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# The Ultimate CECL Study

LAUNCH CONFERENCE – JANUARY 2019

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# Agenda

- Brief methodology overview
- Intro to Ultimate CECL Study
- Auto study results
- Mortgage study results

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# Methodology Overview

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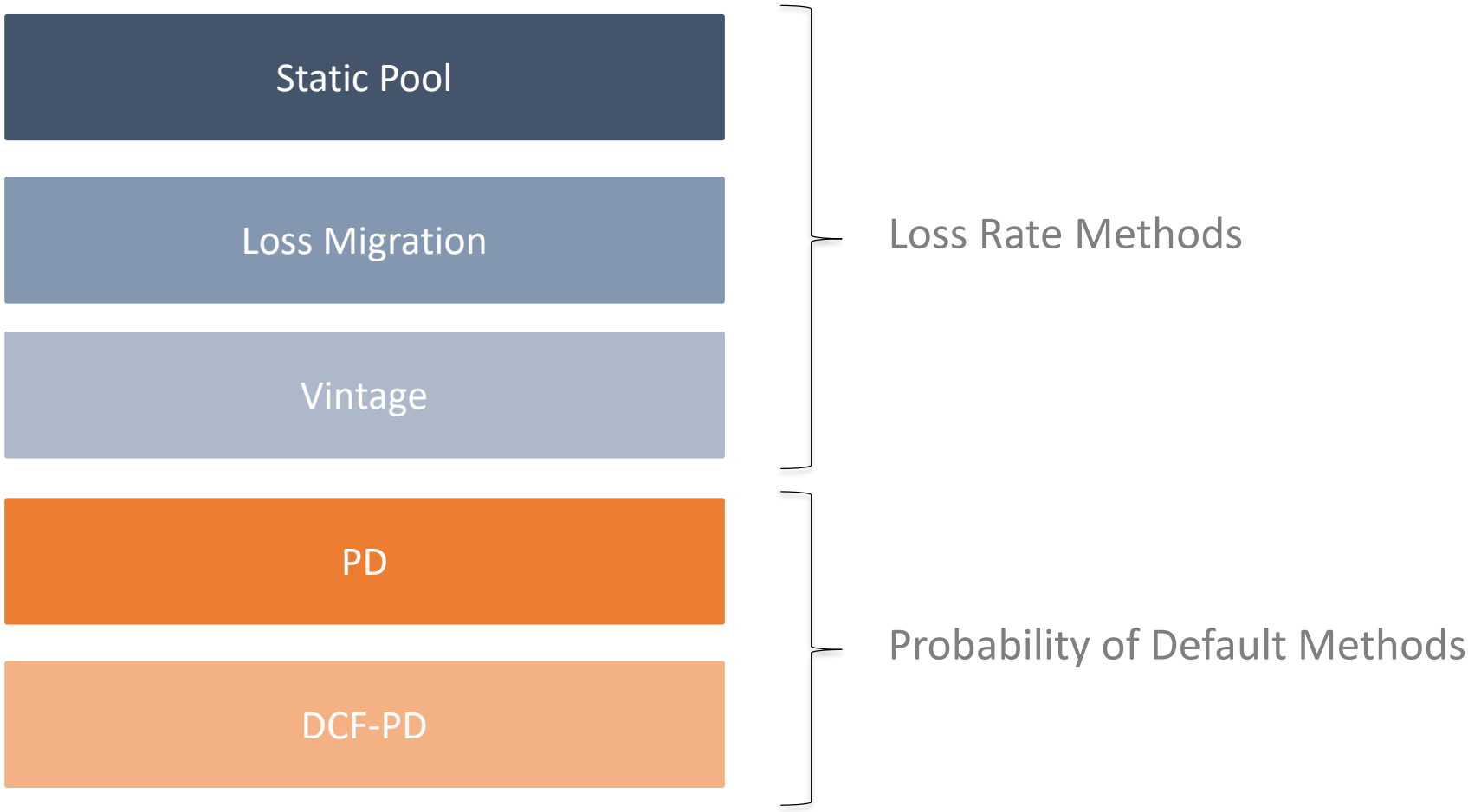
# Common CECL Methods



New Auto – Direct (5 year term)

| Period | Beginning Balance | Closed Balance | Charge-off Balance | Ending Balance |
|---|---|---|---|---|
| 2013 | 130,000 | 56,000 | 1,000 | 73,000 |
| 2014 | 73,000 | 35,200 | 800 | 37,000 |
| 2015 | 37,000 | 20,600 | 400 | 16,000 |
| 2016 | 16,000 | 9,700 | 300 | 6,000 |
| 2017 | 6,000 | 5,940 | 60 | 0 |
| 2018 | 0 | 0 | 0 | 0 |
| **Total** | | | 2,560 | |

Loss Rate:

$2,560 / $130,000 = 1.97%

2018 Q1 Active Balance: $150,000

Expected Lifetime Loss = $150,000 x 1.97% = $2,955

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# Static Pool

## Pros

1. Simple Calculations
2. Similar to current industry standard

## Cons

1. Data availability
2. Only using small part of history
3. Loan age assumptions

## Assumptions for Use

- Long historical data availability
- Consistent age distribution over time
- Historical pool is comparable to current portfolio

**New Auto – Direct**

*Reporting Date: 03/31/2018*

| Vintage | Age | Balance ($) | Loss Rate (%) | Unadjusted Exp. Loss ($) |
|---|---|---|---|---|
| 2018 | 1 | 100,000 | ? | ? |
| 2017 | 2 | 350,000 | ? | ? |
| 2016 | 3 | 200,000 | ? | ? |
| 2015 | 4 | 100,000 | ? | ? |
| 2014 | 5 | 40,000 | ? | ? |
| 2013 | 6 | 10,000 | ? | ? |
| **Total** | | 800,000 | | |

**New Auto – Direct**

*Reporting Date: 03/31/2018*

| Vintage | Age | Balance ($) | Loss Rate (%) | Unadjusted Exp. Loss ($) |
|---|---|---|---|---|
| 2018 | 1 | 100,000 | 1.15% | 1,150 |
| 2017 | 2 | 350,000 | 1.12% | 3,920 |
| 2016 | 3 | 200,000 | 1.13% | 2,260 |
| 2015 | 4 | 100,000 | 1.02% | 1,020 |
| 2014 | 5 | 40,000 | 1.02% | 408 |
| 2013 | 6 | 10,000 | 1.05% | 105 |
| **Total** | | 800,000 | **1.11%** | **8,863** |

# Vintage

## Pros

1. Uses entire data history
2. Stable estimates
3. Accounts for loan age

## Cons

1. Involved calculations
2. Different from current approaches

## Assumptions for Use

- Long historical data availability (or reasonable balance estimates)
- Historical data comparable to current portfolio

LOAN ID: 3974-209029
Origination Date: 04/27/2018
Reporting Date: 04/30/2018
Balance: $23,928.29

## PD Framework

| Month | Date | Estimated PD | Balance | Coll. Value | Cost To Sell (%) | Net Proceeds | LGD | Expected Loss ($) | Disc. Exp. Loss ($) |
|---|---|---|---|---|---|---|---|---|---|
| 2 | 05/31/2018 | 0.008% | 23,676 | 26,308 | 50% | 13,154 | 10,590 | 0.87 | 0.86 |
| 3 | 06/30/2018 | 0.009% | 23,423 | 26,088 | 50% | 13,044 | 10,446 | 0.97 | 0.96 |
| 4 | 07/31/2018 | 0.010% | 23,169 | 25,863 | 50% | 12,931 | 10,304 | 1.07 | 1.06 |
| … | | | | | | | | | |
| 81 | 12/31/2024 | 0.0005% | 1,235 | 13,419 | 50% | 1,238 | 0 | 0.00 | 0.00 |
| 82 | 01/31/2025 | 0.0003% | 916 | 13,303 | 50% | 919 | 0 | 0.00 | 0.00 |
| 83 | 02/28/2025 | 0.0001% | 597 | 13,200 | 50% | 599 | 0 | 0.00 | 0.00 |
| 84 | 03/31/2025 | 0.00002% | 277 | 13,086 | 50% | 278 | 0 | 0.00 | 0.00 |
| **Total** | | | | | | | | 55.91 | 52.72 |

Exp Loss (Not Discounted): $55.91
Exp Loss (Discounted): $52.72

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# PD/DCF-PD

LOAN ID: 3974-209029
Origination Date: 04/27/2018
Reporting Date: 04/30/2018
Balance: $23,928.29

## DCF Framework

Sum of totals, weighted by probabilities

| Month | Date | Estimated PD | Estimated PP | Balance | Monthly Payment | Total if Active | Total if Prepay | Total if Default | Exp. Cash ($) | Disc. Exp. Cash ($) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 05/31/2018 | 0.008% | 1.40% | 23,676 | 321.95 | 321.95 | 23,745 | 13,154 | 646.87 | 643.13 |
| 3 | 06/30/2018 | 0.009% | 1.41% | 23,423 | 321.95 | 321.95 | 23,491 | 13,044 | 641.61 | 636.04 |
| 4 | 07/31/2018 | 0.010% | 1.42% | 23,169 | 321.95 | 321.95 | 23,236 | 12,931 | 635.98 | 628.63 |
| … | | | | | | | | | | |
| 81 | 12/31/2024 | 0.0005% | 1.4% | 1,235 | 321.95 | 321.95 | 1,238 | 1,238 | 41.59 | 32.87 |
| 82 | 01/31/2025 | 0.0003% | 1.6% | 916 | 321.95 | 321.95 | 919 | 919 | 33.52 | 26.42 |
| 83 | 02/28/2025 | 0.0001% | 1.8% | 597 | 321.95 | 321.95 | 599 | 599 | 24.02 | 18.88 |
| 84 | 03/31/2025 | 0.00002% | 4.2% | 277 | 321.95 | 321.95 | 278 | 278 | 11.63 | 9.11 |
| **Total** | | | | | | | | | | 23,876.57 |

Exp Loss (Discounted):
$23,928.29 – $23,876.57 = $52.72

# PD/DCF-PD

## Pros

1. Only need current data
2. Q&E and forecast adjustments seamlessly integrated

## Cons

1. New / less familiar

## Assumptions for Use

- Majority of active class has all required data fields
- Those who do not have required data in class are represented by those who do

# POLL

Which methodology do you plan to adopt for CECL?

A. Static Pool
B. Loss Migration
C. Vintage
D. PD
E. DCF
F. Other

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# Ultimate CECL Study

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# Purpose of Study

Aid financial institutions in preparation by addressing two questions:

1. How much (if at all) will my allowance increase under CECL?
2. Will my CECL allowance change depending on which method I use? If so, which factors contribute to the differences?

