

Theory, current situation and recommendations about retention / risk

[Vivek Pandey](#)

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I have spent some time analyzing our retention, delinquencies and TPV. This document summarizes the findings and makes recommendations.

CM3, payback period and IRR

Historically we have looked at CM3 as a measure of how the business is doing. This is a correct measure to look at, since this is what matters for the books.

However, CM3 encapsulates in itself the cumulative effect of the users acquired in all the years - it includes the revenue & costs of users acquired 5 years ago, as well as the users acquired last month. For the purposes of analysis (how good are various cohorts, are they improving over time), we need a metric which is particular to a cohort.

We have started to use "payback period" as the cohort performance metric. Payback period of users acquired in certain month is the time period at which the cost on cohort equals the revenue from cohort i.e. the cohort has paid for itself.

There is a problem with payback period when analyzing cohort performance: it does not consider cohort performance beyond payback period. There can be two cohorts: both with the same payback period: one in which retention beyond payback period drops to 0, and another for which retention stays at 20%. Payback period does not distinguish between the two.

I propose that IRR (Internal rate of return) is the correct metric to track. IRR is the standard way to track financial performance of a business. We need IRR to be beyond a threshold (which we don't know as of yet) for Simpl to be an attractive business.

For now we will analyse performance wrt all 3 metrics: CM3, payback period and IRR.

Modeling our portfolio and current state of metrics

We model our portfolio as following:

Assume 1st month bill size to be B_0 , and then grows as following:

$$B_t = B_0(1 + b_r)^t$$

For the current situation, we take $B_0 = 1000$ and $b_r = 2\%$.

We assume that retention varies with time as per following formula:

$$r_t = r_0 + (1 - r_0)e^{-\lambda_1 t}$$

r_0 is "terminal retention". We assume that retention does not go below this value even after 5+ years. λ_1 is the rate at which we approach terminal retention. Currently r_0 is 10-15%.

Currently zeroth month delinquency is 8%. Beyond that, delinquency varies as the following:

$$d_t = d_1 + (d_0 - d_1)e^{-\lambda_2 t}$$

where d_1 is first month delinquency = 2.5 and d_0 = delinquency of very mature cohorts, which is like 0.5% currently. λ_2 is the rate at which we approach this delinquency.

Initially, we assume cost of capital (incl repayment cost) to be 0.6%, MDR as 2.14% and cashback = Rs 5 per month per retained user.

All the analysis is worked out [here](#).

Using this model, we calculate CM3, payback period and IRR for various scenarios.

Findings from the modeling

Here are important findings from the modeling:

1. At default values, (what was applicable till April), were at
CM3 = -ve
payback period = infinity
IRR = -ve

2. Most important thing for us is to get our terminal retention right

At terminal retention of 0.2, metrics are:

CM3 = 7 bps
payback period = 69 months
IRR = 0.3 % monthly

At terminal retention of 0.3, metrics are:

CM3 = 19 bps
payback period = 63 months
IRR = 0.88%

3. Now let's assume 0.2 terminal retention, if we get cost of capital (incl txn processing cost) down from 0.6% to 0.4%, we look better:

CM3 = 27 bps
payback period = 60 months
IRR = 1% monthly

Note that with terminal retention at 10%, even if cost of capital is down to 0.4, IRR remains -ve, payback period remains infinity. Only at cost of capital down to 0.3 leads to 72 month (finite) payback period

4. Next important thing to lower is cashback. Assume terminal retention of 0.2, cost of capital of 0.4, if we take cashback from Rs 5 per retained user to Rs 1 per retained user:

CM3 = 47 bps
payback period = 51 months
IRR = 1.9% monthly

5. Terminal delinquency needs to go down from 0.5% to 0.3%, achievable. That leads to

CM3 = 62 bps
payback period = 47 months
IRR = 2.3% monthly

Also, we can trend to terminal delinquency faster, that helps:

CM3 = 47 bps
payback period = 38 months
IRR = 3.1% monthly

And if NU delinquency gets lowered:

CM3 = 88 bps
payback period = 33 months
IRR = 3.9% monthly

6. MDR 2.14% -> 2.5% going up helps. If we put that on top of the above:

CM3 = 124 bps
payback period = 25 months
IRR = 5.6% monthly

7. Finally, if we can grow bill size at 3% rather than 2%:

CM3 = 141 bps
payback period = 23 months
IRR = 6.6% monthly

Lessons from above exercises

1. Most impactful is MDR increase. Any change gets passed to CM3/payback/IRR.
2. 20% terminal retention is needed.
3. Credit upgrades is impactful: not for payback period, but for IRR/CM3
4. Terminal delinquency, NU delinquency, how fast we reach terminal delinquency, cost of capital, all help.

