CLRS 2021

Financial Risk of Loyalty Programs

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September 14, 2021

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Financial Risk of Loyalty Programs

Part 1: Loyalty Program Basics

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Agenda

- What are Loyalty Programs

- History of Loyalty Programs
- Loyalty Programs today
- How Loyalty Programs work

- Accounting Treatment

- Actuarial Roles

- P&C Insurance versus Loyalty Rewards

What are Loyalty Rewards Programs?

- **Loyalty Rewards Programs** are membership programs offered by companies to reward their customers for their loyalty and repeat business
- **The members** are provided with points or miles which act as a currency that can be potentially redeemed in the future for various awards types (like hotel award stays, gift cards etc.)
- **The redemption** of the issued points or miles generates a cost for the loyalty program that needs to be recorded in the annual statement
- **Currency issued today** can be redeemed several years after into the future significantly increasing the uncertainty in the cost estimates

History of Loyalty Programs

- **The birth of Loyalty programs trace their roots back to Ancient Egypt**
  - Ancient Egyptians were awarded commodity tokens, like beer and bread tokens made from wood, for their work
  - The system included tiers since higher positions, like crew leaders, received double tokens when compared to the rest of the crew
- **"Copper tokens" were provided by American retailers in the 1700's** to their customers who could later redeem those points for products on future buys
- **Green Shield in the 1800's replaced tokens** with awarded stamps for purchases at select retailers that could be later redeemed for catalog products
- **Modern Loyalty programs were introduced in the late 1900's**
  - Often regarded as the first full-scale frequent flyer loyalty program of the modern era, American Airlines launched their program in 1981

History of Loyalty Programs (continued)

- **1985** – **Discover** rolled-out the first cash back program. Cash was received from consumers at the end of every year depending on the amount of the purchases
- **1983 – Marriott and Holiday Inn** Loyalty programs were founded
  - Followed up by Hilton in 1987
- **1995** – **UK Supermarket Tesco** deployed a massive card-based program giving full ability to track customer transactions
- **2008** – **Starbucks** launched a card-based Loyalty program followed up in 2011 by a mobile application that allows payments

LOYALTY PROGRAMS TODAY

45%

The sale of frequent flyer miles represent a large portion of total global revenue for airlines

U.S. consumers hold memberships in Loyalty program

3.3 billion

US$48b

perceived annual value issued

Loyalty Leaders grow revenue roughly **2.5** x as fast as other companies in their industries

14.8

average number of programs per U.S. consumer, but they are only active in

6.7

Size of the Liabilities

Hilton

Liability for the guest loyalty program has been $1,733 million as of March 31st, 2021

As of March 31, 2021, Hilton had 115 million members in the Hilton Honors guest loyalty program. The current portion of the Hilton Honors program's liability is $793 million. In April 2020, Hilton Honors sold points to American Express for $1.0 billion in cash. American Express used the points in connection with Hilton Honors co-branded credit cards.

Delta

At December 31, 2020, the aggregate deferred revenue balance associated with the SkyMiles program was $7.2 billion. The current portion was $1.8B. A hypothetical 10% change in outstanding miles estimated to be redeemed would result in an impact of approximately $60 million on annual revenue recognized.

