2023 Q3 Credit Risk Review

Trends and Early Risk Indicators in Consumer Credit

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November 13th, 2023

Executive Summary – State of the US Consumer Credit

There are both headwinds and tailwinds for consumer credit risk:

- **Headwinds**
  - Delinquencies increasing or elevated across asset classes, driven by prime/subprime worsening
  - Minimum payments amounts continue to increase across asset classes due to higher balances and higher interest rates.
  - Higher interest rates and elevated vehicle prices cause record car payments.
  - Normalizing for origination risk score we still see worsening of risk in more recent vintages across asset classes and across risk bands.
  - Student loans payments resumed in September after a few years of deferrals; cards expected to be most impacted as they fall lower in the payment hierarchy historically.
  - Personal savings rate (3.4% as of September 2023) at historic lows.

- **Tailwinds**
  - Unemployment remains low although a slight increase in recent months. Historically, it is one of the primary drivers for the increase in consumer credit risk, especially for prime customers.
  - Credit cards and personal loan issuers continue to tighten their underwriting; subprime segments are experiencing delinquency improvements for personal loans, while we have yet to see improvements in credit card performance.

Executive Summary - Credit Cards

Credit Cards

- Card delinquencies are increasing. Recent vintages are performing worse even after adjusting for risk level at origination.
- Roll rates increased across the delinquency buckets as credit performance deteriorates.
- We continue to see an increase in balances as consumers borrow more but they are still within the pre-pandemic trendlines.
- Subprime card origination volumes dropped as lenders tightened their underwriting standards.
- Average credit limit have increased and back to pre-pandemic averages.

Executive Summary - Personal Loans & Mortgages

Personal Loans

- There has been a flattening in subprime personal loan delinquencies, likely driven by credit tightening beginning in the second half of 2022.
- We continue to see a tightening of underwriting standards with a decrease in originations and an increase in average origination FICO and income.
- Tightening in underwriting is leading to better performance in more recent vintages, especially in segments with lower Vantage at origination.

Mortgages

- Delinquency rates are trending slightly upwards but still well below pre-pandemic levels.
- High interest rates and increased payment burdens are leading newer vintages to have worse performance than those from 2019-2021.
- We see an increase in subprime HELOC originations.

Executive Summary – Auto Loans & Student Loans

Auto Loans

- Auto delinquencies increased in Q3 and are also trending higher than pre-pandemic levels. Newer vintages, especially for used vehicles, are experiencing higher DQ rate across all risk segments at time of origination.

- Loan-to-value continues to be a key risk differentiator post-COVID.

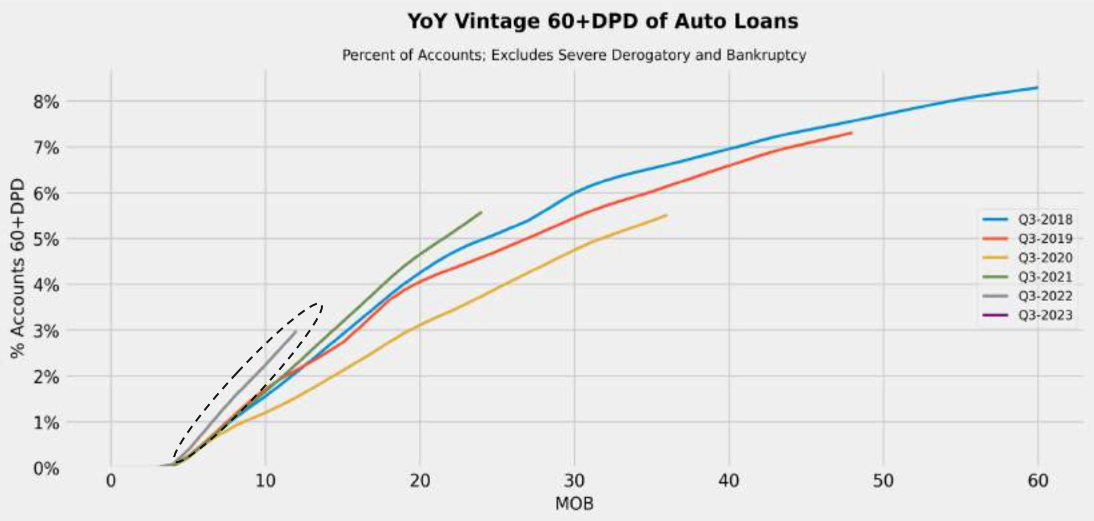
- Sustained higher interest rates and vehicle values have led to record high monthly payments and down payments. This trend has also led to lower prepayments for more recent loans.

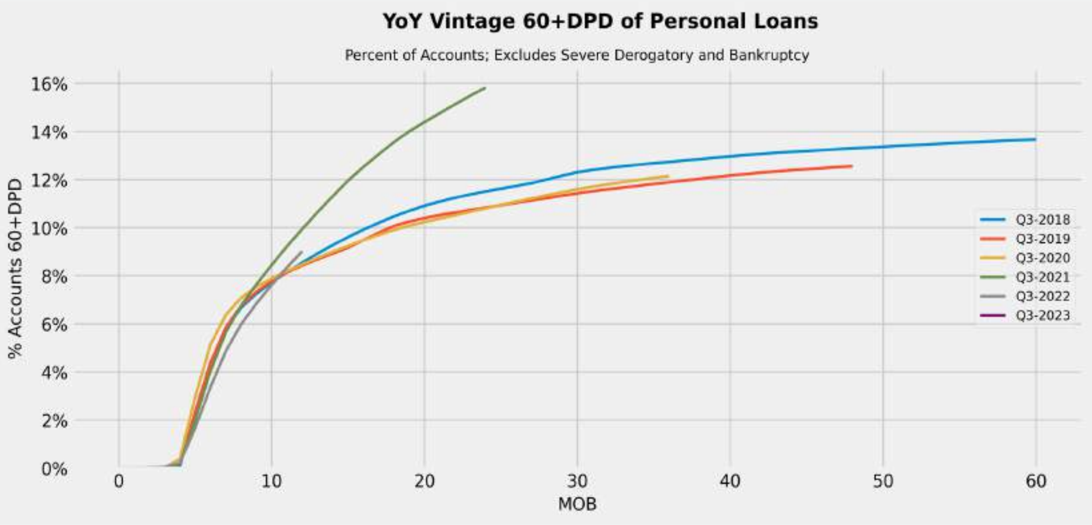
Student Loans

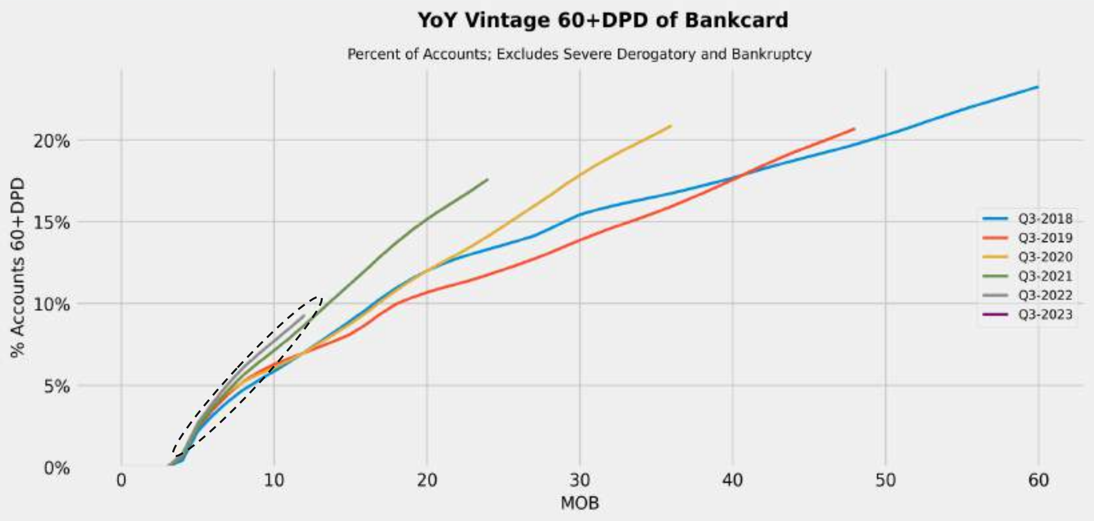
- As deferrals expired in September 2023, we can expect an increase in risk across other asset classes, especially credit cards as historically, student loans have been higher in the payment priority.

- Lower-income and subprime households are more likely to have SL debt and they are expected to draw from their largest asset, deposits, to repay their debt.

Consumers continue to be pressured by inflation and rising interest rates as observed by higher delinquencies compared to a year ago







Newer vintages of Bankcard and Auto are also performing worse when adjusting for Vantage score at time of origination

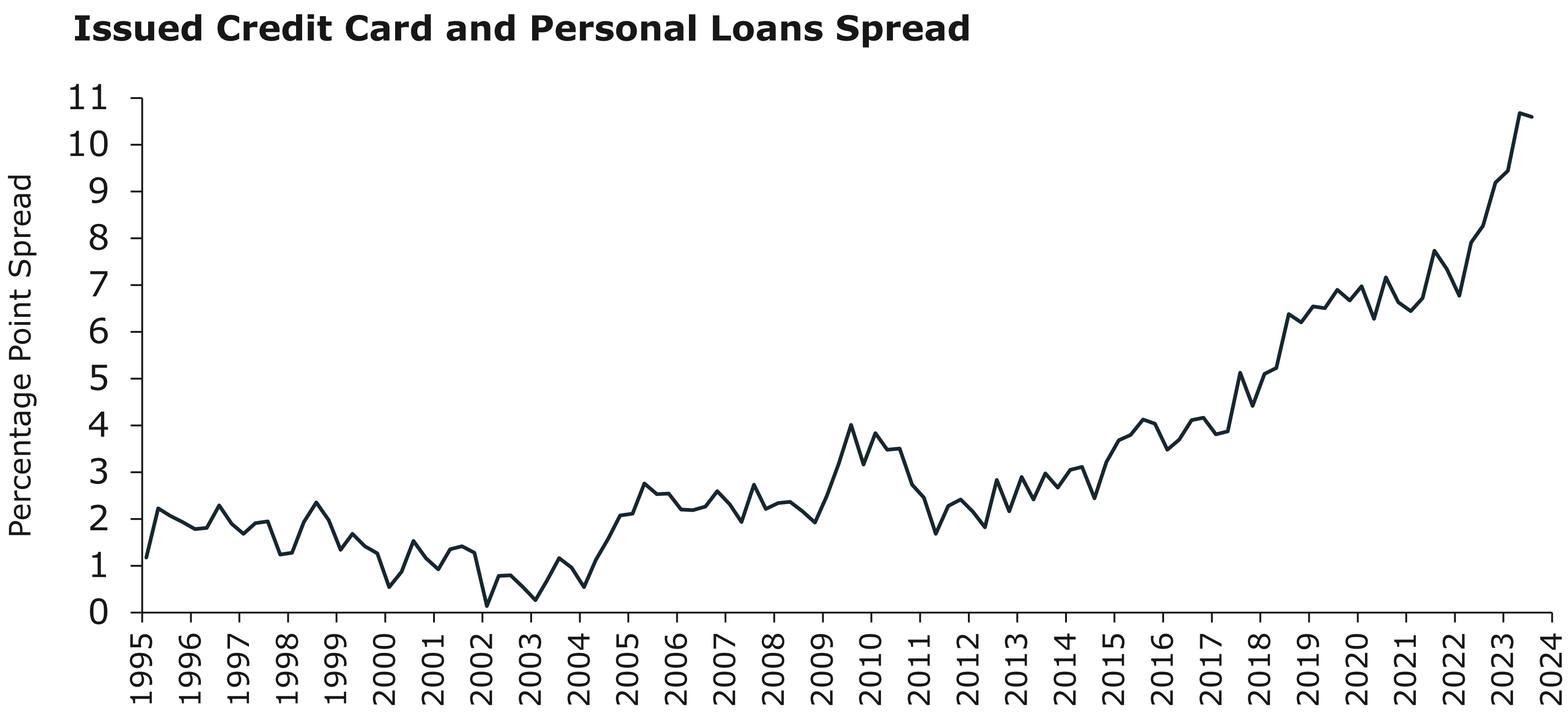
Source: 2OS, Equifax Ignite. Data as of September 30, 2023.

2nd Order solutions

- State of the Consumer
- Credit Card
- Personal Loan
- Auto
- Student Loan
- Mortgage

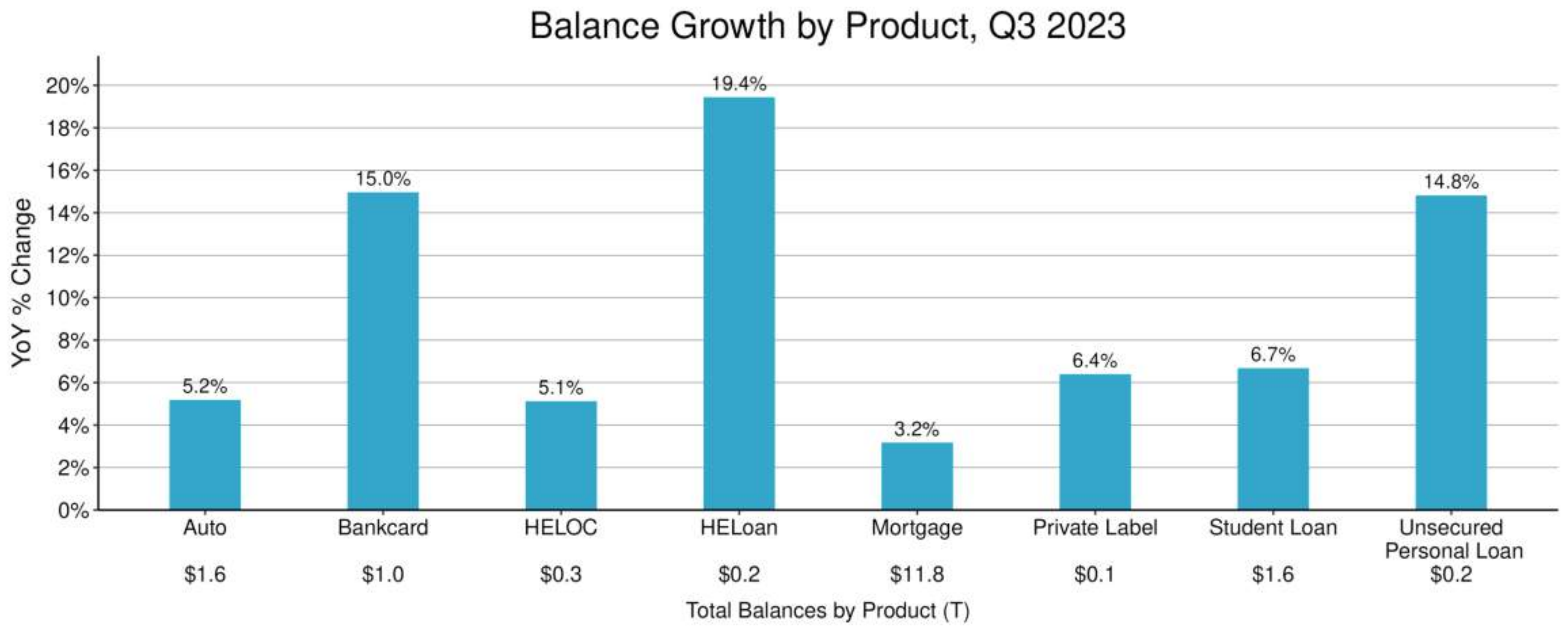
Record high issued credit card rates create opportunity to refinance

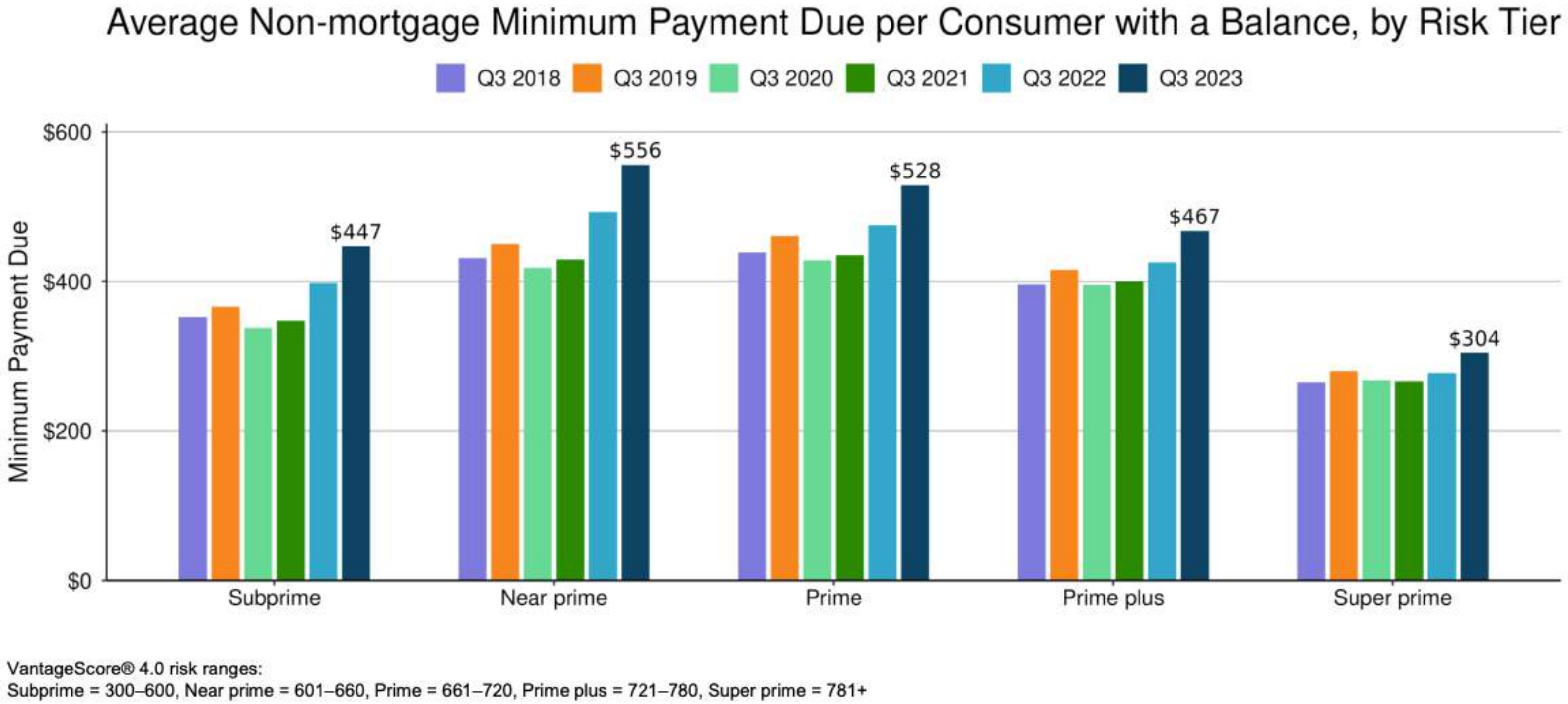
The spread between issued credit card and personal loan interest rates is the widest on record



Source: Federal Reserve bank of St. Louis, data as of August,2023

Minimum payments due continue to increase driven by growth in balance and higher interest rates





Source: TransUnion, data as of September 2023.