Long term performance of cohorts

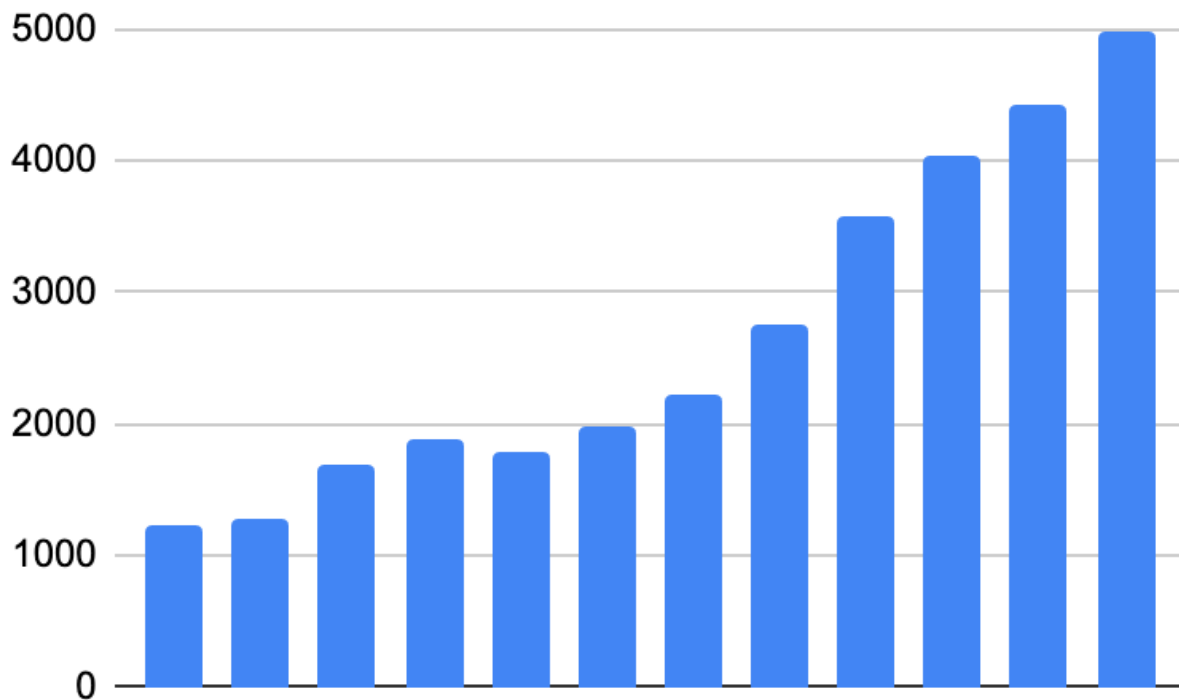
[Worksheet here](#).

Summary: Retention keeps going down. Not good. Delinq keeps going down. Good.

2018 acquired users				
	Retention	TPV	Delinq amount	Delinq
Month 6	30.13%	675,550,959	23,200,659	3.43%
Month 12	26.95%	636,777,417	8,637,101	1.36%
Month 18	20.23%	625,282,102	5,784,421	0.93%
Month 24	14.12%	485,092,873	4,330,008	0.89%
Months 30	12.39%	403,339,808	2,689,872	0.67%
Months 36	14.76%	536,487,738	3,708,198	0.69%
Months 42	17.17%	702,448,445	4,252,483	0.61%
Months 48	17.93%	909,884,065	4,571,469	0.50%
Months 54	17.00%	1,113,284,499	5,522,584	0.50%
Months 60	15.44%	1,144,236,803	4,668,743	0.41%
Months 66	14.54%	1,182,882,153	4,527,142	0.38%
Months 72	11.95%	1,088,953,015	2,482,547	0.23%
2019 acquired users				
	Retention	TPV	Delinq amount	Delinq
Months 6	31.66%	745,687,839	17,415,751	2.34%
Months 12	18.35%	470,638,276	6,555,695	1.39%
Months 18	17.14%	551,334,605	6,863,066	1.24%
Months 24	21.16%	847,586,813	9,434,270	1.11%
Months 30	24.54%	1,139,779,396	9,512,994	0.83%
Months 36	25.74%	1,525,254,631	12,621,344	0.83%
Months 42	23.91%	1,669,915,653	12,298,722	0.74%
Months 48	21.43%	1,666,636,560	10,787,264	0.65%
Months 54	19.85%	1,706,138,017	8,766,273	0.51%
Months 60	16.95%	981,029,024	2,037,192	0.21%