Hyatt

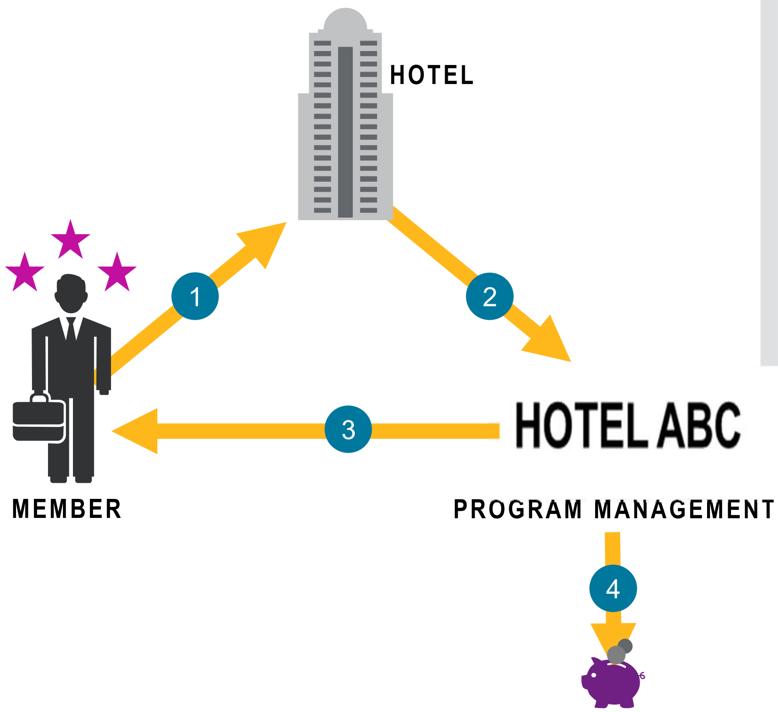
As of March 31st, 2021, Deferred revenue related to the loyalty program was $752 million.

AMEX

The Membership Rewards liability was $9.8 billion as of December 31, 2020. An increase in the estimated ultimate redemption rate of current enrollees of 25 basis points would increase the Membership Rewards liability by approximately $128 million.

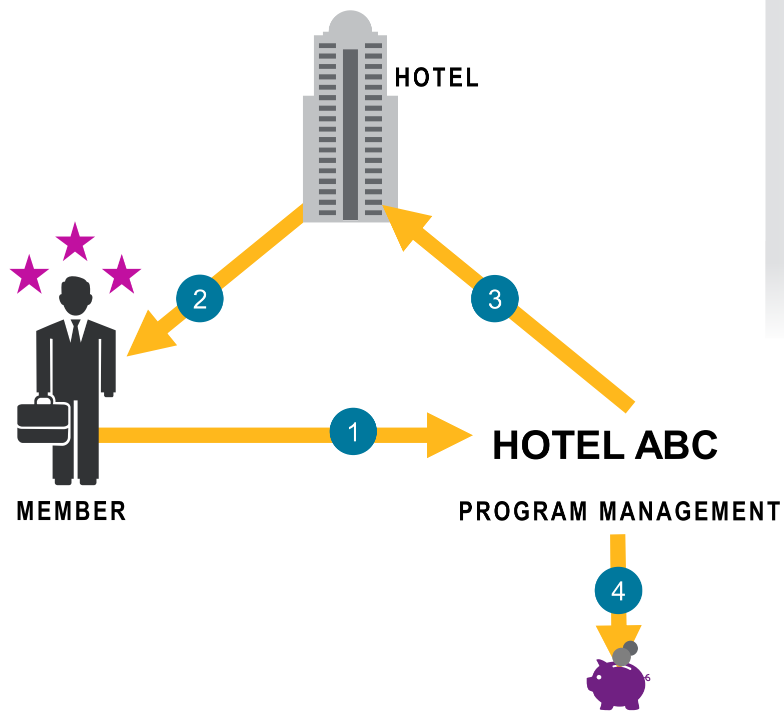
Source: 10K

Earning Points



1. Member “buys” points as part of room rate
2. Hotel passes the funding to the Program as the “charge-out rate”
3. Program awards points to Member
4. Program establishes a liability

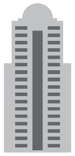
Redeeming Points



1. Member redeems points
2. Hotel provides “free night”
3. Program reimburses hotel
4. Program reduces liability

Recap

HOTEL ABC
PROGRAM MANAGEMENT



Points	Program	Hotel	Member
Earned	Increases Liability	Hotel Expense Charge out rate	Points Earned!
Redeemed	Decreases Liability	Hotel Revenue Reimbursement	Free Stay!