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# Study Design

- Assume current date is 12/31/2017
- 1-yr charge-off ratio calculated for each portfolio
- Each portfolio passed through 6 CECL-compliant calculations
- Comparison of outcomes

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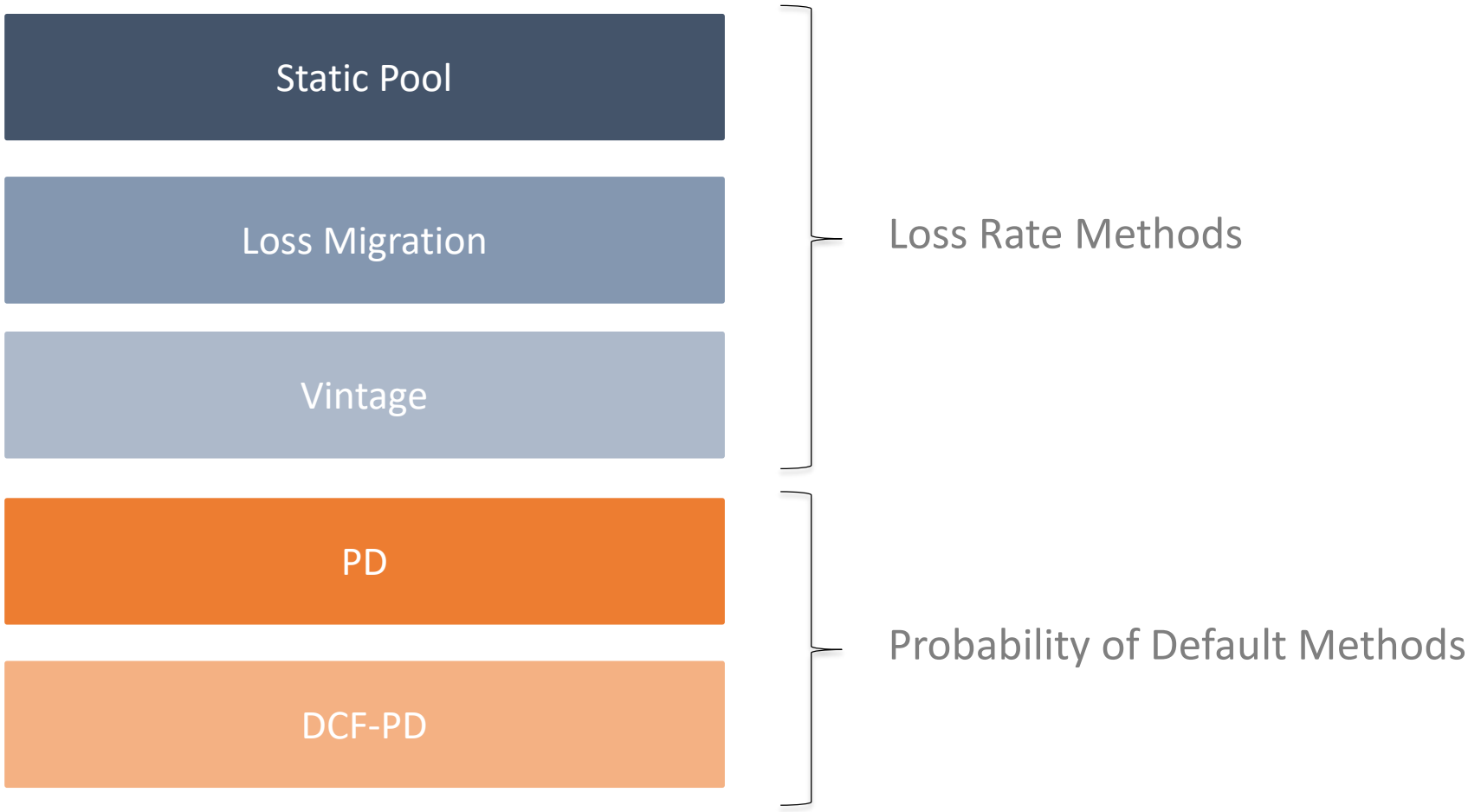
# Common CECL Methods



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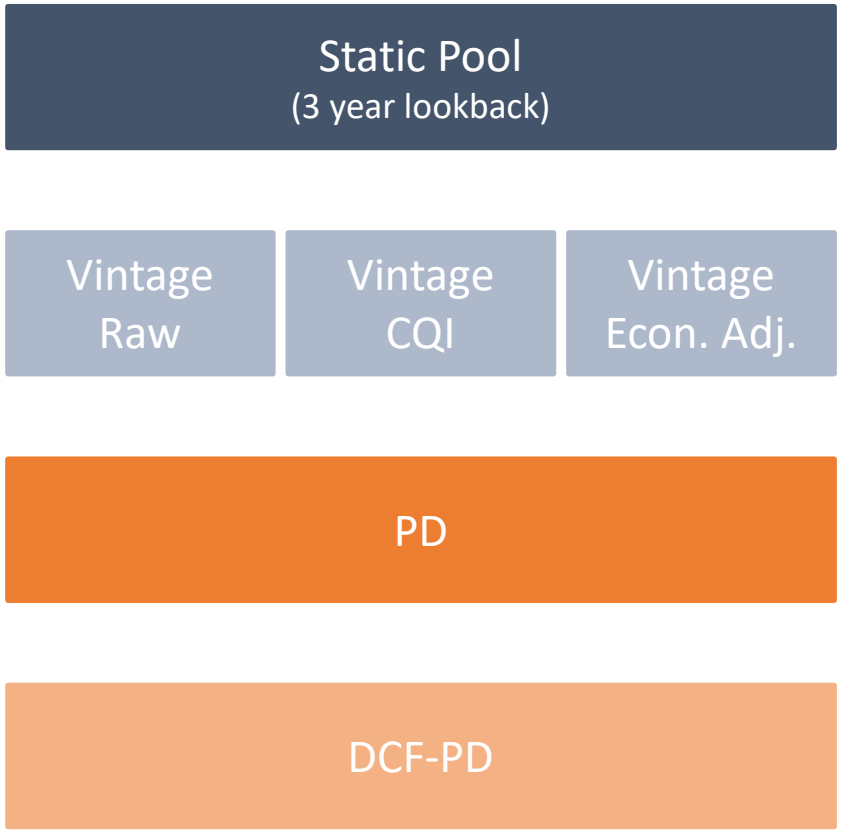
# Study Candidates




- **Vintage Raw**: not segmented by CQI or adjusted for economic forecast
- **Vintage CQI**: segmented by CQI, not adjusted for economic forecast
- **Vintage Econ. Adj.:** adjusted for economic forecast but not segmented by CQI

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Auto Loan Study

1st Mortgage Study

(Coming soon: Credit Card, Business, etc.)

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Auto Loan Study



1st Mortgage Study

(Coming soon: Credit Card, Business, etc.)

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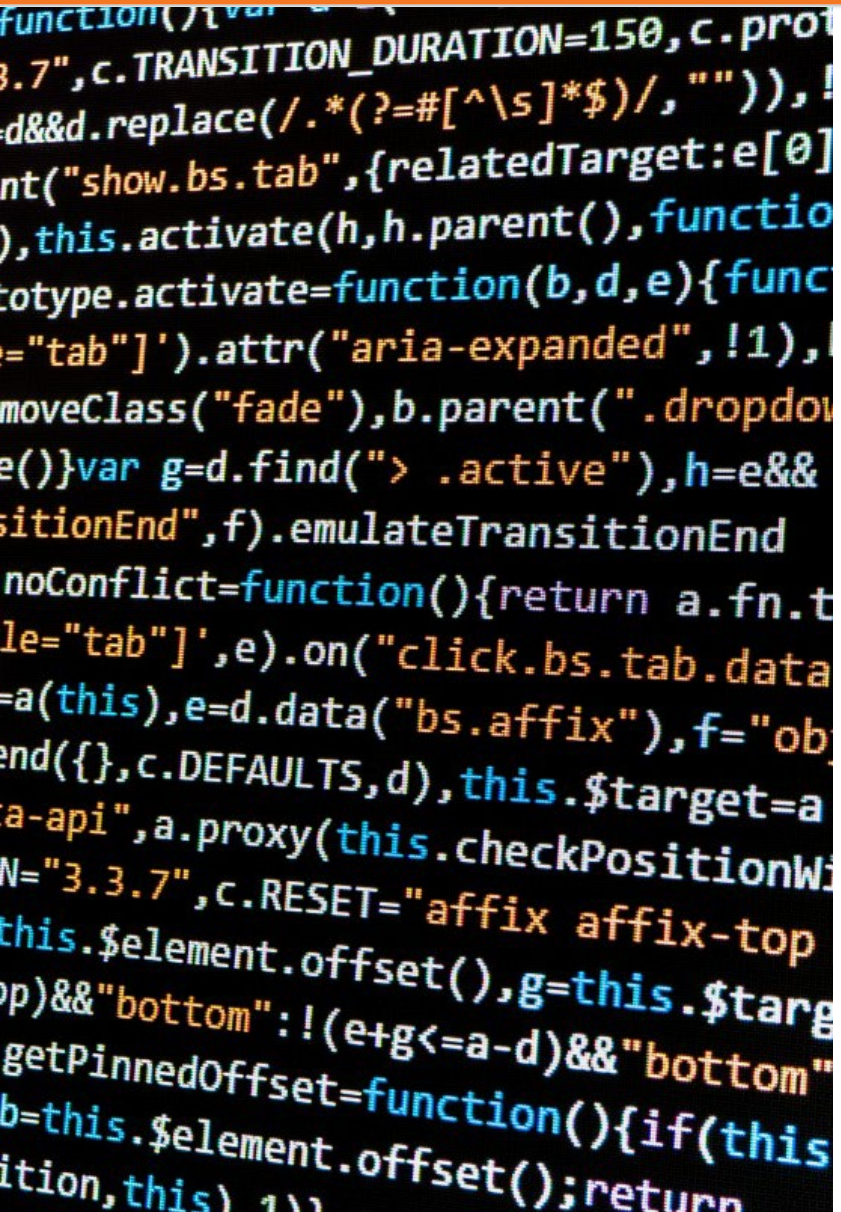
# The Data - Auto




- Monthly, loan-level auto loan records uploaded by Visible Equity users
- 53 institutions selected based on data quality and completeness
- Balance data since 2010, charge-off data since early 2000s

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# Aggregate Results

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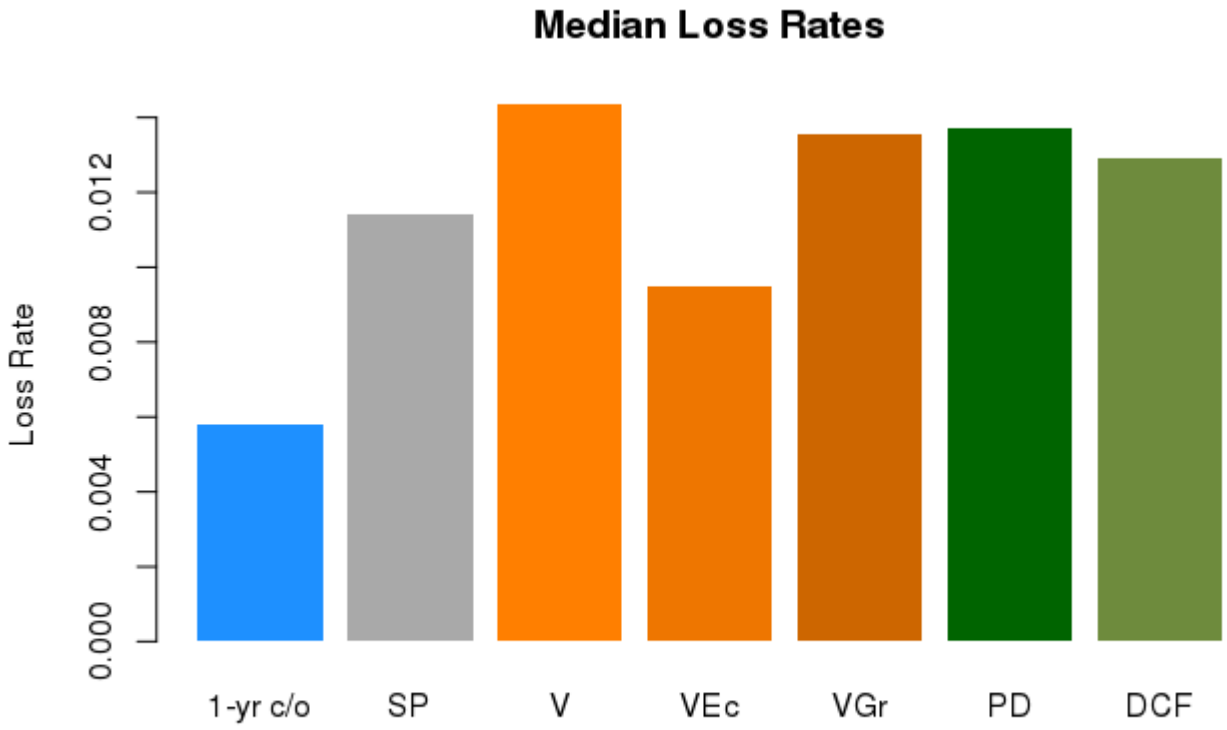
# Median Rate by Method




- **SP** = Static Pool (3 yr lookback)
- **V** = Vintage
- **VEc** = Economic Adjusted Vintage
- **VGr** = Vintage by CQI
- **PD** = Probability of Default
- **DCF** = Discounted Cash Flow

