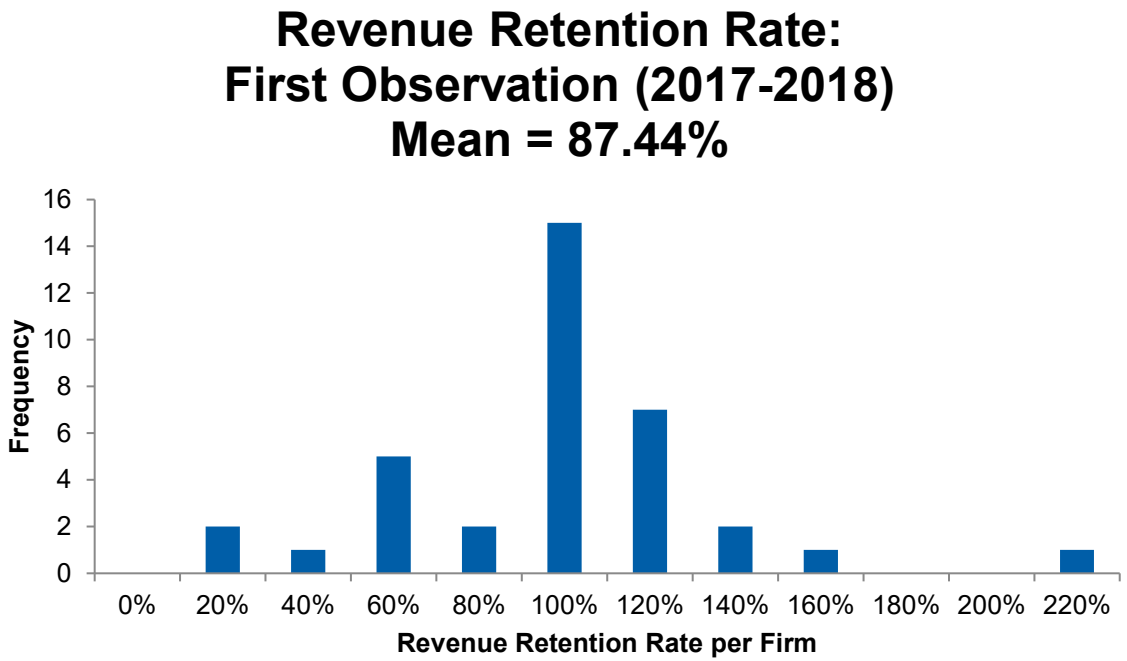
Firm Reports (N = 6)

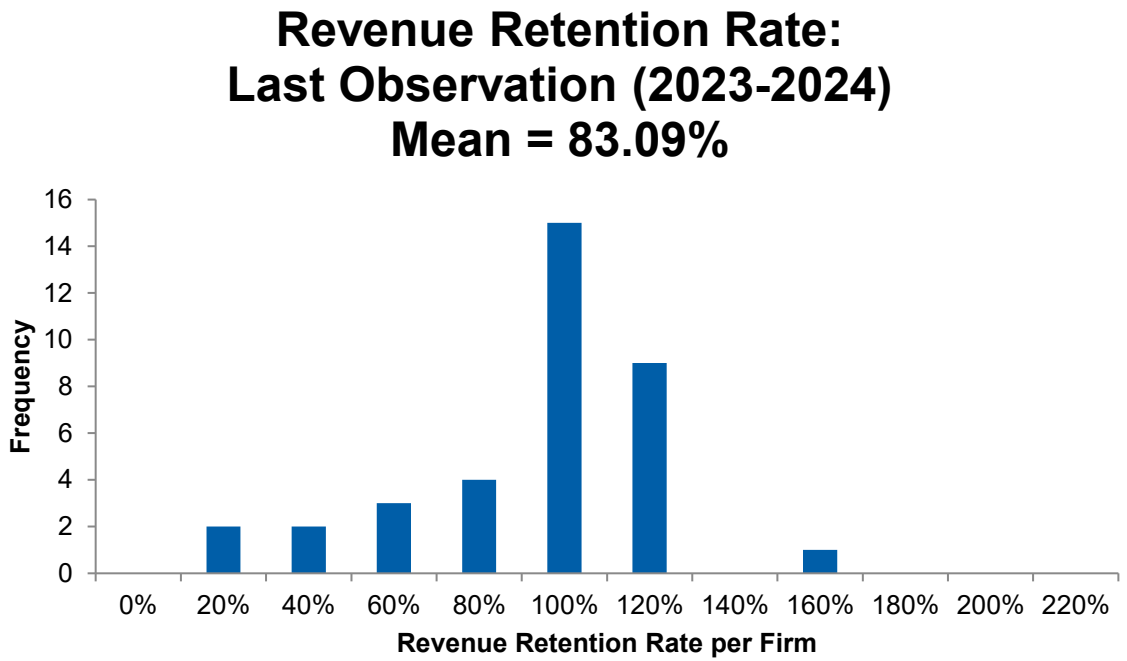
- Revenue Cohort Tables
  - SaaS (N = 5; $4,339 B)
  - Zooplus ($0.2 B)

