2023 Q1 Credit Risk Review

Trends and Early Risk Indicators in Consumer Credit

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May 12th, 2023

2nd Order solutions

Executive Summary – State of the US Consumer Credit

- Risk increased across most asset classes like Credit Cards and Personal Loans in Q1 2023 while Mortgage risk remained at low levels. However, we do see a slight drop/flattening in delinquencies and other risk indicators in some cohorts.

- Although still elevated, subprime and low-income consumers experienced a noticeable decrease in risk. This is the first time in several months that such a drop has occurred, but it is uncertain whether it signifies a long-term improvement.

- Some indications that this improvement may not be sustained in the long term:

    - This drop in risk is mostly driven by seasonality factors like tax refunds.

    - Another contributing factor is the tightening of underwriting in the last few quarters. We are starting to see the impact of tightening flow through to performance with more recent vintages performing better. As only the best subprime and low-income customers are getting approved, the overall risk of the cohort is flattening and, in some cases, dropping.

- Some indications that this improvement may be a continuing trend:

    - As inflation is easing, the impact is flowing through to cohorts that are most impacted by inflation – low-FICO and low-income consumers. As inflation comes down, the performance of these cohorts will improve further.

    - Despite layoffs in some industries, the overall unemployment rate is still low and holding up.

Executive Summary – State of the US Consumer Credit

Some of the headwinds and tailwinds for consumer credit risk in the coming quarters:

- **Headwinds**
  - Rising interest rates are driving up auto and card payments, putting pressure on consumers.
  - The pause in Student Loan payments is ending in June 2023; this is expected to not only increase losses for student loans but also across other asset classes. One big bank estimates an impact of 3-4% rise in risk on their whole portfolio.
  - Tax refunds, which drive the seasonal improvement in credit risk performance, are already trending 10% lower than last year. Consumers from low-income households saw a decrease whereas high-income households got higher refunds.
  - The warping and gaming of credit risk scores continue to distort the risk signal for consumer underwriting.
- **Tailwinds**
  - Unemployment remains at an all-time low of 3.4%. Historically, unemployment has been a primary driver for the increase in consumer credit risk, especially for prime customers.
  - Risk dropped for low-income and low-FICO cohorts, consumers who were most impacted by inflation, for the first time in many months.
  - Although there has been a historic increase in consumer debt levels, credit card balances as a percentage of disposable income are still below 2019 levels.
  - The consumer personal savings rate is picking back up after historic lows. Although fast depleting, consumers still have a buffer of excess savings and deposits from the last couple of years.
  - Card utilization, although rising, is still below 2019 levels, providing an additional buffer for consumers.

Executive Summary - Credit Cards

Credit Cards

- For the first half of 2022, the increase in credit risk was concentrated in populations especially squeezed by inflation — subprime and lower-income consumers (whose risk levels were higher than pre-pandemic levels). We are now starting to see the impact on more prime consumers too. There is a drop in delinquencies for March 2023 but that is primarily driven by seasonality.

- There is a ~40-50% increase in year-over-year card delinquencies, contributed mainly by subprime and near-prime consumers. Although the delinquencies are creeping above the average pre-pandemic levels, they are still within the pre-pandemic trendlines. A big driver of the increased delinquencies is the exceedingly worse performance of recent vintages compared to particularly low delinquency rates during government support payments.

- We see an increase in balances as consumers borrow more in the face of economic uncertainty. Card balances increased across risk tiers, but the increase flattened in March 2023. Although there has been a historic increase in revolving debt, credit card balances as a percentage of disposable income are still below 2019 levels.

- Although card utilization rates have been increasing, especially for lower-income households, they are still below 2019 levels.

- Card origination volumes have been dropping as of Jan 2023 as lenders tightened their underwriting, with a sharper decrease in subprime originations.

- Consumers are getting higher origination credit lines on average and there is a drop in subprime concentration.

- Several lenders tightened their underwriting standards in 2022, and we are seeing the impact with more recent vintages performing better. Lenders who tightened more heavily in 2022 are seeing better performance.

- Due to the all-time low unemployment rates and significant excess savings accumulated from the pandemic, the super-prime consumers continue to do better.

- Given the trend of consumers using neo-banks to game credit scoring, we are seeing more lenders differentiating acquisition policies for the existence of neo-bank accounts, particularly Chime.

Executive Summary - Personal Loans

Personal Loans

- We are seeing a much steeper rise in risk for PL (much higher than the pre-pandemic levels). As Personal Loans (PL) may often be lower in the consumer's payment hierarchy compared to Credit Cards, Auto Loans, and Mortgages — risk patterns in Personal Loans can be a bellwether for upcoming trends in other asset classes.
- There is a drop in delinquencies for subprime in the most recent months, driven mostly by seasonality and the previous tightening of underwriting. Although the risk remains elevated, we are starting to see the impact of credit tightening flow through with the latest vintages performing better than previous years.
- The risk in prime and higher-income customers is trending above pre-pandemic levels, with some easing for subprime and low-income consumers.
- We continue to see a tightening of underwriting standards with an increase in both average origination FICO and Income. The concentration of subprime in more recent vintages also continues to decrease.
- Prepayment rates – a leading indicator of consumer health – have recovered a bit from the steep drop in Q4 2022. The lower income and subprime consumers are still trending below pre-pandemic levels.

Executive Summary – Auto Loans

Auto

- Rising interest rates are driving the payments higher and hindering vehicle purchases in Q1 despite improving inventory levels.
- Despite shifts to longer term loans, rising auto interest rates are driving up the payment amounts — the share of $1,000+ monthly payments increased to record levels. Auto LTV (Loan To Value ratio) is trending much higher than pre-pandemic levels especially for used cars. Customers buying in these conditions are at risk of going underwater down the road as financing costs rise and car values decline.
- Auto originations balances remain high as vehicle prices are elevated. High interest rates disproportionately impact the consumers who can not put down a larger down payment.
- There is an increase in delinquencies for Auto with better performance in Subprime Auto. Overall, Auto delinquencies are trending above pre-pandemic levels, but Subprime Auto are still within the pre-pandemic levels.
- Attributes like LTV appear to be stronger differentiators of risk compared to pre-pandemic trends.
- Prepayment rates dropped rapidly in Q4 2022 but have been recovering in Q1 2023.
- Subprime Auto had higher cure rates than Consumer Unsecured, this suggests that subprime borrowers continue to effectively manage their payments to avoid losing their vehicles, even as the economy deteriorates for consumers as a whole.

Executive Summary – Mortgage and Student Loans

Student Loans

- Student loans make up ~30% of all non-mortgage consumer debt but the delinquencies have been non-existent because of government deferral programs. After many extensions, the federal loan deferrals are set to expire in June 2023, and the $10k debt relief plan has been blocked by the courts. We can expect a significant increase in risk across asset classes as payment burdens will rise.

- Even though the federal student loan payments are paused, there is already a stark increase in delinquencies across these consumers' other asset classes (Auto, Credit Card, Private Student Loans).

- One big bank estimates an impact of 3-4% rise in risk on their whole portfolio once the deferrals end.

- Borrowers in their first year of private student loan repayment — borrowers who are often recent college graduates — are having a harder time paying their student loans than similar cohorts from past years did. These borrowers have less income and fewer savings available to absorb the blow from decades-high inflation and a sharp increase in interest rates.

Mortgage

- Slight uptick in Mortgage delinquencies but still below pre-pandemic levels. Mortgages are usually higher up in the payment hierarchy, and a large majority of them are fixed-rate so the payment burden remains the same for a major portion of the portfolio even though the interest rates are rising.

- Significant drop in origination volumes with the rise in interest rates but this can mostly be a reversion-to-mean to pre-pandemic levels.

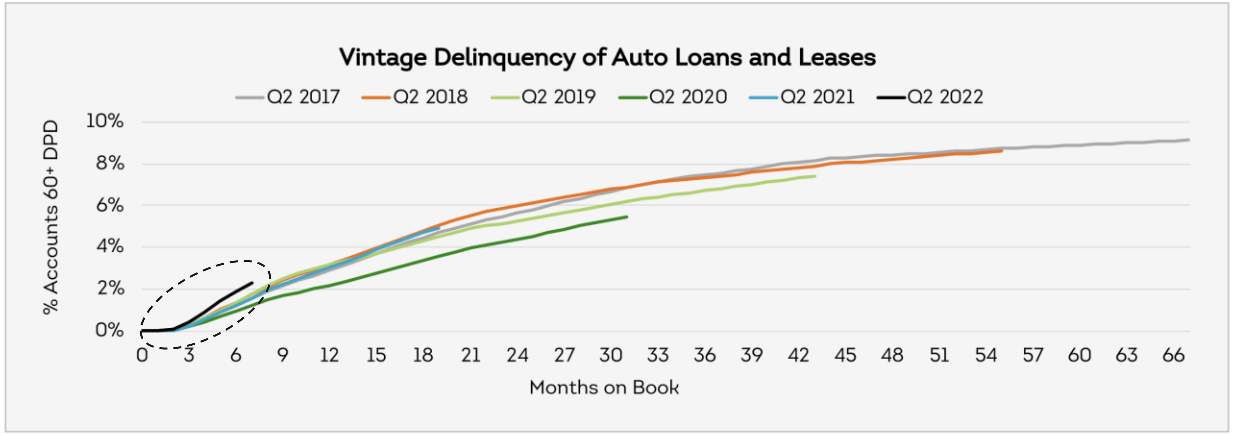
Executive Summary – Risk Score Warping and Gaming

Risk Score Warping and Gaming

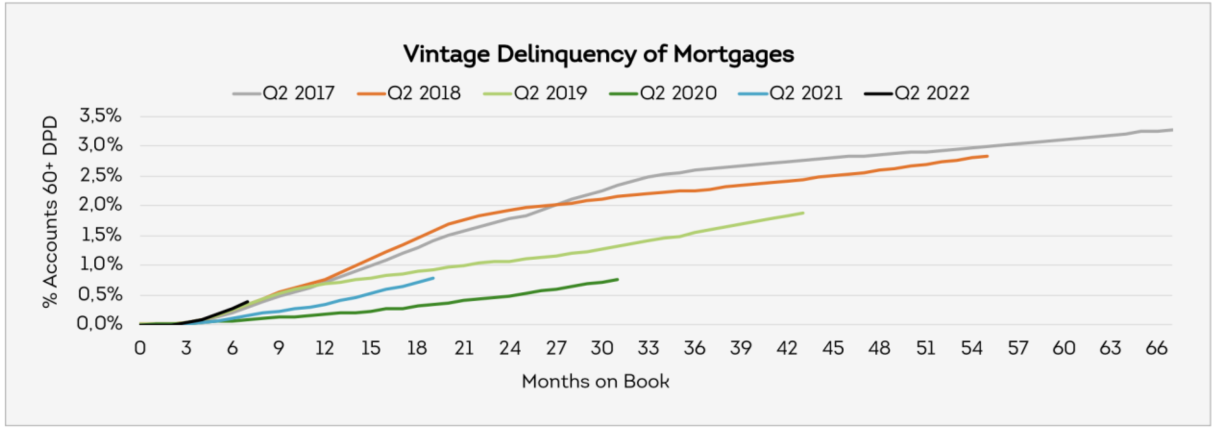
- We continue to see warping and gaming of risk scores. This means that some of the risky subprime customers can appear as near-prime. Some contributors are:
    - Student Loan Deferrals
    - Buy-Now-Pay-Later (BNPL) trades
    - Credit builder trades
    - COVID data degradation
- Consumers with student loan deferrals had an average risk score inflation of ~25 points.
- Currently, not all BNPL trades are reported to the bureaus and can not impact a consumer’s credit score – this invisibility incentivizes consumers to move BNPL lower in their payment hierarchy during financial stress.
- Recently, the overall score inflation seems to be plateauing due to the rise in risk – rising delinquencies, utilization, balances etc.

Recent vintages for Bankcard and Personal Loans are experiencing significantly higher delinquency rates compared to the older ones

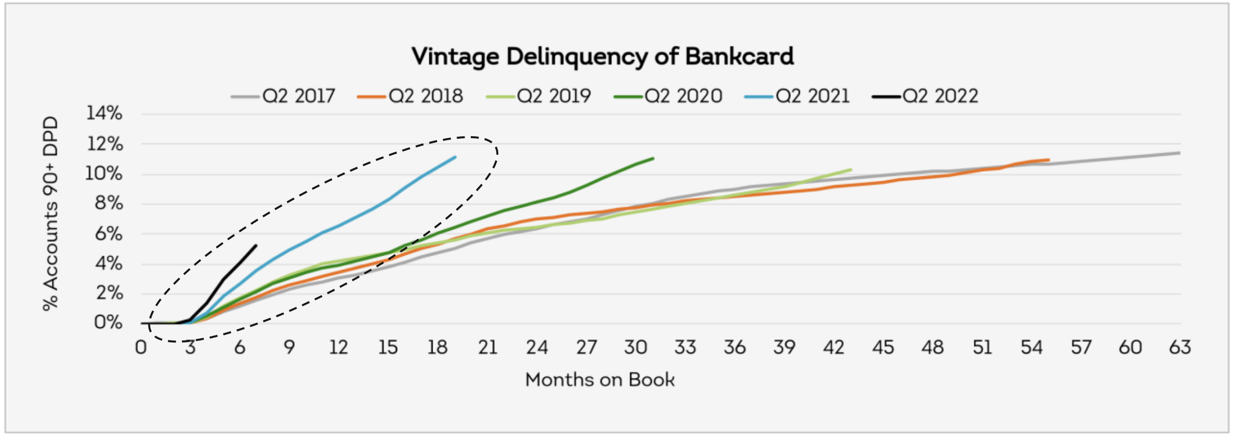
AUTO



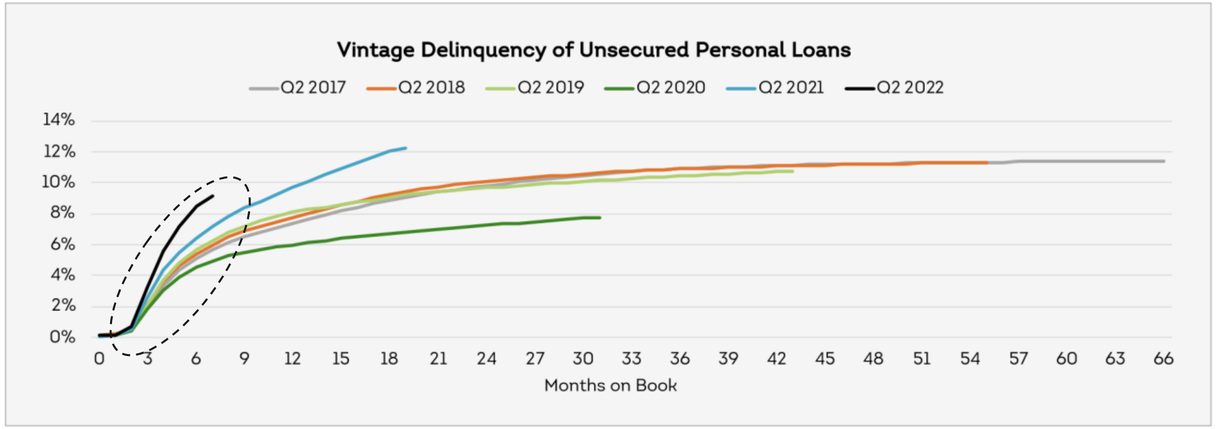
MORTGAGE



BANKCARD



UNSECURED PERSONAL LOAN



Mortgages delinquencies are back in line with historic vintages

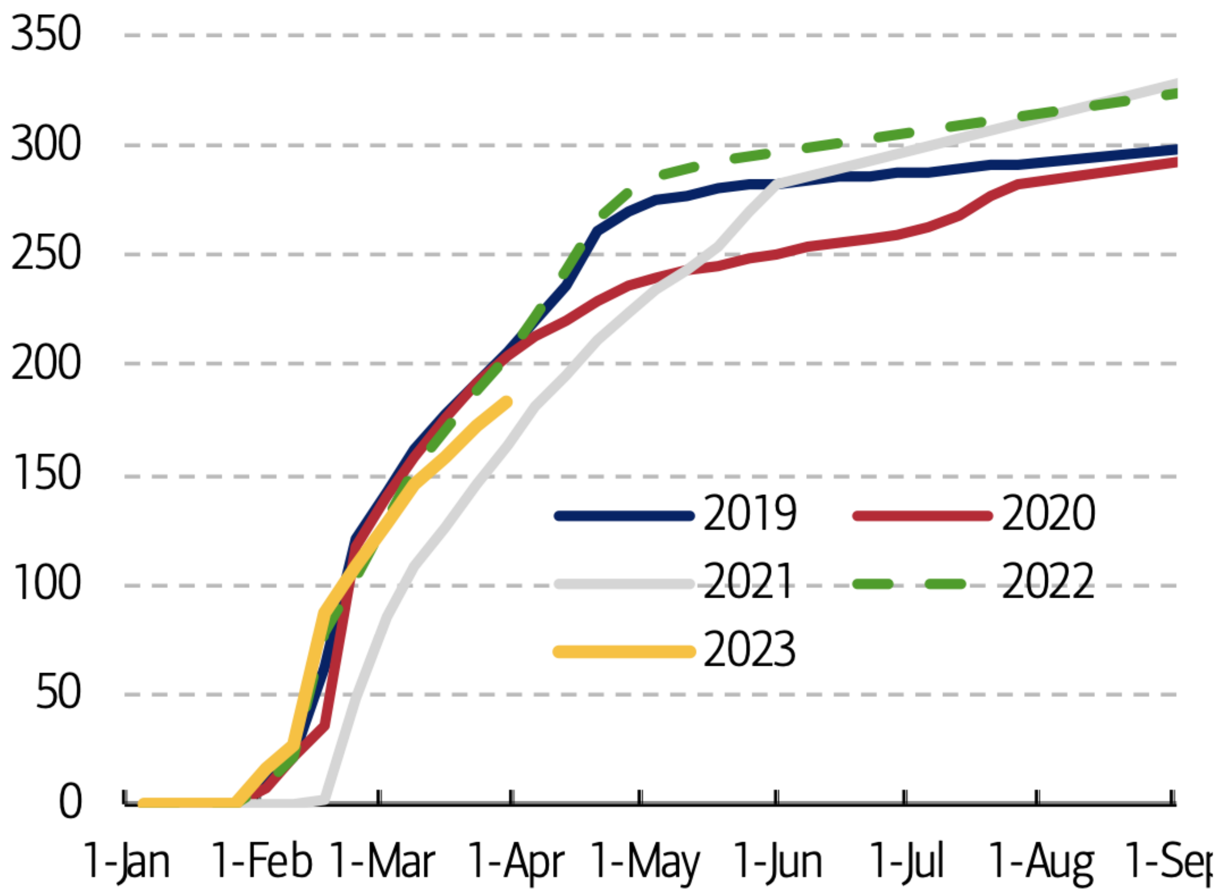
Source: Transunion, data as of March 2023