- State of the Consumer
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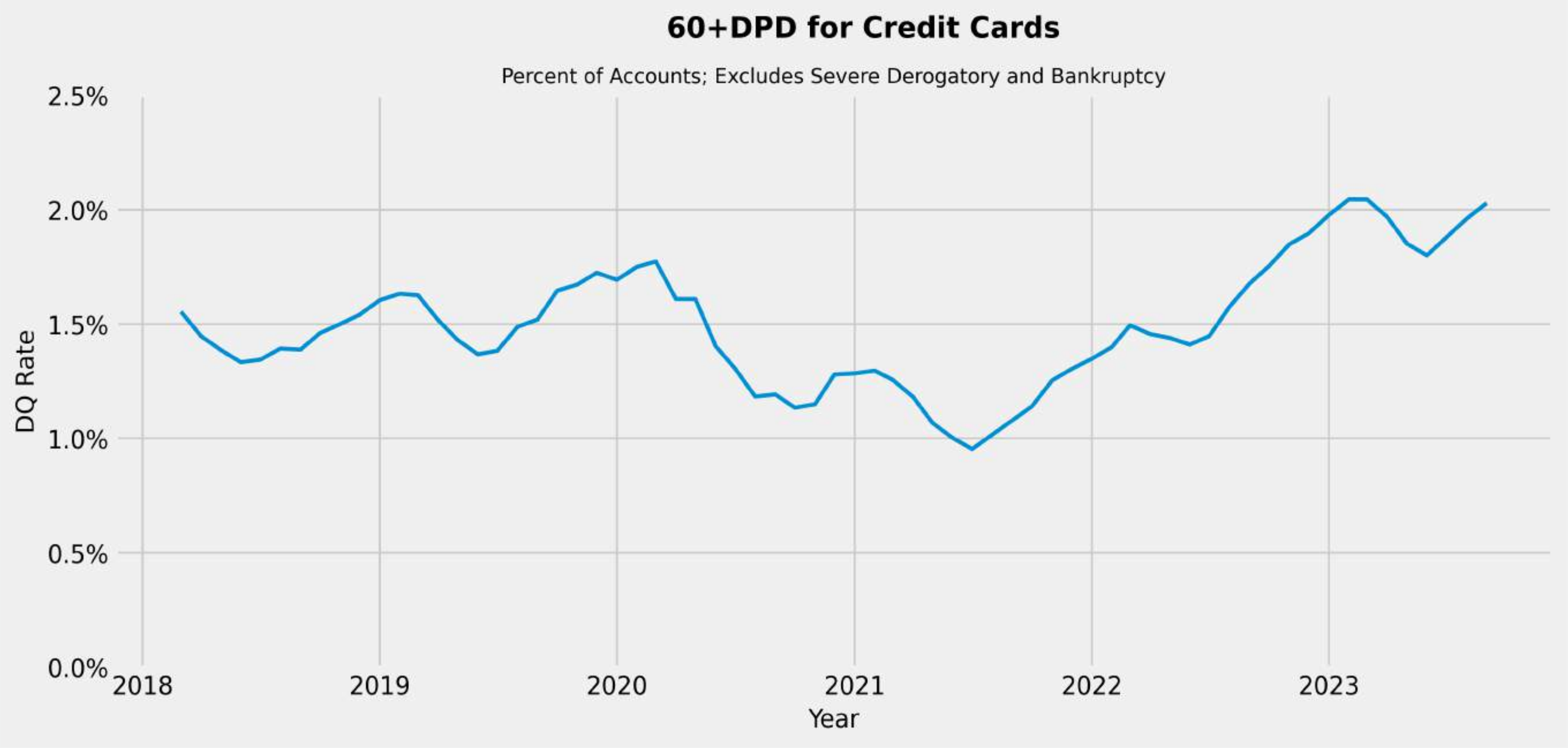
Delinquencies continue to increase in the last several months

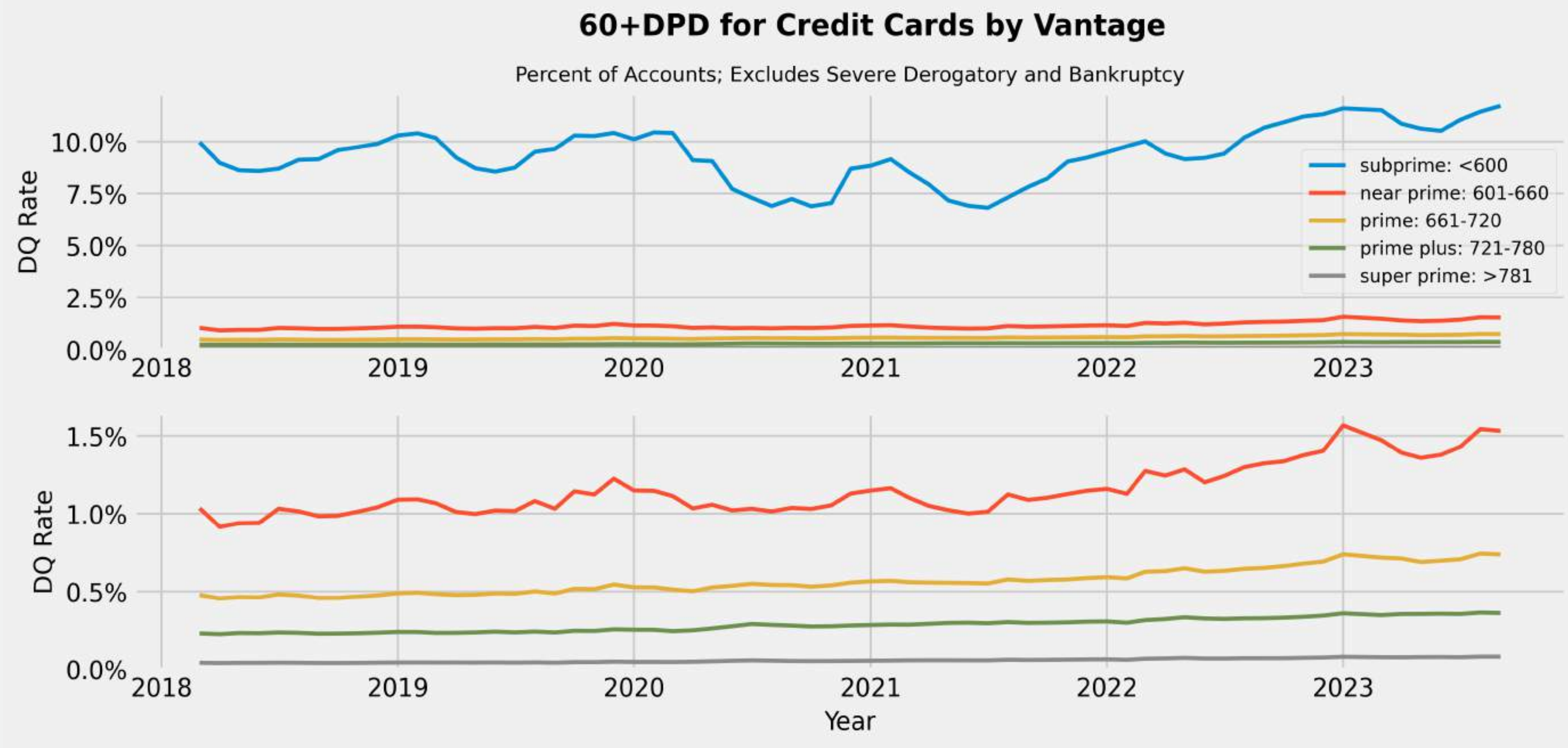
DQs are now much higher than pre-pandemic averages



Source: 2OS, Equifax Ignite. Data as of September 30, 2023.

Delinquency rates are on the rise across risk score buckets

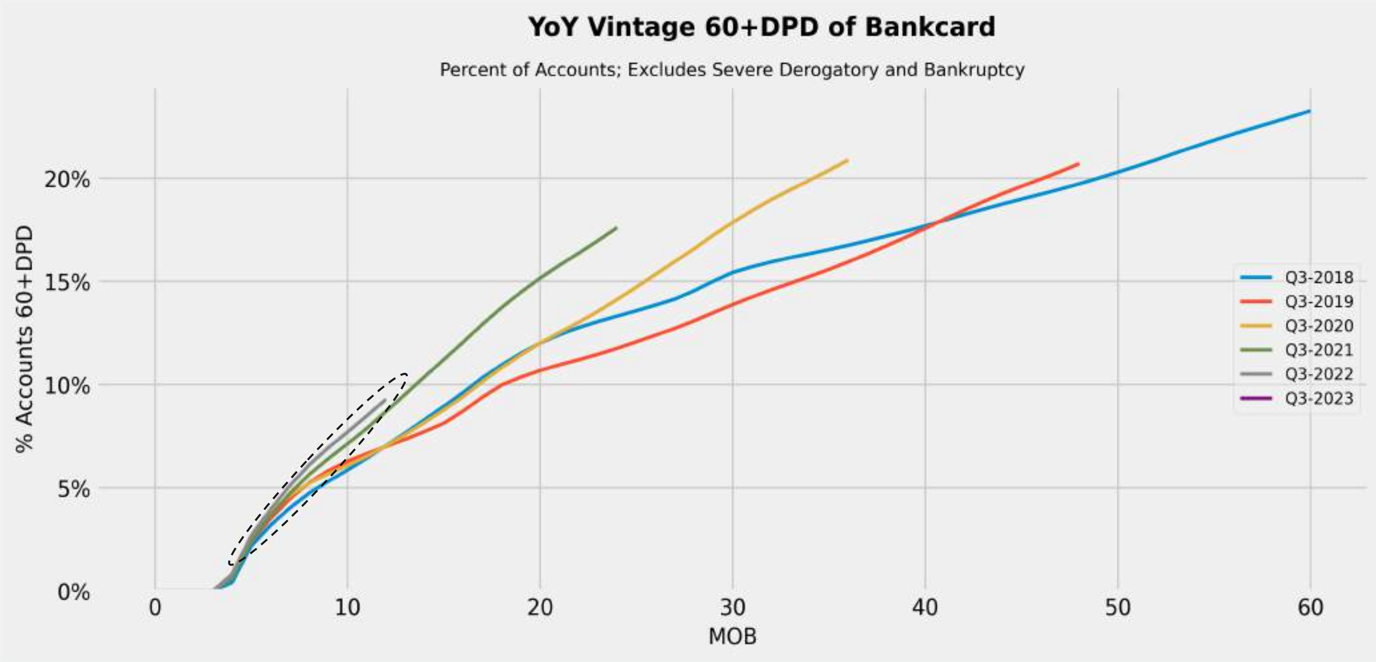
The prime and near-prime customers have especially higher DQs (50% increase) compared to pre-pandemic averages

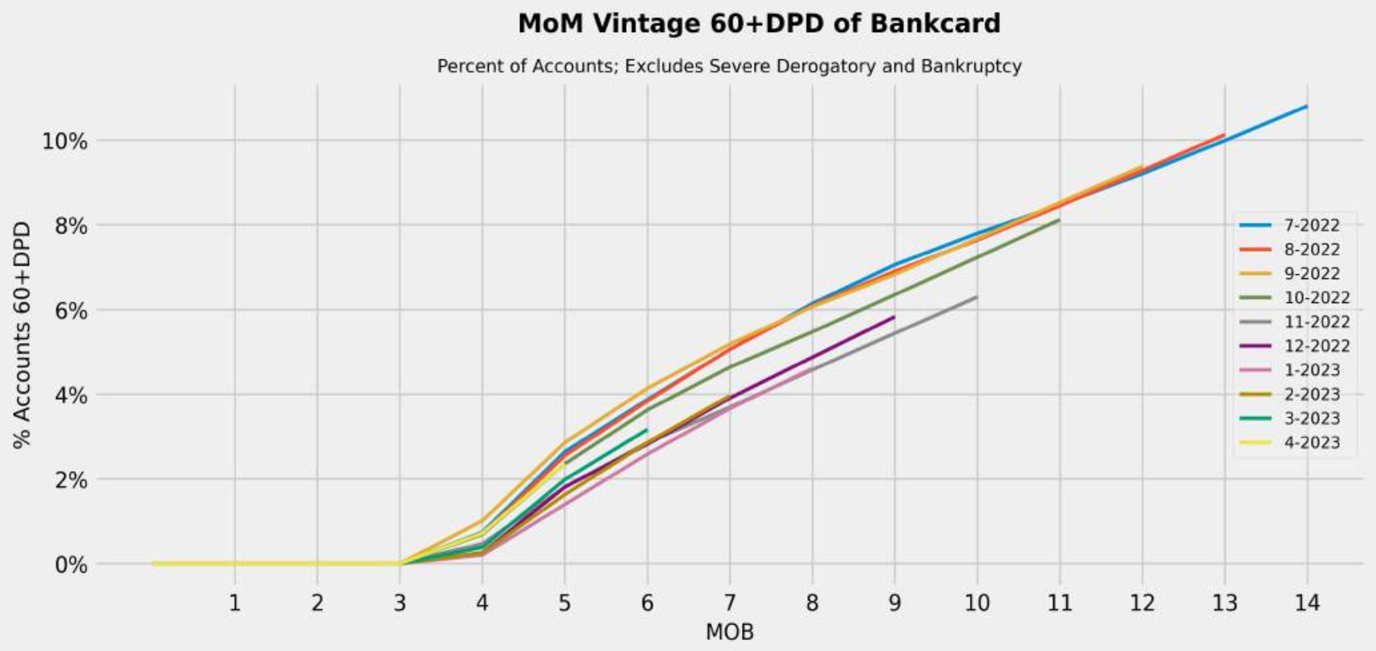


Source: 2OS, Equifax Ignite. Data as of September 30, 2023.
Vantage buckets are lagged 3 months from the performance date. For more details on methodology, see appendix.

Recent origination vintages continue to do worse compared to previous years

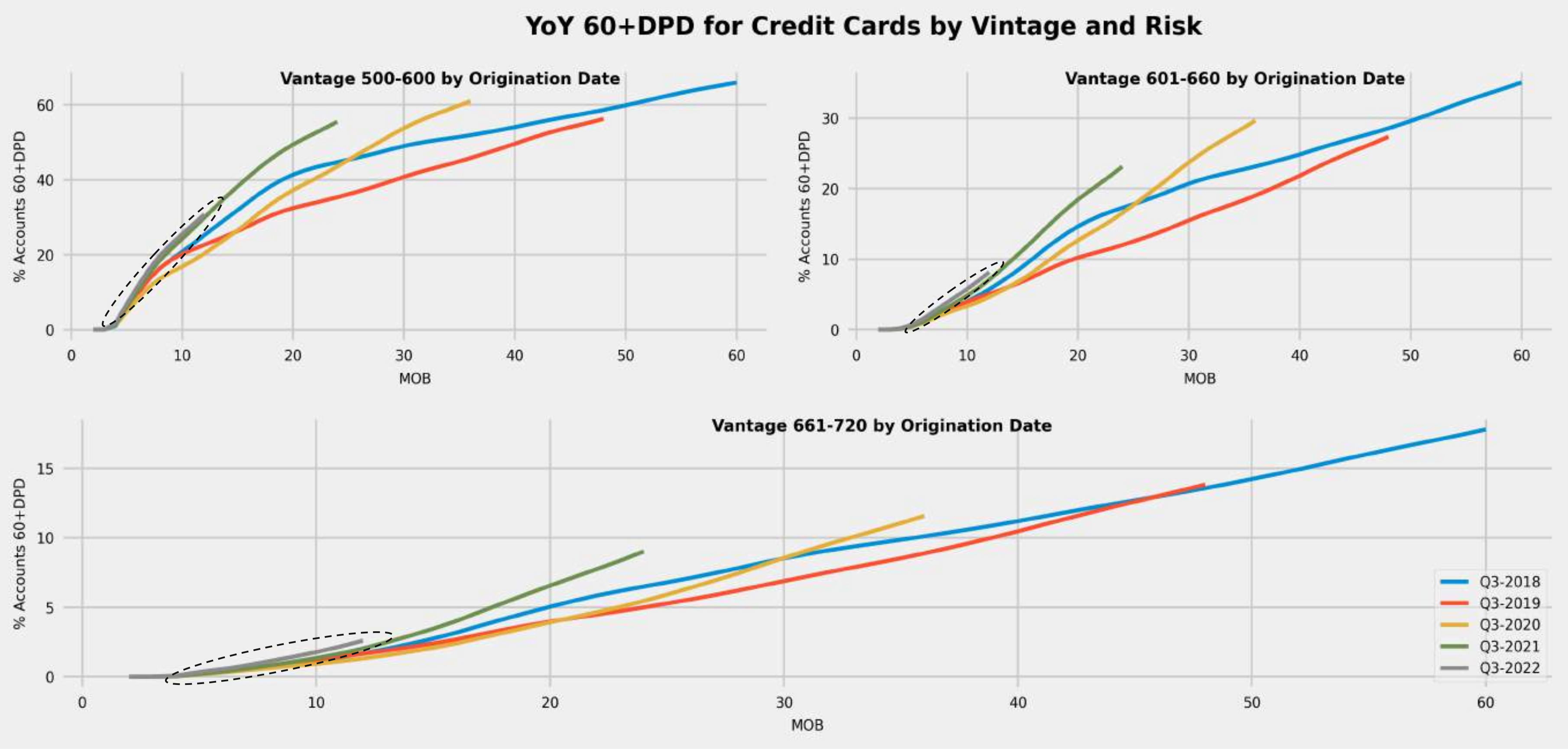
When looking at month-over-month comparisons, there is some improvement but that is mostly driven by credit tightening





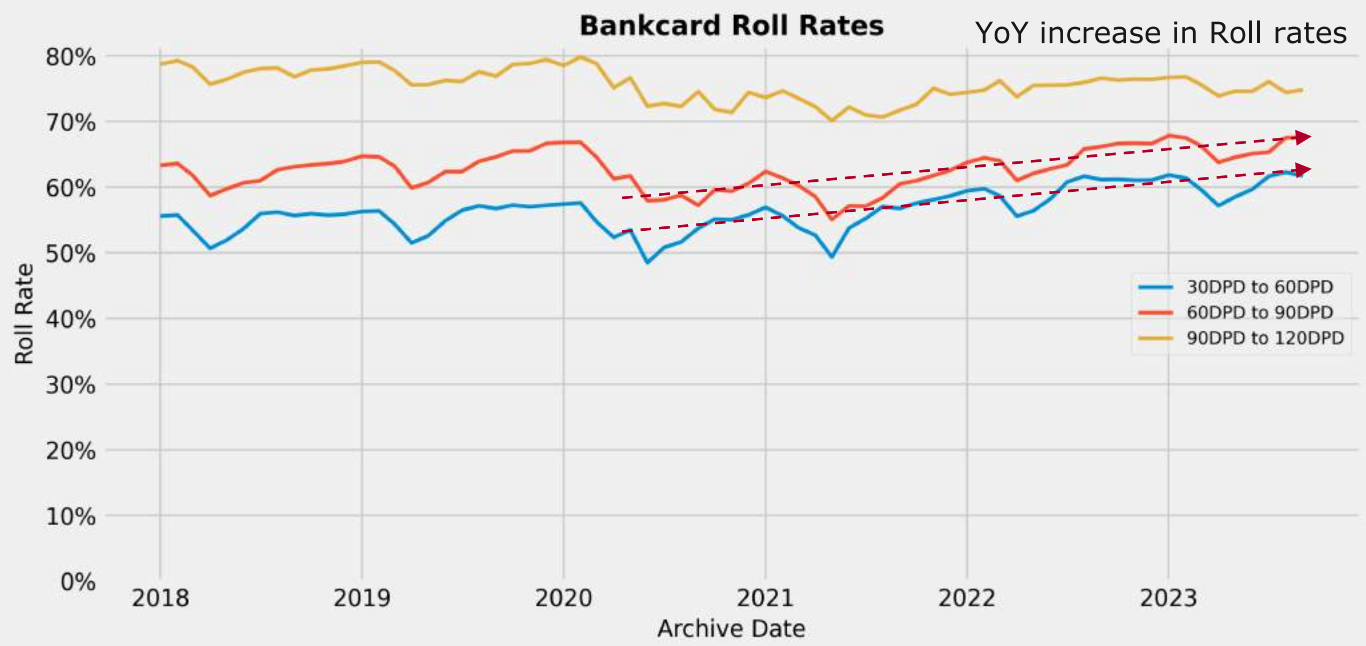
Source: 2OS, Equifax Ignite. Data as of September 30, 2023.