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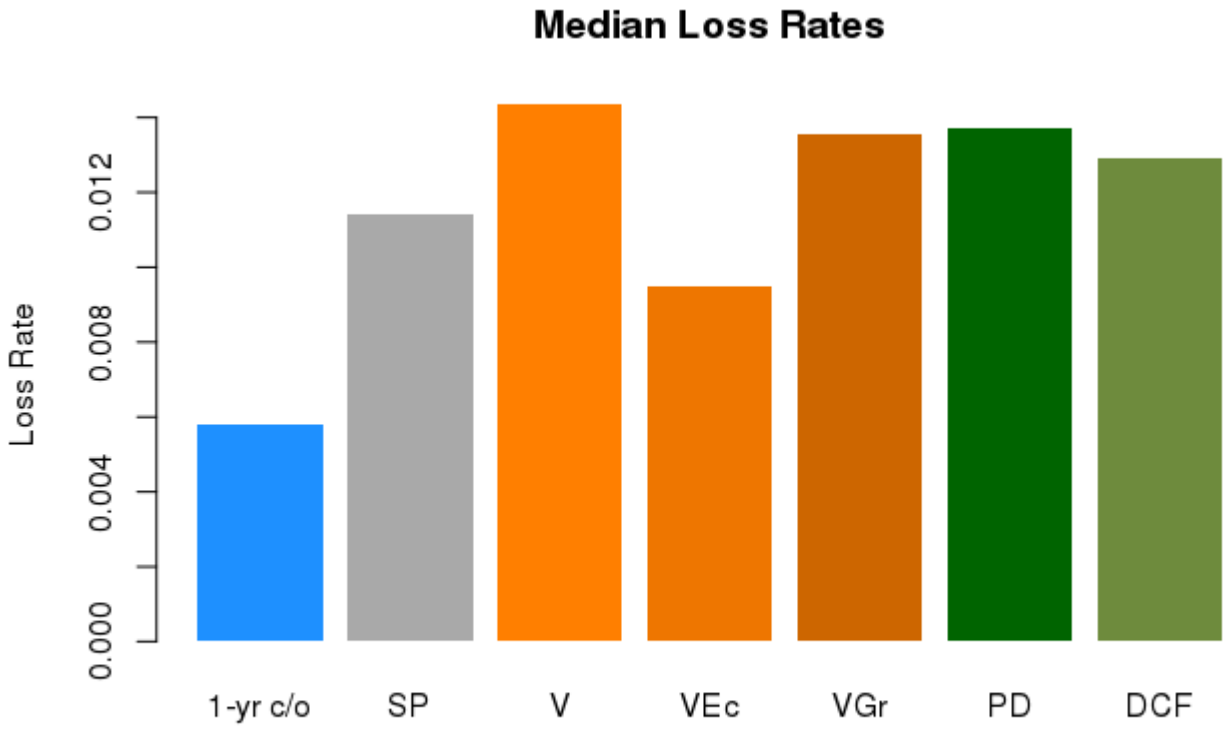
# Median Rate by Method




**Takeaway:** There is no clear systematic difference between CECL methods, except for Economic Adjusted Vintage.

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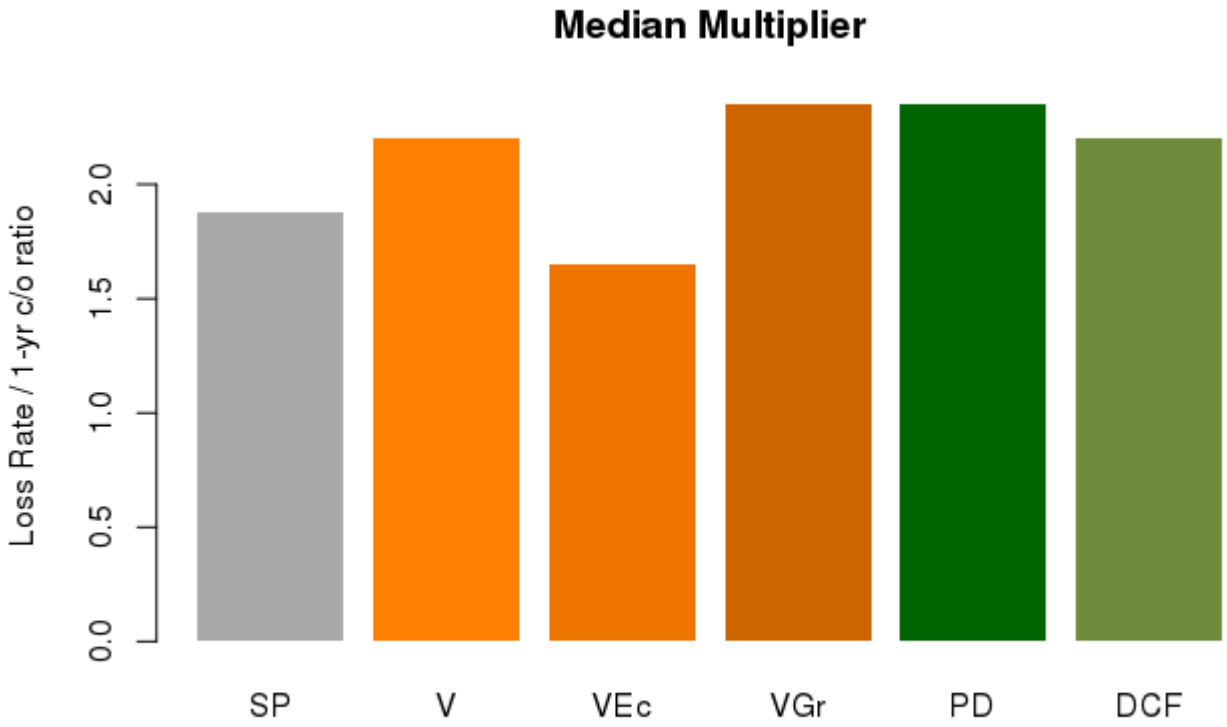
# Median Multiplier by Method




- **SP** = Static Pool (3 yr lookback)
- **V** = Vintage
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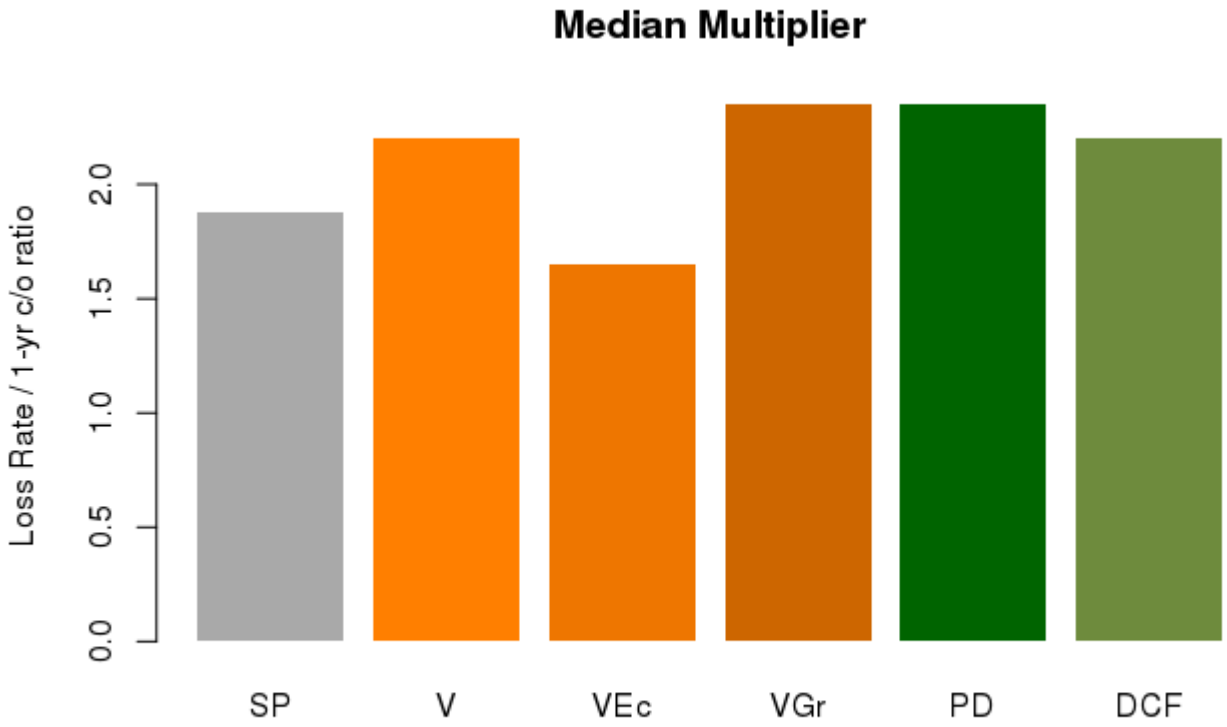
# Median Multiplier by Method




**Takeaway:** CECL base loss rates will *on average* be approximately double the *unadjusted* 1-yr c/o ratio. Q&E adjustments decrease the difference.

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# Individual Results

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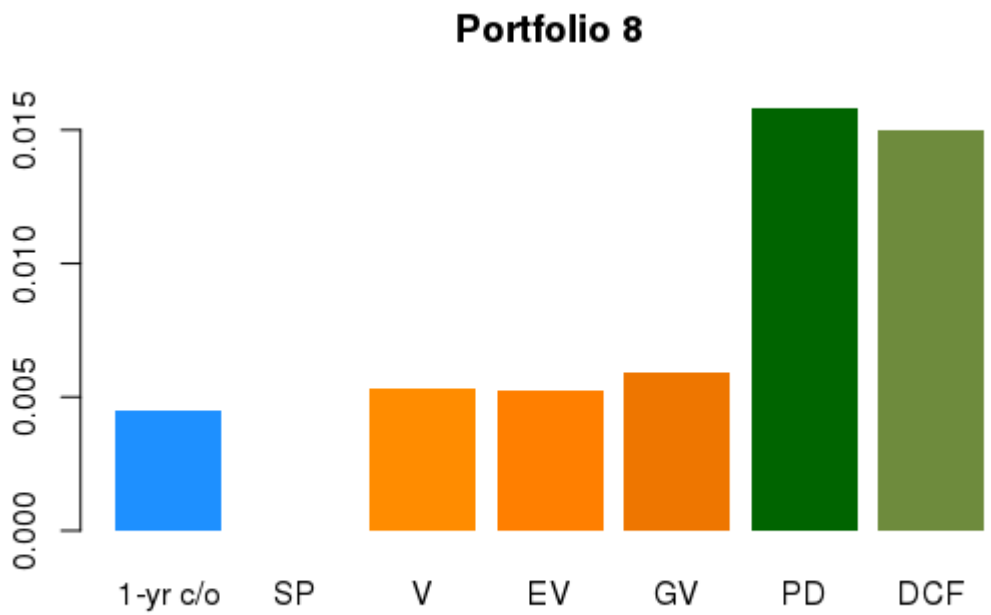
# Portfolio 8: Short History




- Only 1 complete year of data history
- Ineligible for Static Pool
- Vintage less reliable

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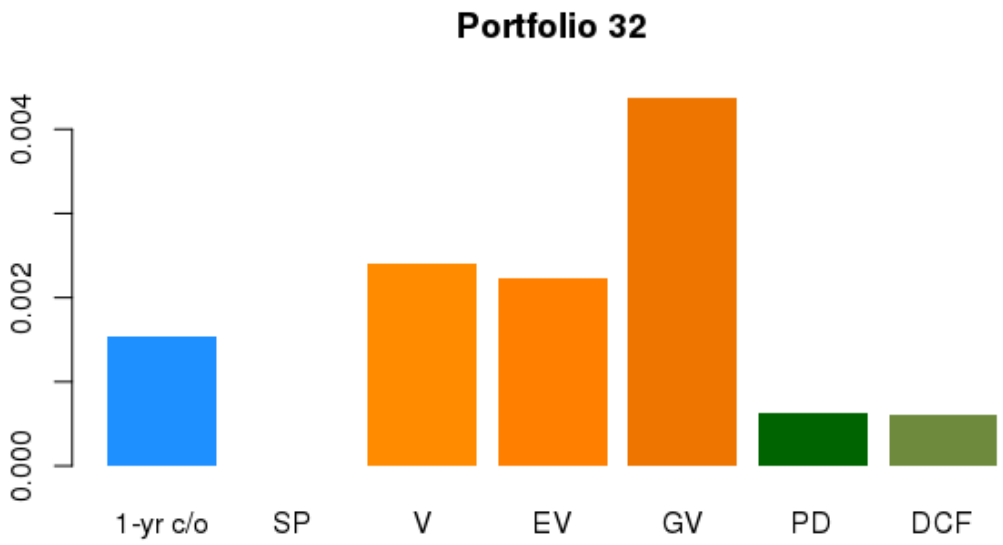
# Portfolio 32: Small Sample Size




- Only 430 of 2900 active loans PD-eligible
- The 430 are relatively high quality
- Not representative of class