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

Tax refunds for 2023 are trending 10% lower than last year

Low-income tax refunds are way down and high-income are actually up

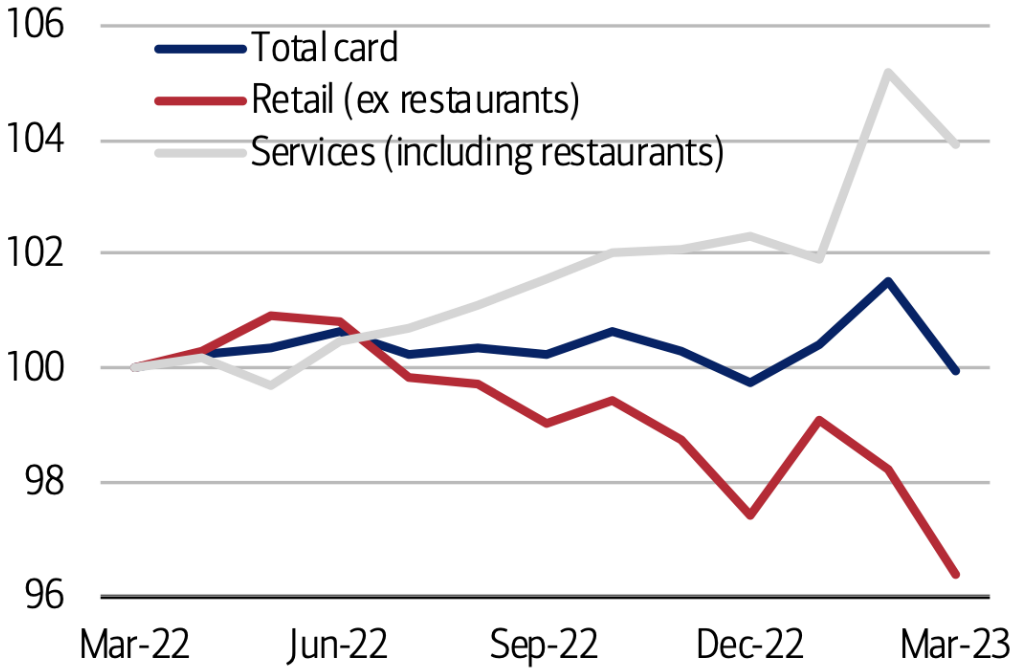
Cumulative of tax refund payments (10% drop YOY)



Source: BOA, IRS data as of March 31st 2023

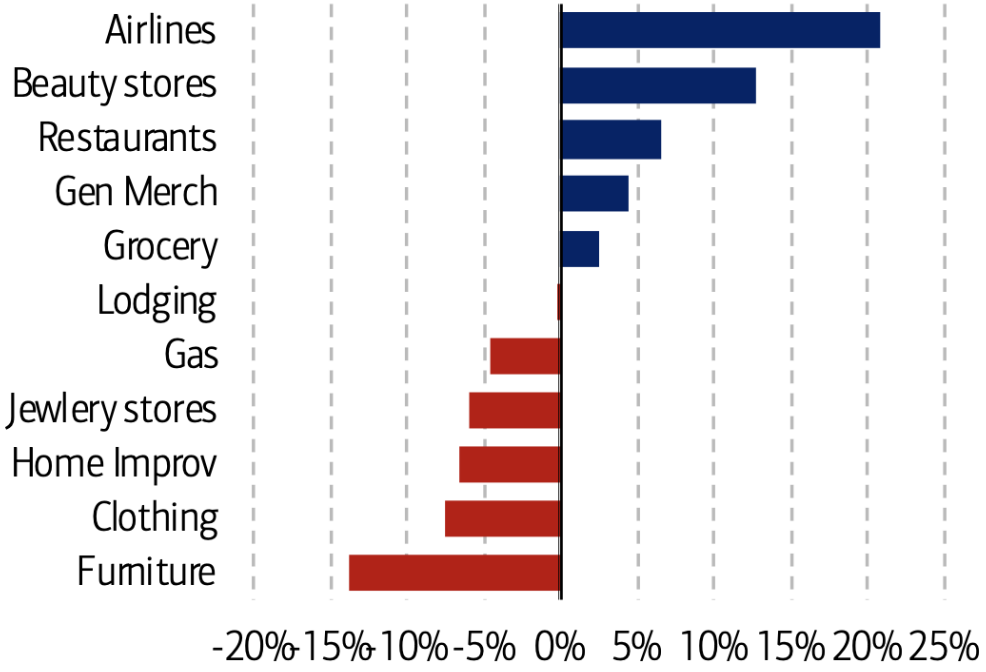
There are some major shifts happening in consumer spending behavior

Total credit and debit card spending per household (index Jan 2020 =100)



Source: Bank of America internal data

Total credit and debit care spending YOY % change Feb 2023



Source: Bank of America internal data

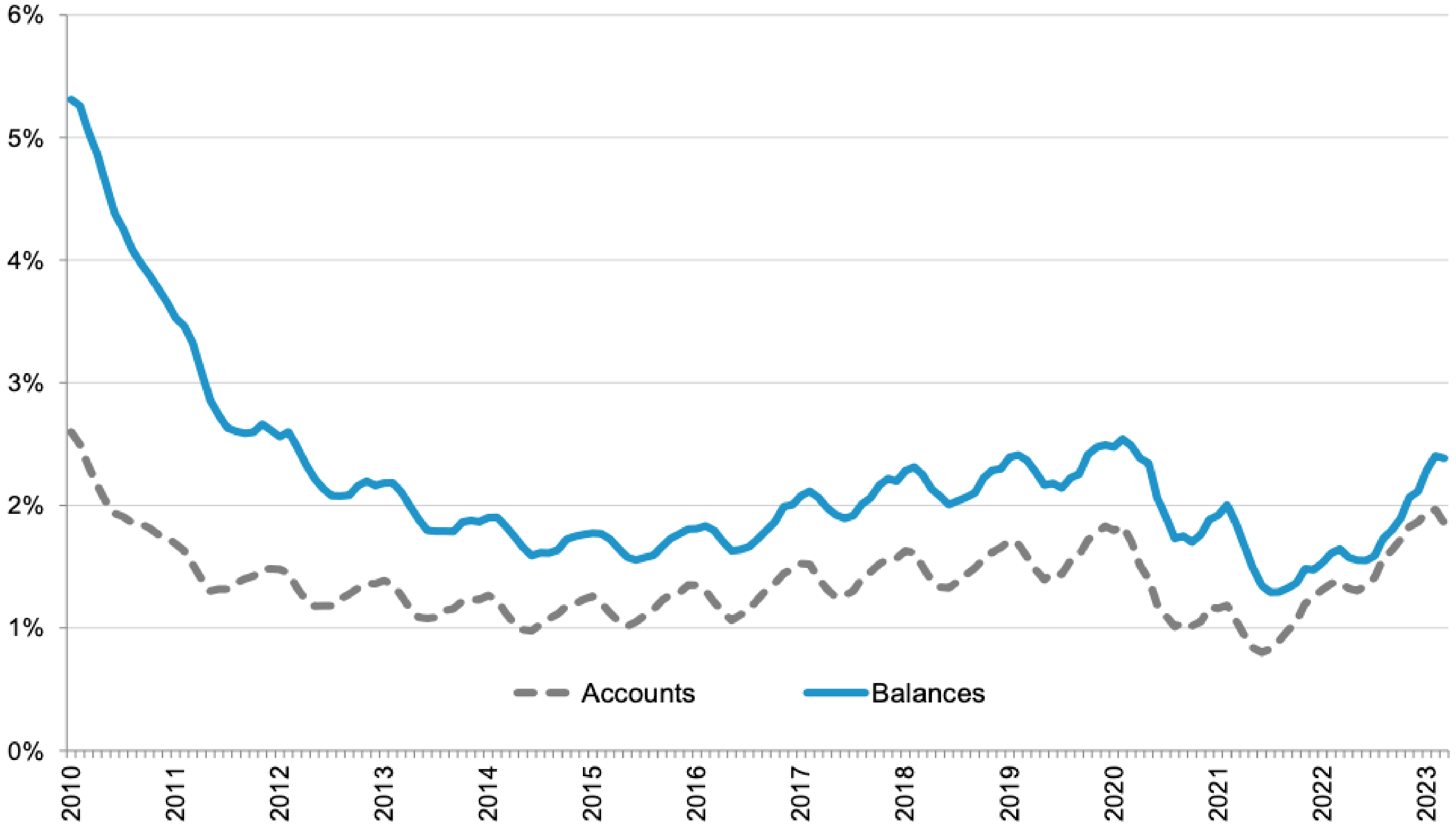
- State of the Consumer
- **Credit Card**
- Personal Loan
- Auto
- Student Loan
- Mortgage
- Risk Score Inflation

Card delinquencies are creeping above pre-pandemic levels

Drop in the most recent month, in part due to seasonality

Severe Delinquency Rate

60+ Days Past Due
Percent of Accounts and Balances; NSA; Excludes Severe Derogatory and Bankruptcy



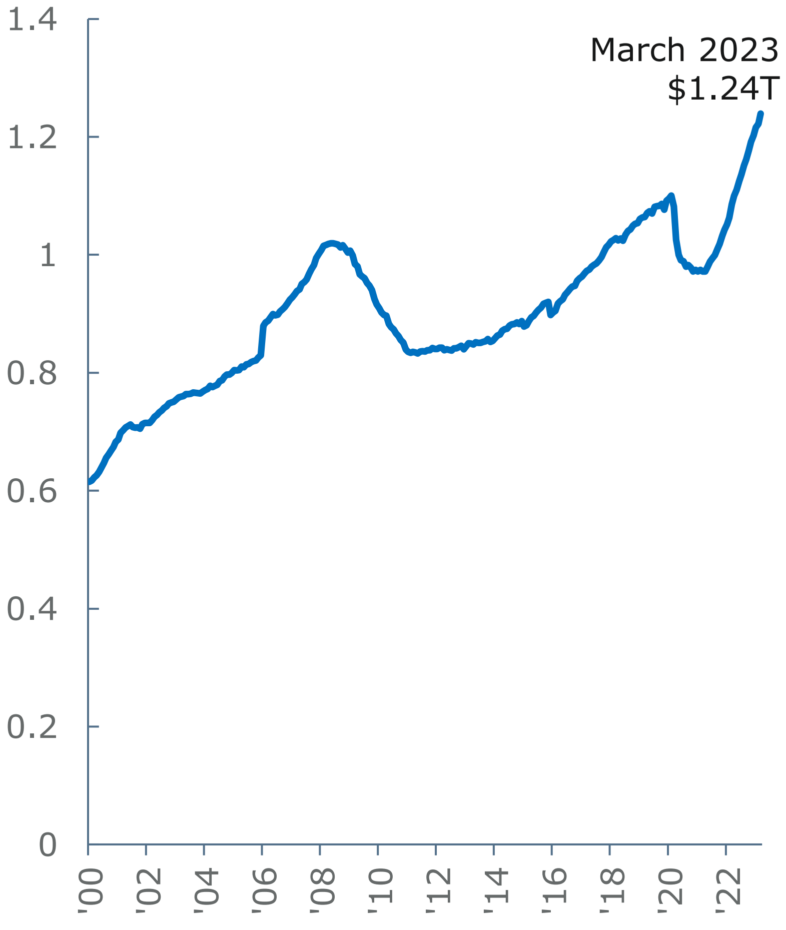
Source: Equifax Inc.

Data as of March 2023

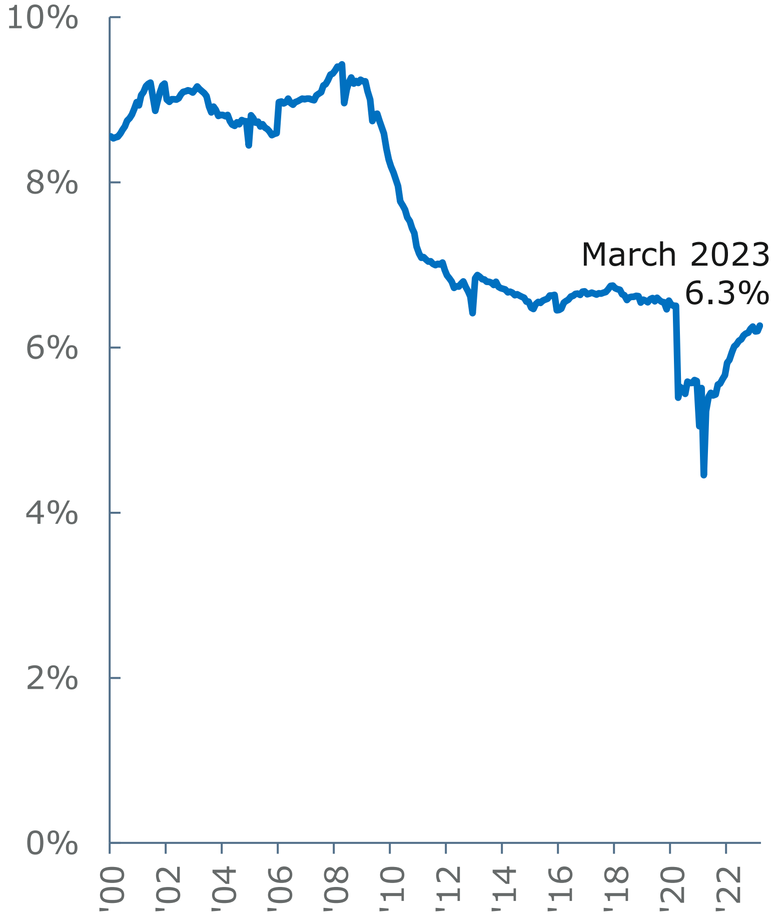
Credit card balances are at an all-time high but still within the pre-pandemic trendline

As % of personal income the balances are still below pre-pandemic levels

Revolving Consumer Credit Outstanding
USD Trillions
(Seasonally Adjusted)