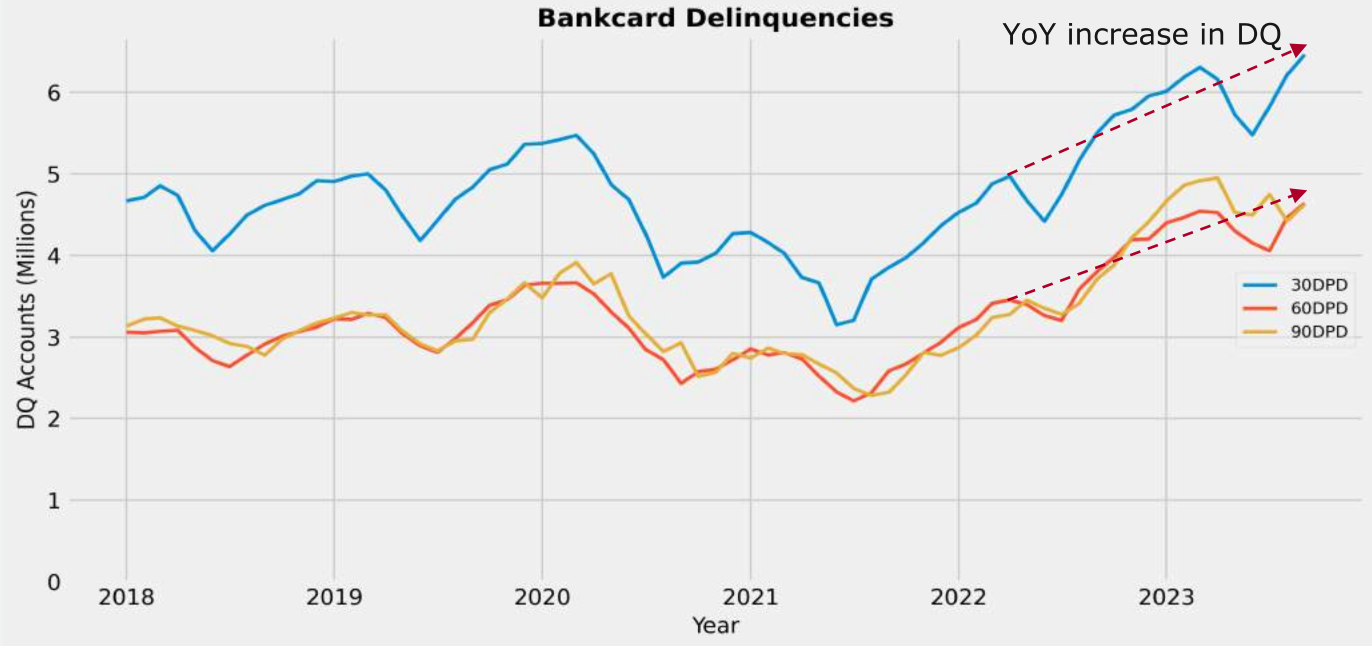
Even when adjusted for origination Risk score, recent vintages still show worsening across risk bands



Source: 2OS, Equifax Ignite. Data as of September 30, 2023.
Vantage bucket is captured at the time of origination.

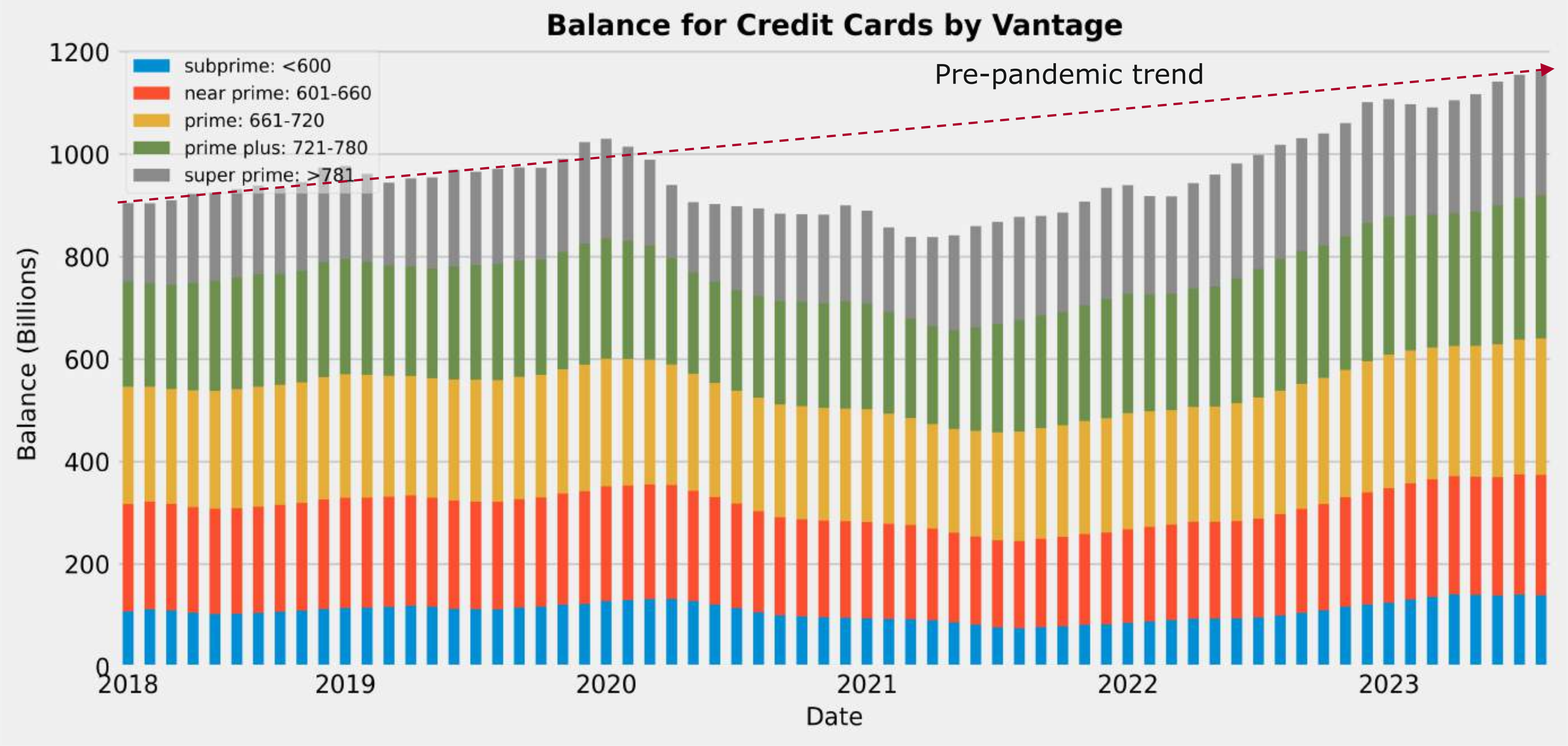
Credit Card account roll rates are rising compared to the pandemic lows





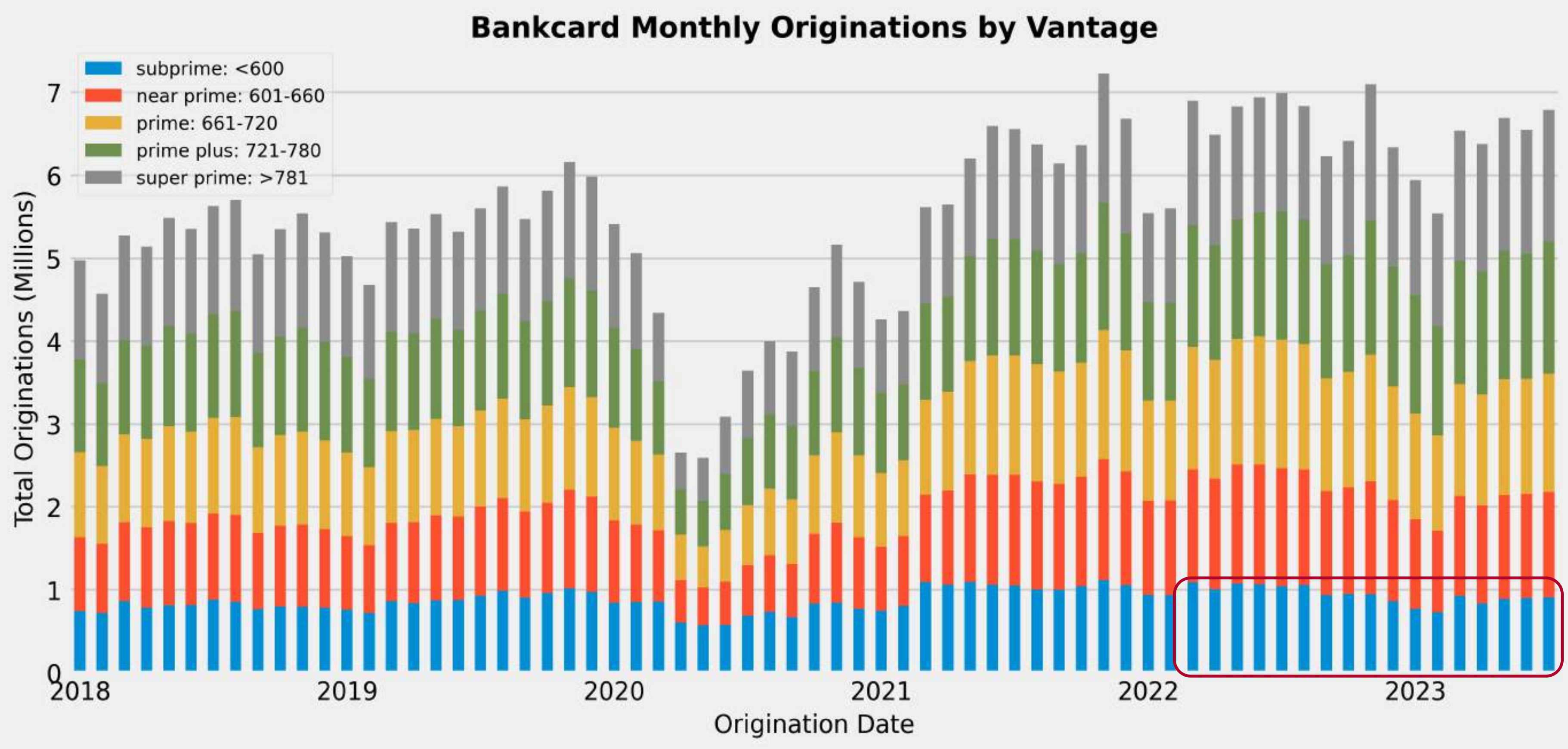
Source: 2OS, Equifax Ignite. Data as of September 30, 2023.
For more information on methodology, refer to appendix.

Credit card balances are rising but within pre-pandemic trendline



Source: 2OS, Equifax Ignite. Data as of September 30, 2023.
Vantage buckets at time of origination.

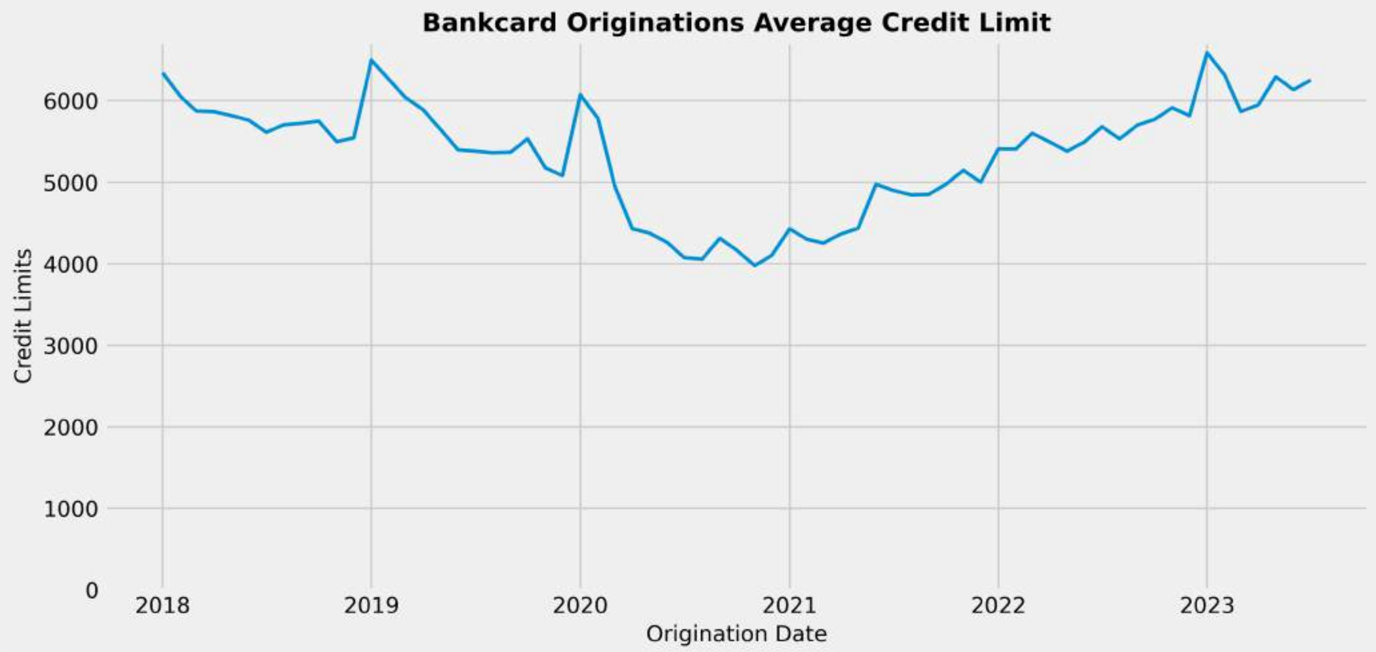
Credit card issuers have tightened subprime originations

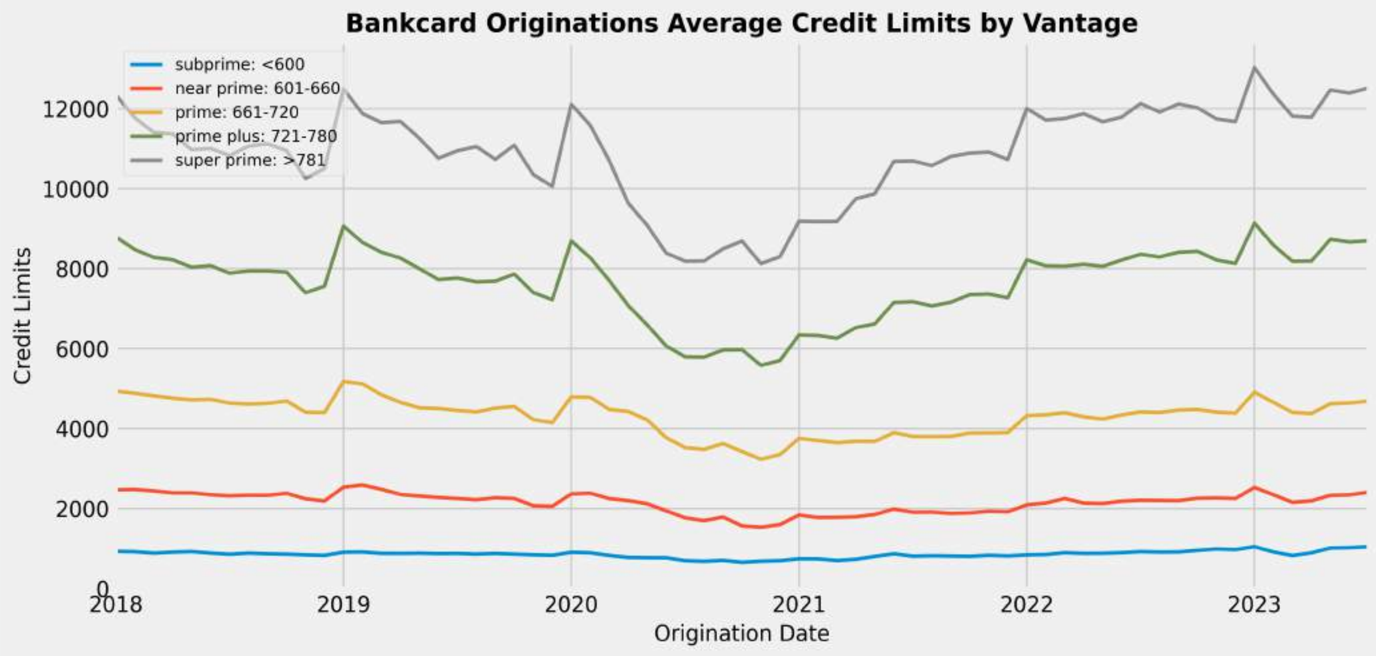


Decrease in subprime originations compared to 2022 levels

Source: 2OS, Equifax Ignite. Originations through July 31, reported as of September 30, 2023.
Vantage buckets at time of origination.