Accounting Treatment of Loyalty Programs

Loyalty programs around the world employ two different accounting standards for Loyalty Rewards

- **Incremental cost accounting standards:** recognizes the revenue associated with the issuance of points at the time of the sale. At the same time the full liability associated with the estimated future point redemptions related to that sale is also recognized
- **Deferred revenue accounting standards:** recognizes only a portion of the revenue associated with the issuance of points at the time of the sale. That portion is proportional to breakage, i.e., the percentage of points that are not expected to ever redeem
  - The portion of the revenue associated with points expected to be redeemed in the future is assigned to deferred revenue
  - The deferred revenue accounting standard estimates the cost of future redemptions on a Fair Value basis
- One of the main difference between the two accounting methods relates to the estimated timing of revenue recognition

Accounting Treatment of Loyalty Programs (continued)

- An overestimation of breakage results into an underestimation of deferred revenue. As actual redemptions come higher than expected the income statement will be affected adversely
- An underestimation of breakage results into an overestimation of deferred revenue. That delays the recognition of revenue resulting into a revenue understatement

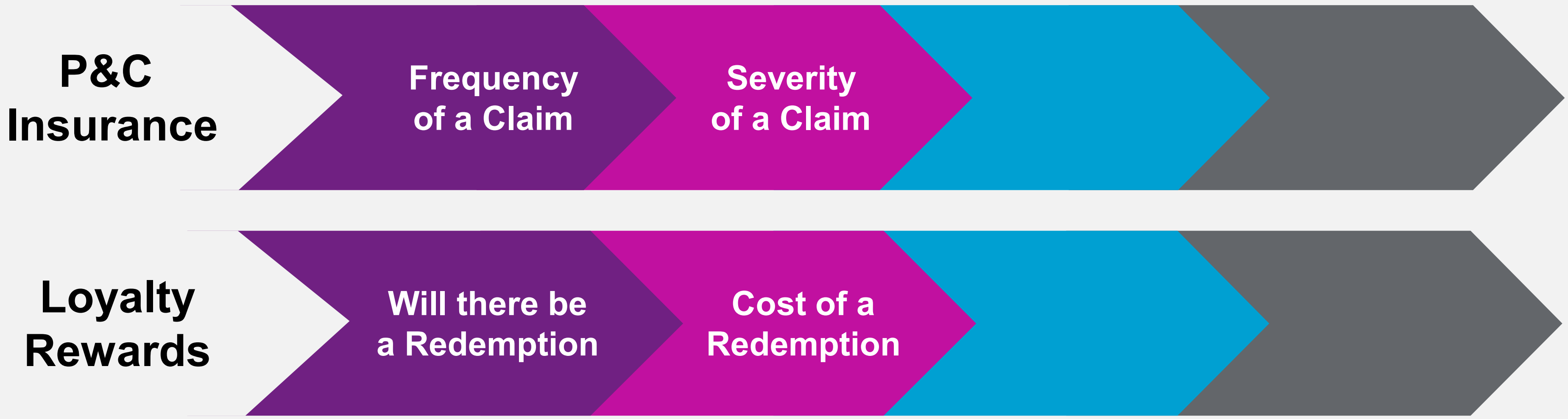
Actuarial Roles in Loyalty Rewards Programs

- **Liability valuation**
  - The liabilities represent a large part of the balance sheet
- **Redemption patterns**
  - The timing of redemptions is very important with deferred revenue accounting
- **Forecasting of breakage for prospective calendar periods**
  - Very important for companies to estimate prospective redemption activity
- **Program changes**
  - Both macroeconomic conditions and program changes will have a significant impact on members’ redemption behavior
- **Member level marketing**
  - Loyalty data helps identify members’ earning and redemption activity