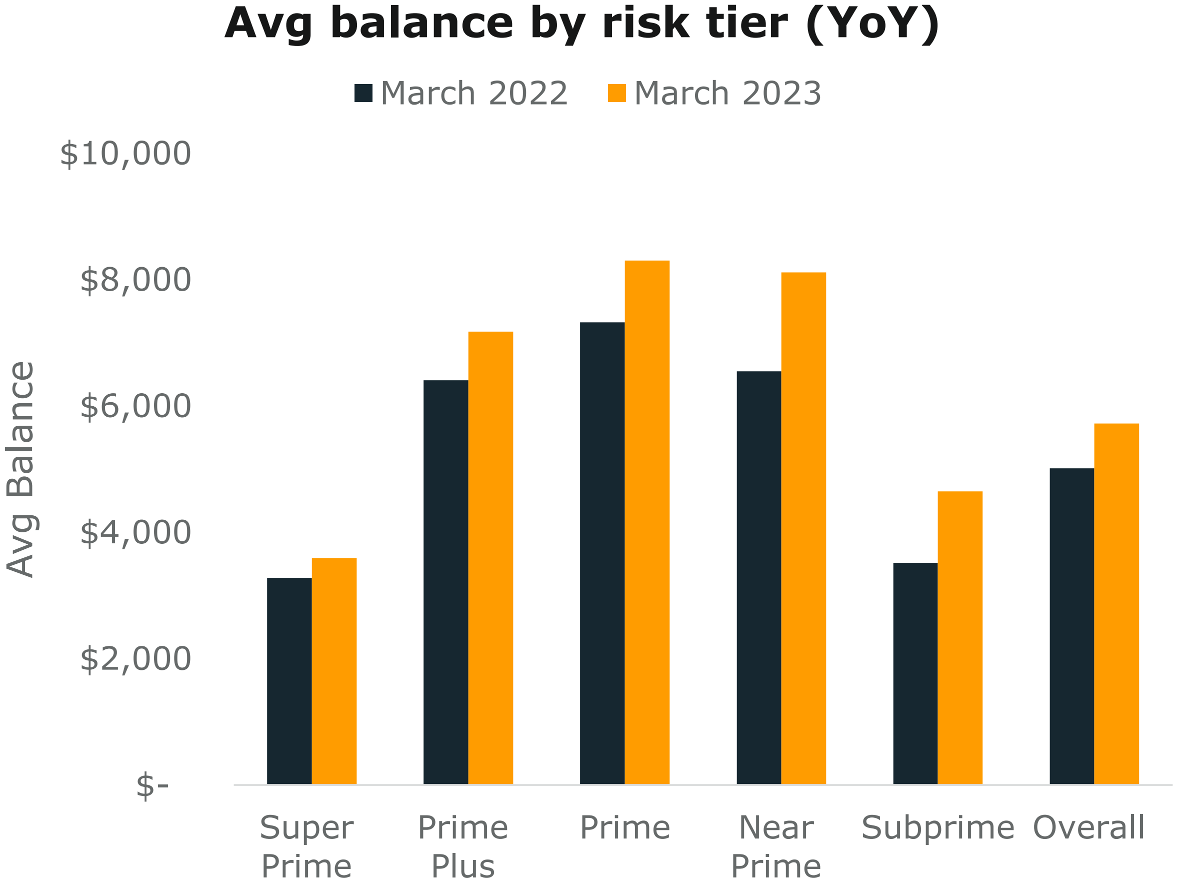


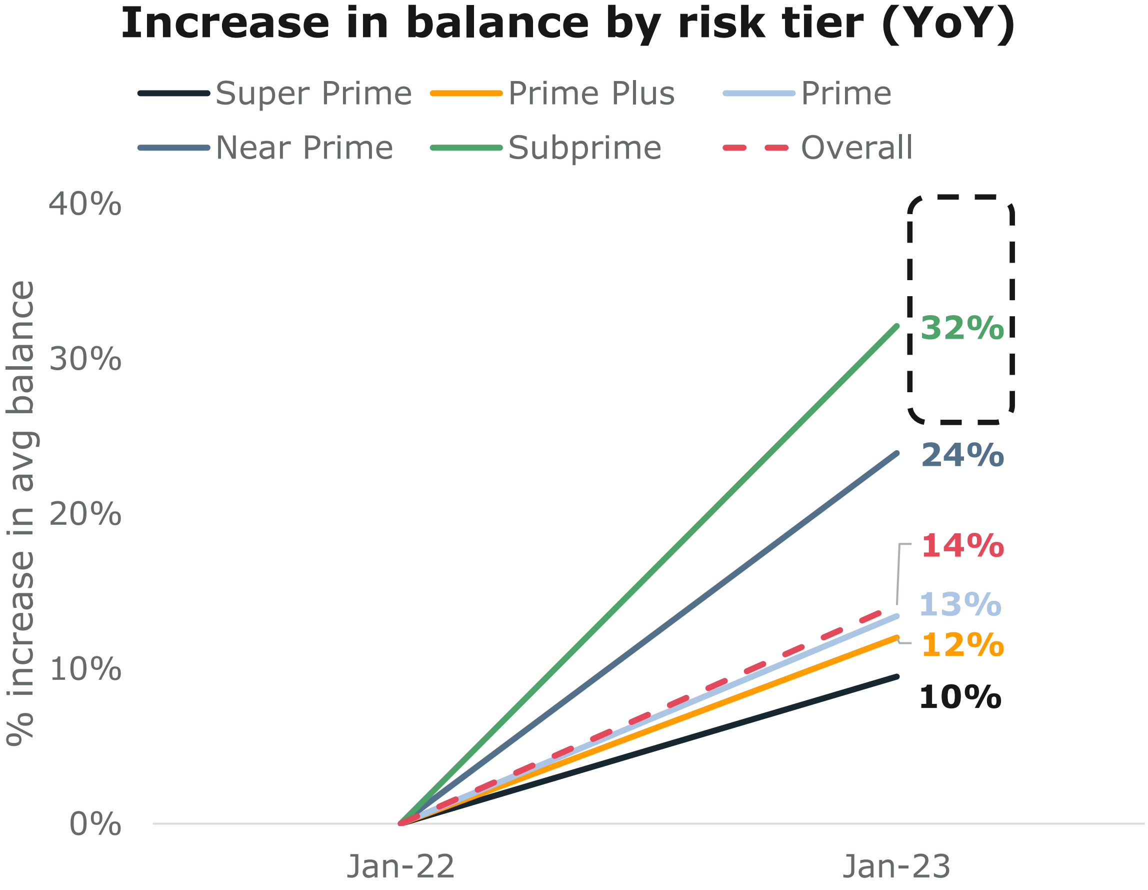
Revolving Consumer Credit Outstanding
as % of Disposable Personal Income
(Seasonally Adjusted)



- Source: US BEA as of March 2023

Card balances rose across the board in Q1 but the rate of increase flattened in March 2023*

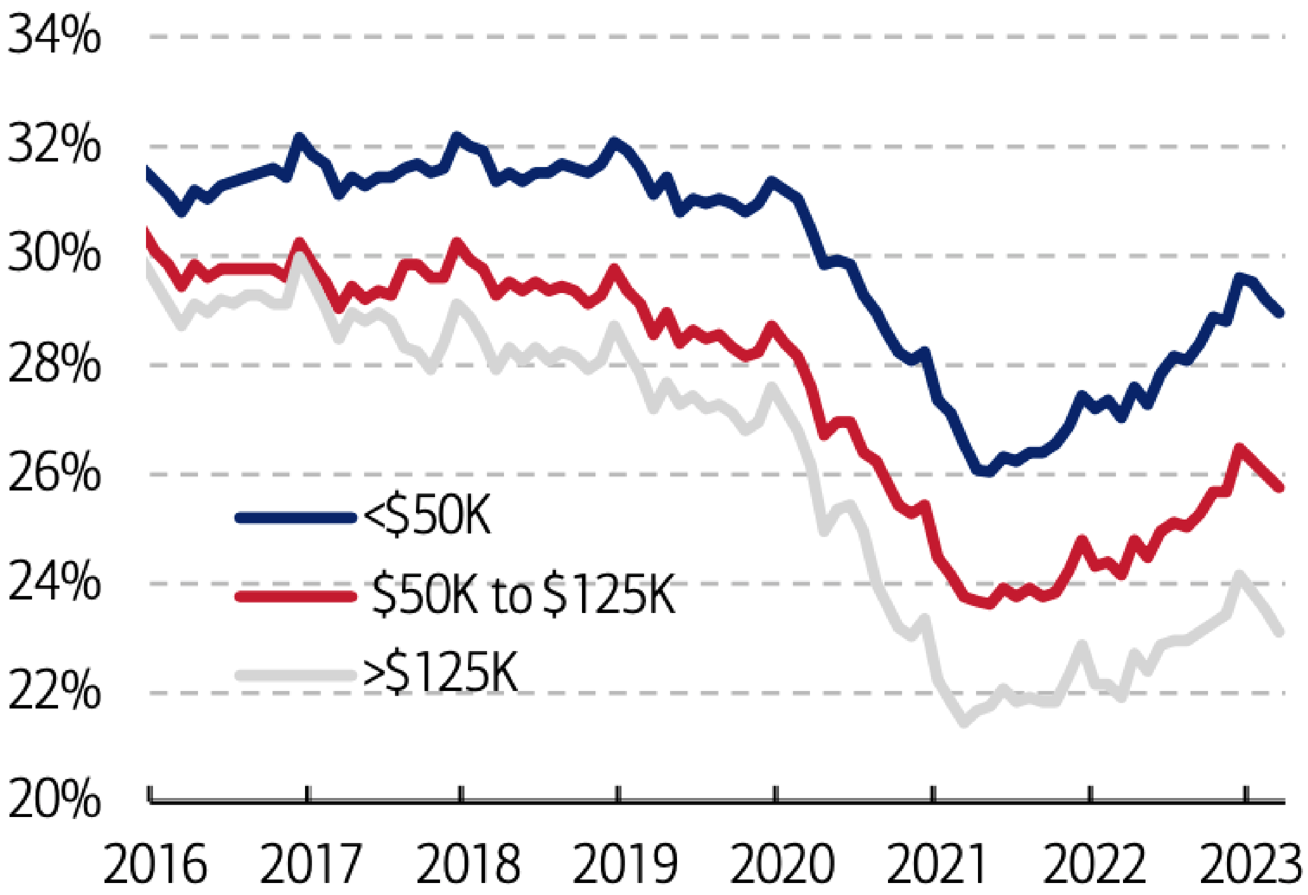




- *See appendix for the month-on-month flattening in March 2023 due to seasonality
- Source: Transunion, data as of March 2023.
- Vantage 4.0 Tiers: Super prime (781–850), Prime plus (721–780), Prime (661–720), Near prime (601–660), Subprime (300–600)
- Population March 2022 by tier: Super prime (42.7%), Prime plus (20.1%), Prime (17.1%), Near prime (10.8%), Subprime (9.2%)

Consumers have some financial buffer as credit card utilization remains below 2019 levels

Average Credit Card Utilization by Household Income



Source: Bank of America Internal Data as of March 2023

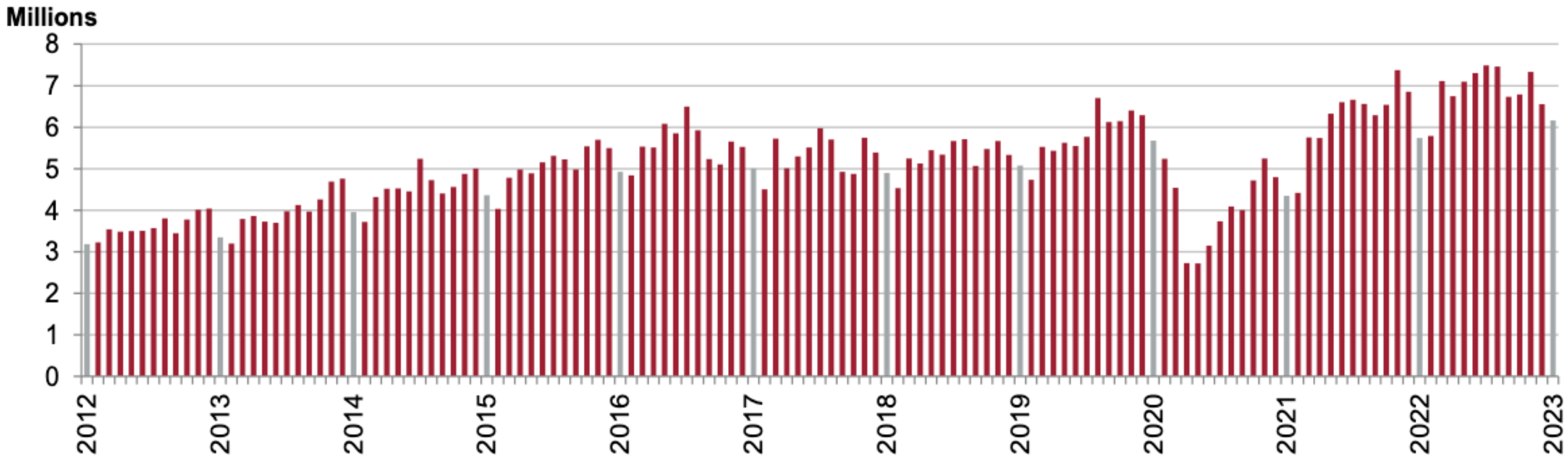
CC Originations

As lenders tightened their underwriting standards, we see a drop in Credit Card originations

With a sharper drop for subprime cards

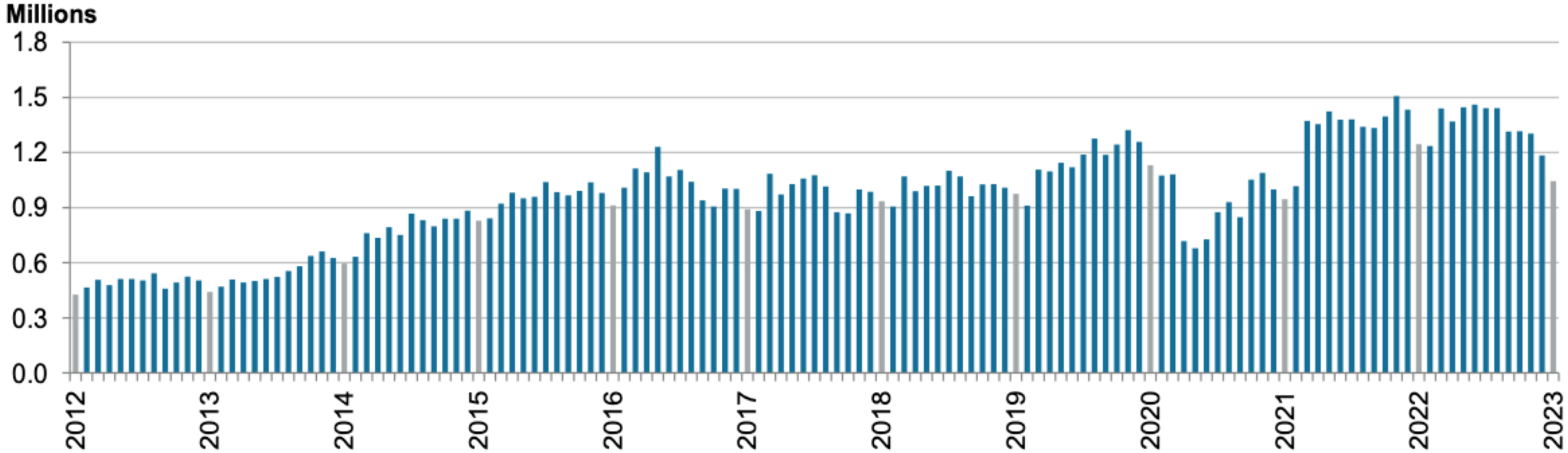
Bankcard Originations

Number of Accounts in Millions; NSA



Subprime Bankcard Originations

Subprime accounts defined as those with borrower's origination VantageScore® 3.0 credit score less than 620



Source: Equifax
Data as of March 2023, originations through Jan 2023

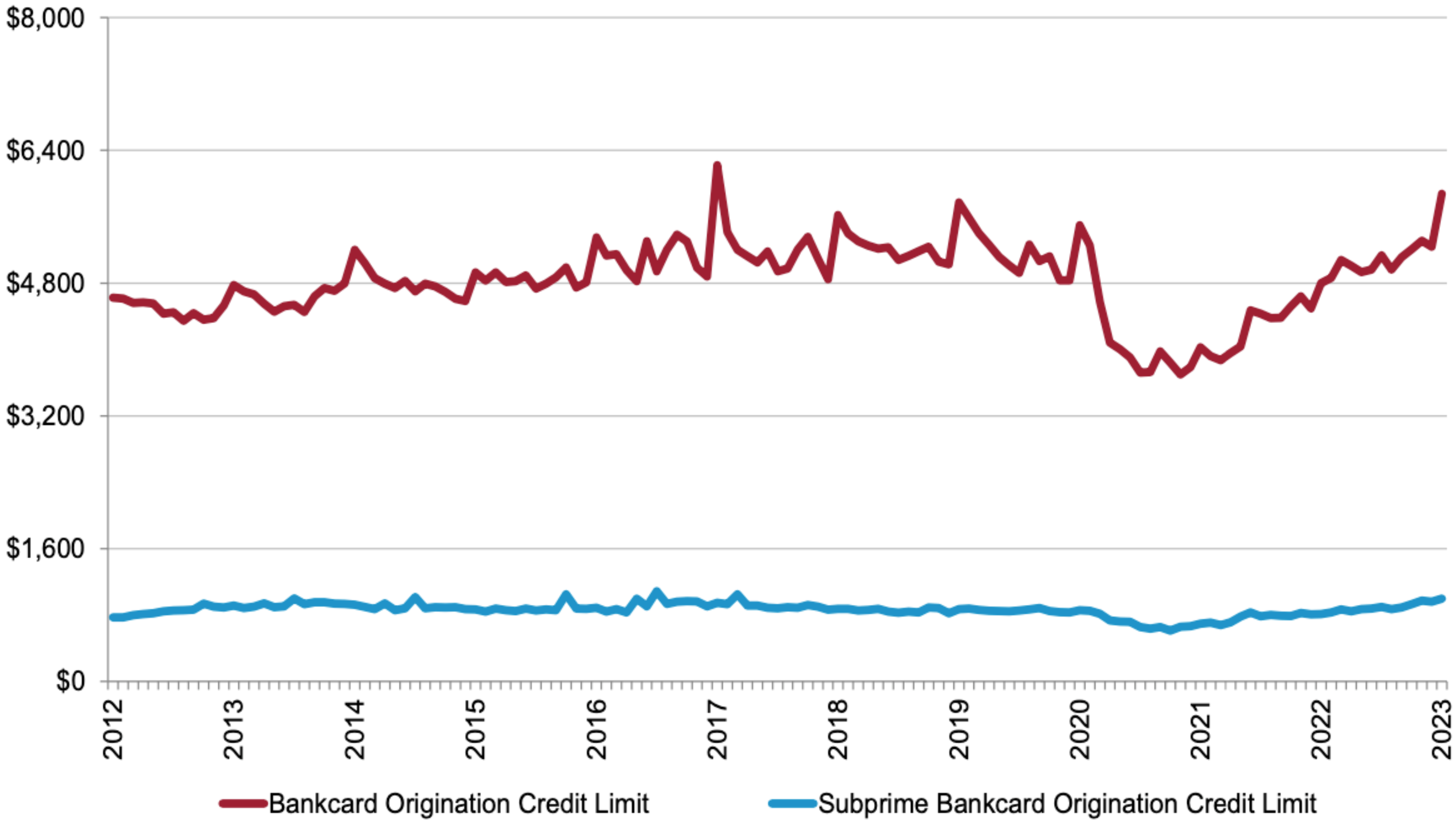
CC Originations

As of Jan 2023, consumers are getting higher credit lines on average

We have seen lenders tighten their lines more recently

Bankcard Average Origination Credit Limit

Average Origination Credit Limit Over Time; NSA
Subprime accounts defined as those with borrower's origination VantageScore® 3.0 credit score less than 620



The higher average lines could be contributed to tightening of credit. As only the better performing consumers get approved, they would get a higher line on average