Origination credit limits have increased and back to near pre-pandemic averages





Source: 2OS, Equifax Ignite. Data as of September 30, 2023.
Vantage buckets are lagged 3 months from the performance date. For more details on methodology, see appendix.

- State of the Consumer
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- Auto
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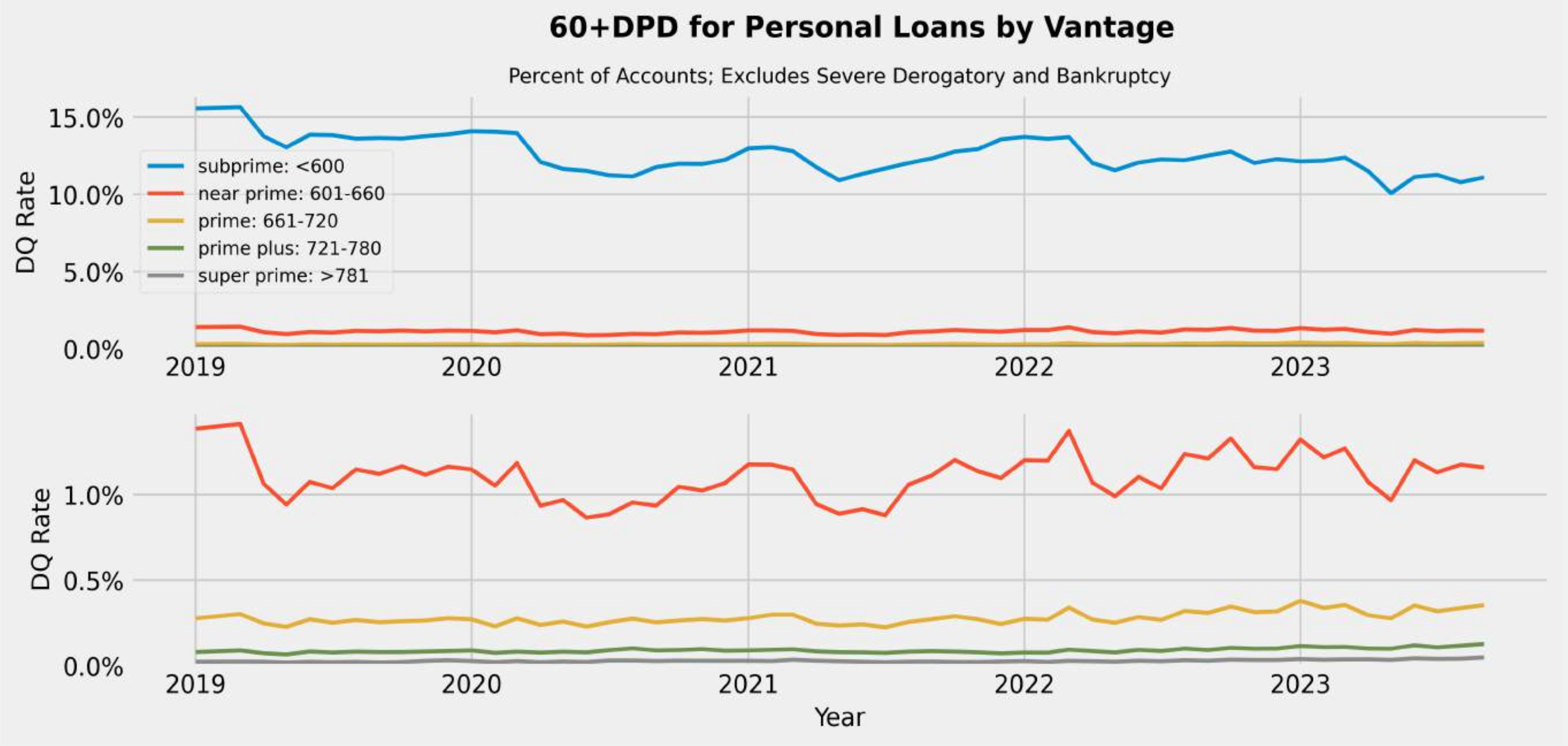
- Mortgage

Near prime and subprime delinquencies have flattened in recent months



Source: 2OS, Equifax Ignite. Data as of September 30, 2023.
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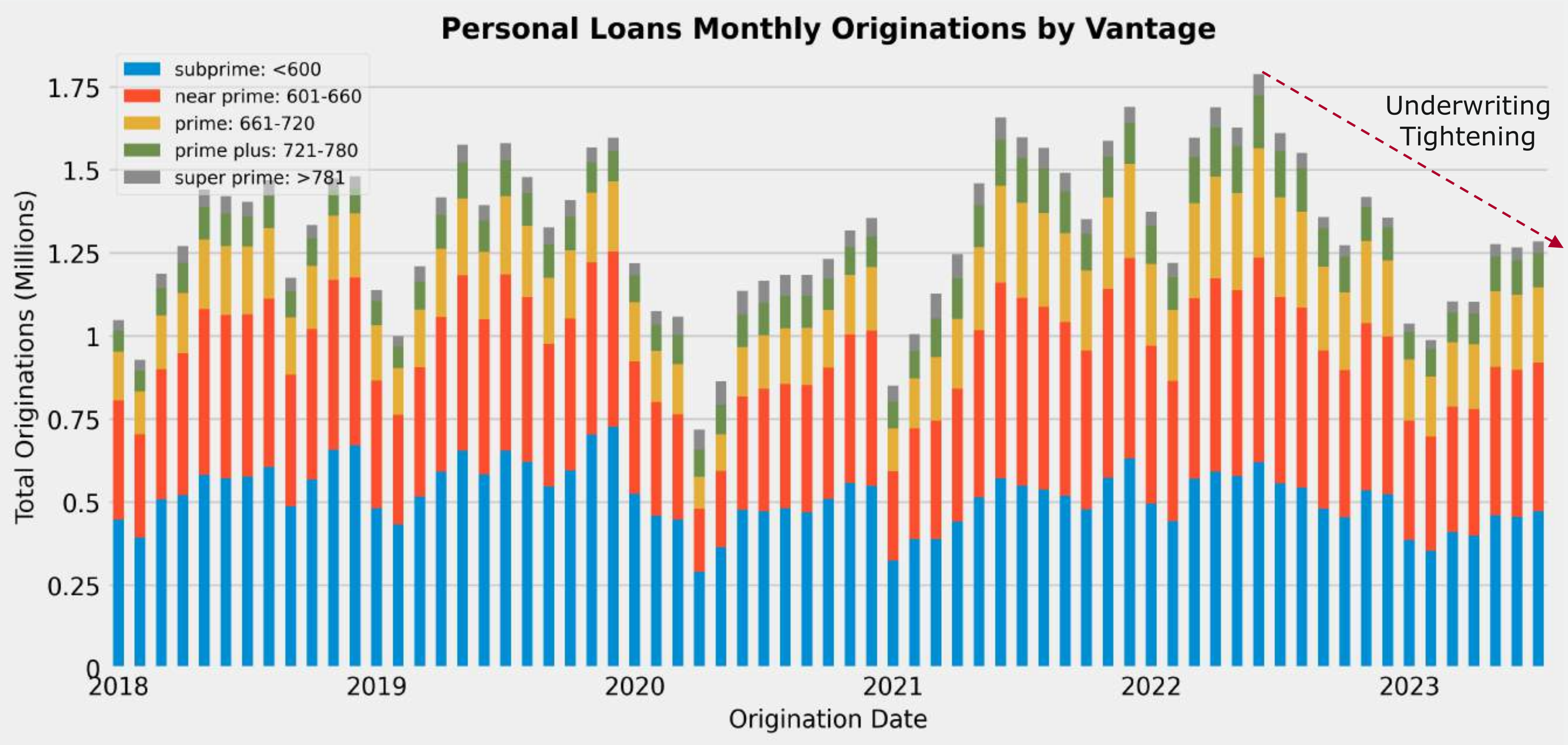
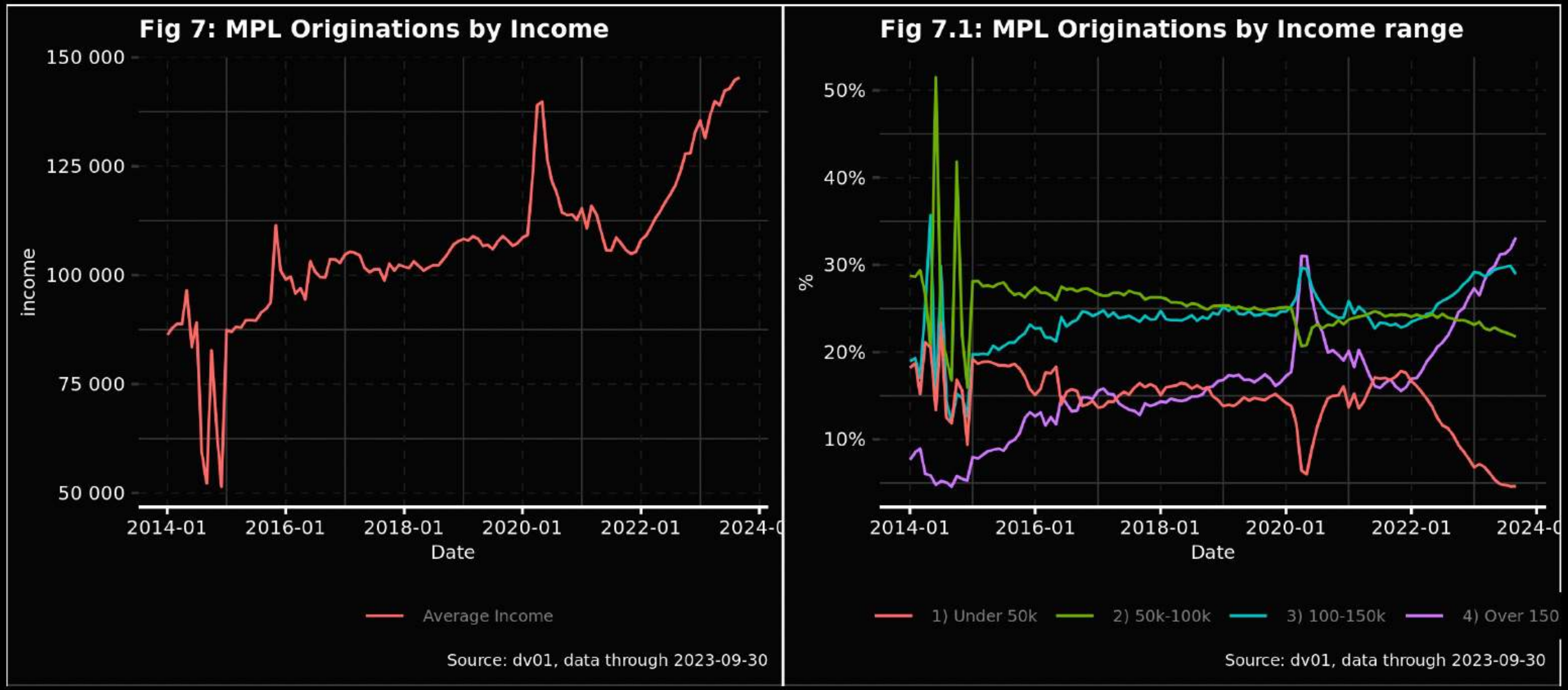
Significant tightening in underwriting compared to last year



Source: 2OS, Equifax Ignite. Originations through July 31, reported as of September 30, 2023.
Vantage buckets are lagged 3 months from the performance date. For more details on methodology, see appendix.

Tightening in Underwriting

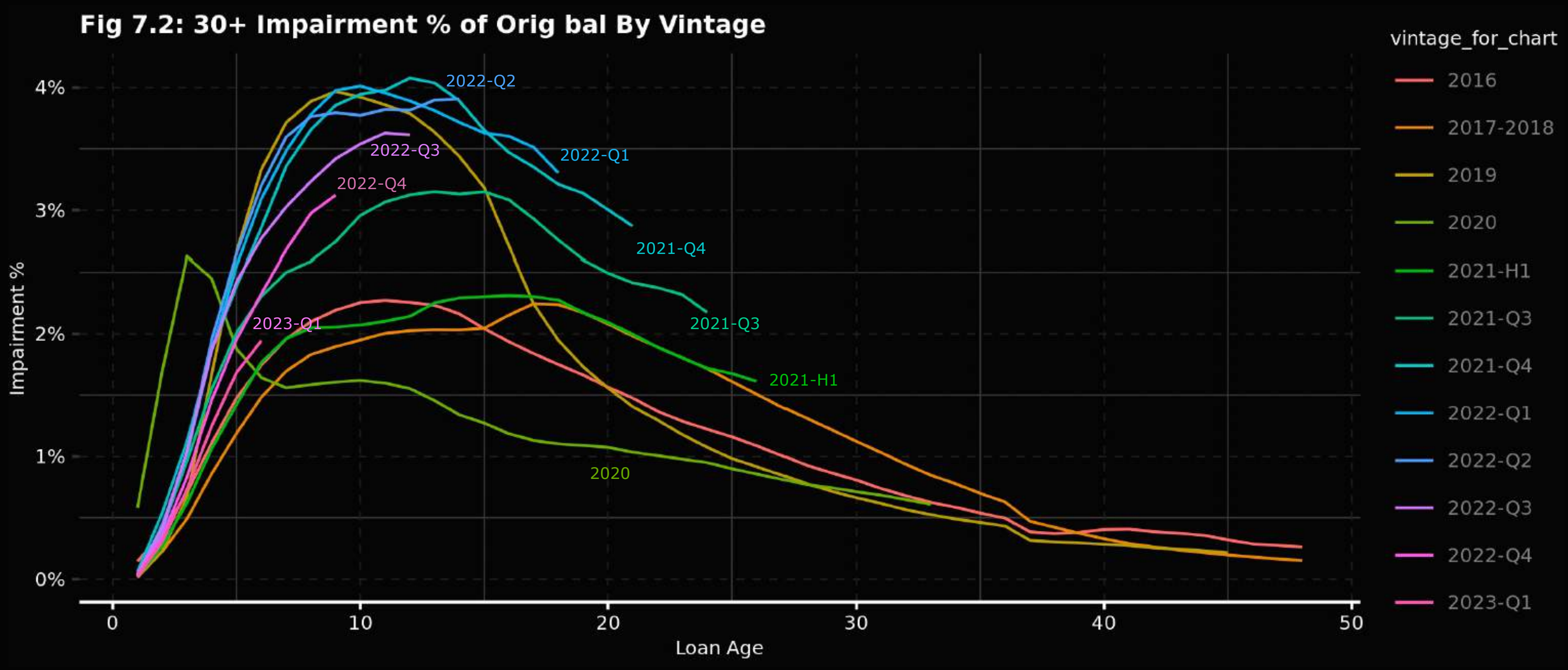
Avg PL origination income is well above pre-COVID levels and loans to sub-$50K income remain low.



Source: dv01, data as of September 30, 2023

Due to credit tightening, more recent vintages show improved performance

Impairment = DQ + Modification



Lenders who tightened more heavily in 2022 are seeing better performance

Source: dv01, data as of September 30, 2023

Prepayments rose slightly in the last quarter in line with seasonal trends. Levels are back to near pre-COVID averages

Subprime loans are still below pre-COVID prepayment trends

Source: dv01, data as of September 30, 2023

- State of the Consumer
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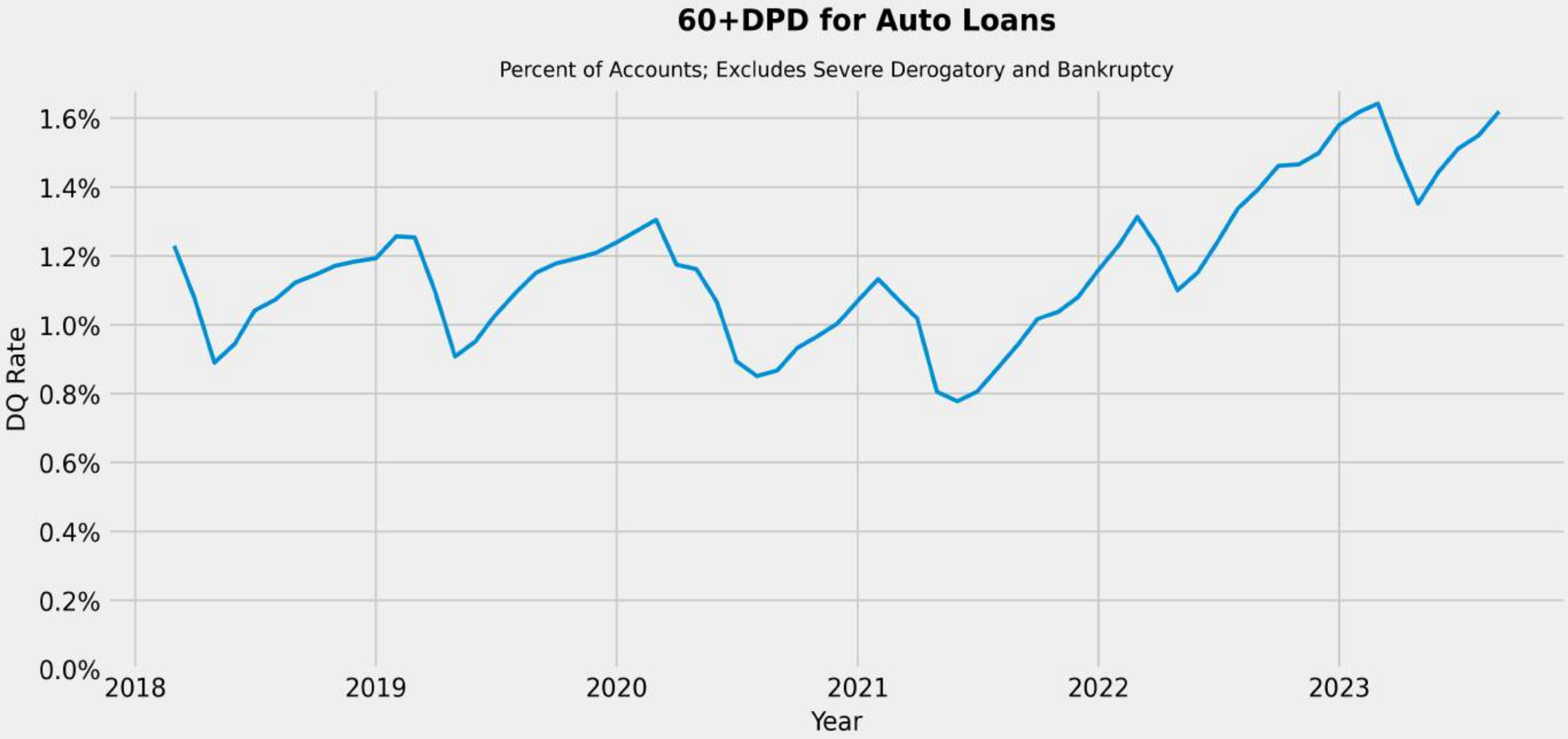
Auto delinquencies increased and are trending above pre-pandemic levels