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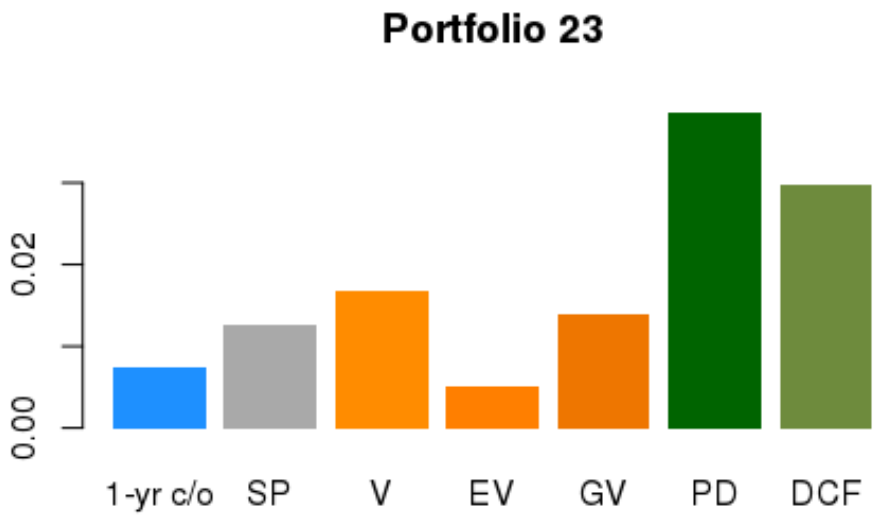
# Portfolio 23: High LTV




- Unusually high LTVs lead to high PD/DCF
- Not well reflected in the CQI used in GV

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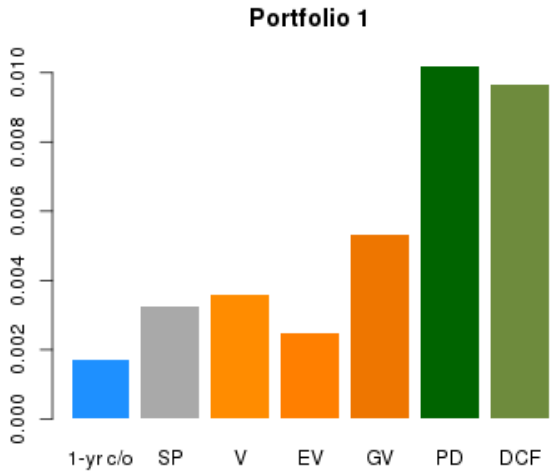
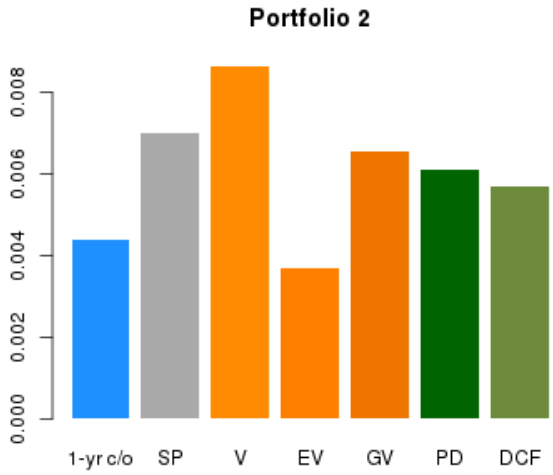
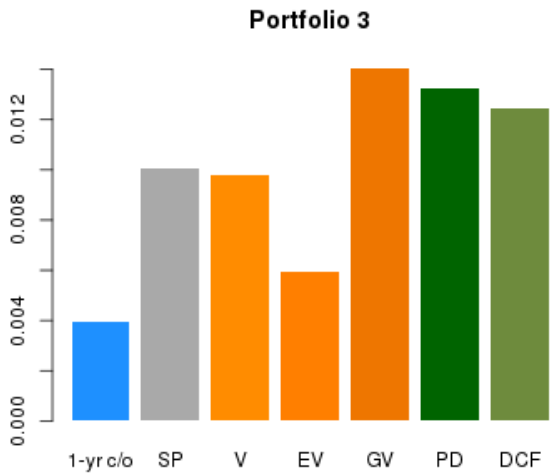
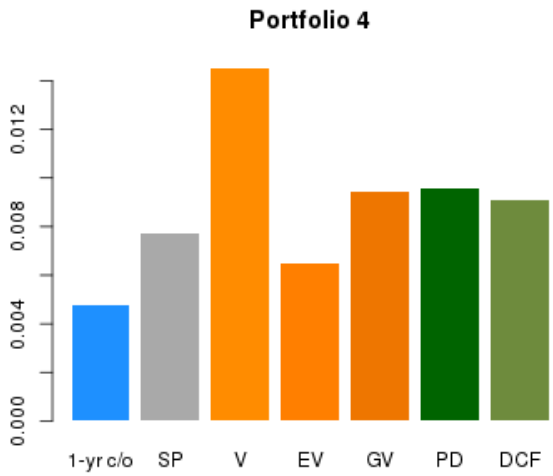
- Lower current grade quality
- Institution effect



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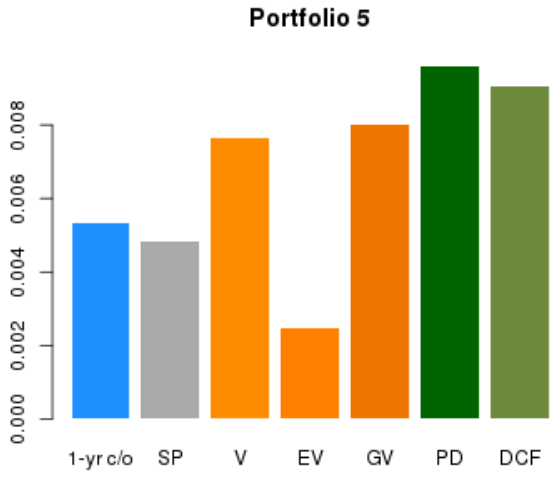
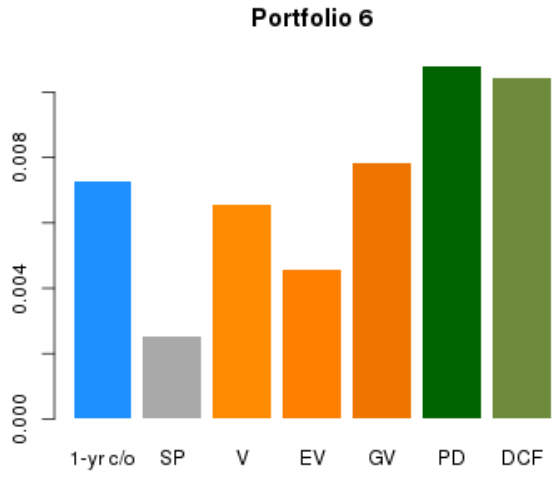
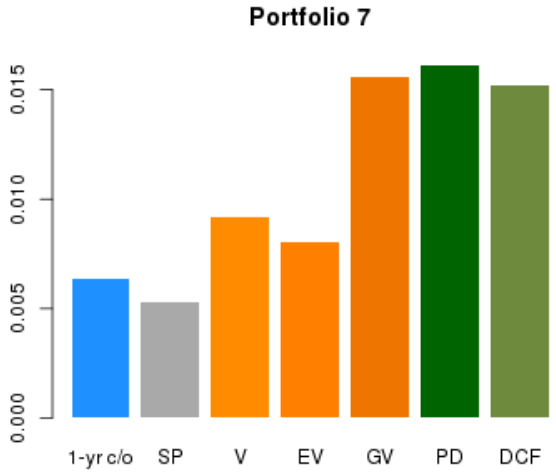
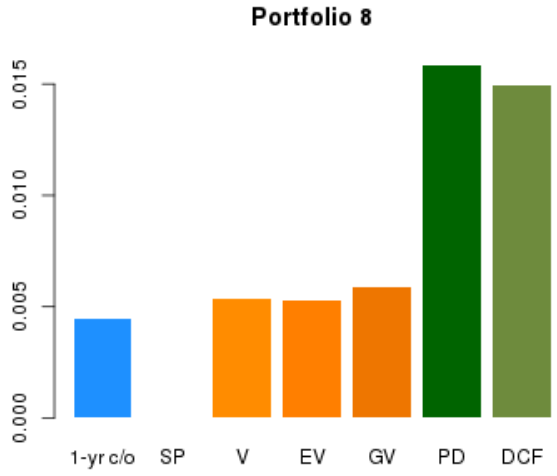
- Regional economic conditions extremely favorable




- Heavy c/o's in 2017
- Light c/o's in 2014-2016




- Small sample size (only 1 year of complete data)

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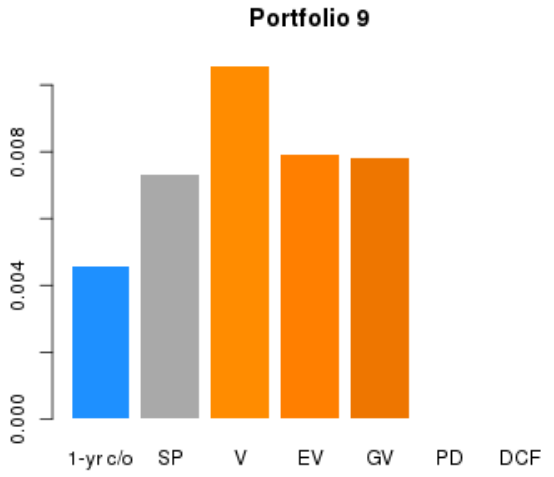
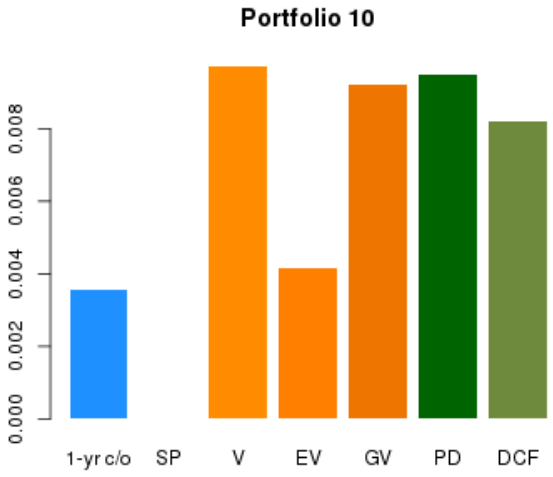
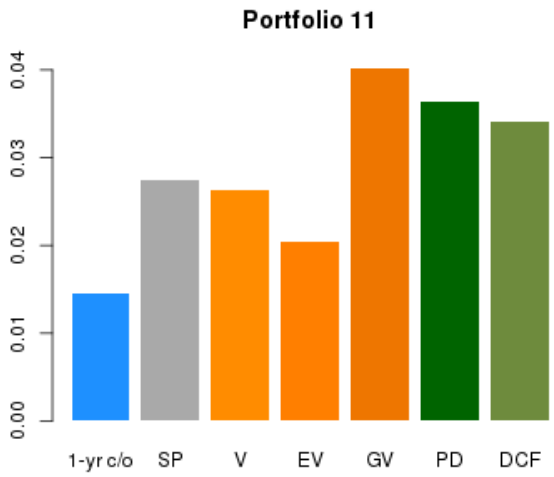
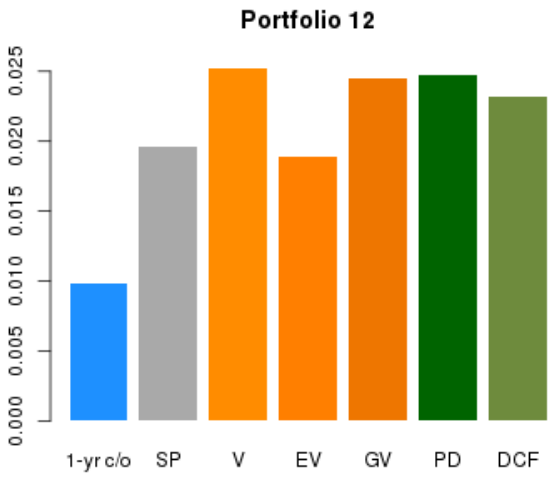
- Missing required PD data