Source: Equifax
Data as of March 2023, originations through Jan 2023

- State of the Consumer
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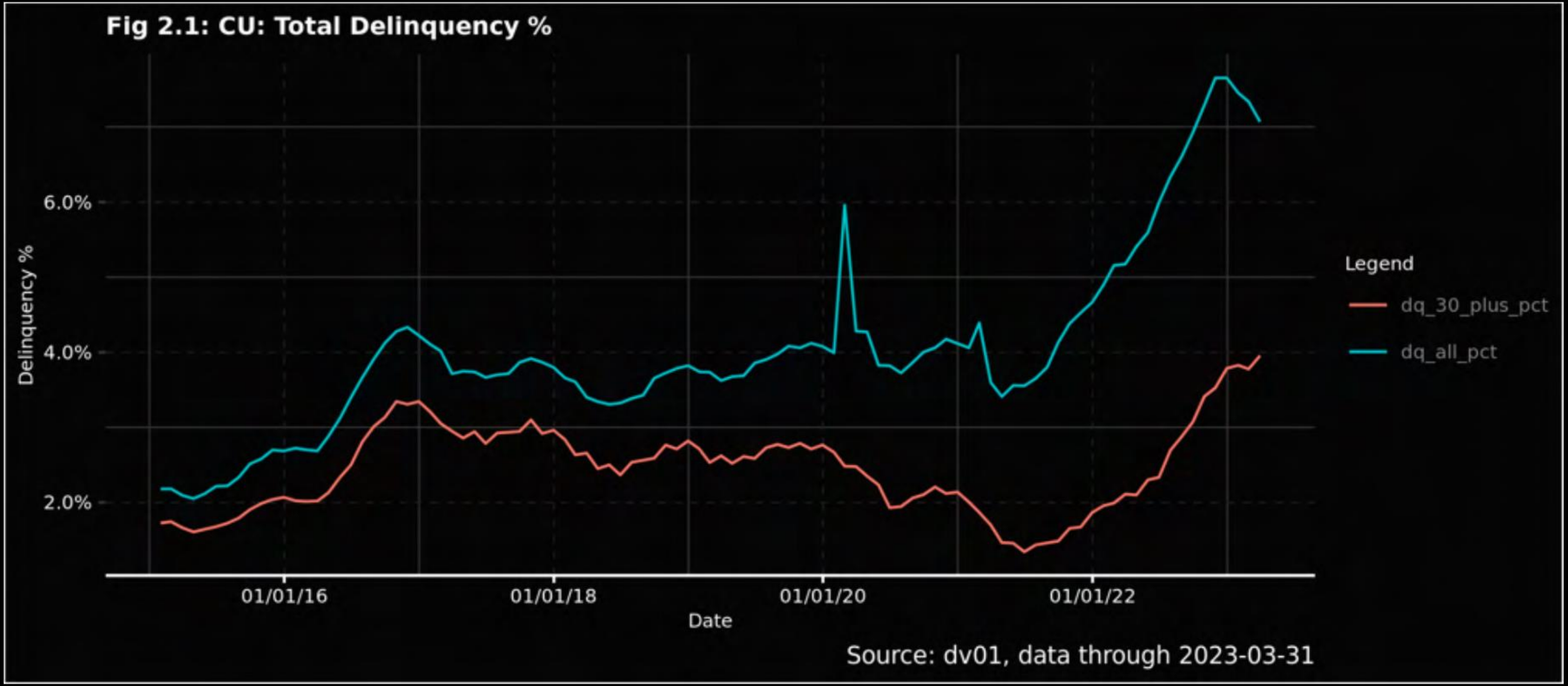
- Risk Score Inflation

Soaring 30+ delinquencies (much higher than the pre-pandemic levels) with a slight drop in March 2023

The surge in first time delinquencies continues*

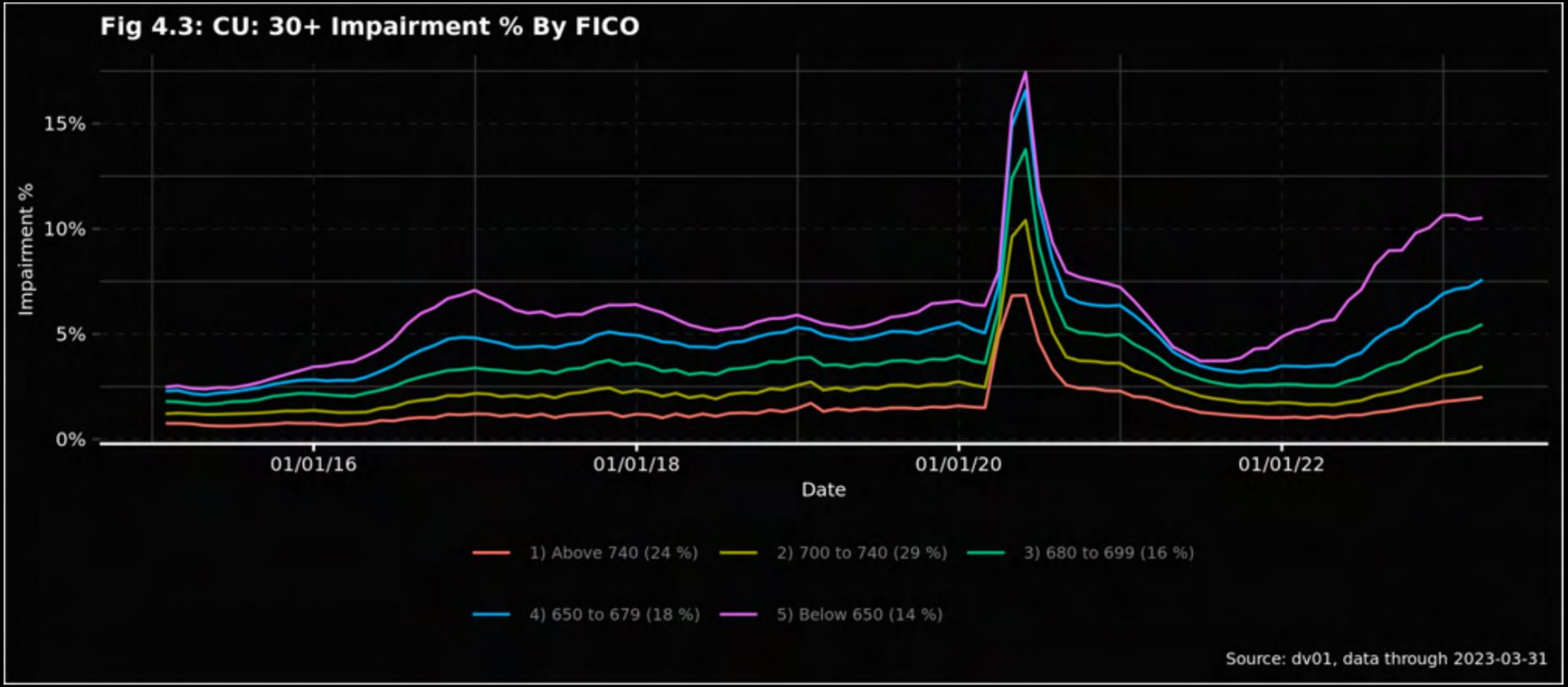


Source: dv01, data as of March 31, 2023
*see appendix

Increase in risk continues unabated except for subprime

The increase in risk was concentrated in subprime for early 2022, but we can see an uptick in prime/near-prime in recent months. Flattening of risk in subprime for March 2023

Impairment = Delinquencies + Modification

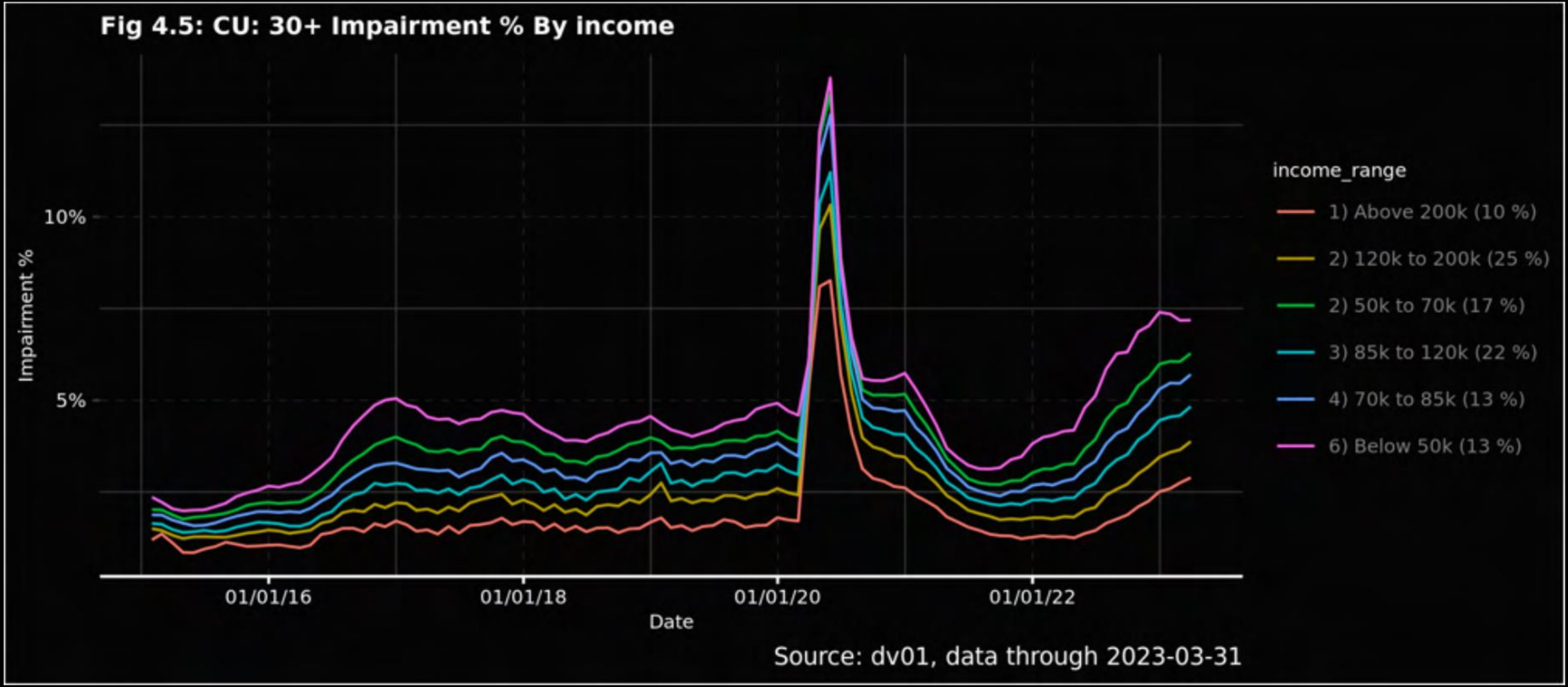


Source: dv01, data as of March 31, 2023

Increase in risk continues unabated across the income bands except for <$50k

Slight drop in risk for low income in March 2023 driven by seasonality and tightening

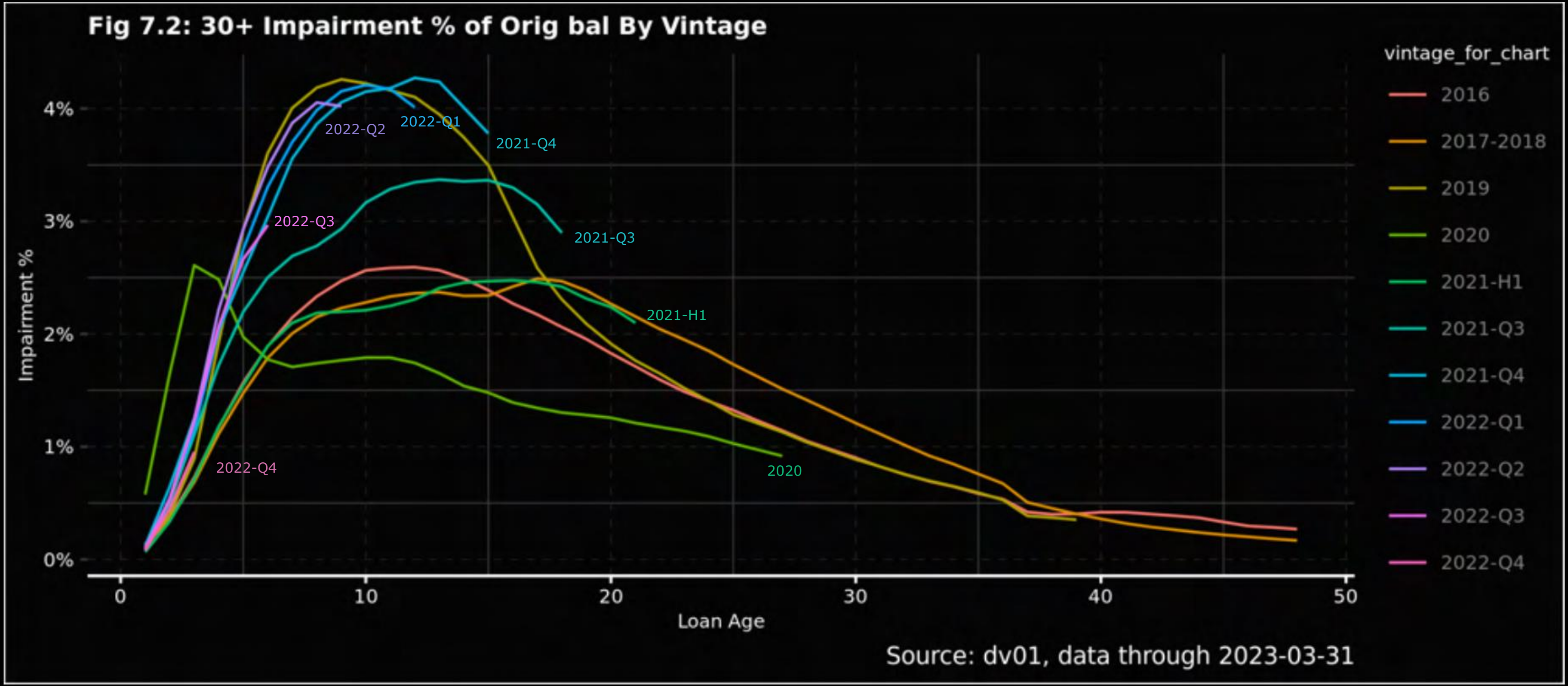
Impairment = Delinquencies + Modification



Source: dv01, data as of March 31, 2023

Although risk remains elevated, we are starting to see the impact of credit tightening flow through with the latest vintages performing better