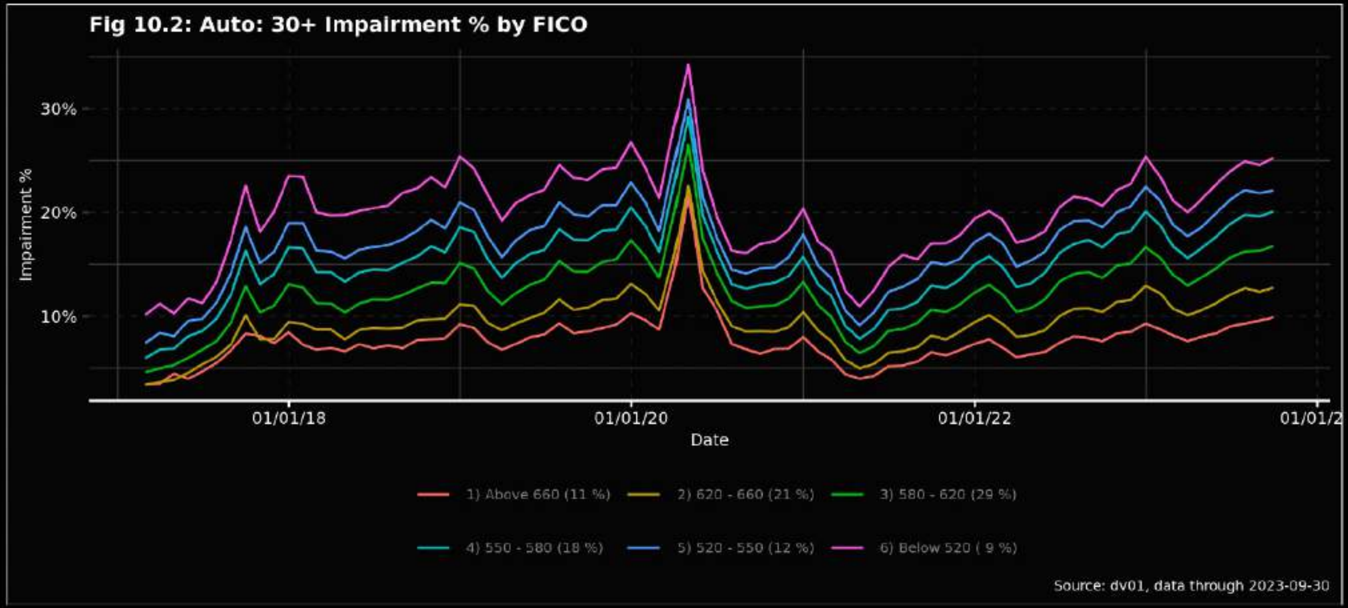


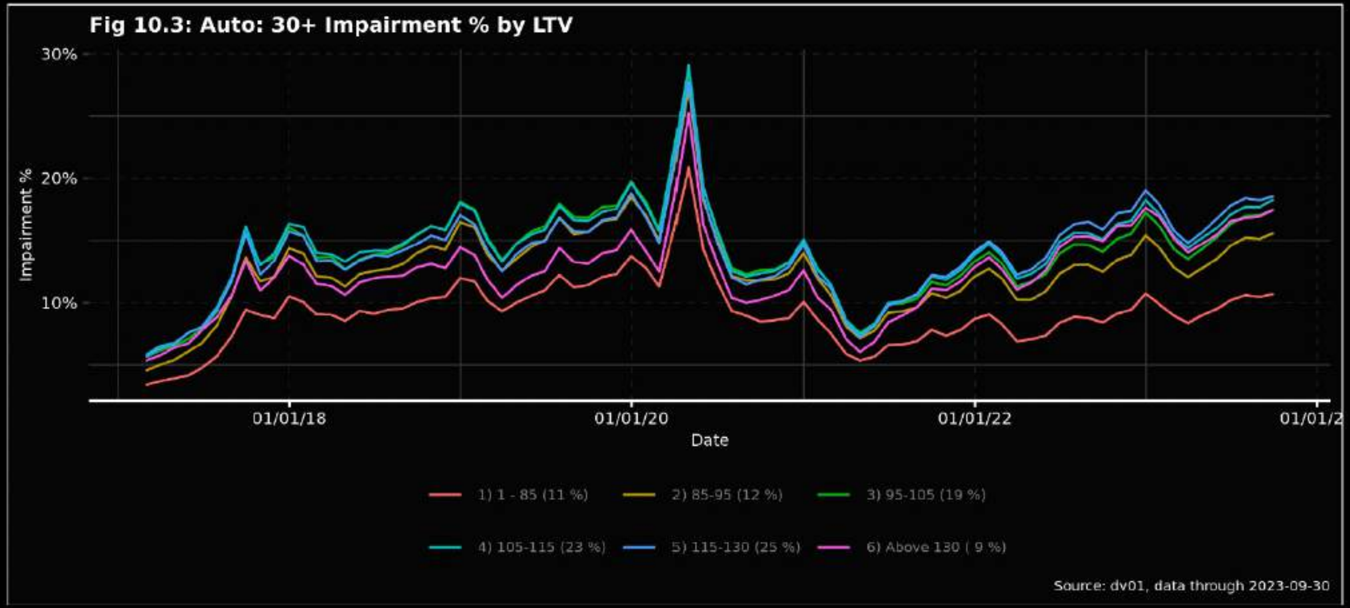
Source: 2OS, Equifax Ignite. Data as of September 30, 2023.

Impairment = DQ + Modification

Delinquencies increased across all FICO bands

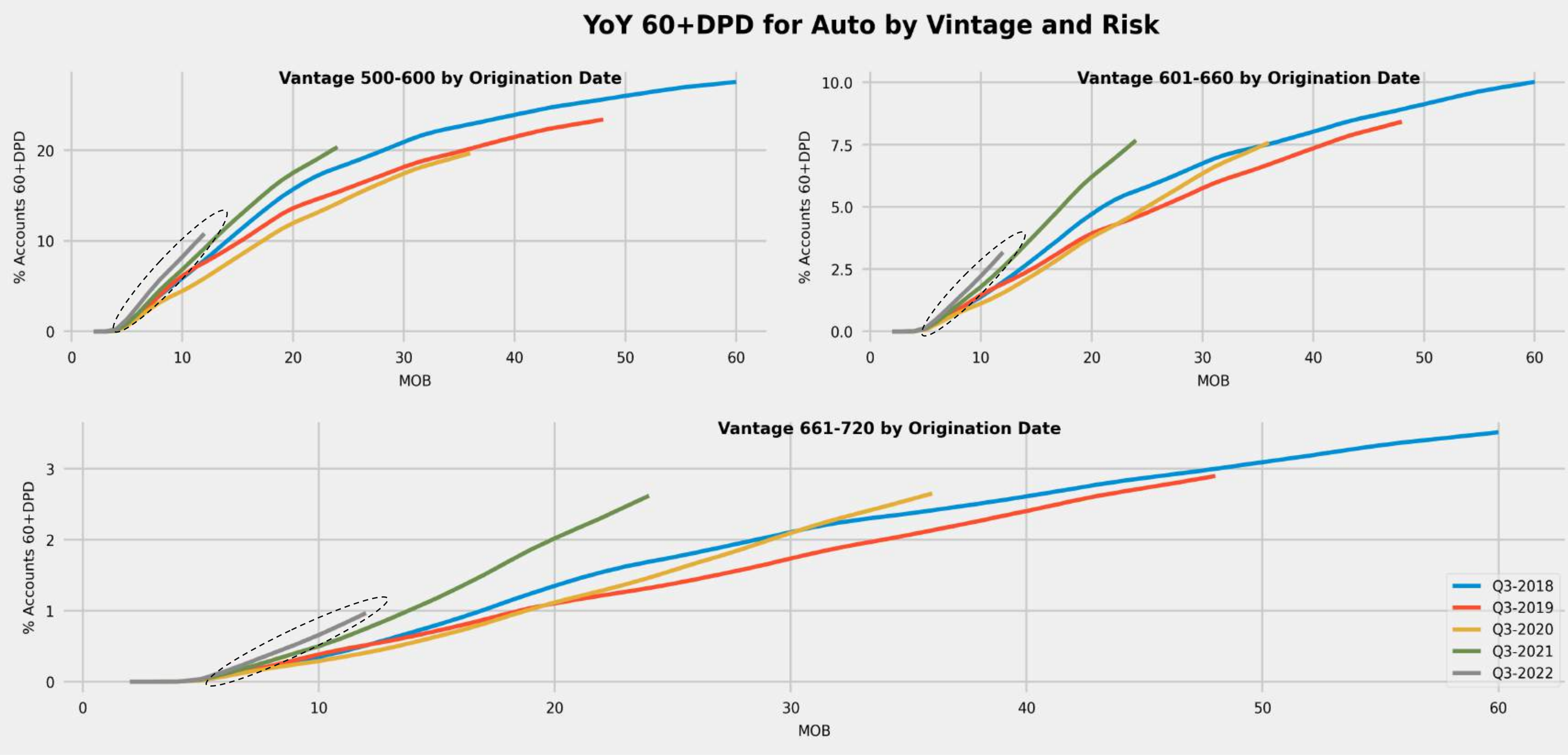
LTV continues to be a key risk differentiator post-COVID





Source: dv01 Subprime Auto, data as of September 30, 2023

Even when adjusted for origination risk score, the recent vintages continue to perform worse than before

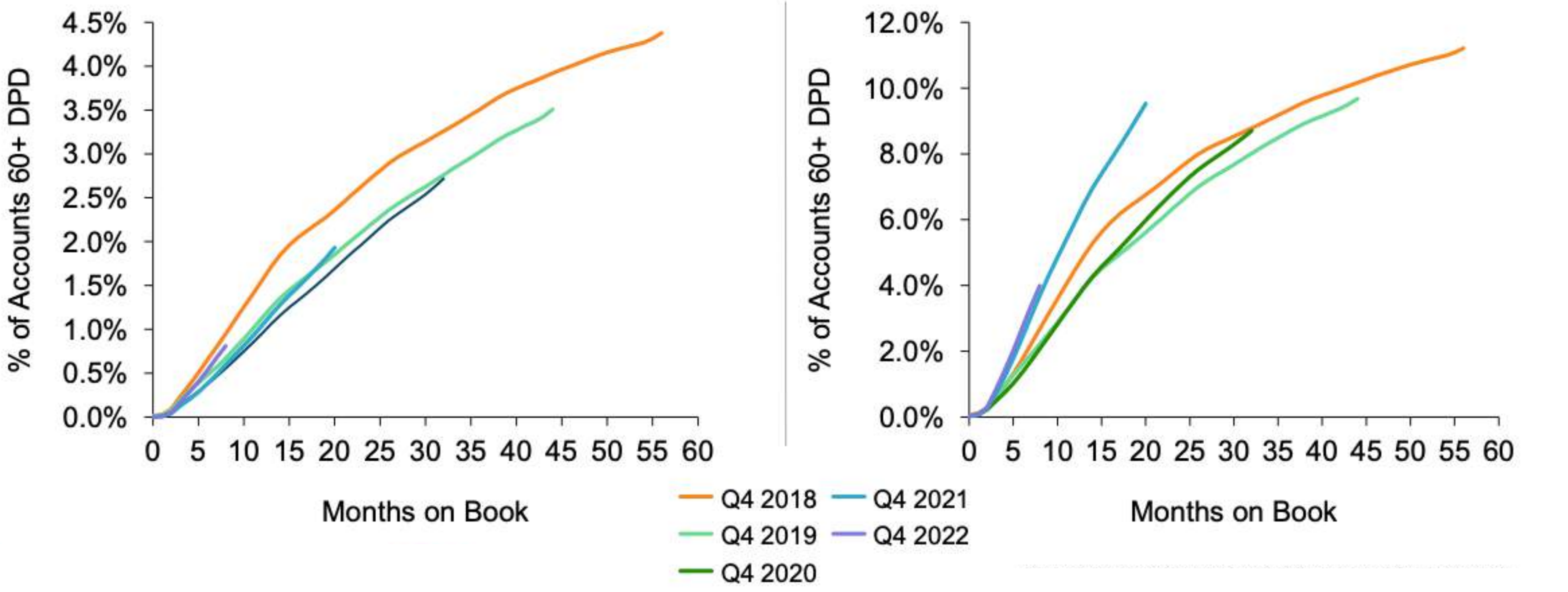


Source: 2OS, Equifax Ignite. Data as of September 30, 2023.

The performance of Used Auto has worsened in recent vintages, while New Auto is in line with pre-pandemic

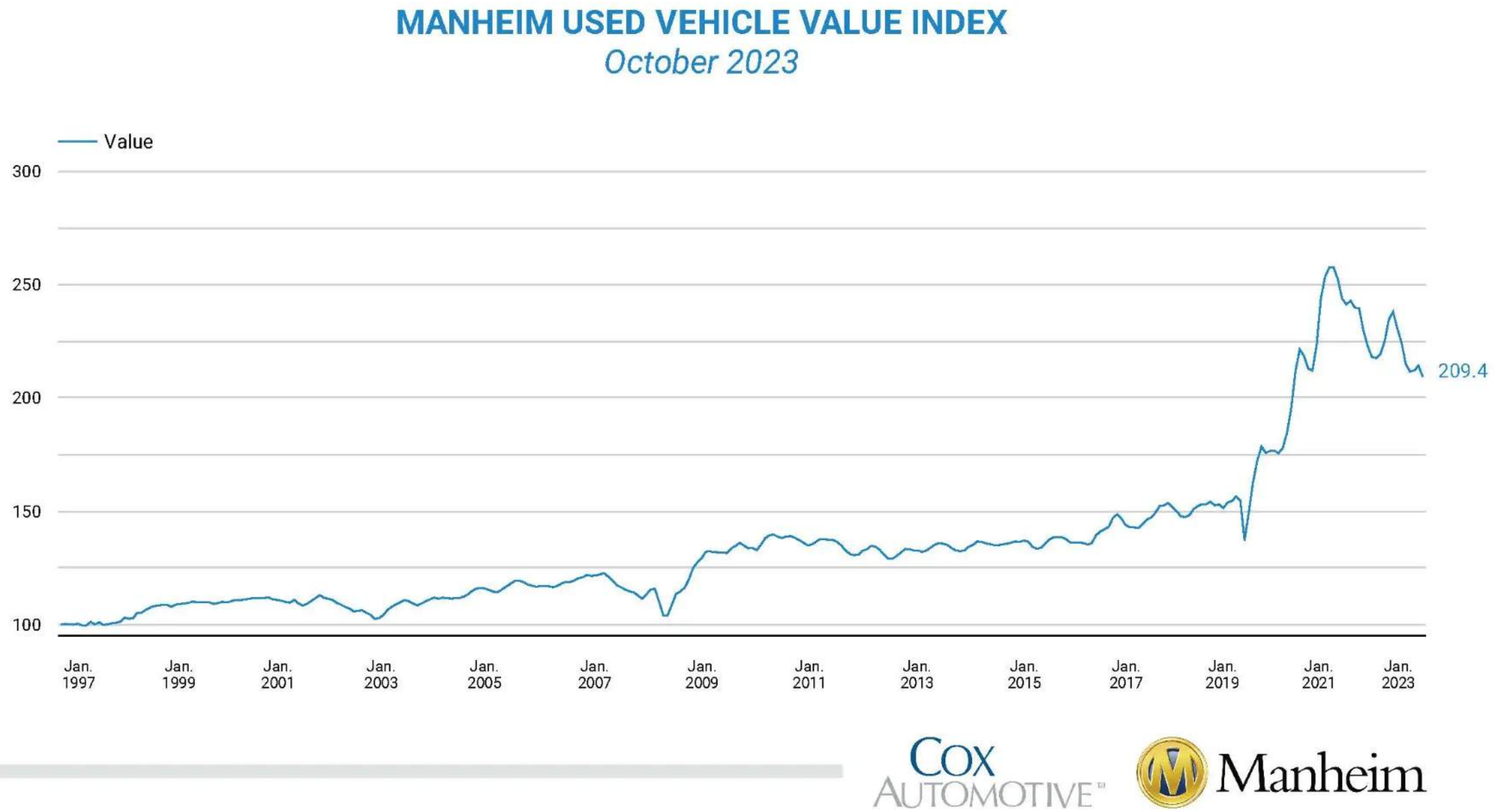
Vintage Delinquency of New Auto Loans and Leases