P&C Insurance versus Loyalty Rewards

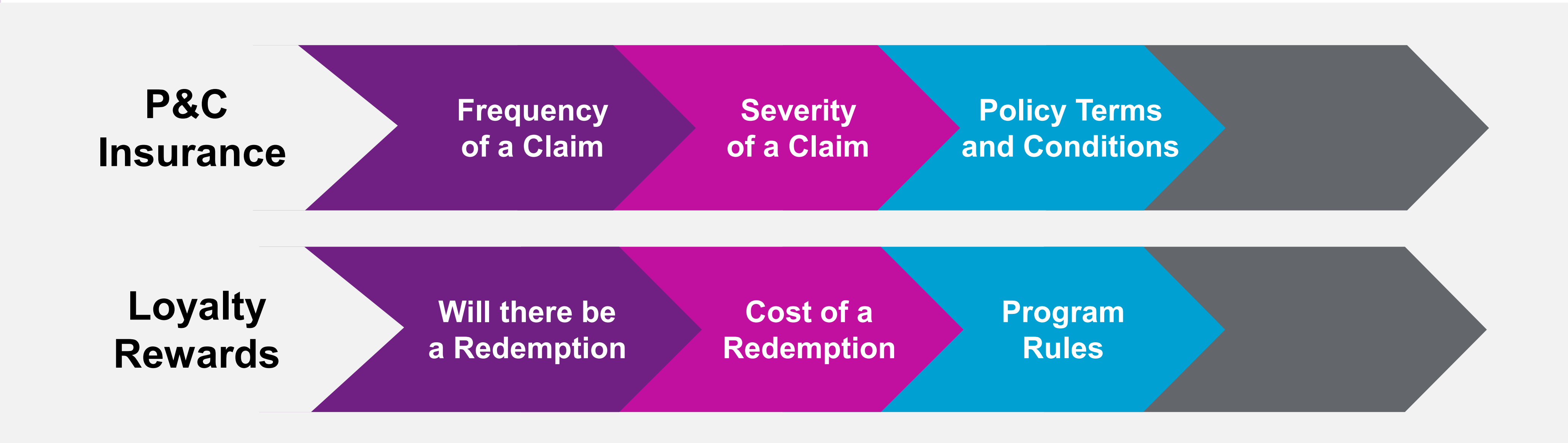
- Frequency of a claim is affected by safety measures, legal environment, weather, COVID etc.
- Redemption activity is affected by macro economic conditions, accrual rules, award charts, available awards types, COVID etc.

P&C Insurance versus Loyalty Rewards (continued)



- Severity of a claim is affected by safety measures, legal environment, social inflation, COVID etc.
- Cost of redemption is affected by macro economic conditions, agreement with vendors, COVID etc.

P&C Insurance versus Loyalty Rewards (continued)



- Policy T&C are fairly inflexible, mostly defined when the policy is issued, standardized product
- Program rules can easily change over time, for example with new accrual/award charts, changes in expiration policies, programs can be vastly different affecting redemption propensity etc.

P&C Insurance versus Loyalty Rewards (continued)

P&C Insurance	Frequency of a Claim	Severity of a Claim	Policy Terms and Conditions	Reserving Techniques
Loyalty Rewards	Will there be a Redemption	Cost of a Redemption	Program Rules	Reserving Techniques

- Employ claim and policyholder information, affected by claim settlement rates and case reserving methodology
- Larger amounts of data available considering all member transactions since joining the program

Levers to Manage Program Liability

Reduce Points Outstanding

- Issue fewer points
- Expire points

Manage Cost Per Point

- Increase points req. to redeem
- Reduce hotel/partner reimbursements
- Change mix of rewards

Increase Funding

- Increase hotel charge out rates
- Increase partner funding

Financial Risk of Loyalty Programs

Part 2: Estimating Liability

Alex Turrell, FCAS, MAAA

Agenda

- Definitions – Basic Concepts
- Calculation of Liability
- Estimating URR
- Other Considerations

Definitions

Points	***The currency of a loyalty program*** Airline frequent flyer programs use “miles” instead of “points”
Earned points	***Points accrued to a loyalty program member’s account related to a qualifying activity*** Types of earning: ▪ Travel ▪ Hotel stay ▪ Credit card purchase
Outstanding points	***Earned points that remain in a member’s account***

Definitions (continued)

What can happen to outstanding points?