Impairment = DQ + Modification

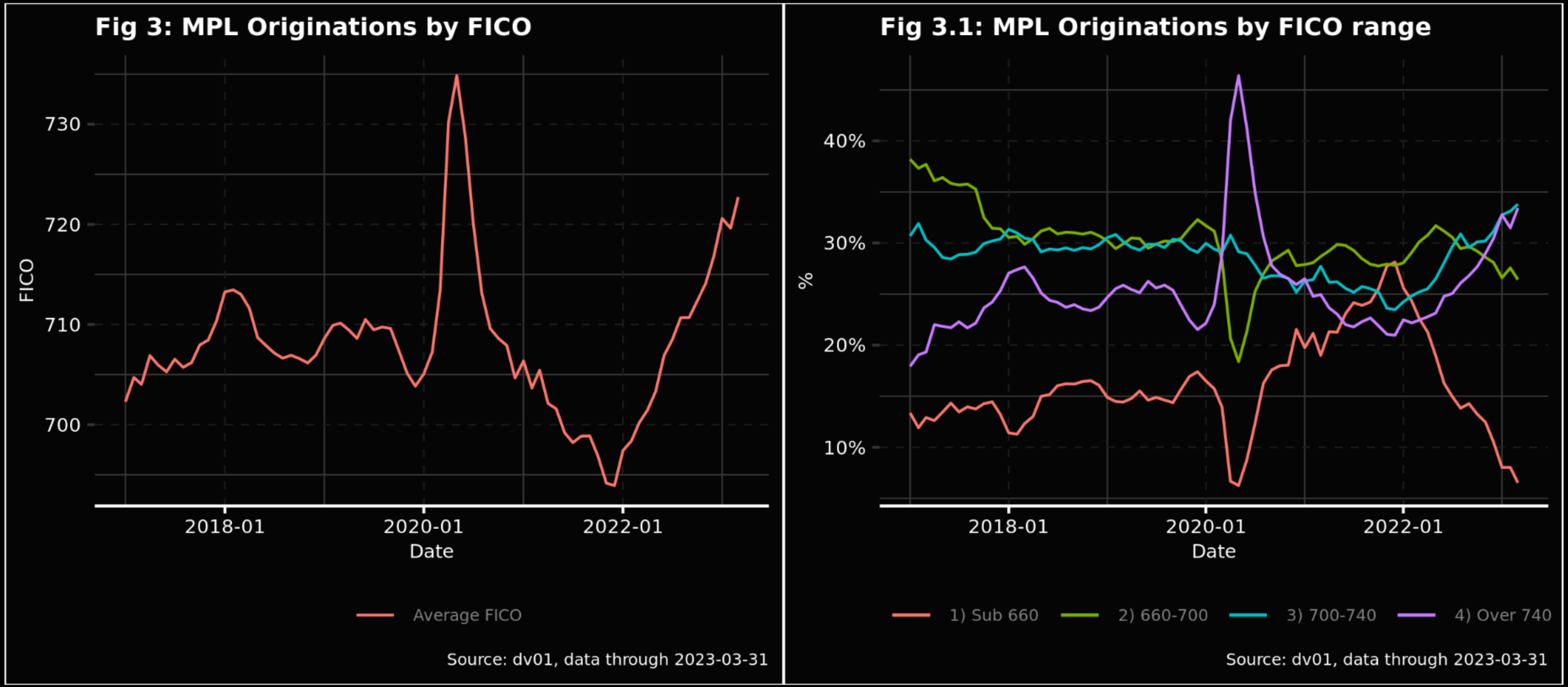


Lenders who tightened more heavily in 2022 are seeing better performance

Source: dv01, data as of March 31, 2023

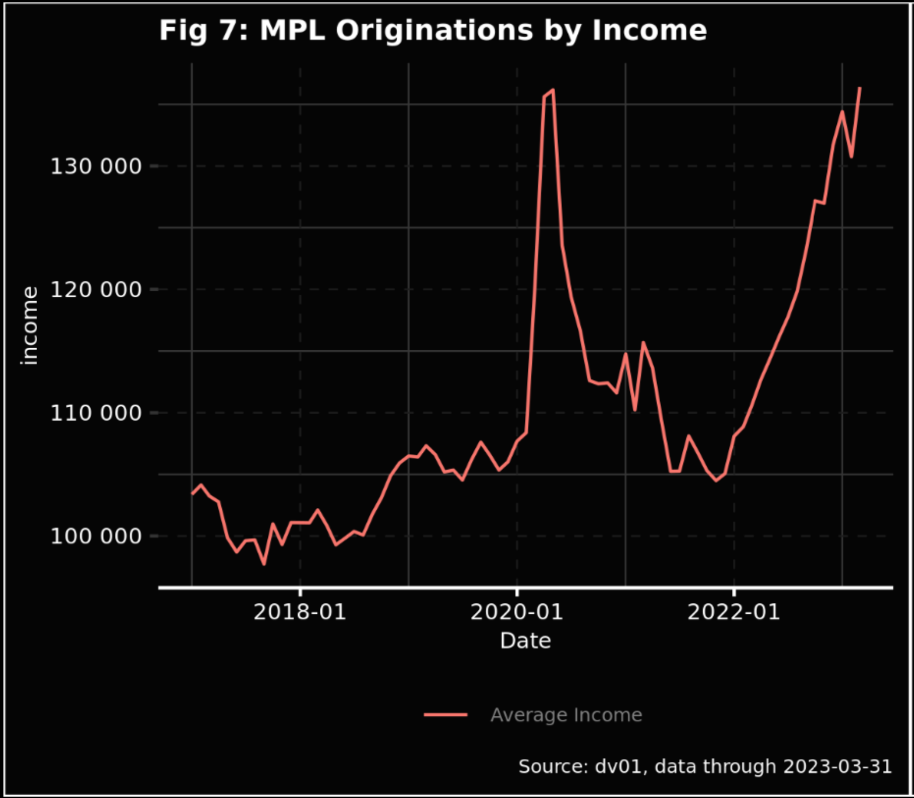
Tightening of Underwriting

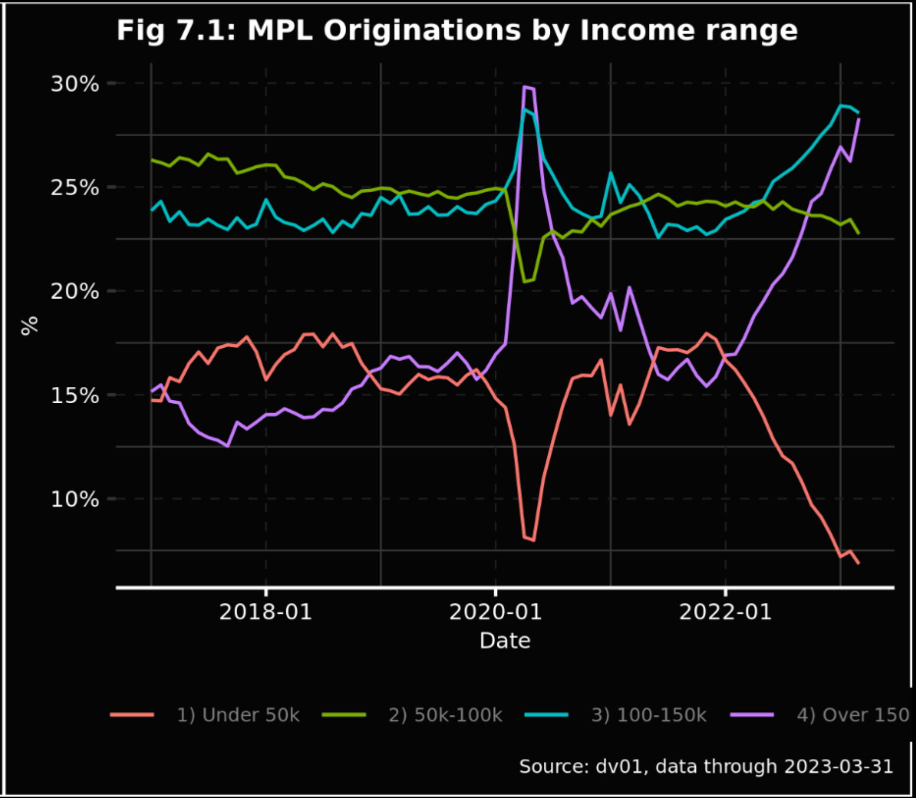
Avg origination FICO continues to increase and there is a significant drop in subprime originations



These FICO scores are also inflated by suppression of various risk signals like FICO-spoofing with credit builder trades, invisibility of BNPL trades, and student loan deferrals

Source: dv01, data as of March 31, 2023





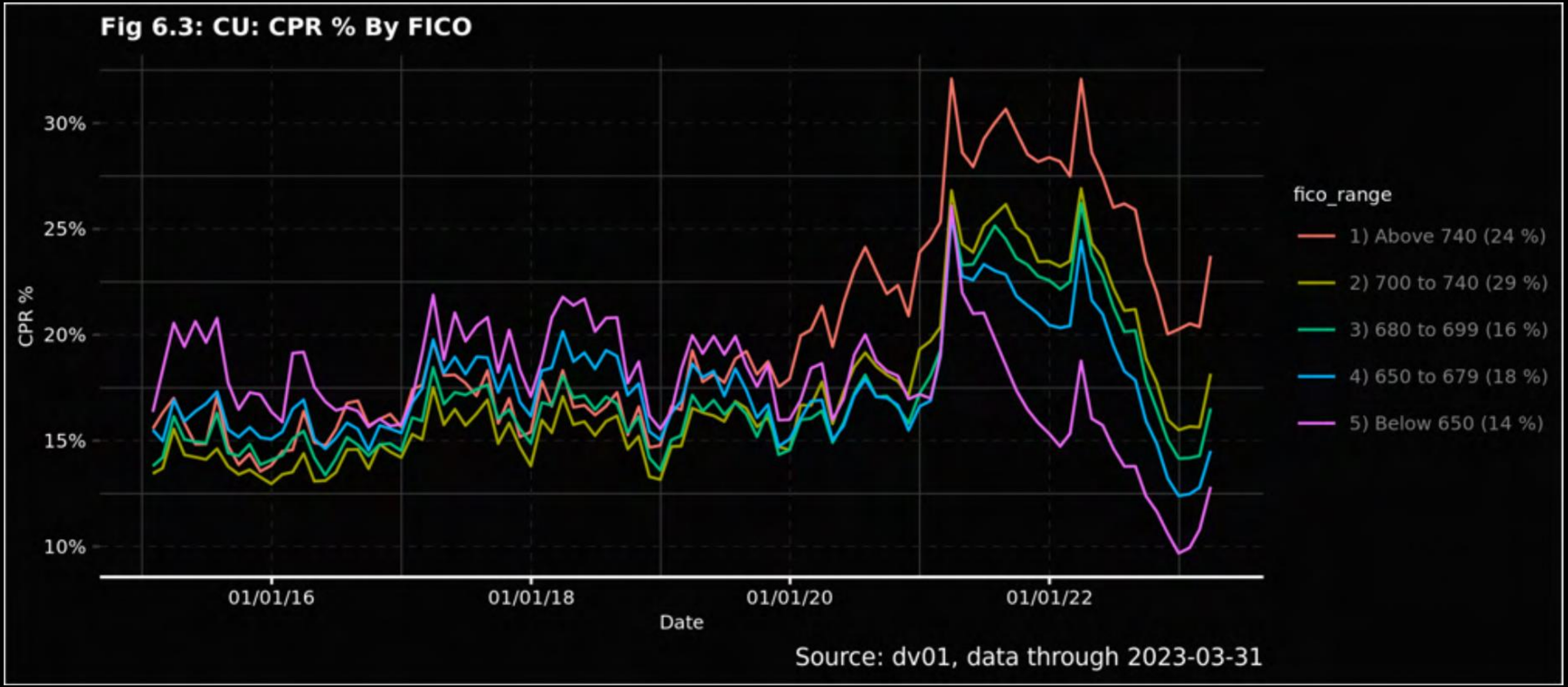
Tightening of Underwriting

Avg origination Income continues to increase and with a significant drop in sub-$50k income

Source: dv01, data as of March 31, 2023

Improvement in prepayment rates in recent months

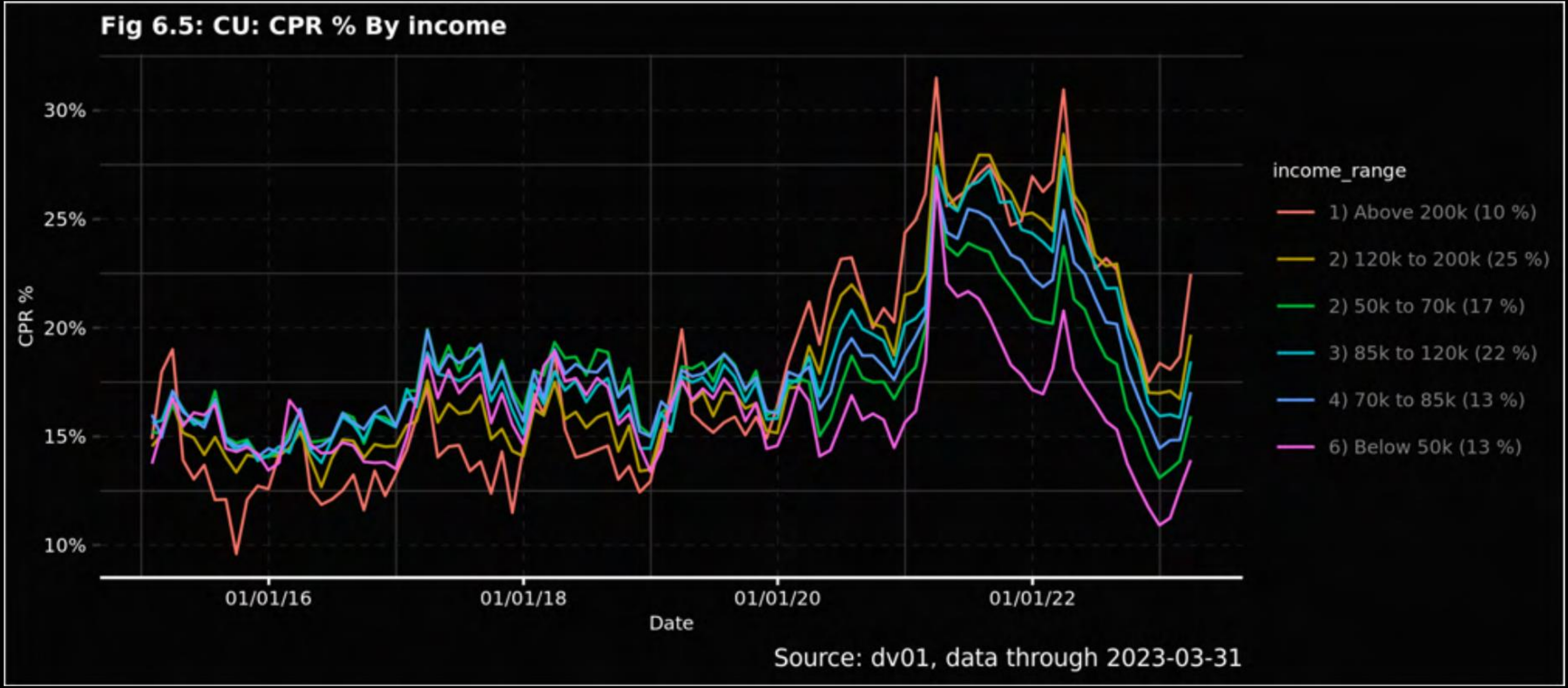
This is primarily driven by seasonality factors like tax refund season



Subprime consumers are still below pre-pandemic levels. The >740 FICO customers are the only ones with pre-payment rates above pre-pandemic levels

Source: dv01, data as of March 31, 2023

Improvement in prepayment rates driven in part by seasonality



There is a starker spread in prepayments rates based on income compared to historical trends

Source: dv01, data as of March 31, 2023

- State of the Consumer
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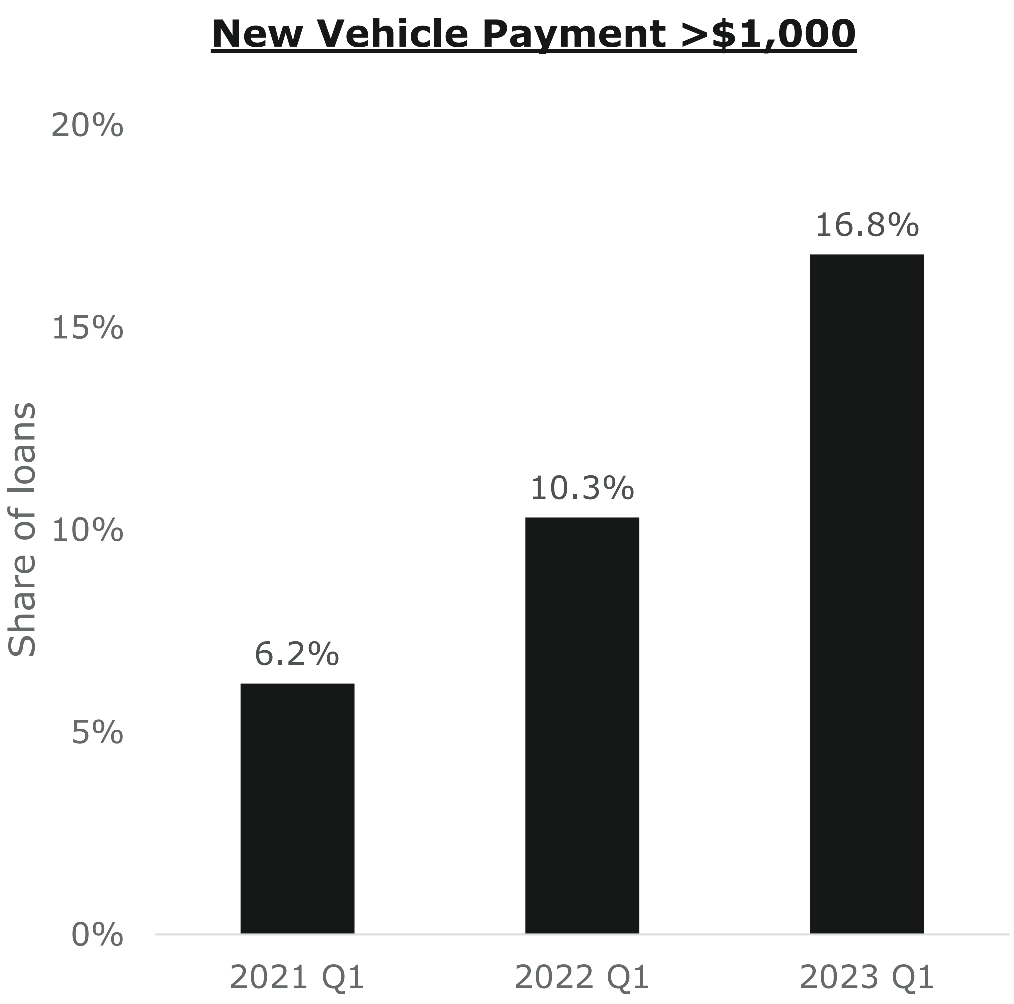
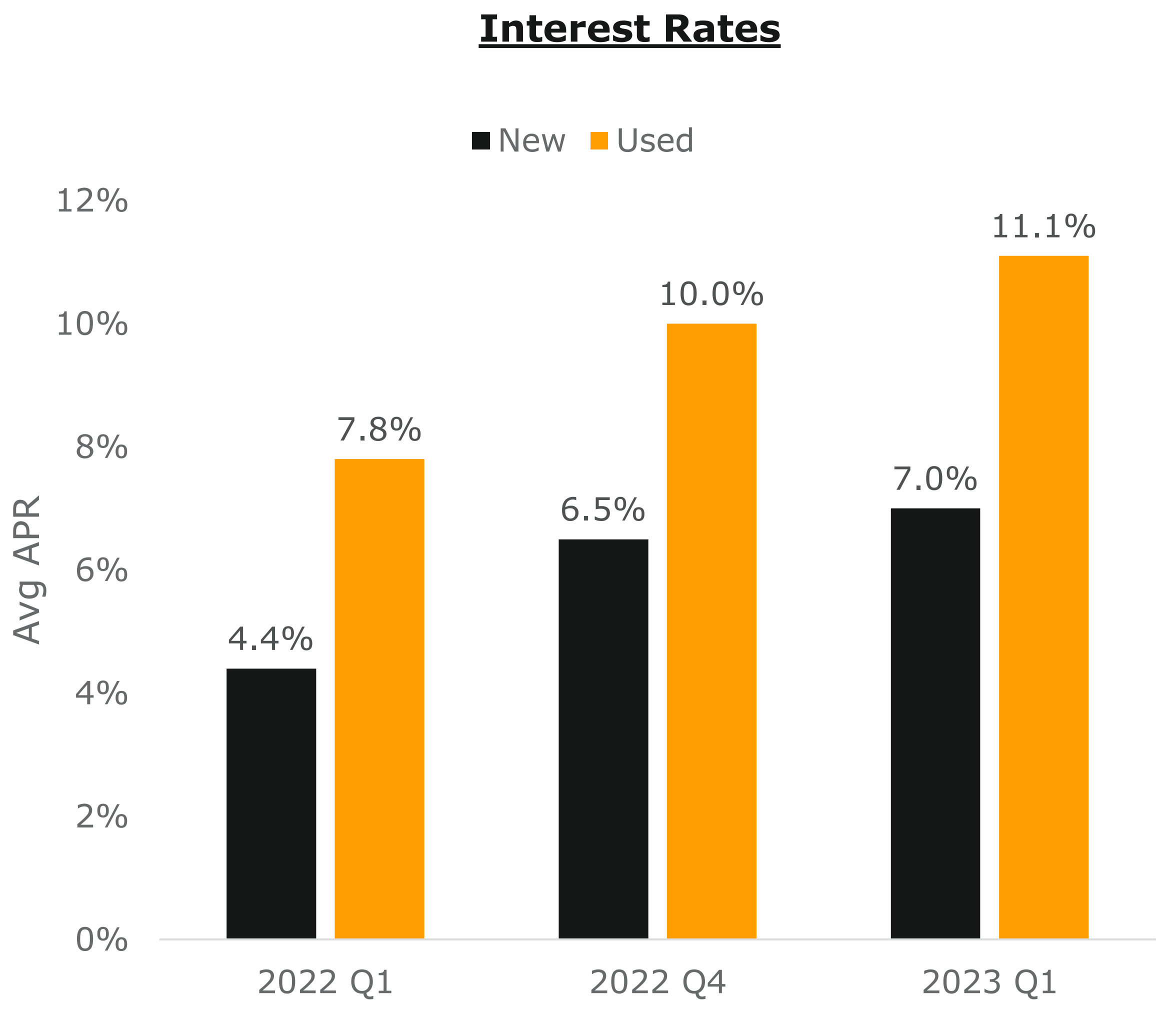
- Personal Loan
- **Auto**
- Student Loan
- Mortgage
- Risk Score Inflation