Vintage Delinquency of Used Auto Loans and Leases



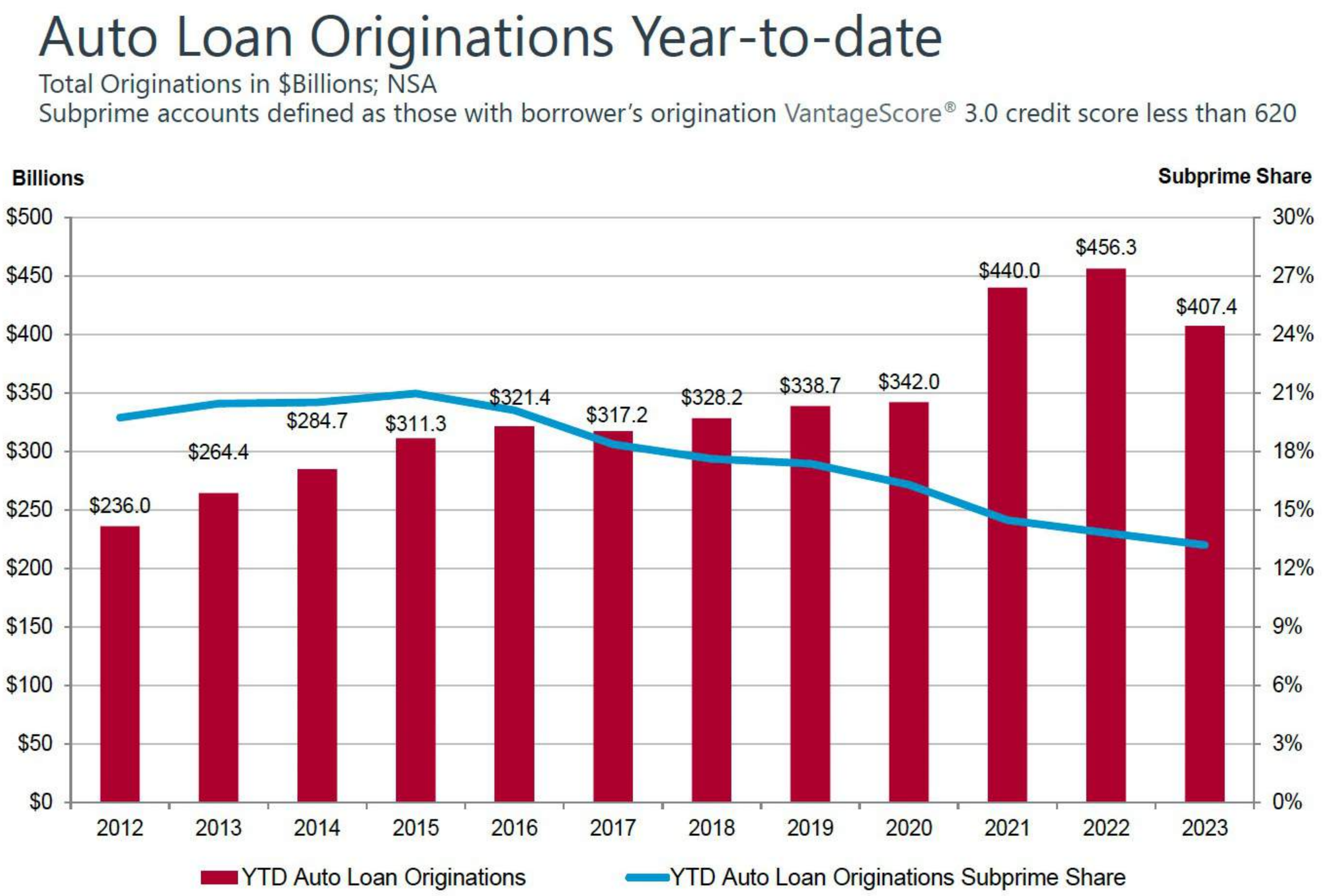
Source: Transunion

Wholesale used-vehicle prices remain elevated



Elevated car prices and high interest rates continue to hinder Auto originations

Subprime share of originations continues to reach decade lows

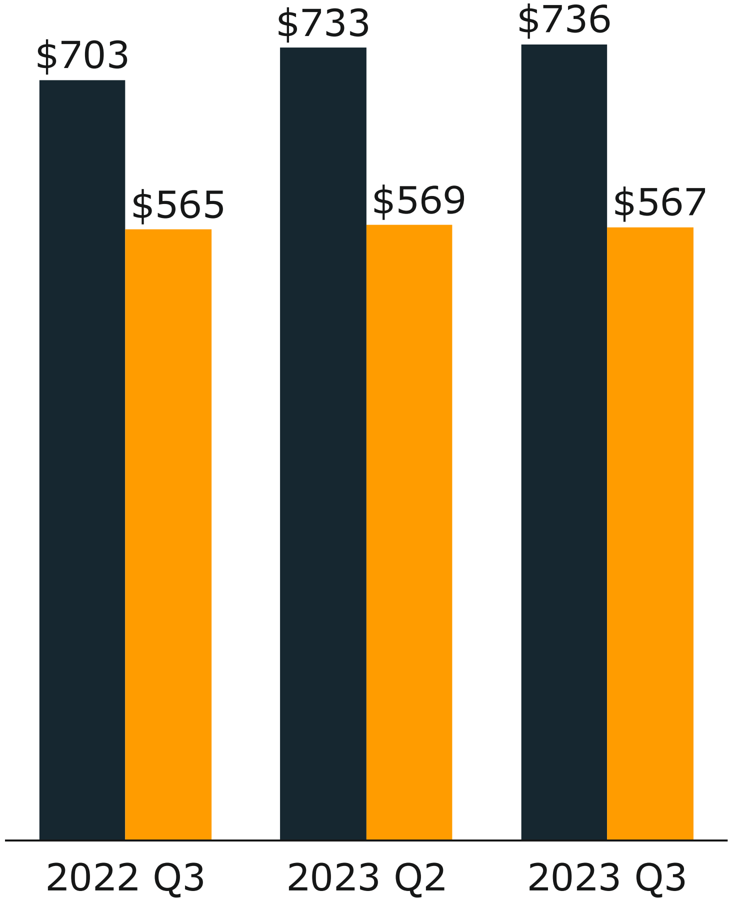


Source: Equifax, originations through July 2023 reported as of September 30, 2023

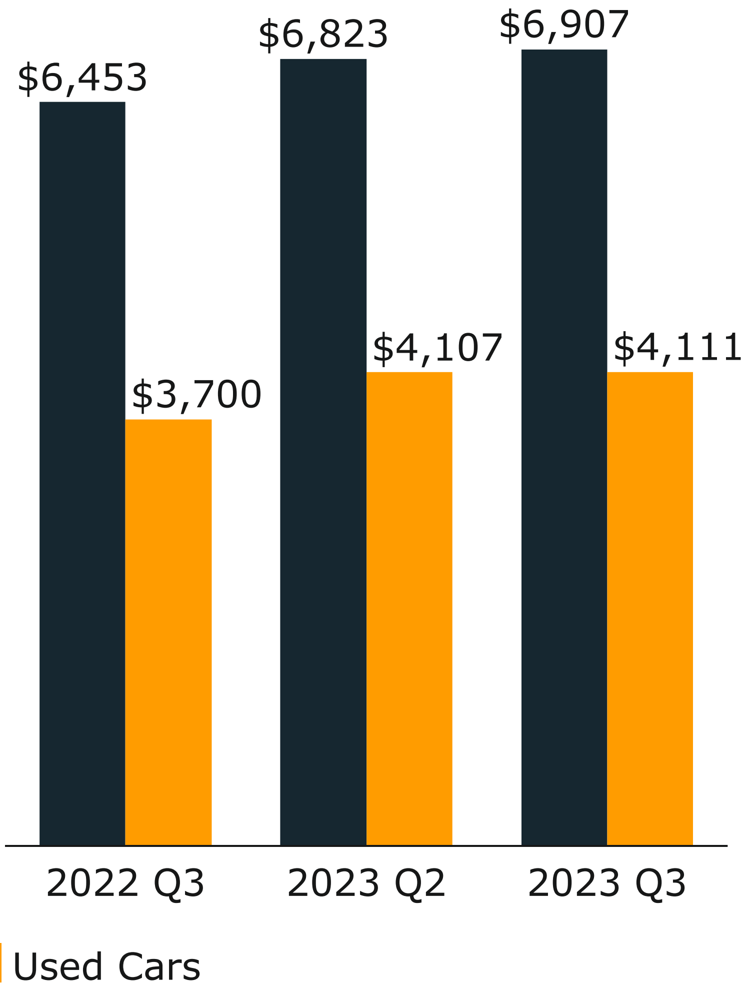
Higher interest rates and vehicle prices are driving high monthly payments

Average down payment reached record highs as consumers attempt to grapple with high interest rates

Average monthly payment on new and used cars



Average down payment on new and used cars

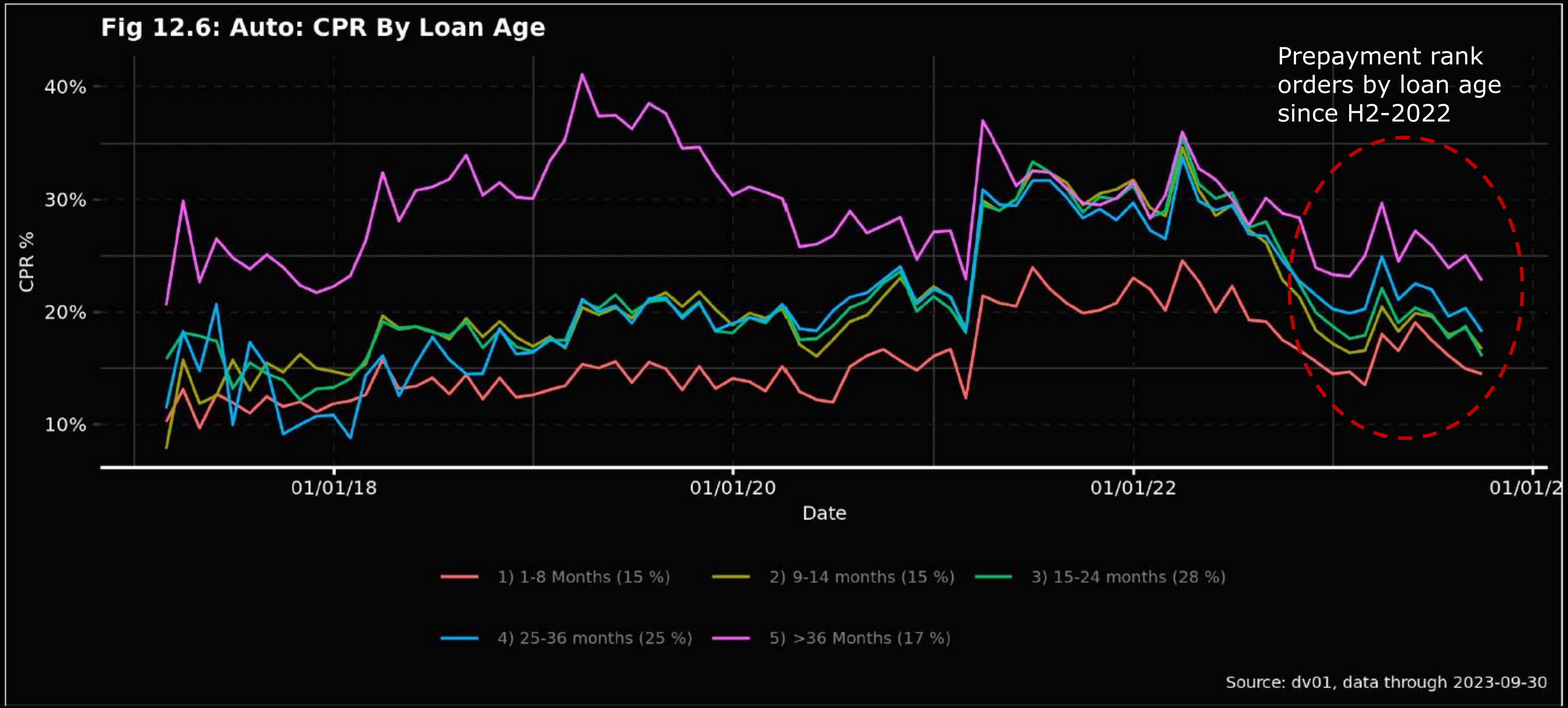


Source: Edmunds, data as of October 3, 2023

Prepayment rates have decreased in Q3

Sustained increase in auto prices and rates reflect in lower prepayments for more recent loans

Loan Age = Months between Origination and Reporting Date



Source: dv01, data as of September 30, 2023

- State of the Consumer
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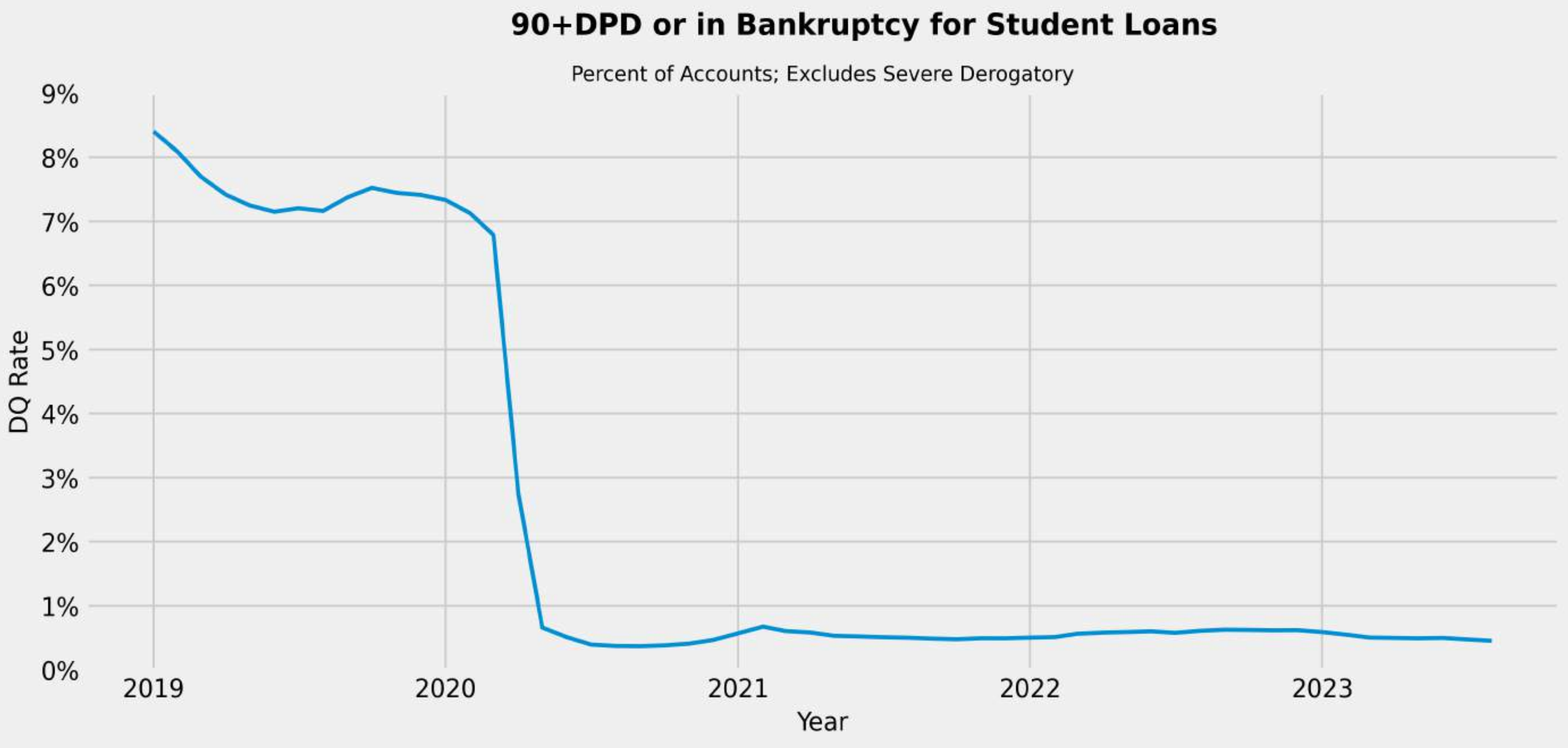
- Auto
- **Student Loan**
- Mortgage

Federal student loan delinquencies have been non-existent because of deferral programs

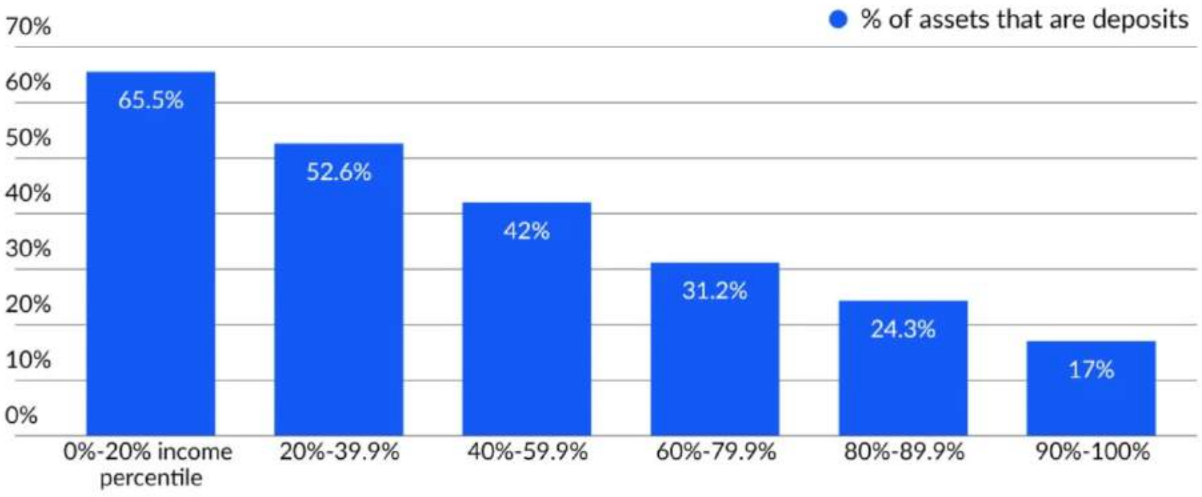
As deferrals expired in September 2023, we can expect an increase in risk across other asset classes as payment burdens rise



Source: 2OS, Equifax Ignite. Data as of September 30, 2023.