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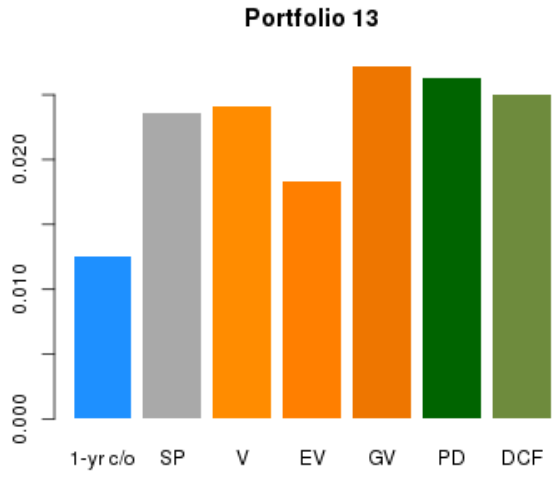


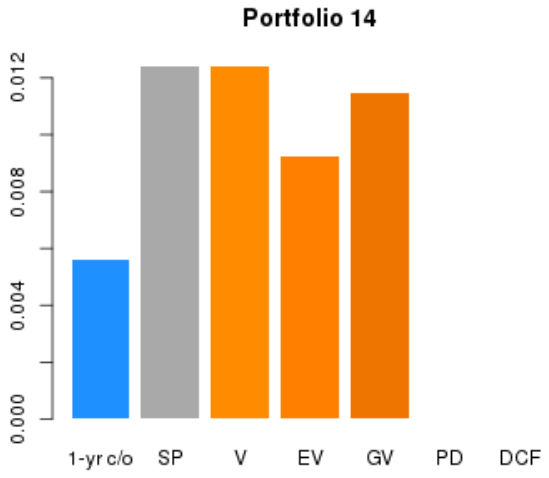


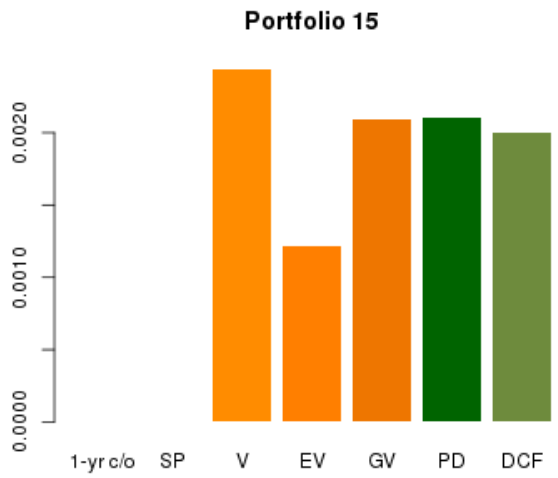


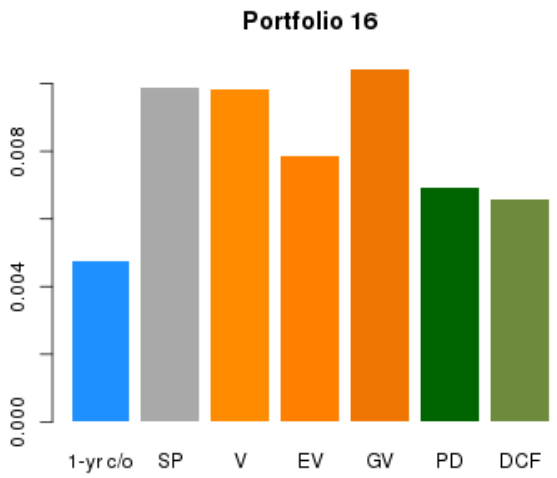

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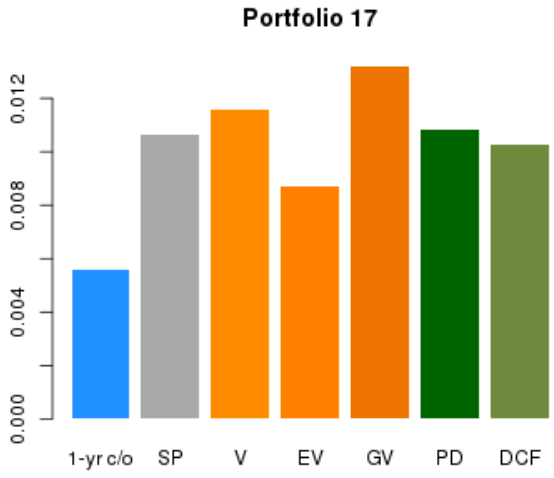


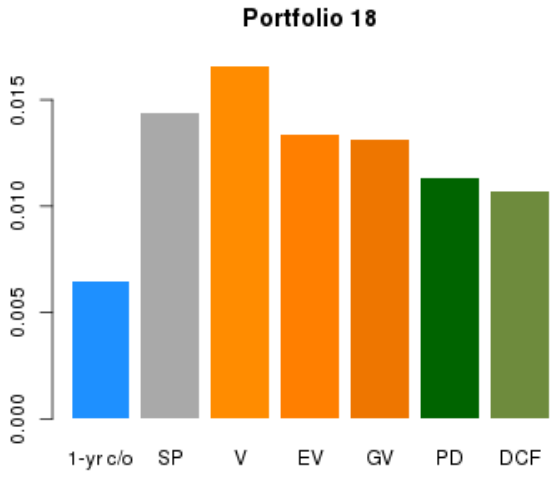


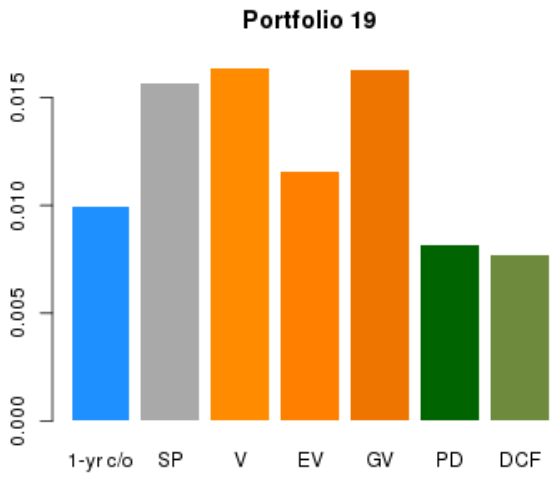


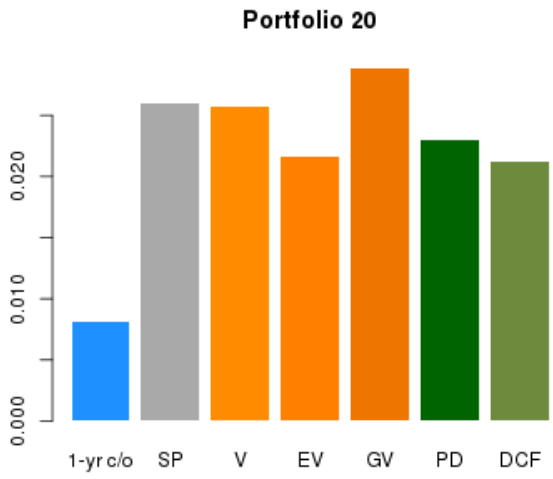

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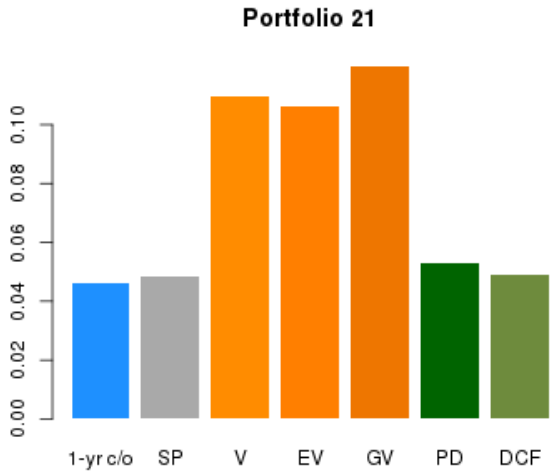
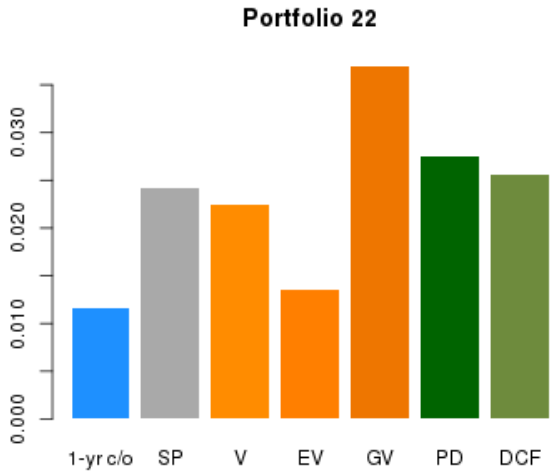
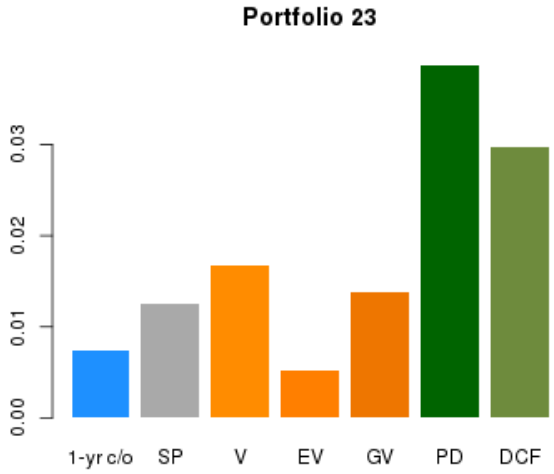
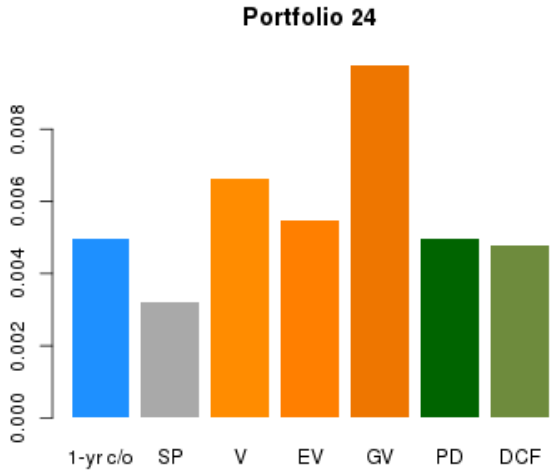
- Heavy losses in years 4-6 (unusual)




- Unusually high LTVs (not fully reflected in overall grade)



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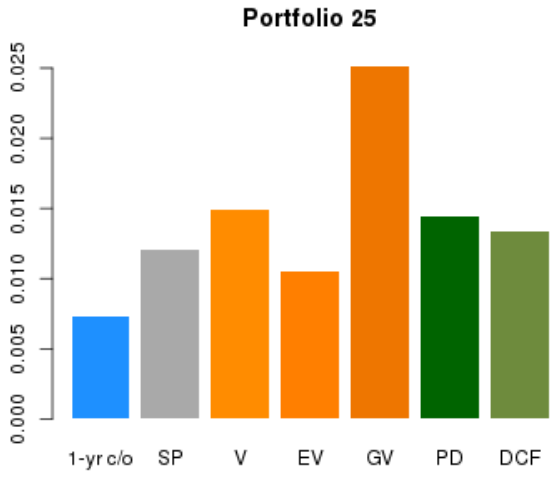
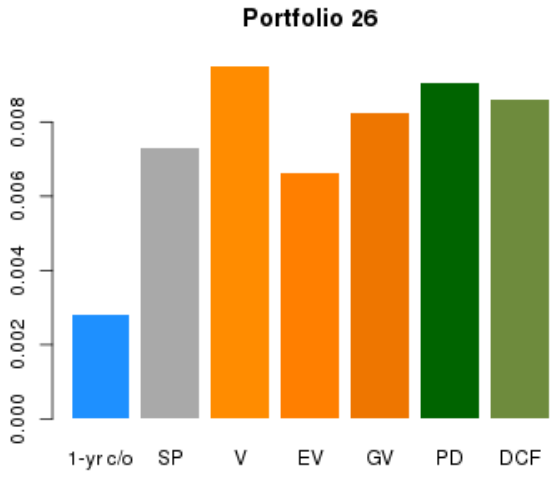
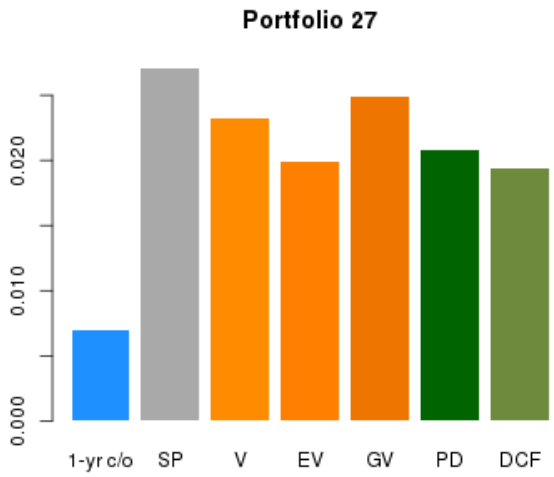
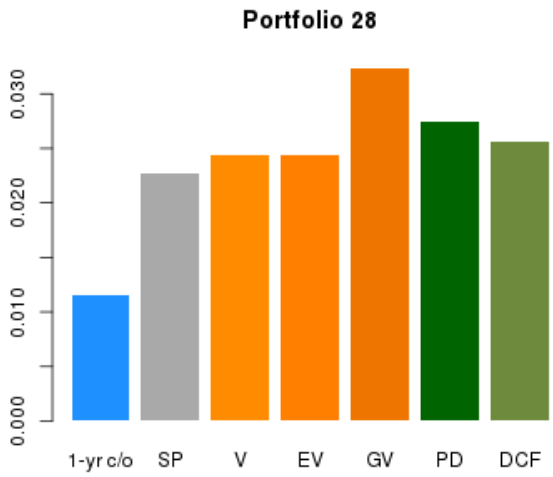