Redemption/ Burn	***The member uses their outstanding points in place of cash to make a purchase*** ▪ Types of redemption include hotel stays, airfare, gift cards, restaurant purchases, etc. ▪ Once an outstanding point is redeemed, it is removed from outstanding point balance
Expiration	***Some or all of a member's outstanding points expire or are forfeited, based on the program's rules of expiration*** ▪ Once an outstanding point expires, it is removed from outstanding point balance
Nothing	***Points that are not redeemed and do not expire remain indefinitely in member balances*** ▪ Members in some loyalty programs carry outstanding point balances related to points earned 30+ years ago

Definitions (continued)

The key metric in the actuarial valuation of loyalty rewards liability is the Ultimate Redemption Rate (URR)

- The URR measures the percentage of points that will eventually (or ultimately) be redeemed
- The complement of the URR is “breakage”: the breakage rate is the percentage of points that will not be redeemed
  - Breakage includes expirations as well as the “Nothing” category of points (points that don’t expire but are never redeemed)

If URR ~ ultimate losses, then CRR (cumulative redemption rate) ~ reported losses

- CRR represents the ratio to date of redemptions to earnings

Two Key Types of URR

URR on Outstanding Points (URRos)

- The URRos represents the ratio of future redemptions to the outstanding points

URR_{OS}	=	Expected Future Redeemed Points	/	Outstanding Points
		Estimated		Known Quantity

URR on Earned Points (URRep)

- The URRep represents the ratio of all redemptions (both past and future) to all earned points

URR_{EP}	= (	Expected Future Redeemed Points	+	Consumed Points to Date	) /	Earned Points to Date
		Estimated		Known Quantity		Known Quantity

Poll

Which is usually higher?

A: URR on earned points

B: URR on outstanding points

DEFINITIONS

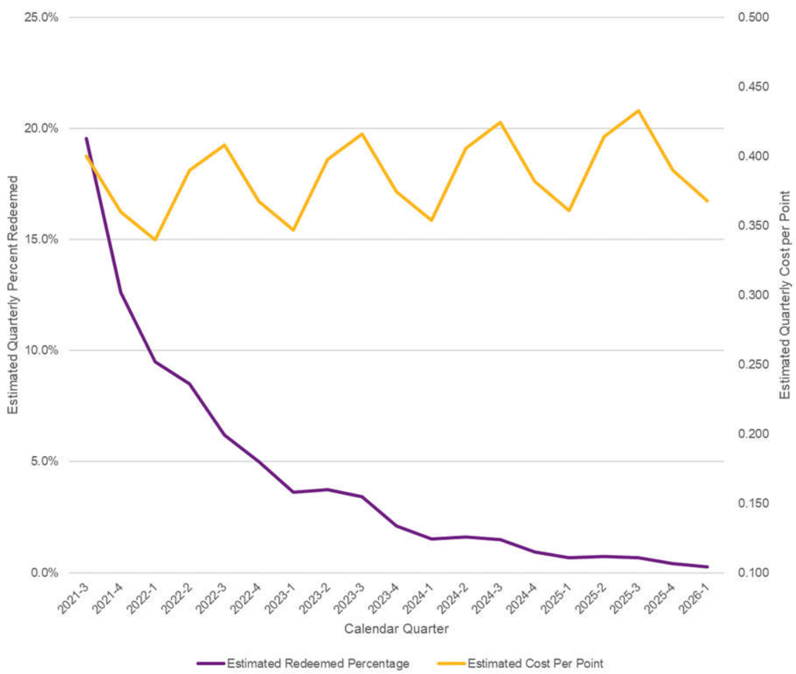
Cost Per Point “CPP” (or cost per mile)