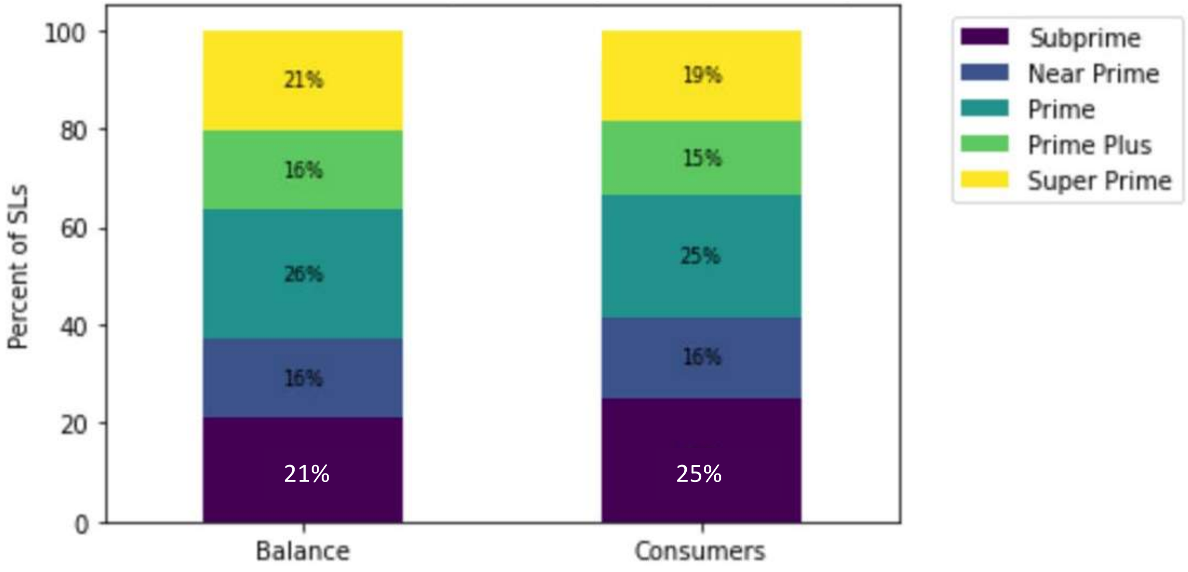
As a result of SL repayment, banks could see a decline in deposits among lower income customers

Deposits as a percentage of assets by income bucket



Source: Federal Reserve

Distribution of student loan population by Vantage Score (June 2023)

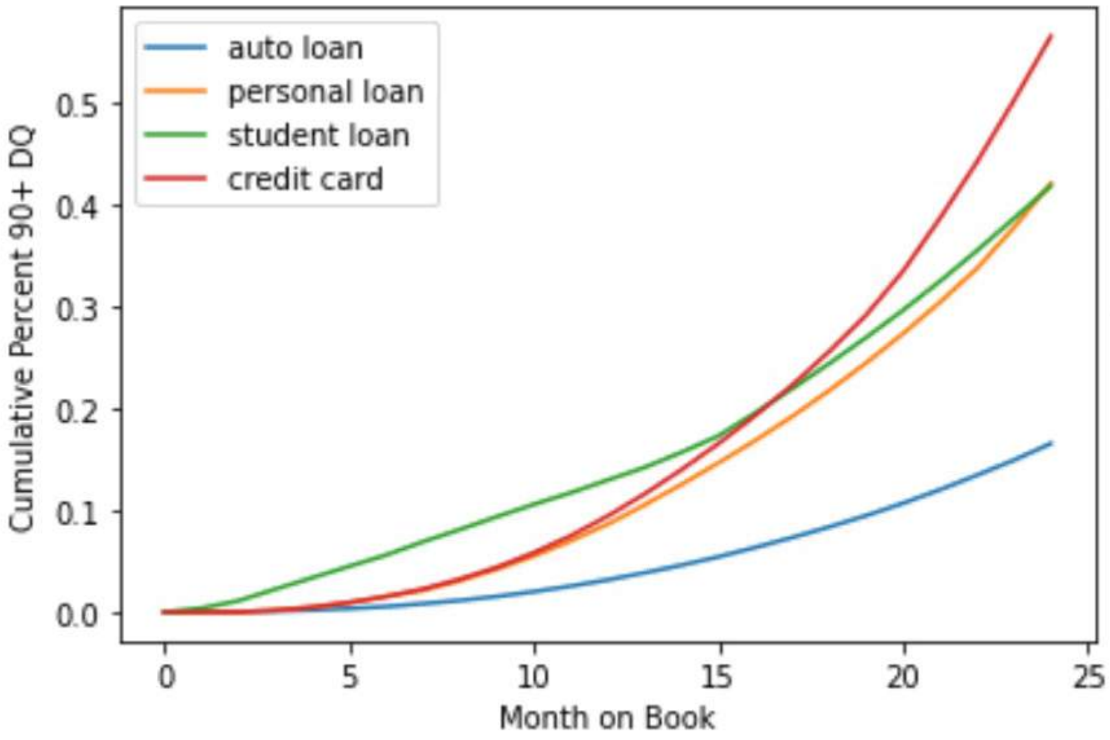


Source: 2OS, Equifax Ignite

Lower-income and subprime households are more likely to have SL debt and they are likely to draw from their largest asset, deposits, to repay their debt.

Student Loans are ahead of credit cards in payment hierarchy, suggesting the end of Student Loan forbearance will most affect credit card repayment

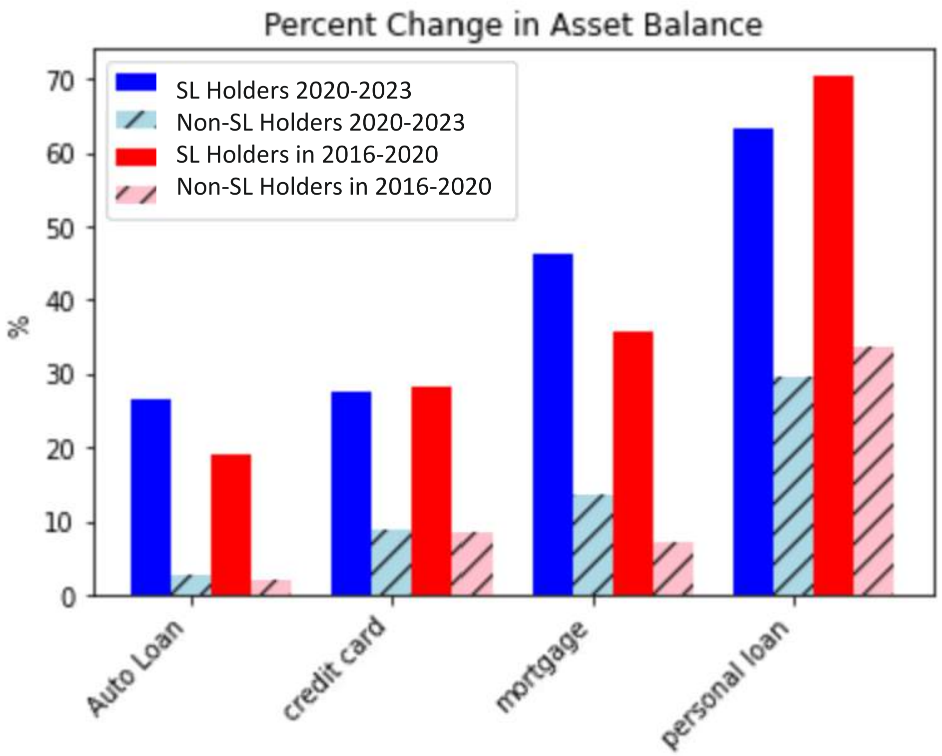
Serious Delinquency for borrowers with many asset types Across Asset Types: February 2018-2020

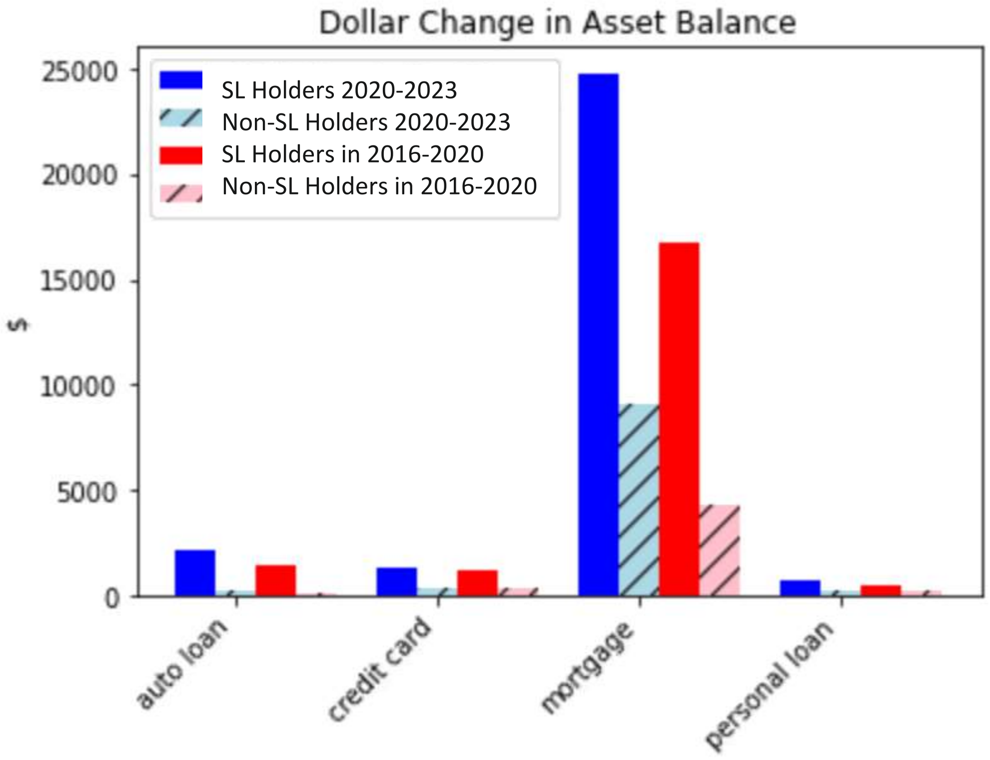


Source: 2OS, Equifax Ignite
Cohort includes a random sample of borrowers who had all 4 displayed loan types open in February 2018 and were current on their payments.

SL-borrowers took out more new debt than non-SL borrowers during the last 3 years, but the same is true of SL-cohorts from before the pandemic

Additional Debt Accumulated Over 3 Years: 2016-2020 and 2020-2023



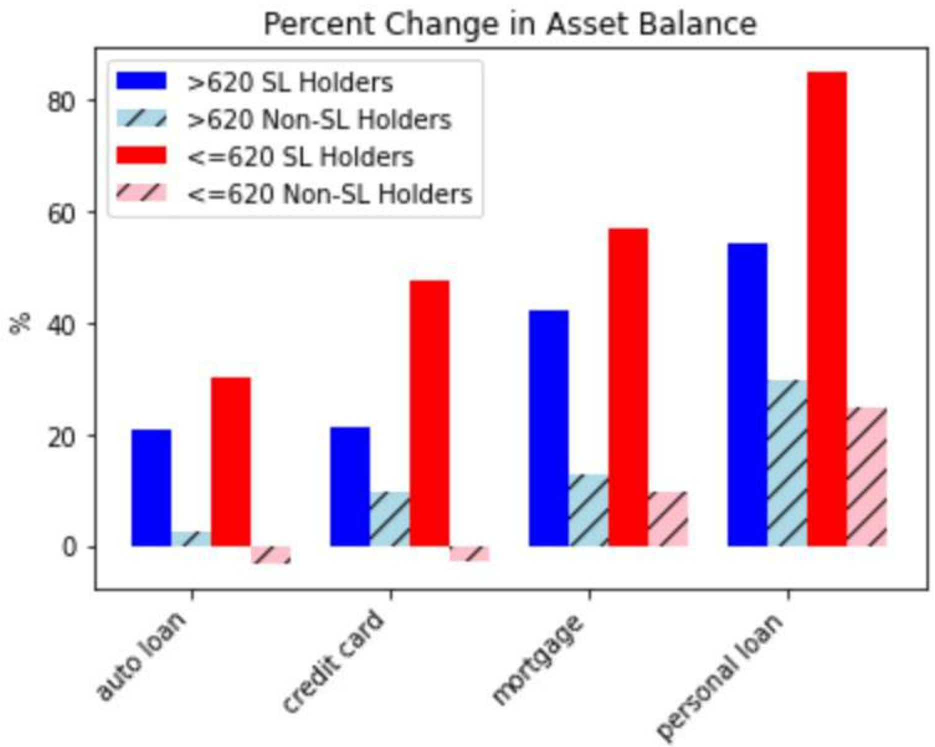


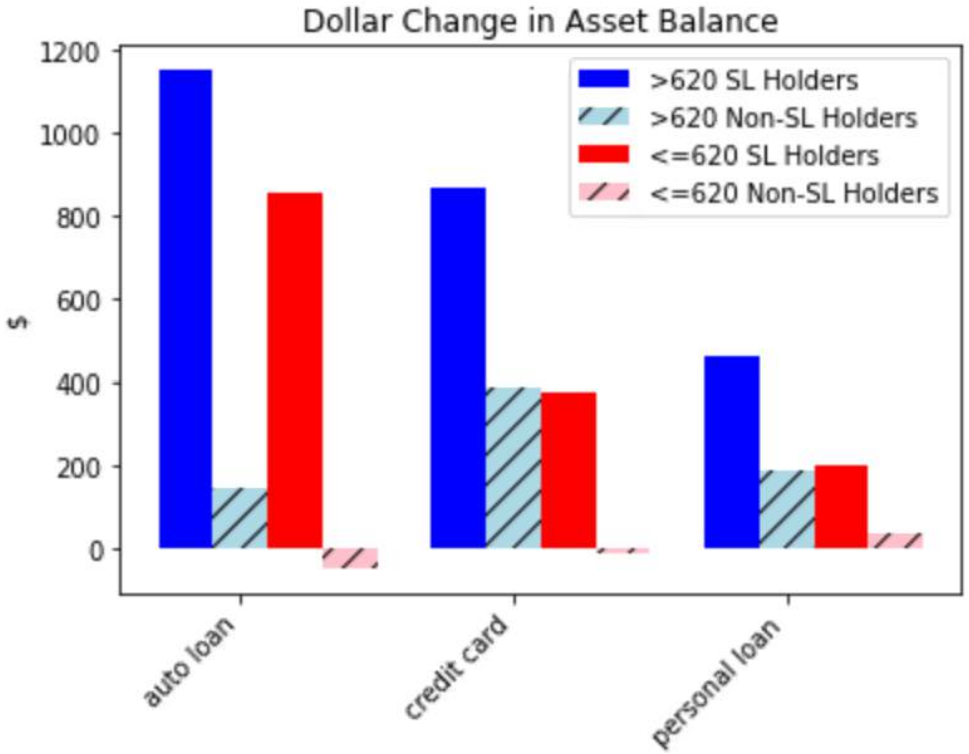
Amongst asset classes, mortgage balances grew the most in both 3-year windows, likely reflecting inflation in the housing market rather than pandemic-particular trends

Source: 2OS, Equifax Ignite
Note: 39-month periods: October 2016-February 2020 and March 2020-June 2023

The riskiest SL-borrowers (Vantage <= 620) accumulated less debt than their higher-credit counterparts during the pandemic, but still more than non-SL holders.

Change in Outstanding Loan Debt for Other Asset Classes by Vantage Score: March 2020-June 2023





Increased debt of SL borrowers is true across Vantage scores and suggests that the increase in payment burden due to the end of student loan deferrals could have a meaningful impact

Source: 2OS, Equifax Ignite

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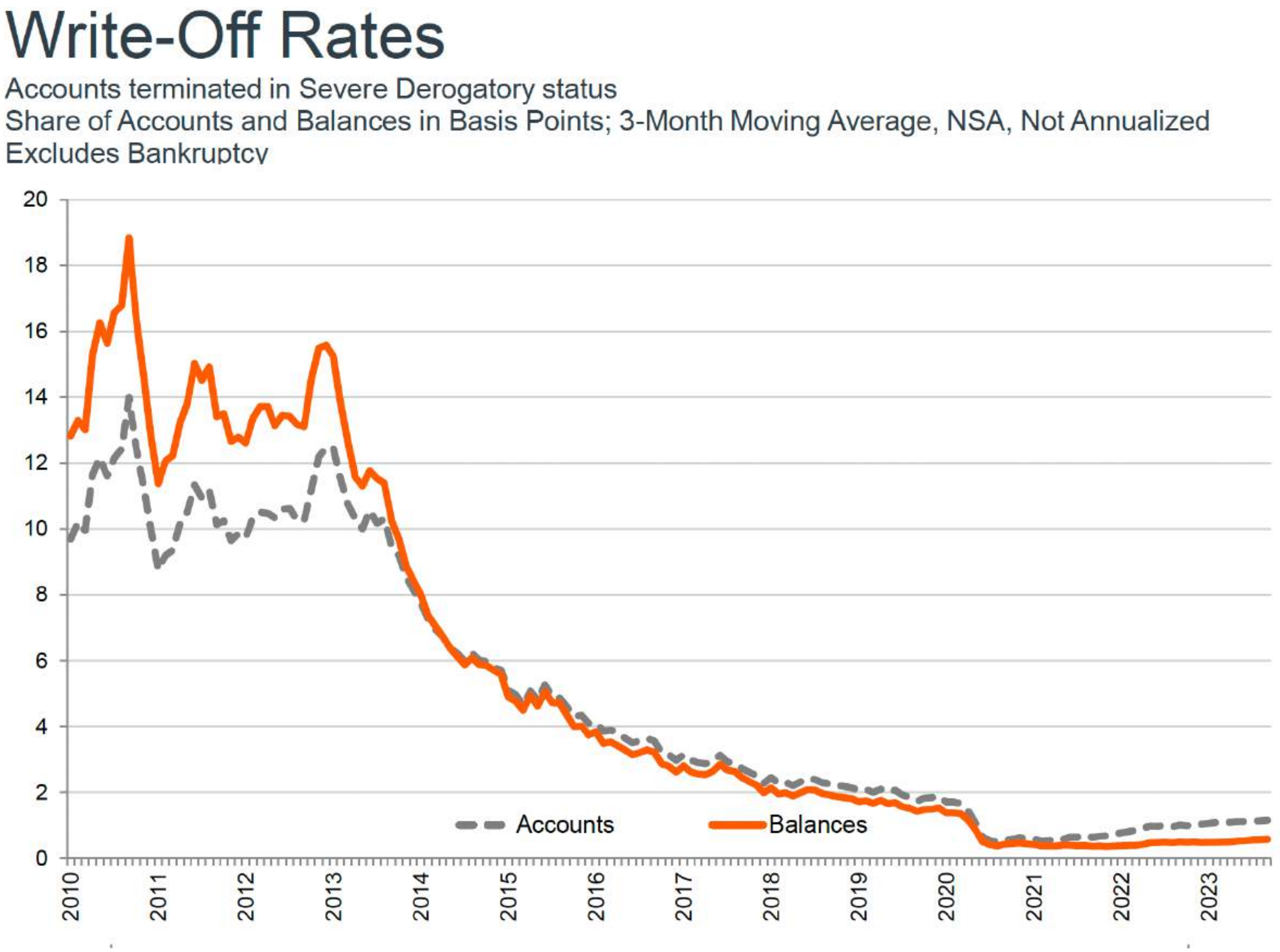
Write-off rates are trending slightly upwards but still well below pre-pandemic levels