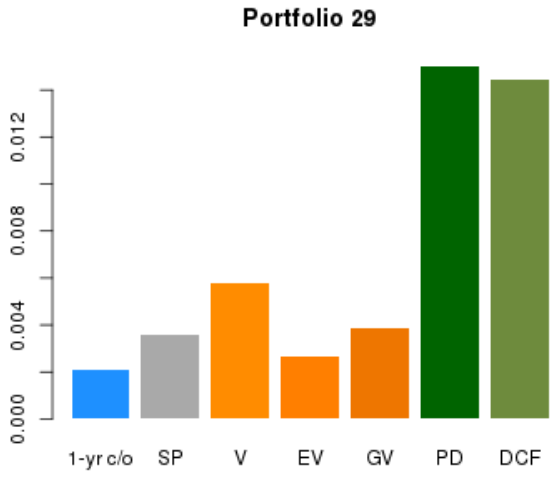



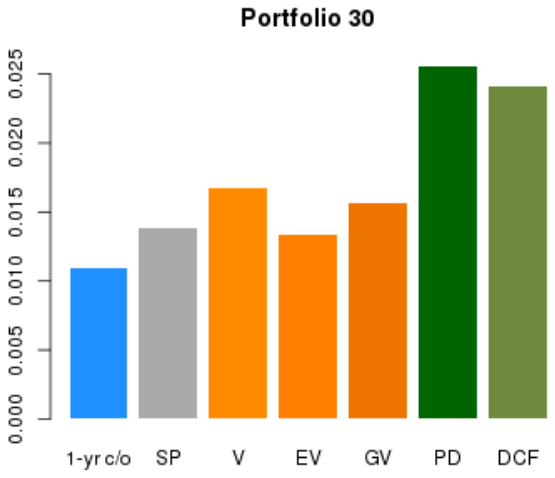



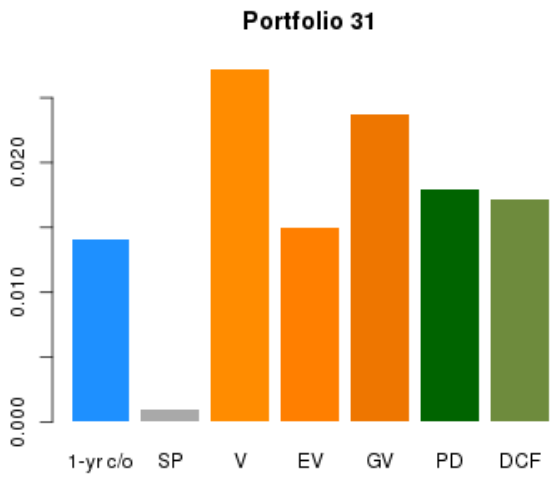



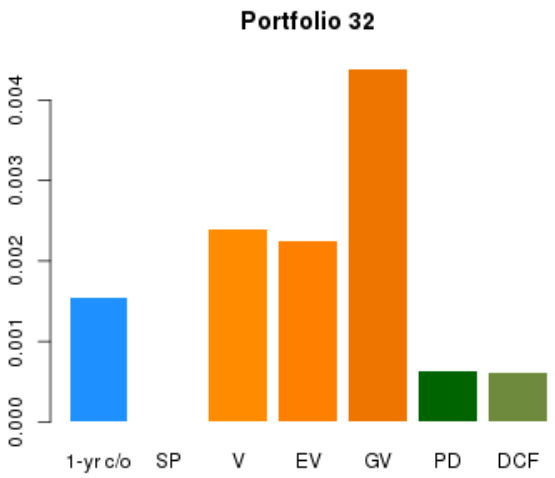
VISIBLE EQUITY

- Institution effect or missing c/o data



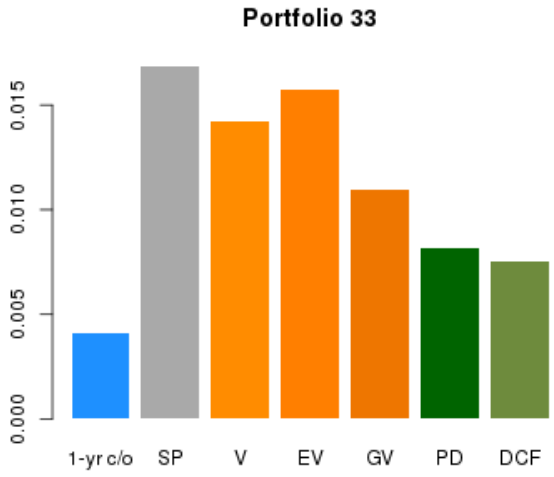



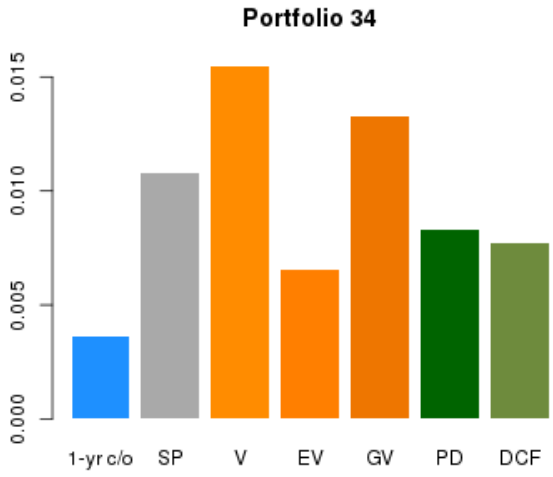



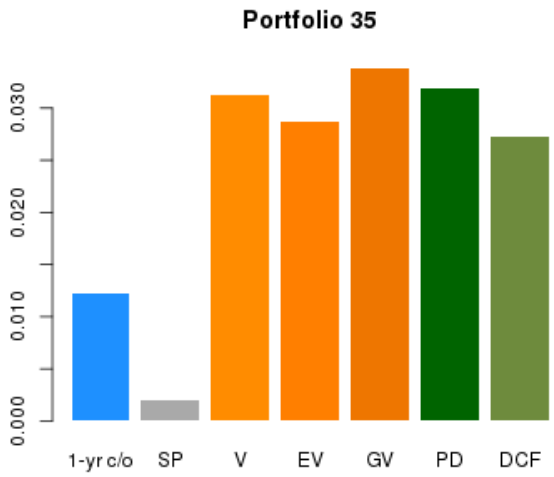



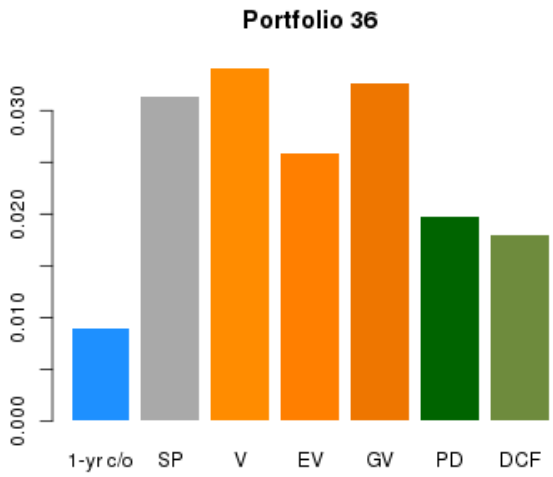

- Only 430/2900 loans PD-eligible. Not representative.

VISIBLE EQUITY



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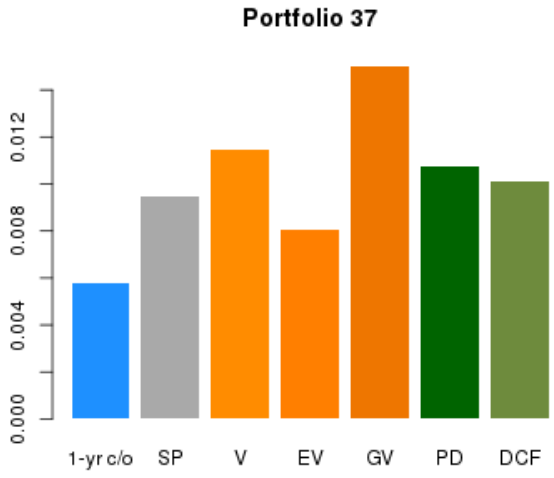


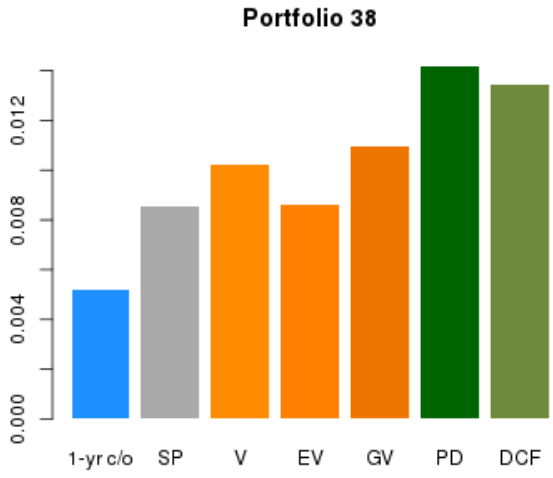


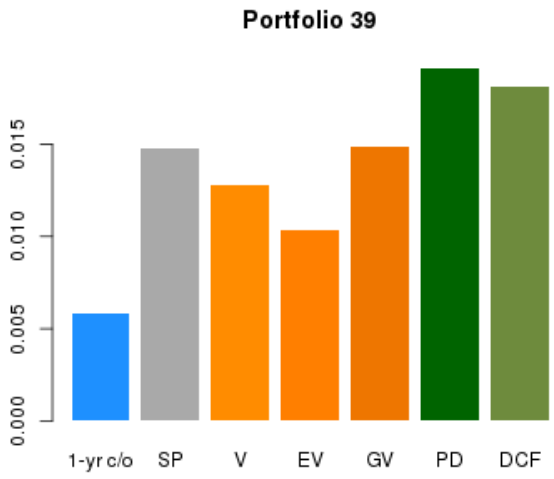


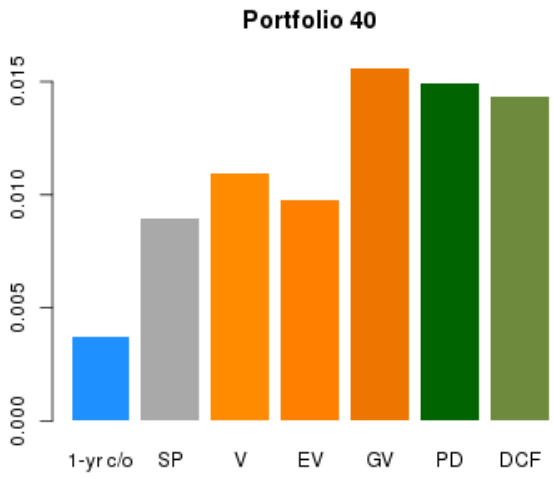

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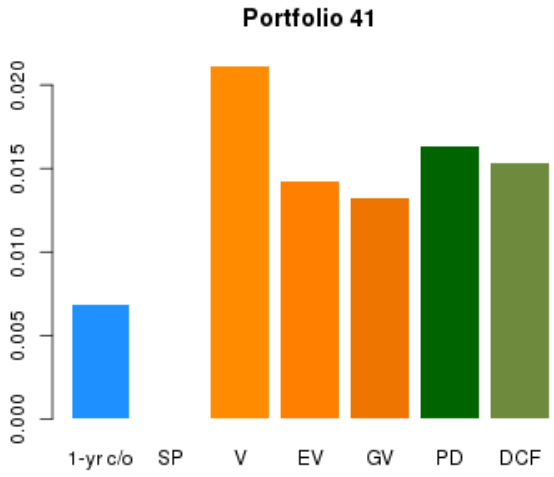