Auto Originations

Interest rates are driving the payments higher and hindering vehicle purchases in Q1 despite improving inventory levels

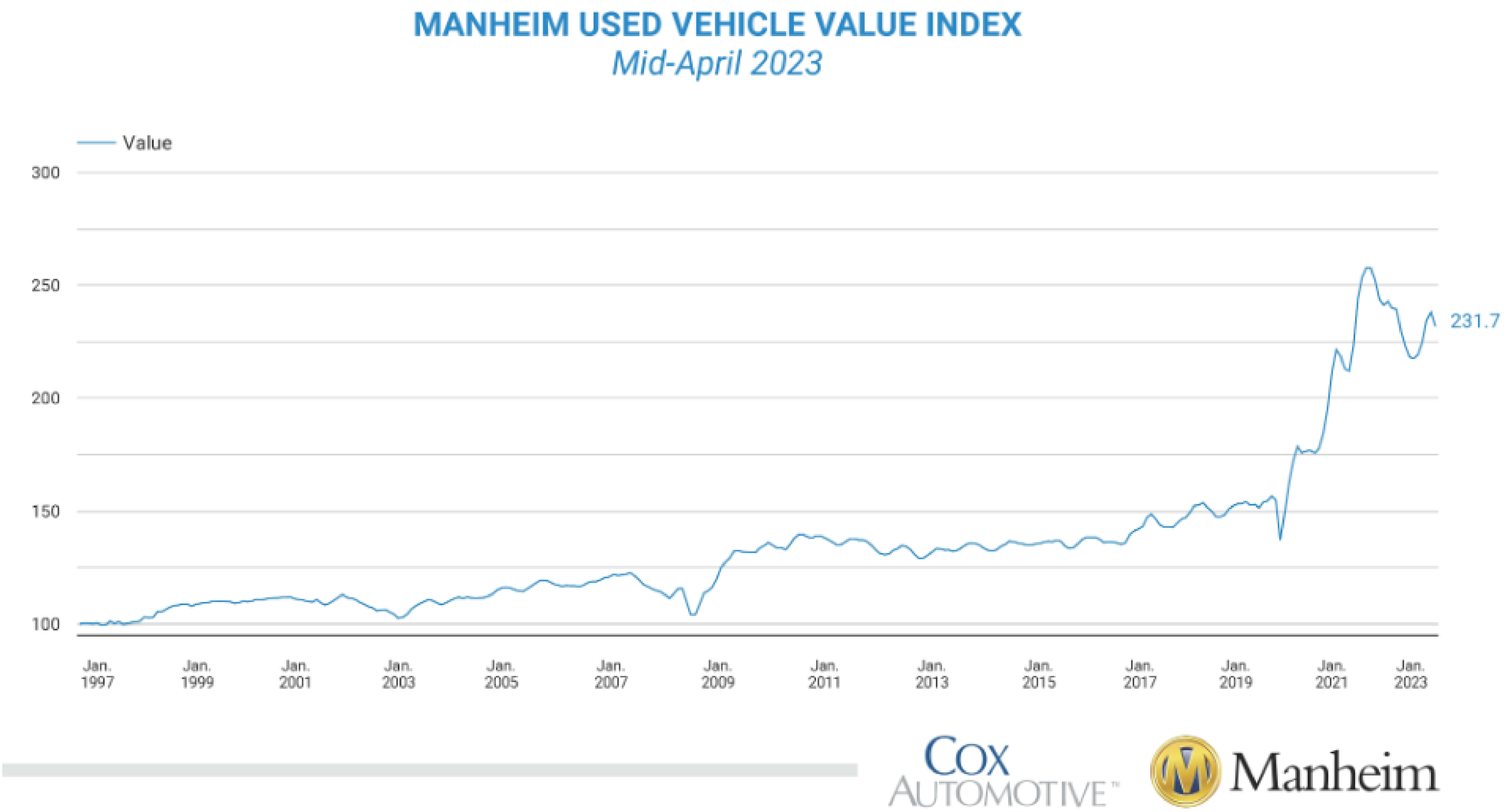




High interest rates disproportionately impacting the consumers who can not put down a larger down payment

- Source: Edmunds April 3, 2023

Wholesale used-vehicle prices remain elevated compared to historic levels



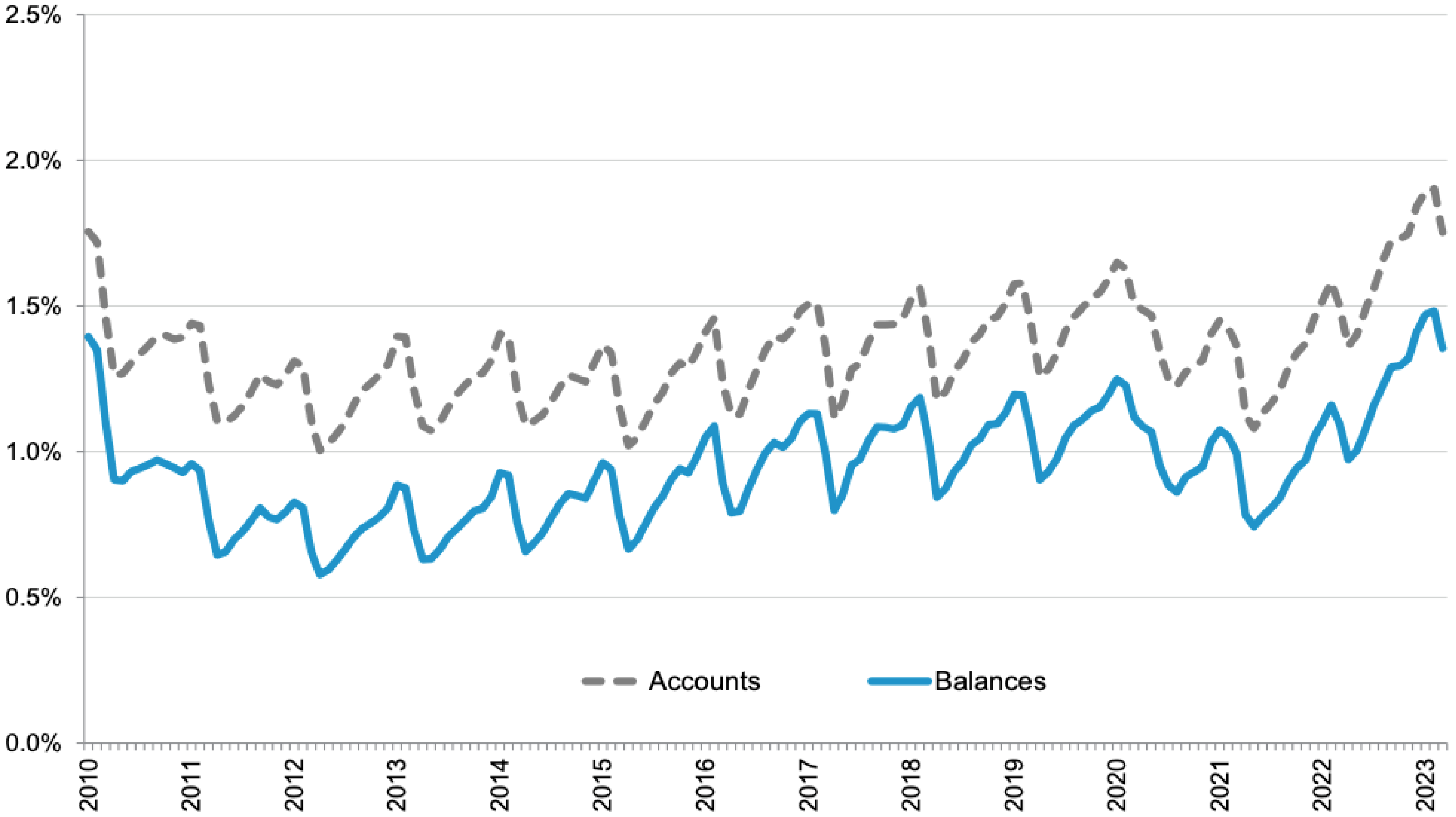
Auto delinquencies rising to about pre-pandemic levels

Dip in March due to seasonality

Severe Delinquency Rate

60+ Days Past Due

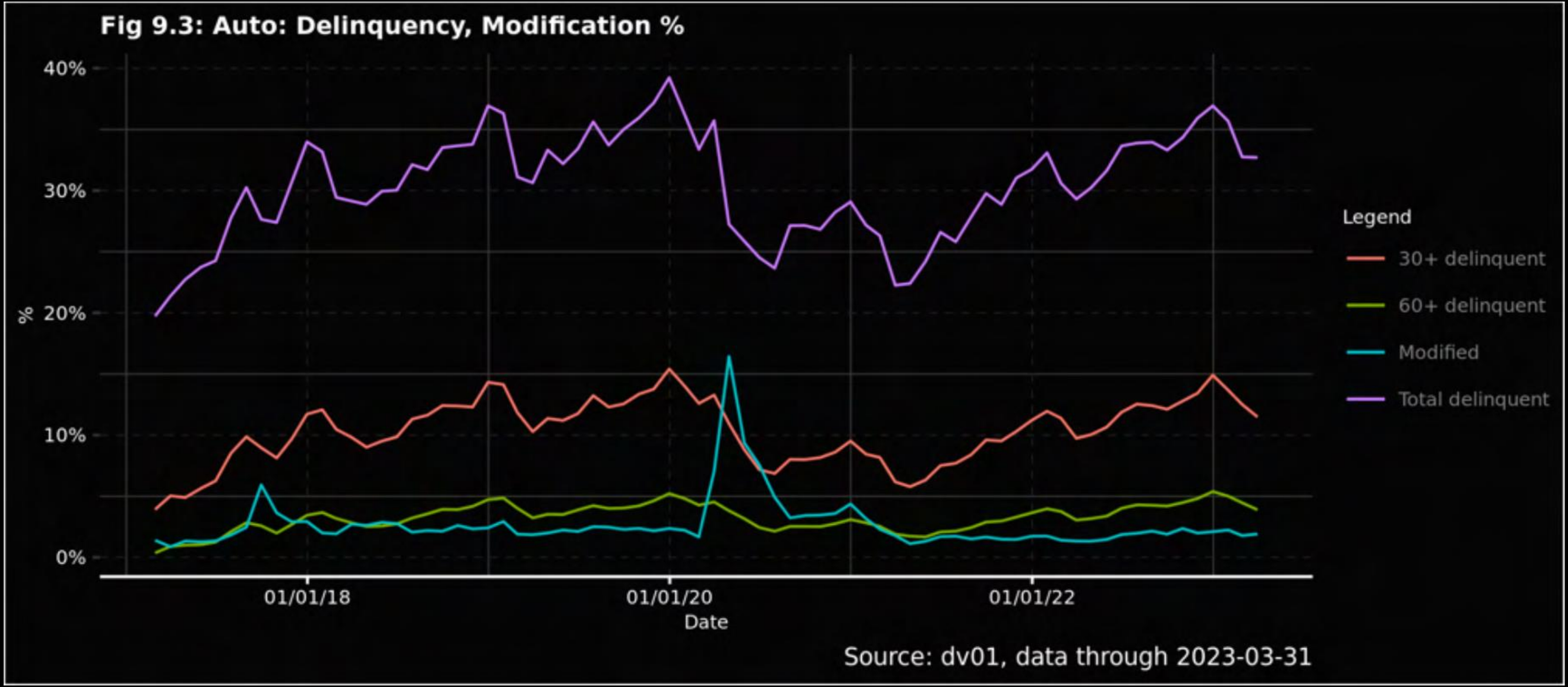
Percent of Accounts and Balances; NSA; Excludes Severe Derogatory and Bankruptcy



Source: Equifax Inc.