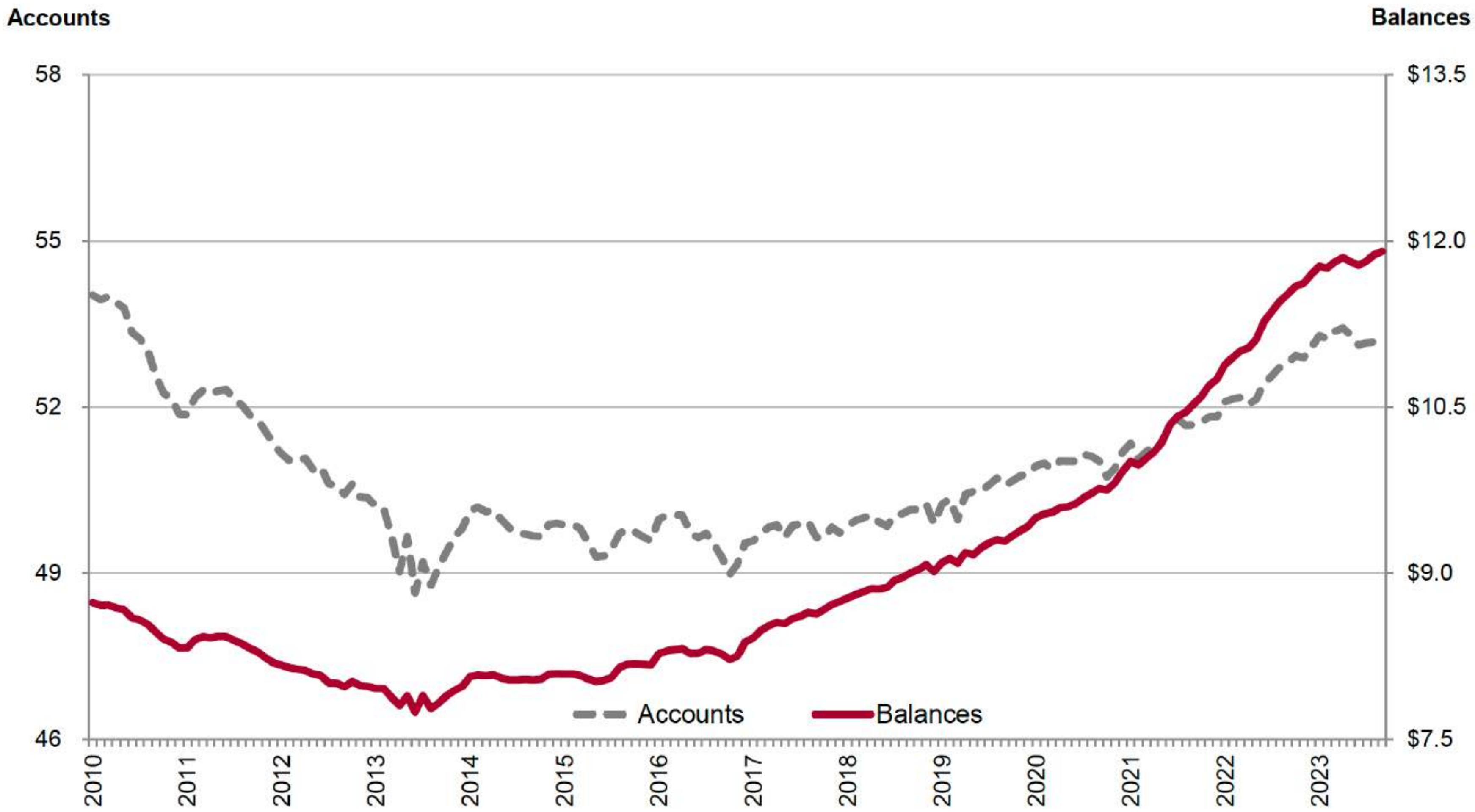


Source: Equifax. Data as of September 30, 2023.

Mortgage balances continue to increase due to elevated housing prices and interest rates

Outstanding Loans

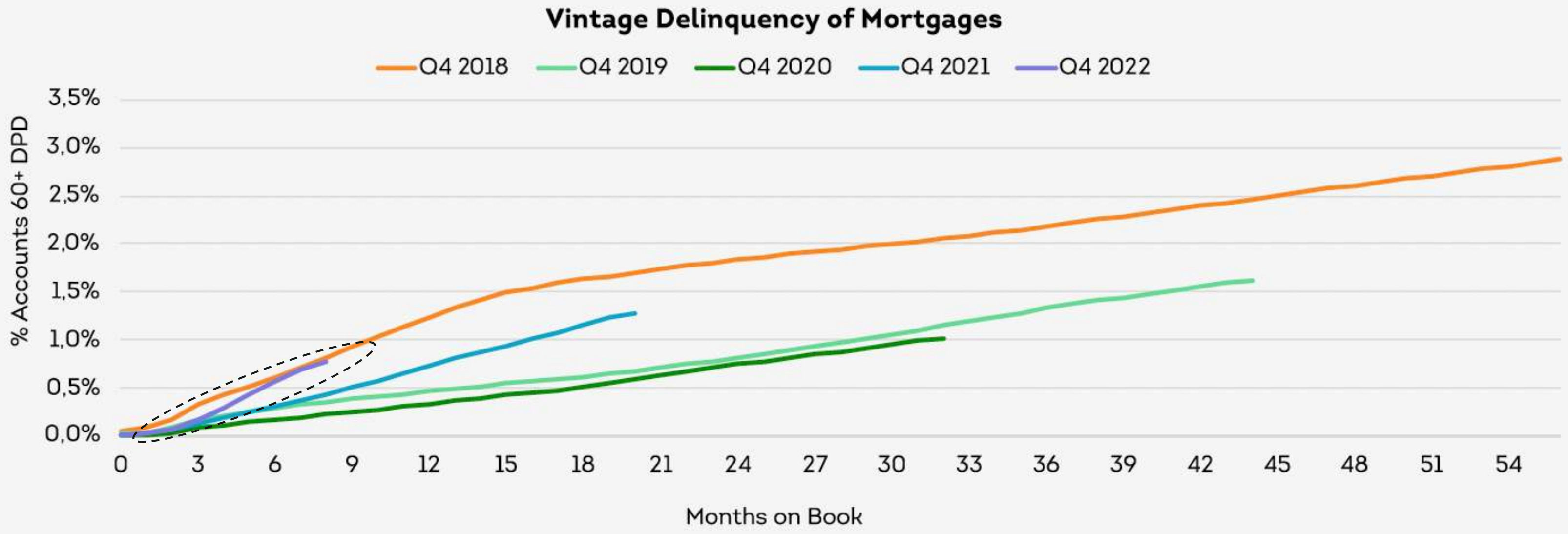
Number of Accounts in Millions; NSA
Balances in $Trillions; NSA



Source: Equifax, Transunion. Data as of September 30, 2023.

Newer vintages are performing worse than those from 2019-2021

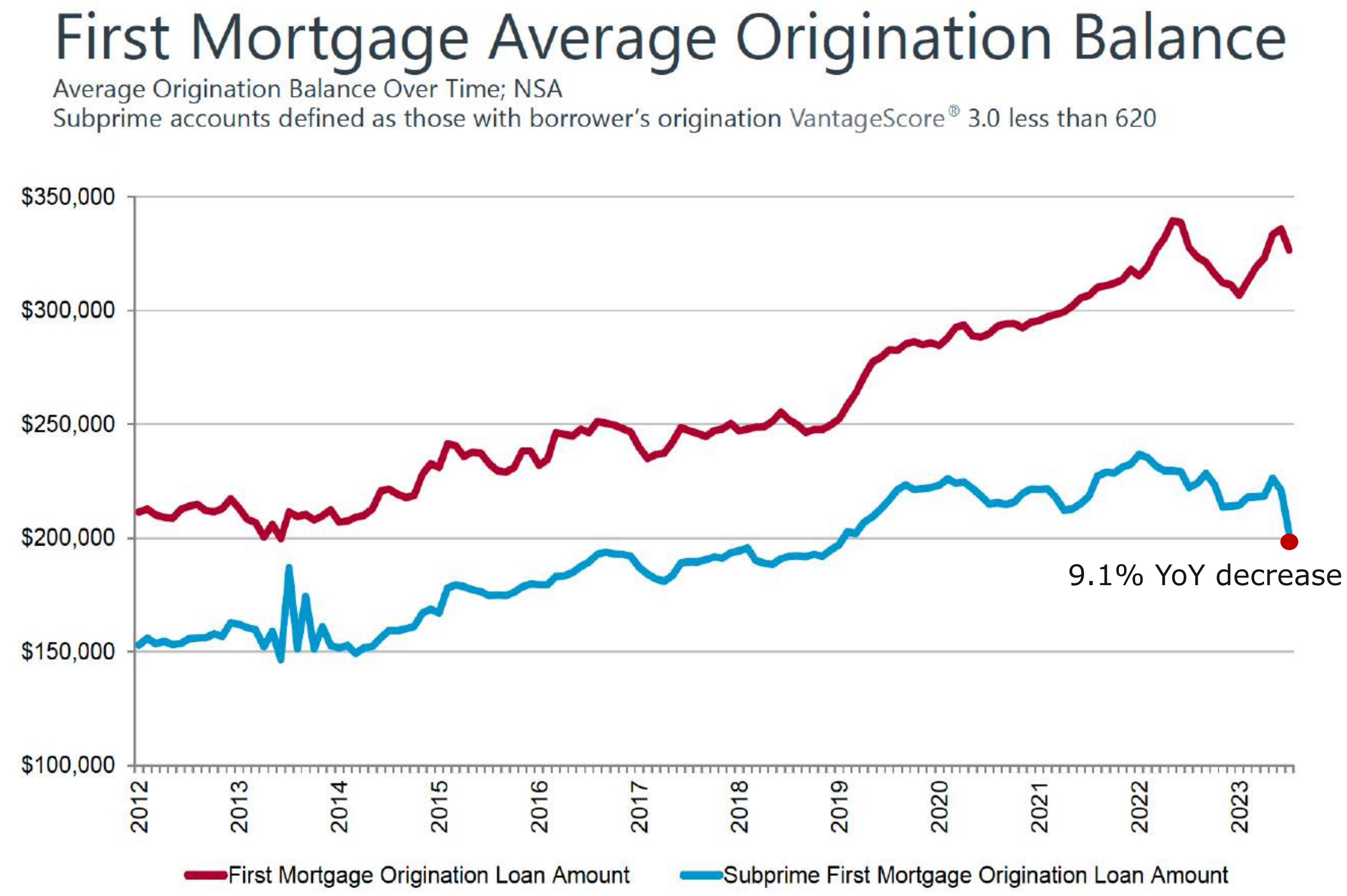
High interest rates and increased payment burdens are affecting consumers' ability to pay mortgage on time



Source: Transunion. Data as of September 30, 2023.

The average loan amount for subprime mortgages has significantly decreased

There has been a 31% YoY decrease in subprime mortgage originations.



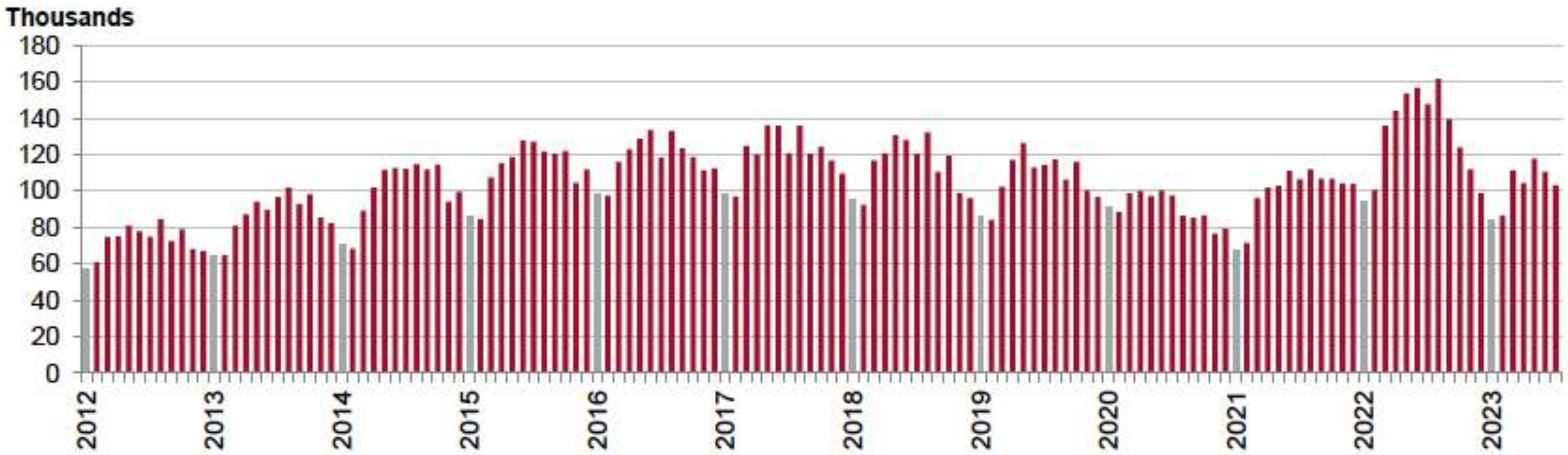
Source: Transunion. Data as of September 30, 2023.

Increasing home equity continues to drive HELOC originations

4.4% of HELOCs have been issued to subprime accounts YTD.

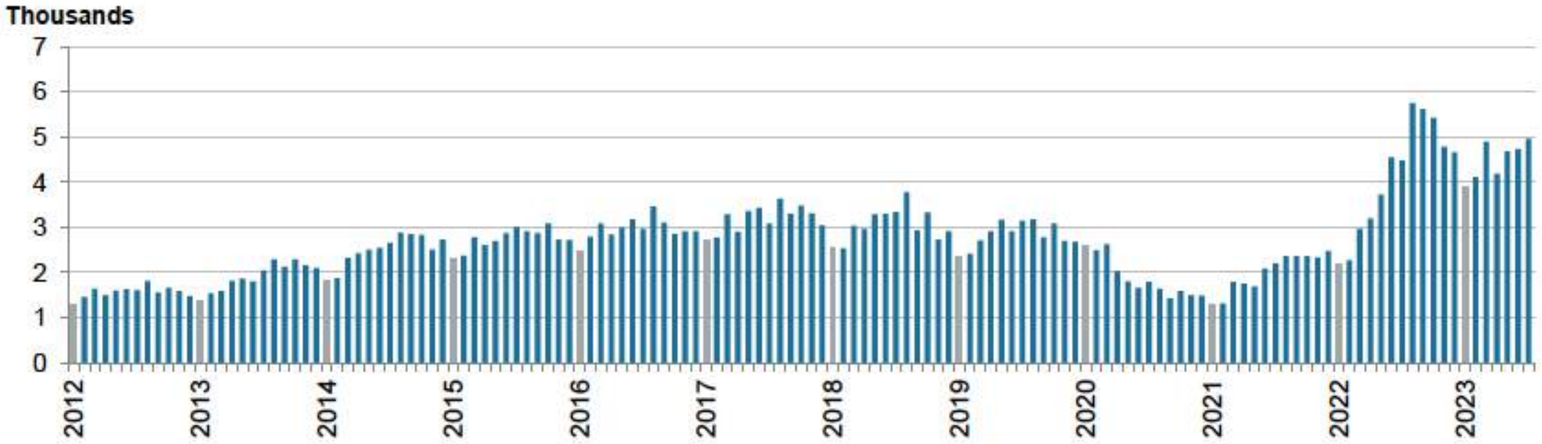
HELOC Originations: Accounts

Number of Accounts in Thousands; NSA



Subprime HELOC Originations: Accounts

Number of Accounts in Thousands; NSA
Subprime accounts defined as those with borrower's origination VantageScore® 3.0 less than 620



Source: Equifax. Data as of September 30, 2023.

Acknowledgments

The authors would like to especially thank Equifax for facilitating the Ignite platform for generating these views. The authors would also like to thank dv01, Bank of America, and Transunion for providing data used to generate insights in this paper.

This report was prepared by Elizabeth Mejia-Ricart, Syed Raza, Chase Nielsen, and Scott Barton.

- **Elizabeth Mejia-Ricart** is a Sr. Data Scientist at 2nd Order Solutions with experience building individualized credit models and policies for fintechs and large banks. She has also developed customizable optimization algorithms grounded in performance data to efficiently allocate marketing spend between credit products.

- **Syed Raza, PhD** is a Sr. Manager of Data Science at 2nd Order Solutions with experience in quantitative modeling and the lending industry. He has built several credit risk models for both big banks and fintechs, advising clients across the consumer credit lifecycle. He specializes in consumer credit research & unsecured lending.

- **Chase Nielsen** is an Associate Principal at 2nd Order Solutions; with experience across all customer lifecycles of secured and unsecured lending. He has overseen multiple model development projects, including risk models for new account originations, customer management, and loss mitigation. Additionally, he has led model audit/diagnostics for both fintechs as well as larger issuers.

- **Scott Barton** is the Founder and Managing Partner at 2nd Order Solutions; he has led hundreds of major initiatives for major banks and fintechs, including overhauls of Collection strategies, overarching model redesigns, and major architectural changes to organizational credit risk assessment. He previously was one of a handful of Senior Credit Officers at Capital One and led several business units, including Partnerships, Collections, Recoveries, and Fraud.

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About 2OS

2nd Order Solutions (2OS) is a boutique credit risk advisory firm that specializes in solving the world's most challenging credit problems. 2OS was founded 12 years ago and consults to a wide range of banks, card issuers, fintechs, and specialty finance companies in the US and abroad.

2OS has deep experience with lending businesses across Card, Auto, Small Business, and Personal Loans, at all points in the credit lifecycle. 2OS partners have vast expertise in all aspects of Collections, both as operating executives and as consultants.

For more insights and commentary on the lending industry, visit us at https://2os.com/insights/

Equifax Ignite Definitions

Active Accounts: This includes all accounts that have a reported status in the most recent three months. Accounts categorized as closed or delinquent were included in the month in which the status is first reported and are excluded from active accounts thereafter. For student loans, we only considered those non-deferred accounts. A deferred student loan refers to no payment being required, and generally pertains to students still in school up until 6 months after graduation. Non-deferred student loans relates to students that have already graduated where a payment is required.

Definition of delinquency: For bankcard, auto loans and personal loans, we considered accounts as delinquent if those were 60+ days past due. Specifically, we included those accounts in 60-90 DPD, 90-120 DPD and 120+ DPD buckets; we excluded charged off and bankrupt accounts. For student loans, we considered accounts as delinquent if those were 90+ days past due. We included those accounts in 90-120 DPD, 120+ DPD and bankruptcy buckets; we excluded charged off accounts.

Definition of Personal Loans: We define personal loans as those accounts labeled as personal finance and installment loan.

Vantage bucket timing: To better observe movements within Vantage 3.0 buckets (and reduce the effect of re-classification of accounts across buckets), we lagged the date when the vantage bucket is observed by 3 months from the current archive date when looking at performance charts.

Origination timing: Originations are lagged by 2 months from the current archive date. Hence, the most recent origination datapoint is from July 31, 2023.

Roll Rate Methodology: Roll rates are calculated as percentage of accounts that transition into a higher delinquency bucket in the next month. 30DPD bucket refers to those customers that transitioned into 30-59 days delinquent. Similarly, 60DPD refers to those customers 60-89 days delinquent; 90DPD are those customers 90-119 days delinquent; 120DPD are those customers 120+ days delinquent that have not charged off.