Credit Card Data (N = 30)

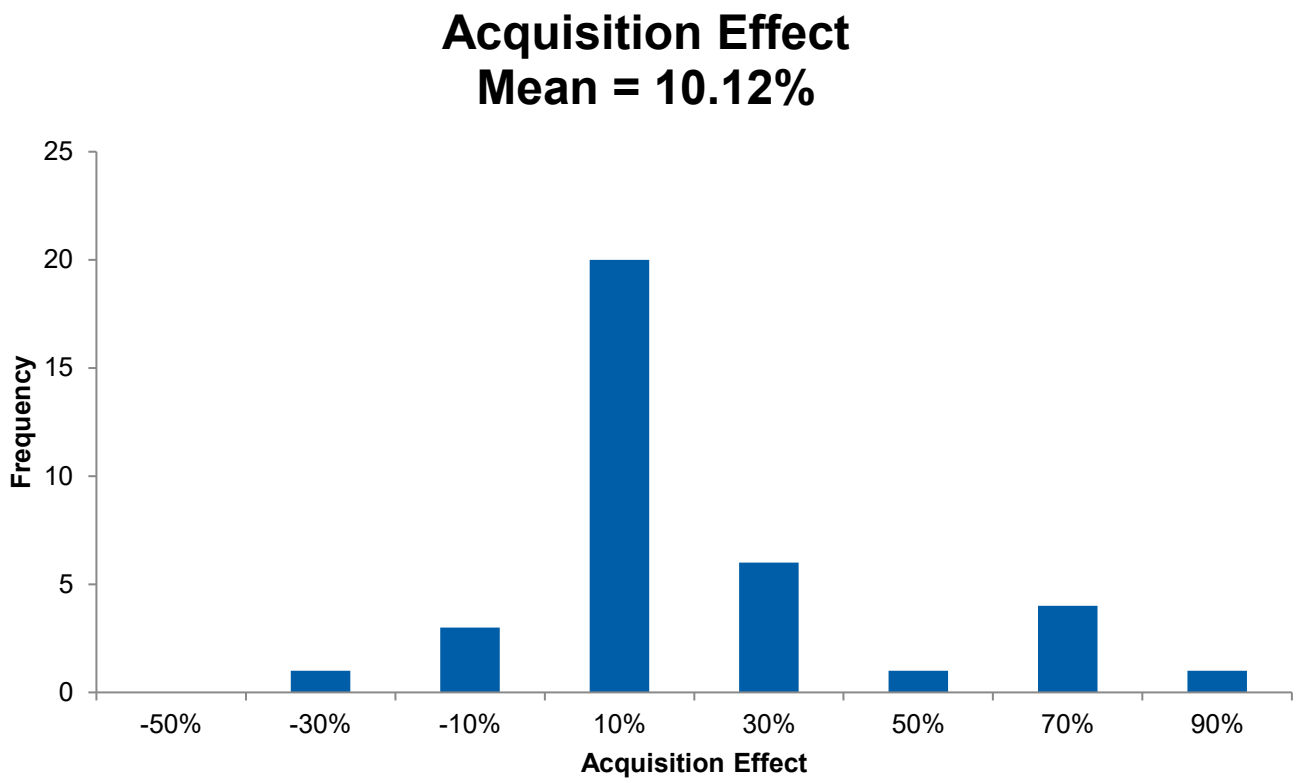
- Select all available companies from three selected industries
  - $136 B revenue from 2017-2024 (sample revenue is ~4% of reported firm revenue)
    - Cable & Satellite (N = 8; $29 B)
    - Online Subscription (N = 8; $10 B)
    - Online Market place (N = 14; $97 B)