2020 acquired users	Retention	TPV	Delinq amount	Delinq
Months 6	29.87%	667,541,662	20,148,715	3.02%
Months 12	31.71%	856,917,383	14,966,164	1.75%
Months 18	33.54%	1,028,565,726	12,420,488	1.21%
Months 24	32.55%	1,280,806,863	15,470,832	1.21%
Months 30	29.13%	1,374,390,540	13,826,088	1.01%
Months 36	24.58%	1,391,125,283	12,742,173	0.92%
Months 42	22.64%	1,405,246,361	8,602,382	0.61%
Months 48	17.99%	812,288,135	3,388,141	0.42%
2021 acquired users	Retention	TPV	Delinq amount	Delinq
Months 6	41.69%	5,792,427,807	166,294,524	2.87%
Months 12	38.71%	7,467,144,153	136,498,320	1.83%
Months 18	32.87%	7,988,626,203	111,463,575	1.40%
Months 24	27.99%	7,838,089,988	85,091,048	1.09%
Months 30	25.39%	7,837,235,132	65,534,183	0.84%
Months 36	24.41%	5,500,518,509	21,685,332	0.39%
2022 acquired users	Retention	TPV	Delinq amount	Delinq
Months 6	28.59%	10,011,619,204	364,236,230	3.64%
Months 12	23.08%	10,616,586,920	225,689,572	2.13%
Months 18	20.13%	11,085,179,264	163,715,493	1.48%
Months 24	17.29%	7,909,466,997	65,932,222	0.83%

Monthly bill size with cycle. One bar is for 6 months. This is for 2018 acquired users.



Aggregate delinquency will go down with time

Fraction of TPV by settlement counts. As aged users dominate the portfolio, delinquency will inevitably go down.

		<24 settlements	24-48 settlements	48-72 settlements	72+ settlements
2016-H1		100.00%	0.00%	0.00%	0.00%
2016-H2		100.00%	0.00%	0.00%	0.00%
2017-H1		100.00%	0.00%	0.00%	0.00%
2017-H2		100.00%	0.00%	0.00%	0.00%
2018-H1		99.98%	0.02%	0.00%	0.00%
2018-H2		99.88%	0.12%	0.00%	0.00%
2019-H1		99.43%	0.57%	0.00%	0.00%
2019-H2		98.51%	1.49%	0.00%	0.00%
2020-H1		95.08%	4.92%	0.00%	0.00%

2020-H2		88.59%	11.37%	0.03%	0.00%
2021-H1		89.11%	10.80%	0.09%	0.00%
2021-H2		91.44%	8.40%	0.16%	0.00%
2022-H1		92.27%	7.41%	0.32%	0.00%
2022-H2		91.38%	7.91%	0.71%	0.00%
2023-H1		88.55%	10.12%	1.32%	0.01%
2023-H2		83.18%	14.89%	1.89%	0.04%
2024-H1		75.55%	21.72%	2.61%	0.12%

DLQ for each settlement count is going down (risk/DS are doing their job well)

DLQ	<24 settlements	24-48 settlements	48-72 settlements	72+ settlements
2016-H1	11.58%	-	-	-
2016-H2	22.07%	-	-	-
2017-H1	19.27%	-	-	-
2017-H2	20.66%	-	-	-
2018-H1	24.06%	4.11%	-	-
2018-H2	16.74%	0.72%	-	-
2019-H1	6.55%	1.00%	-	-
2019-H2	7.42%	1.29%	-	-
2020-H1	6.59%	1.90%	-	-
2020-H2	7.45%	2.22%	-	-
2021-H1	7.54%	2.71%	0.65%	-
2021-H2	8.66%	2.97%	1.55%	-
2022-H1	8.30%	2.72%	1.37%	-
2022-H2	7.22%	2.41%	0.86%	-
2023-H1	5.18%	1.89%	0.95%	0.48%
2023-H2	4.70%	2.01%	1.08%	1.11%
2024-H1	3.90%	1.62%	0.93%	0.33%