In the example in the first half of the presentation …	In the case of the hotel example …	Other costs are based on negotiated rates with external parties	The “utilization”
… the loyalty program’s cost was the reimbursement of the hotel. There are many types of redemptions and each has an associated cost or range of costs.	… rates are set internally by the company since the hotels are “affiliated” with the loyalty program. Often different hotels have different rates; the rates can also vary depending on the time of year or the monthly occupancy rate of the hotel.	For instance, if members of a frequent flyer program can redeem their points at Home Depot, the program has a negotiated cost with Home Depot.	Represents the allocation of redemptions in a period to various cost types.

DEFINITIONS

Cost Per Point (or cost per mile)

The program's CPP is the weighted average cost across all future redemptions, impacted by utilization distribution, seasonality and inflationary trends



Redemption Type	Utilization	CPP	CPP Trend
Flight	65%	.825	2.0%
Gift Card	18%	.750	0.5%
Airport Shops	11%	.400	0.0%
Car Rental	6%	.650	1.5%

ILLUSTRATIVE

To calculate liability, you can use either URRep or URRos

Liability = (Earned Points [Known Quantity] x URR on Earned (URR_{EP}) [Estimated] – Redeemed Points to Date [Known Quantity]) x Cost Per Point (CPP) [Estimated]

OR Liability = (Outstanding Points [Known Quantity] x URR on Outstanding (URR_{OS}) [Estimated]) x Cost Per Point (CPP) [Estimated]

URR Methodology: Earn period approach

- The primary job of the actuary is to estimate the URR (although often actuaries are employed in the calculation of the cost per point as well)
- Historical data can be organized into earn month or earn year triangles – for each earn period the CRR is calculated at various evaluation periods

Cumulative Redemption Rates

ILLUSTRATIVE

Earn Month	Evaluation Period 1	2	3	4	5	6	7	8	9	10	11	12	…
Jan-18	3.2%	6.4%	9.4%	12.1%	14.8%	16.8%	19.3%	21.6%	23.6%	25.7%	27.7%	29.5%	
Feb-18	2.9%	6.2%	9.2%	12.0%	14.2%	16.9%	19.4%	21.4%	23.5%	25.4%	27.2%		
Mar-18	3.0%	6.2%	9.3%	11.7%	14.5%	17.2%	19.3%	21.6%	23.5%	25.4%			
Apr-18	2.9%	6.3%	8.9%	11.7%	14.5%	16.7%	19.1%	21.3%	23.2%				
May-18	3.5%	6.6%	9.7%	12.7%	15.2%	17.6%	19.8%	21.8%					
Jun-18	3.2%	6.7%	9.9%	12.5%	15.2%	17.6%	19.8%						
Jul-18	3.1%	6.3%	8.9%	11.4%	13.7%	15.9%							
Aug-18	3.2%	6.1%	8.8%	11.2%	13.4%								
Sep-18	3.1%	6.5%	9.2%	11.7%									
Oct-18	4.1%	7.3%	10.0%										
Nov-18	3.5%	6.8%											
Dec-18	3.7%												

Square out the triangle

Extrapolate the tail

URR on Earned Points

- The objective, as in the chain ladder method for reserving, is to estimate the bottom half of the triangle (“square out the triangle”) and extrapolate beyond the historical experience
- This produces a URRep for each earn month, and the weighted average across all earn months equals the URRep for the whole program

How to assign a redemption to a particular earned point

In claim reserving, there is generally no question which period (accident year, policy year, report year, etc.) a payment or case reserve belongs to, because it follows the date of the claim

In contrast, earned points just accrue to a member's outstanding balance, and redemptions reduce the balance

There is no natural correspondence between a specific earned point and a specific redeemed point

The standard approach for assigning redemptions to earned points is first-in, first-out (FIFO)