Distribution of Revenue Retention Rates Across All Firms





Distribution of Acquisition Growth Across All Firms



How Do Firms Grow Revenue?

- Positive acquisition effect > 0%
  - 22 out of 37 (59%)
- High Base Effect > 100%
  - 22 out of 37 (59%)

Number of Firms	High Base Effect	Low Base Effect	Sum
Positive Acquisition Effect	10	12	22
Negative Acquisition Effect	5	10	15
Sum	15	22	37

Can Firms Improve Their Revenue Retention Rate (RRR) over Time?

- High Base Effect > 100%
- Measurement of "positive RRR development"
  - Next period's predicted RRR increases

Number of Firms	High Base Effect	Low Base Effect	Sum
Positive RRR Development	2	14	16
Negative RRR Development	13	8	21
	15	22	37

Online Subscription

Company	Base β_1	Cohort β_2	Age β_3	Acquisition Effect	Number of Years	wMAPE %
Crunchyroll	110.62	3.67	-15.31	22.95	8	3.72
Disney-Entertainment	103.80	16.09	-14.47	-10.51	5	1.17
GAIA	70.41	-9.74	3.53	1.24	8	2.23
Hulu	130.59	-11.00	-2.62	10.1	8	2.18
NBCU	55.99	-0.01	10.95	1.47	8	11.31
Netflix	108.11	3.91	-3.46	5.33	8	1.50
Roku	140.30	-5.14	-7.33	27.21	8	3.61
Spotify	110.03	4.53	-4.44	1.25	8	0.89
Average (SD)	**103.73% (26.35)**	**0.29% (8.29)**	**-4.14% (8.15)**	**7.38% (11.61)**	**7.63 (0.99)**	**3.33% (3.17)**

Online Marketplaces

Company	Base β_1	Cohort β_2	Age β_3	Acquisition Effect	Number of Years	wMAPE %
Alibaba	92.25	-10.35	3.42	17.96	8	10.25
Amazon	134.09	-7.54	-4.35	-3.78	8	3.66
BareNecessities	47.56	-2.09	4.82	-9.15	8	3.83
Beyond	46.69	-4.94	7.73	-5.24	8	13.32
Comoto	59.02	-3.99	7.9	5.62	8	3.91
ContextLogic	78.65	-8.8	-2.49	-47.85	8	21.68
EBAY	149.7	-10.7	-8.55	12.78	8	16.61
ETSY	96.00	-0.98	-2.08	6.82	8	4.97
LightInTheBox	14.38	0.05	-3.8	1.78	8	22.71
Minted	39.37	0.05	4.22	-2.50	8	5.99
Poshmark	88.87	-7.3	3.43	8.46	8	3.38
Real	65.67	-0.86	3.85	8.56	8	8.18
Shein	95.97	-13.17	10.95	57.77	8	8.98
Solo	4.21	1.34	4.66	70.93	8	12.69
Zooplus	89.11	-1.55	3.39	13.37	8	3.41
Average (SD)	**73.44% (38.70)**	**-4.72% (4.46)**	**2.21% (5.15)**	**9.04% (26.40)**	**8 (0)**	**9.57% (6.35)**