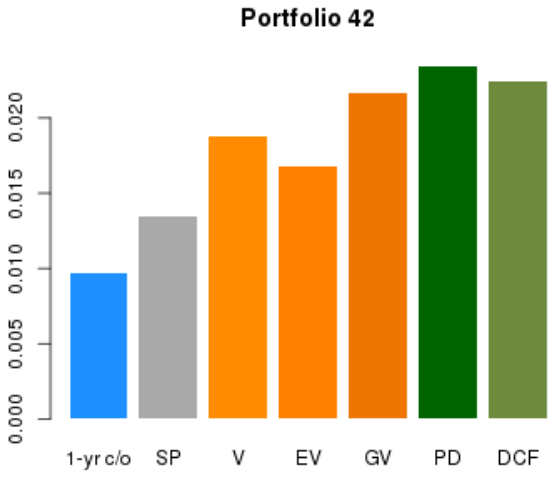


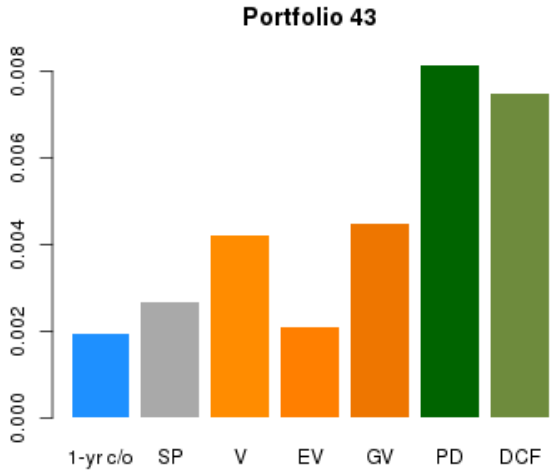


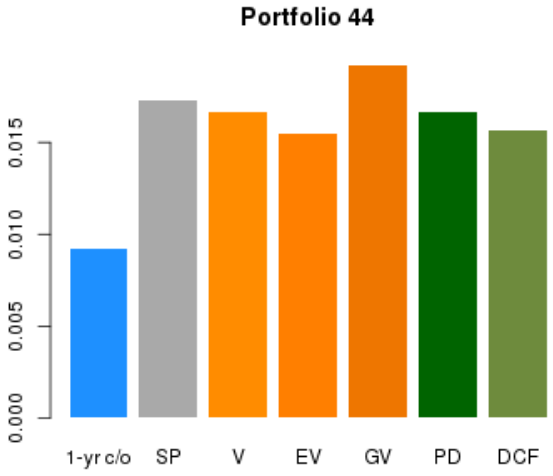

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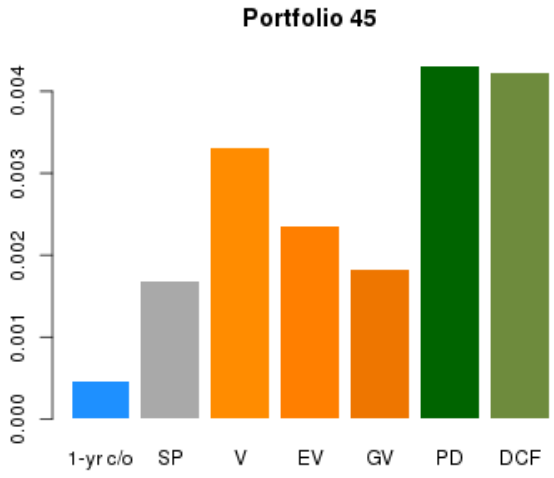
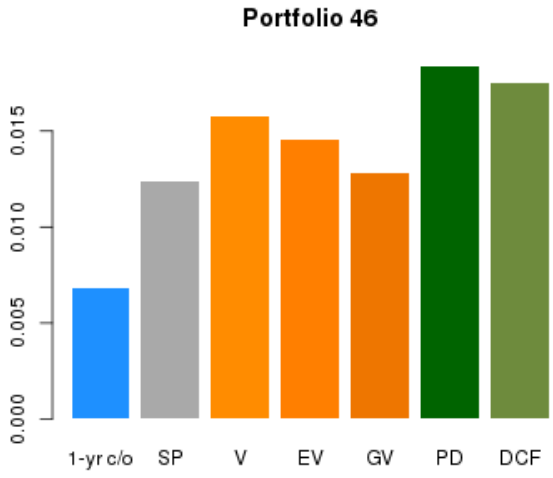
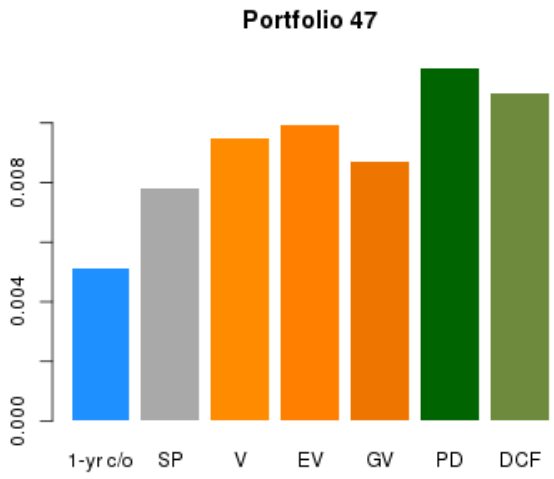
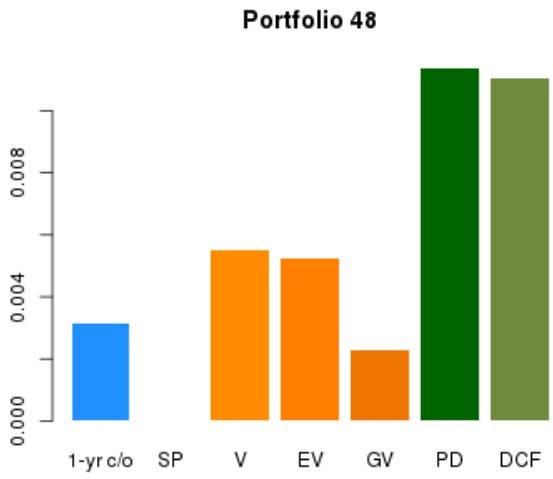


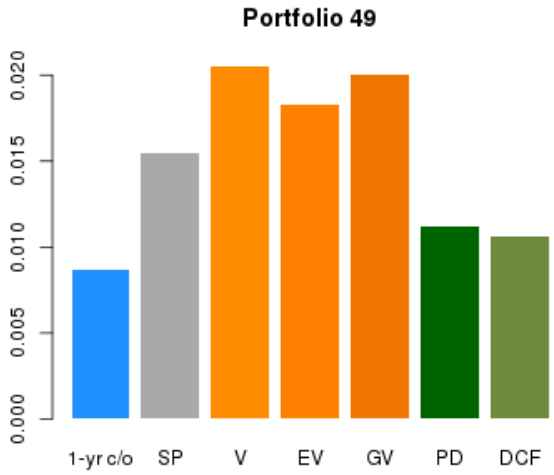



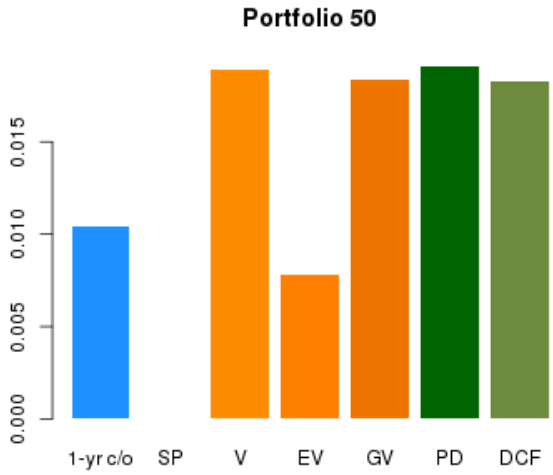



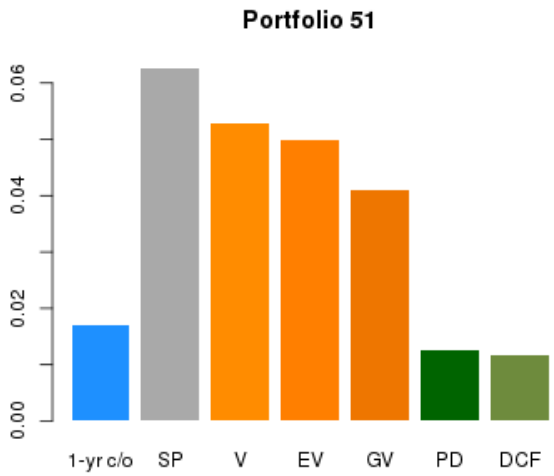



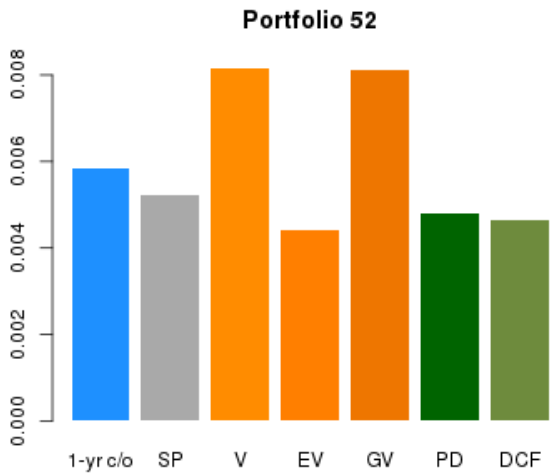

- Few loans have auto collateral data for PD. Small sample size issue.

VISIBLE EQUITY



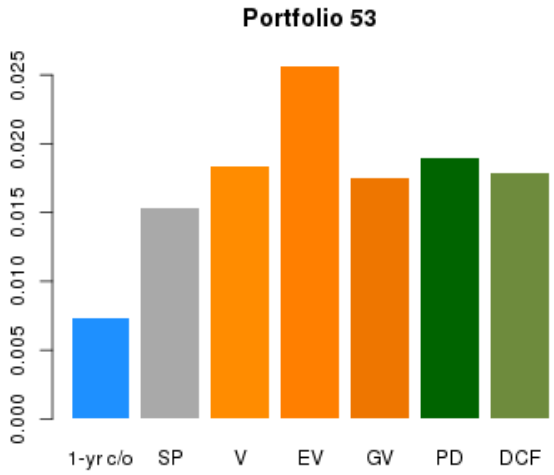




- Institution effect or data issue

VISIBLE EQUITY



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Auto Loan Study

1st Mortgage Study

(Coming soon: Credit Card, Business, etc.)