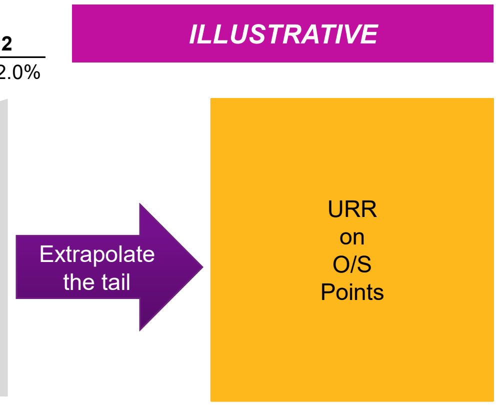
If a member earns 10 points in April and another 10 points in May, then redeems 10 points in June, the April points are considered to have been redeemed and the May points are considered to be outstanding

URR Methodology: Outstanding (snapshot) approach

- An alternative way to organize the development triangles is by snapshot date
- A snapshot considers all outstanding points at a given evaluation

	Incremental Redemptions on Outstanding Points											
Snapshot Date	1	2	3	4	5	6	7	8	9	10	11	12
Jan-18	2.5%	1.8%	2.5%	2.6%	2.9%	2.8%	2.8%	2.6%	2.3%	2.5%	2.3%	2.0%
Feb-18	2.5%	2.0%	2.3%	2.7%	2.8%	2.8%	2.7%	2.4%	2.6%	2.4%	2.2%	
Mar-18	2.3%	1.8%	2.3%	2.6%	2.7%	2.5%	2.4%	2.6%	2.4%	2.2%		
Apr-18	2.2%	1.9%	2.3%	2.6%	2.5%	2.4%	2.7%	2.5%	2.3%			
May-18	2.0%	2.0%	2.2%	2.4%	2.4%	2.7%	2.6%	2.3%				
Jun-18	2.1%	1.8%	2.1%	2.2%	2.6%	2.5%	2.3%					
Jul-18	2.2%	1.7%	2.0%	2.5%	2.4%	2.3%						
Aug-18	2.1%	1.7%	2.3%	2.4%	2.3%							
Sep-18	2.3%	2.1%	2.4%	2.4%								
Oct-18	2.4%	2.0%	2.2%									
Nov-18	2.3%	1.9%										
Dec-18	2.1%											