Data as of March 2023

Drop in Q1 delinquencies driven in part by seasonality



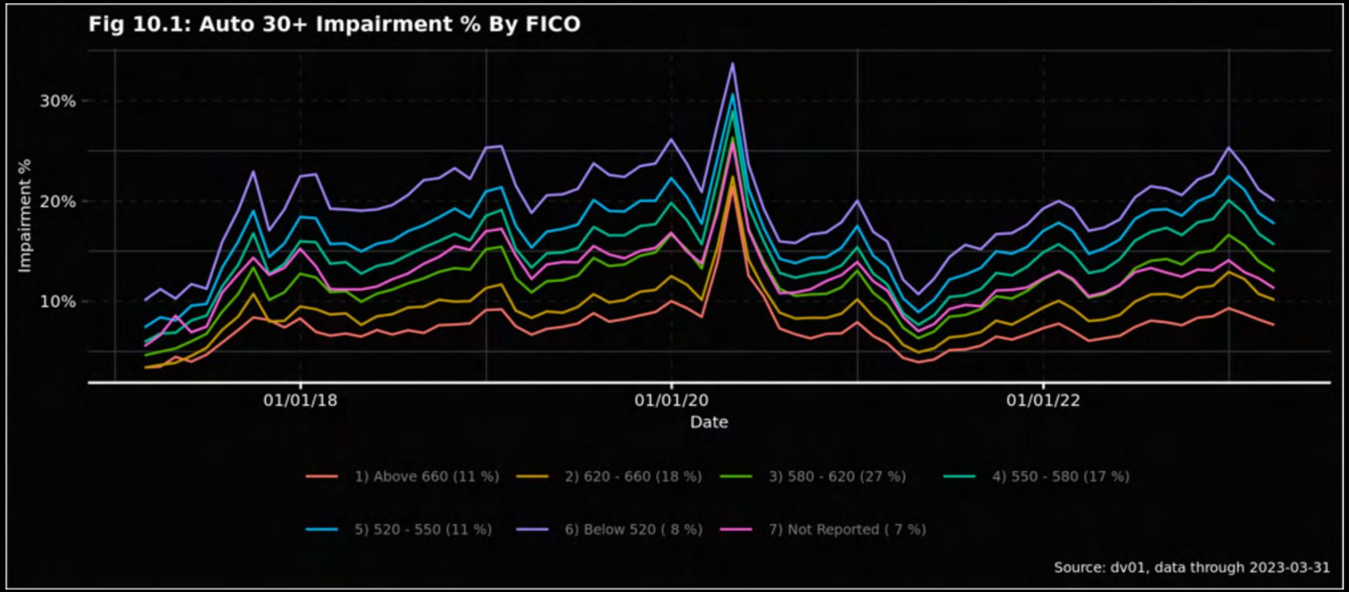
Source: dv01, data as of March 31, 2023

Impairment = DQ + Modification

Drop in Delinquencies across the board in Q1 and trending down

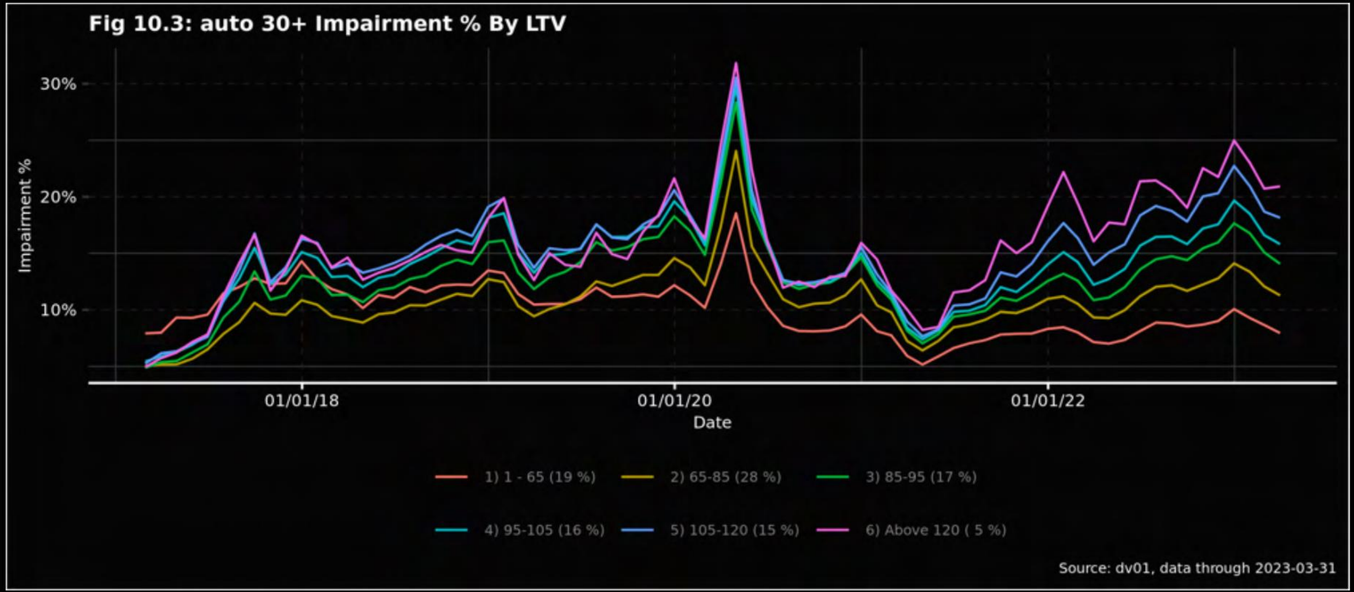
FICO

Delinquencies returning to pre-pandemic levels and trending up



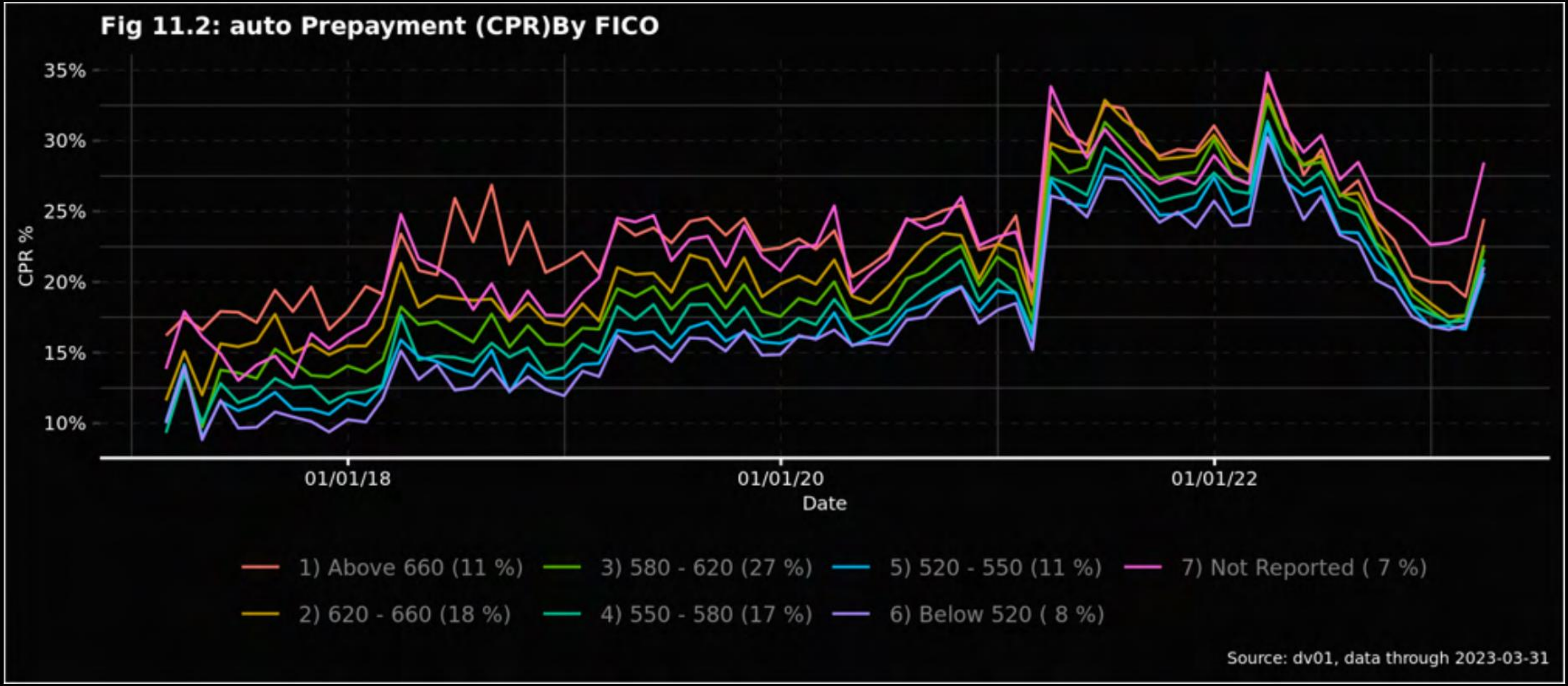
LTV

More pronounced fanning after COVID. Recently, used cars have had much higher LTVs



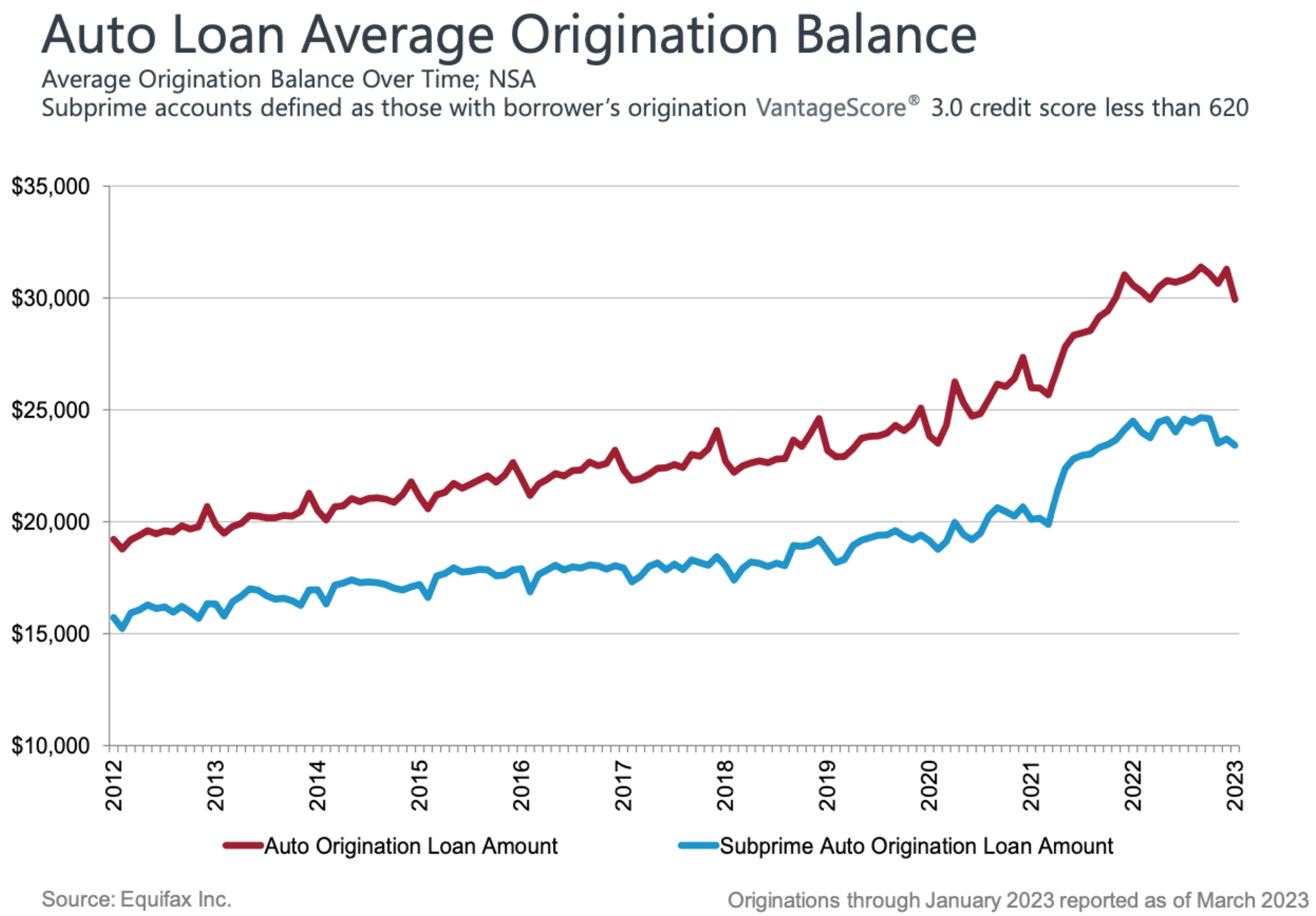
Source: dv01 Subprime Auto, data as of March 31, 2023

Prepayment rates dropped rapidly but have been recovering in Q1 2023



Source: dv01, data as of March 31, 2023

Auto originations balances remain high as vehicle prices are elevated



- State of the Consumer
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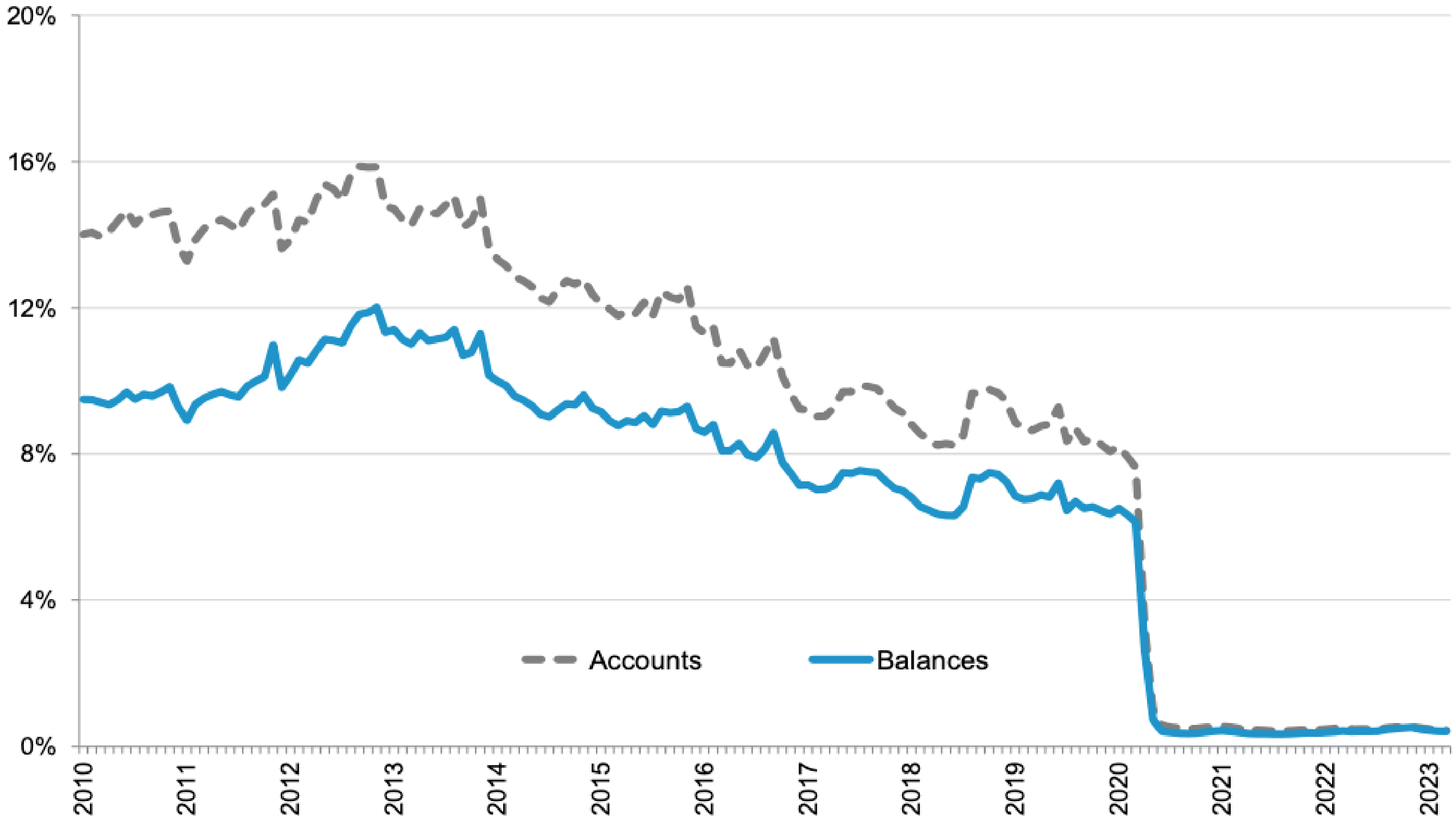
- Risk Score Inflation

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

As deferrals are set to expire in June 2023, we can expect an increase in risk across other asset classes as payment burdens rise

Severe Delinquency Rate

90+ Days Past Due or in Bankruptcy
Percent of Non-deferred Accounts and Balances; NSA; Excludes Severe Derogatory



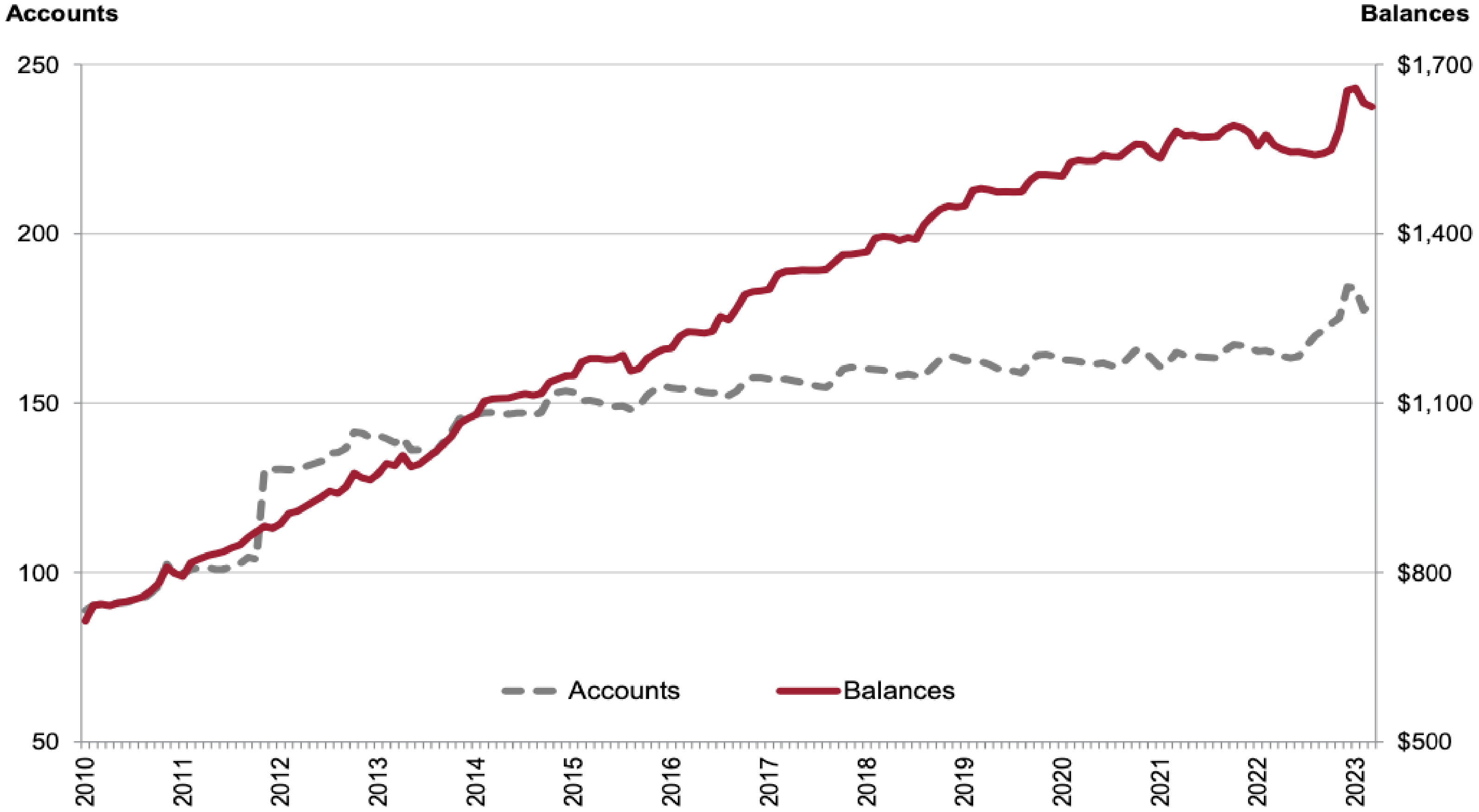
Source: Equifax Inc.

Data as of March 2023

There is an increase in accounts and balances as consumers grapple with financial stress

Outstanding Loans

Number of Accounts in Millions; NSA
Balances in $Billions; NSA
Includes Deferred and Non-deferred Loans

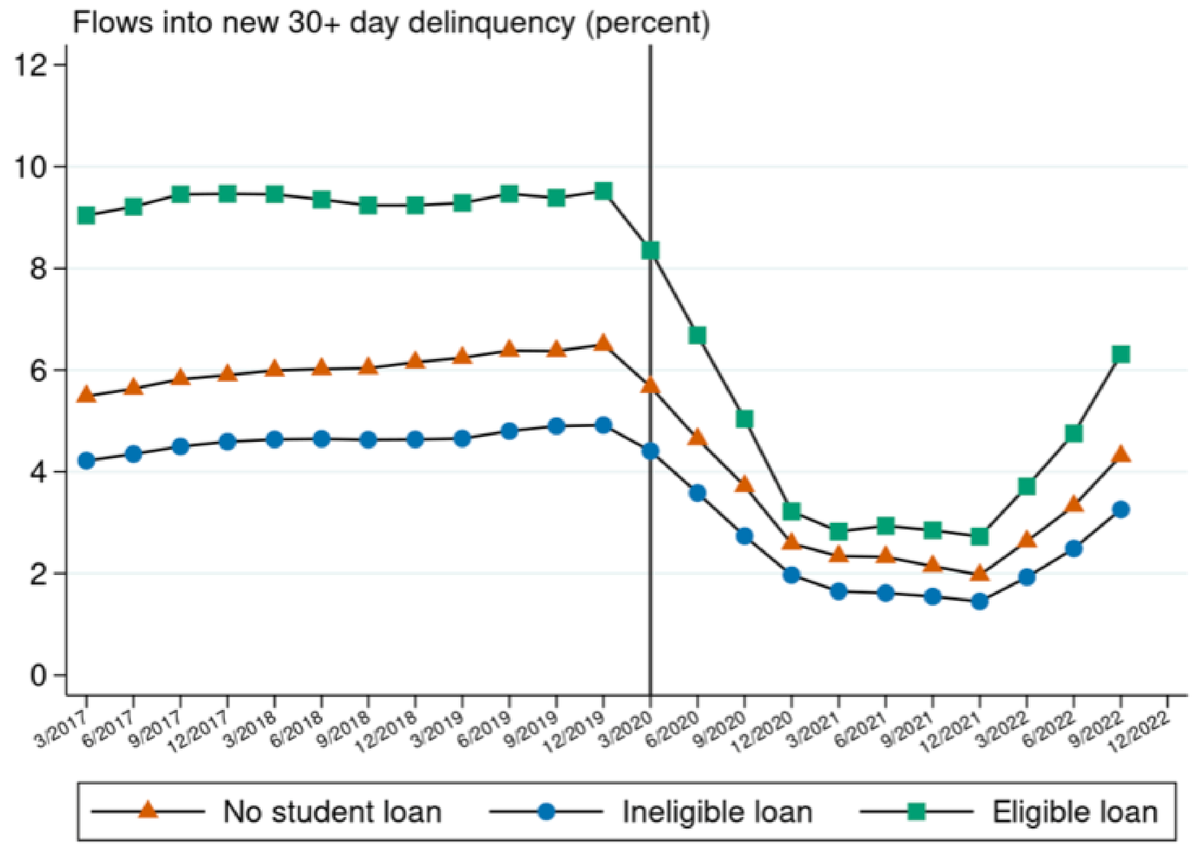


Source: Equifax Inc.