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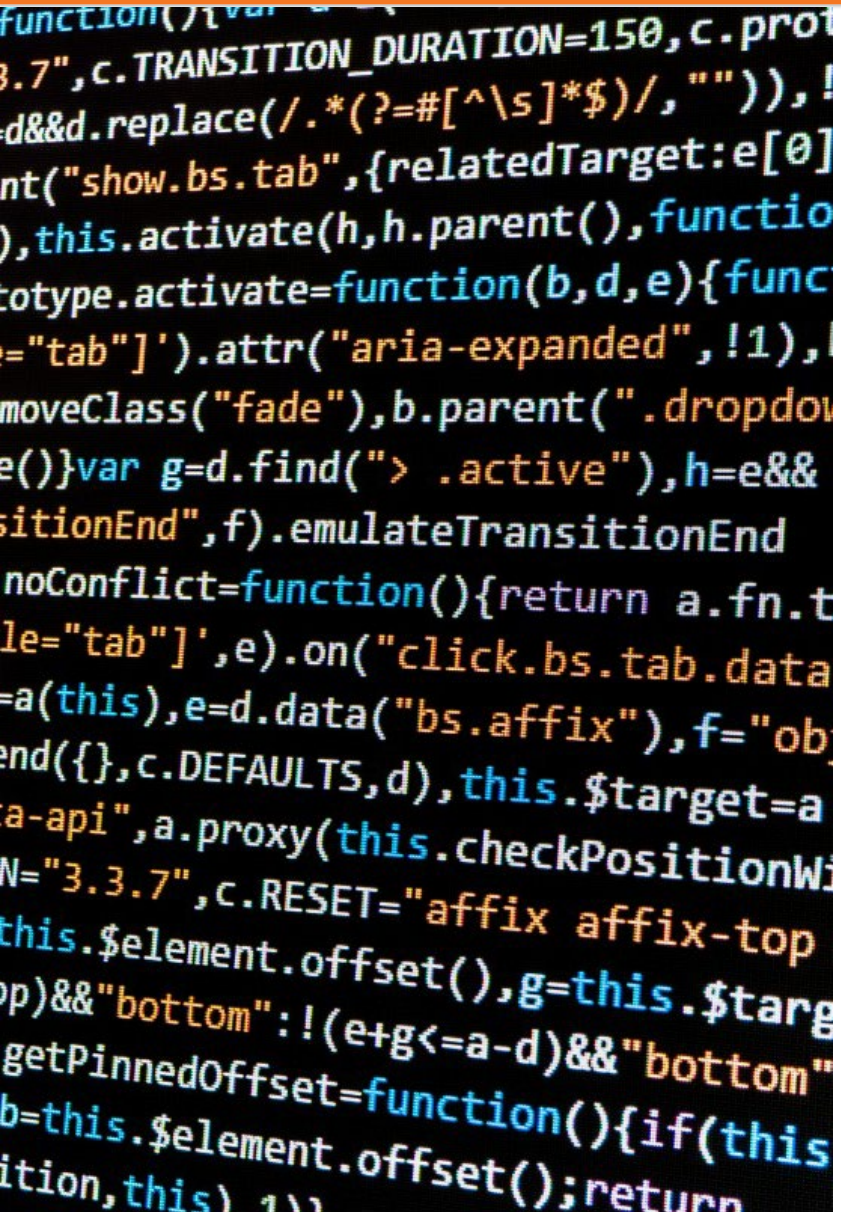
# The Data – 1st Mortgage



- Monthly, loan-level 1st Mortgage records uploaded by Visible Equity users
- 60 institutions selected based on data quality and completeness
- Balance data since 2010, charge-off data since 1980s

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# Aggregate Results

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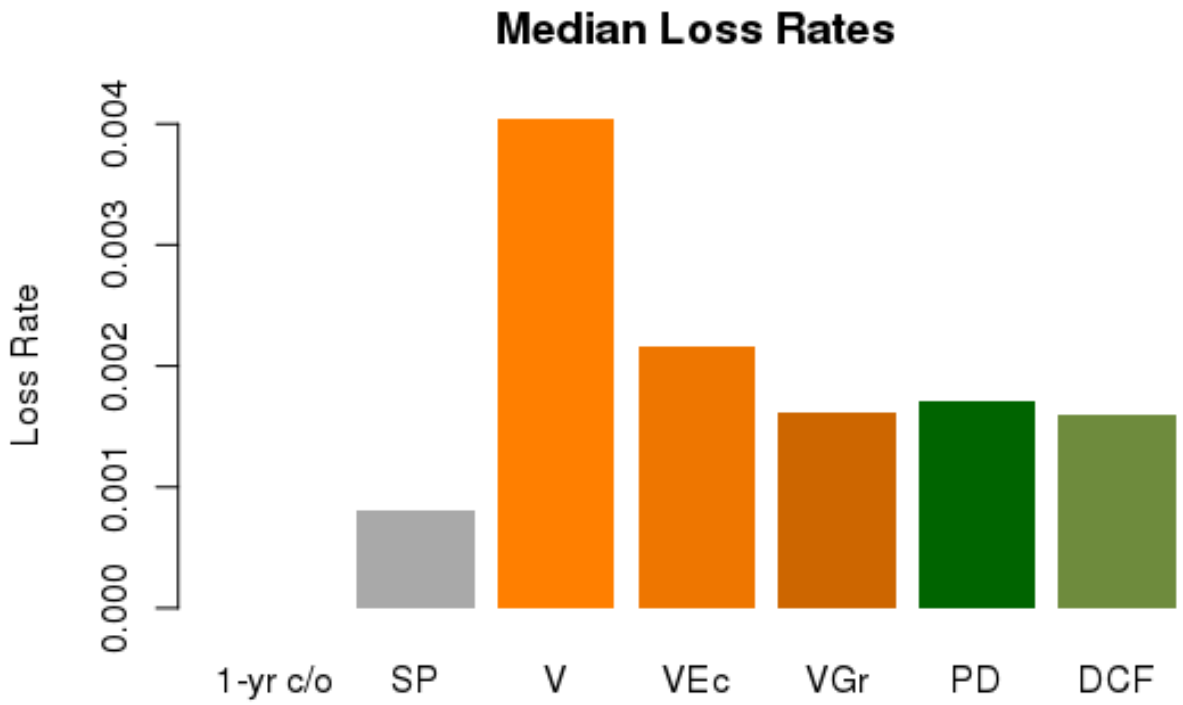
# Median Rate by Method




- **SP** = Static Pool (3 yr lookback)
- **V** = Vintage
- **VEc** = Economic Adjusted Vintage
- **VGr** = Vintage by CQI
- **PD** = Probability of Default
- **DCF** = Discounted Cash Flow

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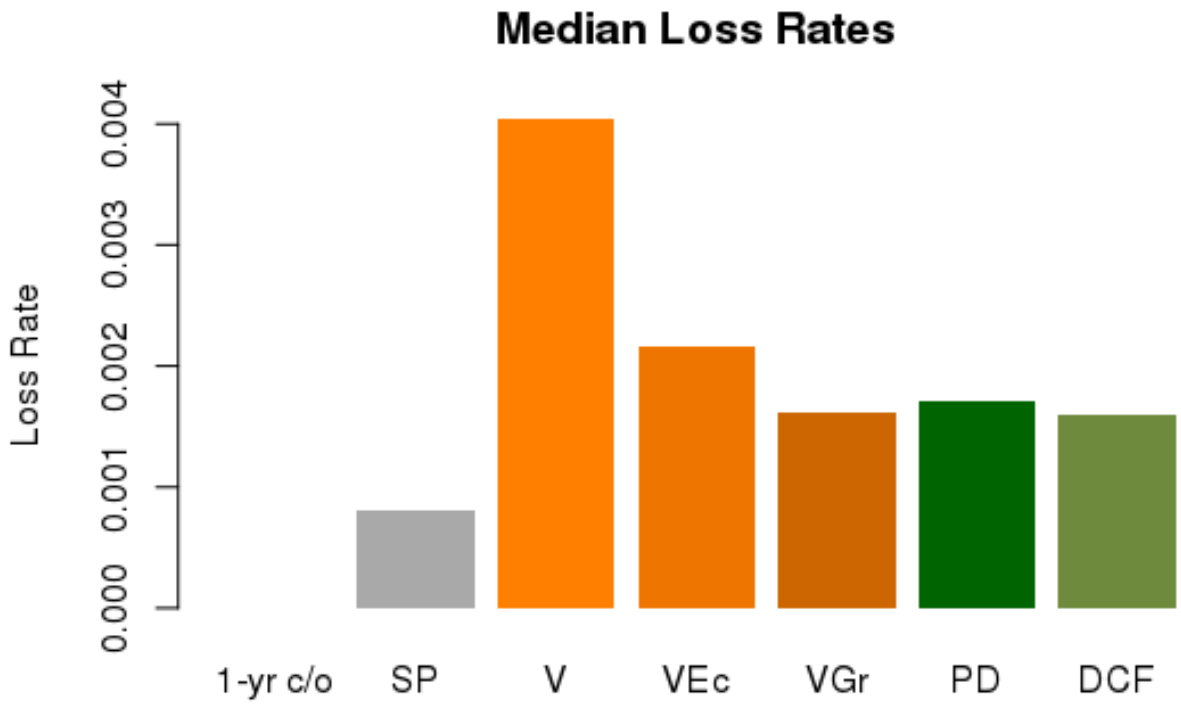
# Median Rate by Method




**Takeaways:**

- 3 years not enough for static pool
- Crisis results in high median raw vintage (V)
- Otherwise, methods similar

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# Other Mortgage Study Takeaways

- Even more variation by method within an institution than for auto classes
- Low incidence of charge-offs makes loss rate methods more volatile
- Collateral recovery rates really matter
- Given the crisis, raw vintage or static pool rates without proper adjustment may be too conservative

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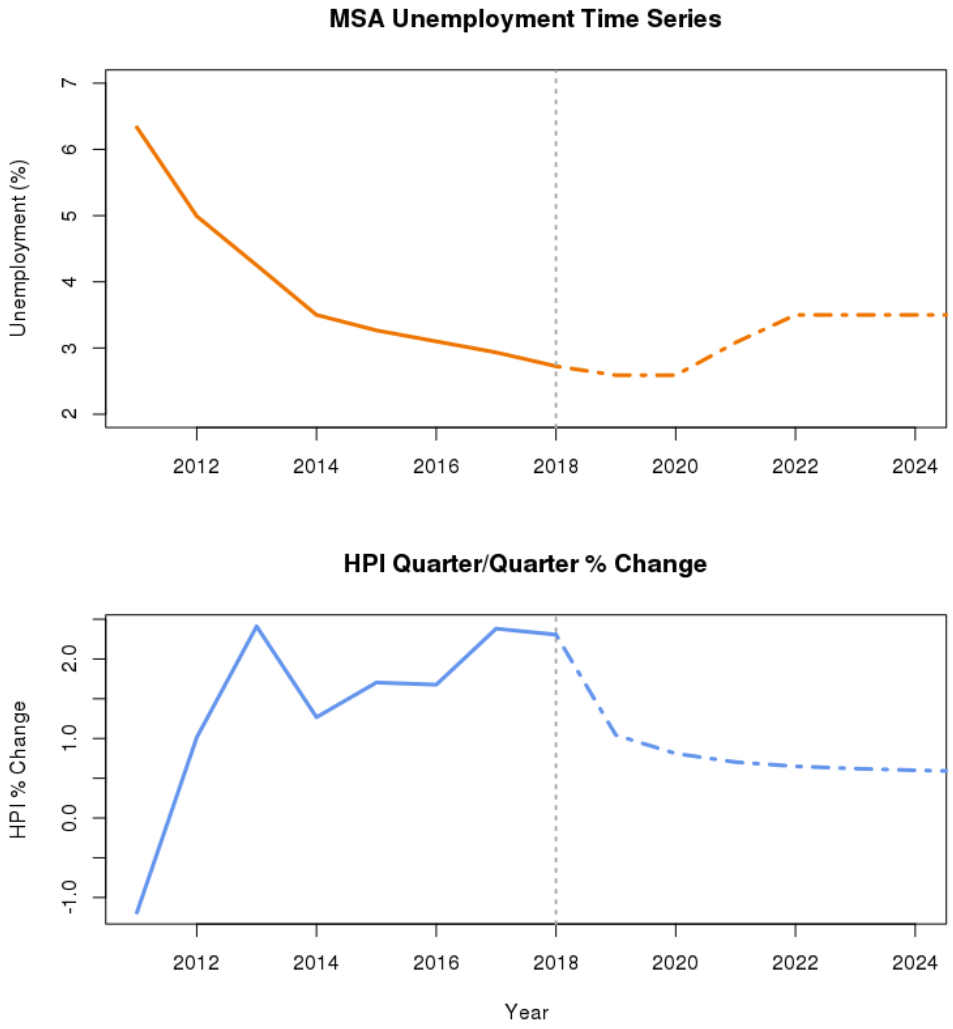
# Portfolio 8: Economic Adjustment




- Significant economic changes over data history
- Adjustments important!

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# Thank You

**FOR MORE INFORMATION PLEASE CONTACT:**
RACHEL.MESSICK@VISIBLEEQUITY.COM