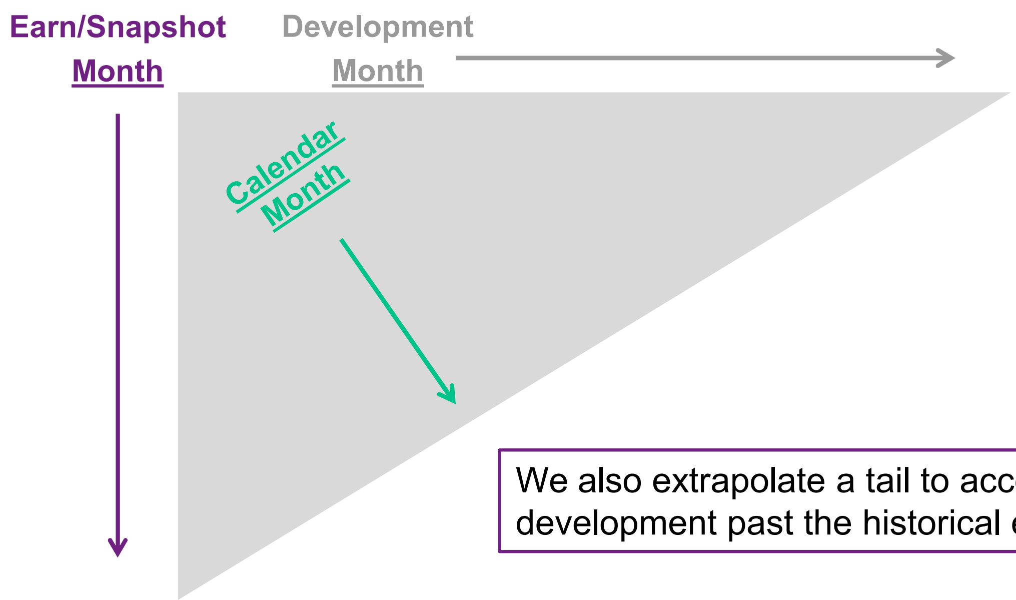
Square out the triangle



- This approach will be less intuitive to reserving actuaries because the points are not mutually exclusive across snapshot dates
  - For instance, if a point is outstanding at snapshot date May 2018 and is still outstanding in June 2018, it's included in both rows of the triangle
- For liability measurement, only the URR for the latest snapshot date is important

Moving beyond chain ladder

- Once triangles are created (whether earn basis or snapshot basis), GLMs can be used as an alternative to chain ladder methods
  - Based on an analysis of trends across the earn month, development month and **calendar month** dimensions of a triangle of historical redemption rates



We also extrapolate a tail to account for development past the historical experience

Poll – Seasonality

Which usually has a higher URR in a hospitality loyalty program?

A: A point earned in January

B: A point earned in July

Segmentation of Analysis

It is common to segment a loyalty rewards liability analysis into various membership types

- Region
- Tier (e.g., platinum vs. gold vs. silver)
- Credit card holders vs. other members

Usually this segmentation is driven by a priori knowledge that there is materially different levels of engagement by segment

Adding complexity, clustering techniques can be used to analytically segment members by their expected level of engagement

What is a normal URR?

There is no normal URR and it’s very hard to benchmark

We have observed URRs all over the spectrum, from 15% to 95%

A high URR doesn’t equal a successful program, it usually just reflects the nature of the rewards offered

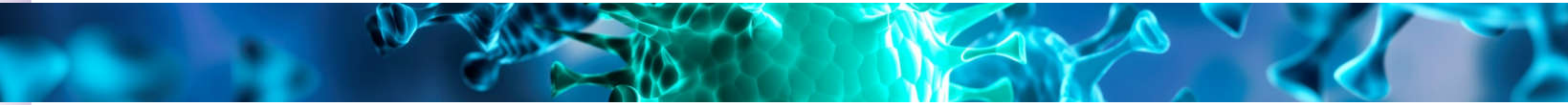
Programs that are heavily credit card based tend to have higher URRs, because the frequency of activity is greater and members tend to be more aware of their benefits

The specifics of the program’s expiration rules, or lack thereof, have a significant impact on the URR

There are two primary types of Expiration Rule

Issuance Based Expirations	Activity Based Expirations
Individual cohorts of points expire after a given time period (e.g., 3 years) subsequent to earning, if they have not yet been redeemed.	Expiration of entire outstanding point balance if a member does not meet certain activity criteria. For instance, if a member has not earned or redeemed any points within the past 24 months, their balance expires.
Issuance based expirations are less and less common	*Changing (or eliminating) expiration rules can cause dramatic changes to URR*

COVID-19



COVID-19 has wreaked havoc on loyalty rewards liability analysis

- Volumes of point earning and redemption plummeted in early 2020, and have gradually recovered, but not back to pre-pandemic levels yet
- Earn point source shifted dramatically toward credit card purchases
- Most companies temporarily halted expiration policies
- How do actuaries use the “bad” data in the latest 15 months of triangles? Ignore it? Apply some sort of Berquist-Sherman-esque adjustment?

Long term impacts on URR

- This is still a gigantic TBD, but substantial changes to commuting patterns and business travel seem to be likely
- Leisure travel presumably will be less impacted
- Signs point to a probable slight reduction to URRos due to COVID-19, all else being equal, but the magnitude is unknown
- Loyalty programs’ responses to the pandemic may offset these impacts

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