Cable & Satellite

Company	Base β_1	Cohort β_2	Age β_3	Acquisition Effect	Number of Years	WAPE %
Altice	102.49	-3.46	-1.19	-6.22	8	2.66
Cable One	98.57	-2.51	-0.05	-3.37	8	4.63
Charter Communications	102.13	-3.01	-0.20	-1.33	8	2.08
ComCast Corp	102.39	-3.11	-0.43	-5.25	8	3.35
Cox	98.30	-4.15	-0.26	-2.26	8	2.35
Dish	94.04	-1.68	-0.21	-9.1	8	6.41
Sirius	96.30	-0.41	-0.01	-12.87	8	3.26
Wideopenwest	93.19	-10.36	0.14	-7.25	8	5.69
Average (SD)	**98.43% (3.49)**	**-3.59% (2.78)**	**-0.28% (0.38)**	**-5.96 (3.57)**	**8 (0)**	**3.80% (1.50)**

SaaS

Firm	Base β_1	Cohort β_2	Age β_3	Acquisition Effekt	Number of years	wAPE %
Jamf	113.84	2.93	-0.19	57.87	7	1.68
Qualtrics	120.00	-0.33	0.21	40.51	7	2.51
Ncino	113.93	0.01	-1.64	58.68	8	1.57
Cloudfare	94.80	2.85	5.97	62.93	7	3.34
Slack	194.00	-26.71	-13.39	27.16	5	3.14
Average (SD)	**127.31% (34.40)**	**-4.25% (11.31)**	**-1.81% (6.35)**	**49.42 (13.52)**	**6.8 (0.98)**	**2.45% (0.73)**

How do Revenue Retention Rates Develop (Mean, SD)?

Industry	Base β_1	Cohort β_2	Age β_3	Acquisition Effect	Companies
SaaS*	127.31% (34.40)	-4.25% (11.31)	-1.81% (6.35)	49.42 (13.52)	5
Cable & Satellite*	98.43% (3.49)	-3.59% (2.78)	-0.28% (0.38)	-5.96 (3.57)	8
Online Subscription*	103.73% (26.35)	0.29% (8.29)	-4.14% (8.29)	7.38% (11.61)	8
Online Marketplace*	73.44% (38.70)	-4.72% (4.46)	2.21% (5.15)	9.04% (26.40)	15
Average (SD)	**100.73% (19.14)**	**-0.71% (3.58)**	**-1.01% (2.31)**	**14.97% (20.72)**	**9**

* $\widehat{f(\cdot)} \coloneqq Cell(p,c) = Cell\,(c,p-1) * (\beta_1 + \beta_2 * cohort + \beta_3 \ * age)$

RQ4: Which path yields higher growth?

Which Path Yields Higher Growth?

- Positive acquisition effect > 0%
- High Base Effect > 100%
- Median revenue growth
  - Measured between first and last observed period

Median Revenue Growth	High Base Effect	Low Base Effect
Positive Acquisition Effect	770%	193%
Negative Acquisition Effect	61%	-11%

How Informative Is The Share of Retained Revenue?

- Positive acquisition effect > 0%
- High Base Effect > 100%
- Median share of retained revenue
  - Measured between first and last observed period

Share of Retained Revenue	High Base Effect	Low Base Effect
Positive Acquisition Effect	79%	62%
Negative Acquisition Effect	92%	87%

Agenda

Introduction to the Problem

Theory & Framework

Development of Approach to Derive Non-Disclosed Metrics

Evaluation of Approach in a Simulation Study & Real-World Settings

Empirical Study

Summary, Conclusion & Implications

Simple Question, Complex Answer

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