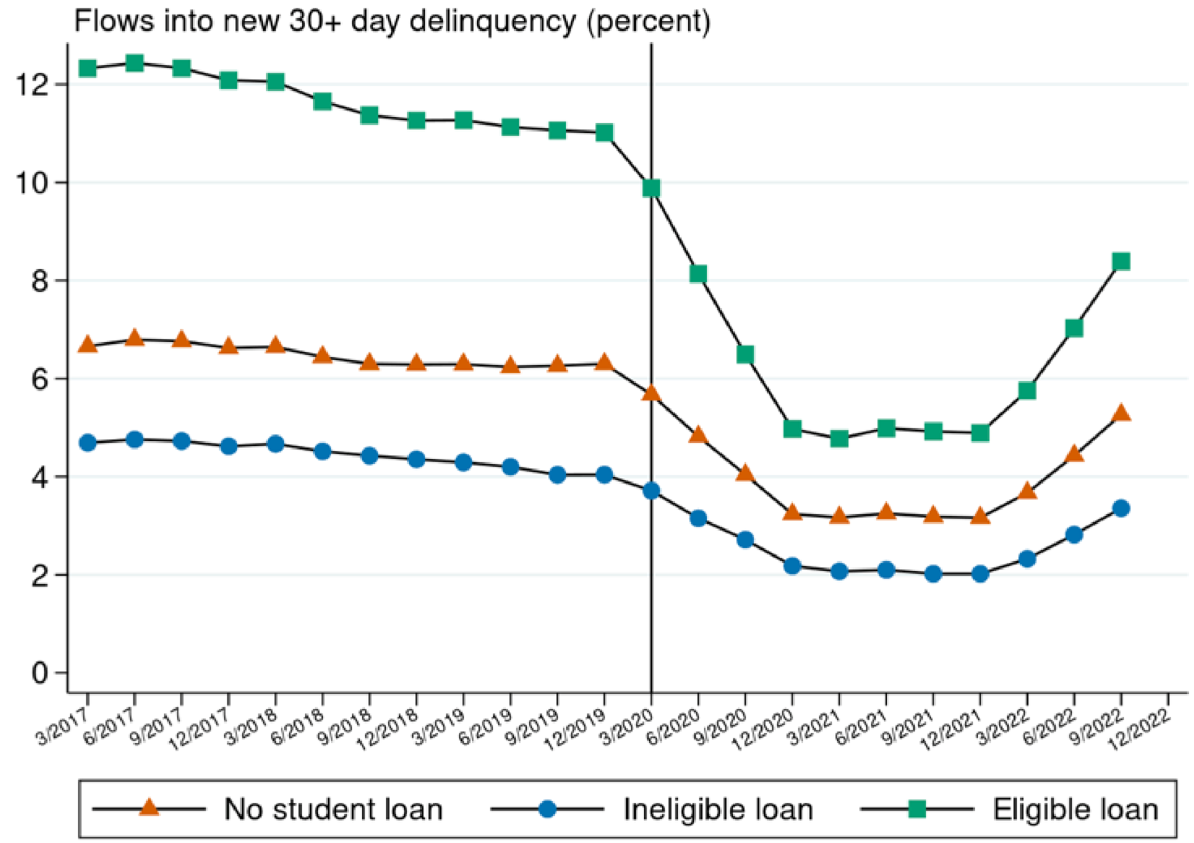
Data as of March 2023

Even though federal student loan payments are paused, there is already a stark increase in delinquencies across these consumers' other asset classes

New Delinquencies for Credit Cards



New Delinquencies for Auto Loans



The risk of consumers with student loans may significantly worsen once the pause in payments expires in June 2023

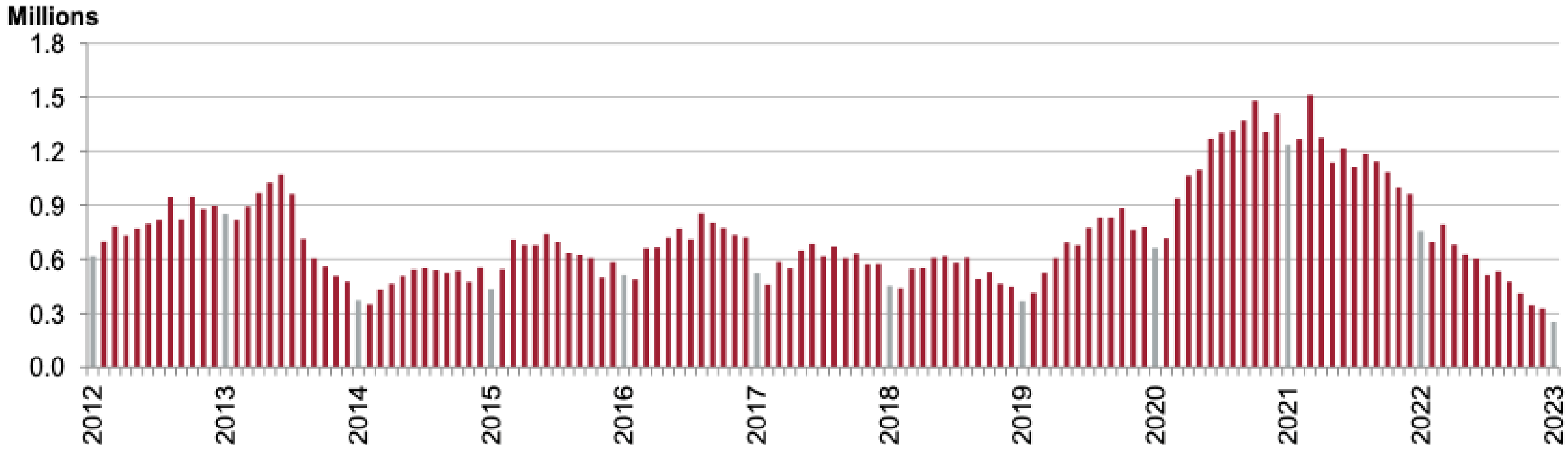
- Ineligible loan: population with student loans ineligible for the Student Loan Forgiveness Program. Eligible loan: Population with student loans that is eligible for the program
- Source: New York Consumer Credit Panel/Equifax Jan 2023

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

There is a significant drop in originations as we come out of the low interest rate era

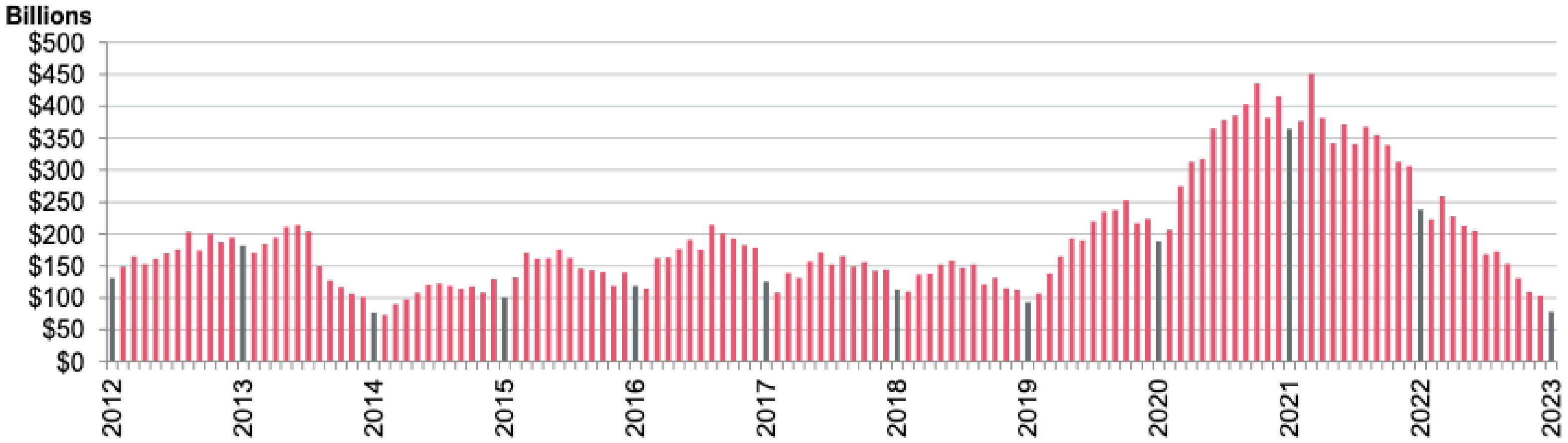
First Mortgage Originations: Accounts

Number of Accounts in Millions; NSA



First Mortgage Originations: Balances

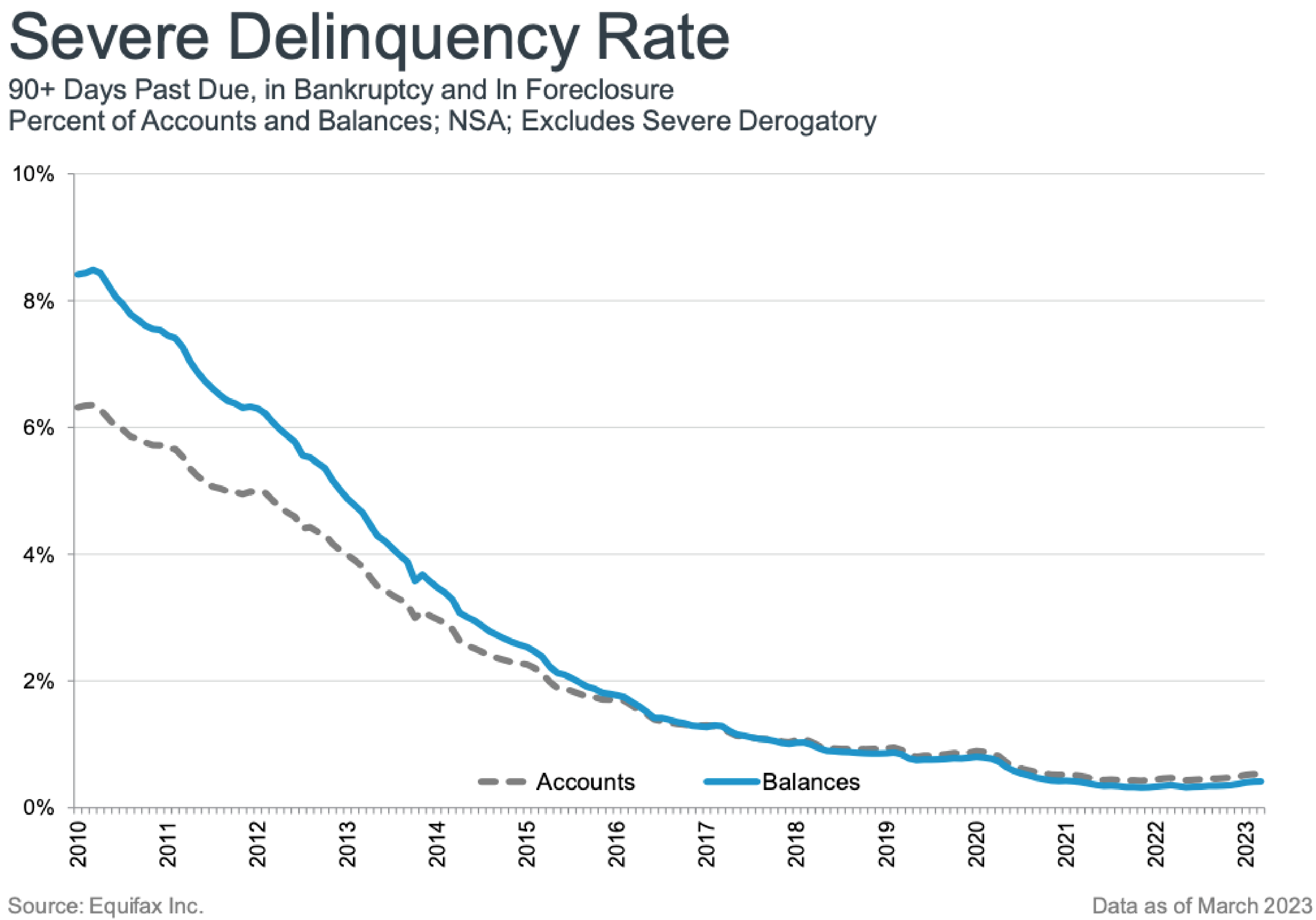
$ Balances in Billions; NSA



Source: Equifax
Data as of March 2023, originations through Jan 2023

Delinquencies remain low for Mortgages

They are usually higher up in a consumer's payment hierarchy, and the majority of them are fixed rate, so the payment burden remains the same for a majority of the portfolio even though the interest rates are rising



- Source: Transunion Q1 2023 Credit Industry Insights

- State of the Consumer
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- Risk Score Inflation

We continue to see warping and gaming of risk scores leading some of the risky subprime customers to appear as nearprime

Student Loan Deferrals

- We have seen evidence of higher score inflation for new to credit & thin file (especially younger borrowers), one of the major reasons being the large number of student loan deferrals (92%)
- Historically, student loans have a relatively high delinquency rate and the majority of them have been muted because of deferral programs. This has caused lenders to put more young customers on their books than ever before. We are already seeing signs of stress in young cohorts at many of our partner banks

COVID-related Data Degradation

- Although a lot of the data degradation has alleviated, we still see remnants as a majority of the policies and models currently in use are still grounded on COVID-impacted data.
- This includes reduced delinquencies, foreclosures, & bankruptcies due to deferral programs. Sharp reduction in balances & utilization, temporary increase in savings & deposit balances. Inflated risk scores and higher temporary cashflows due to unemployment benefits and govt stimulus

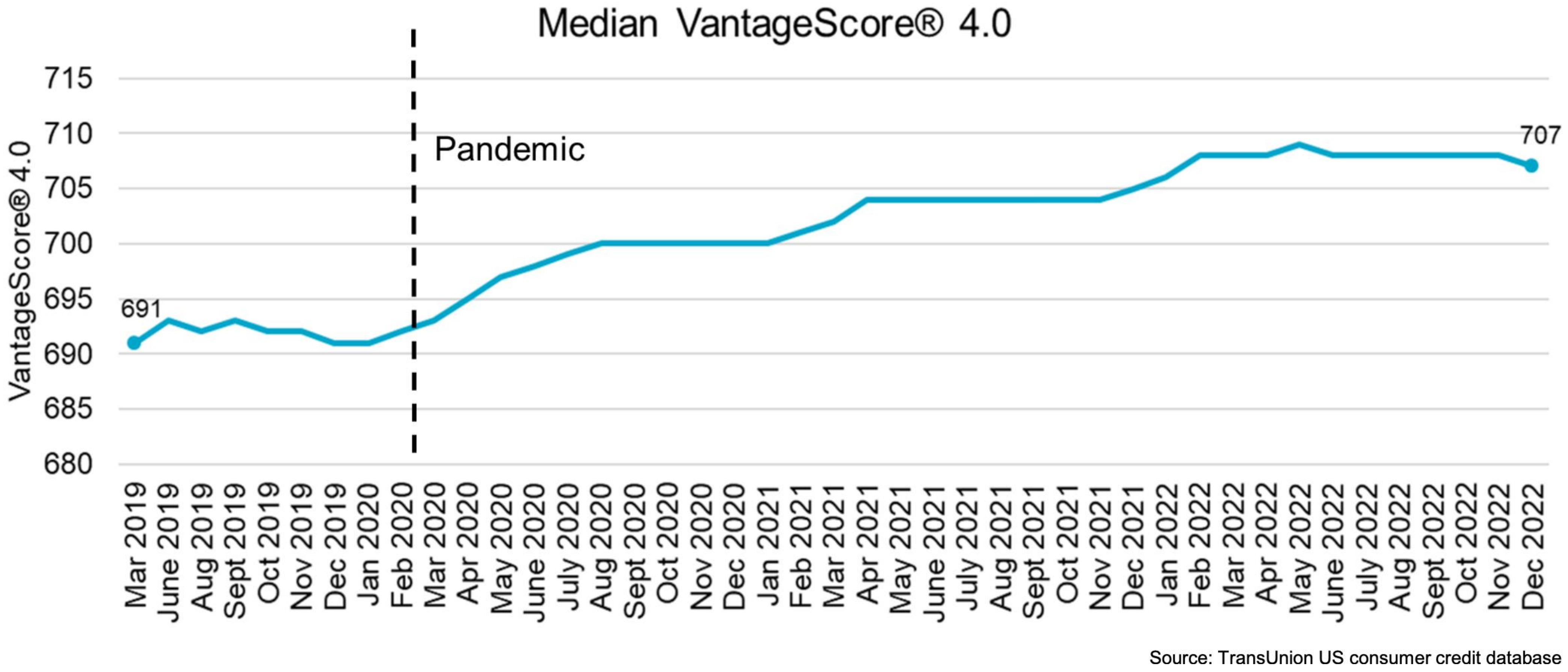
Buy-Now-Pay-Later (BNPL) trades

- These products are continuing a fast upward rise in usage. Unfortunately, these trades are not fully reported to the bureau yet – as such, the risk of these customers is not fully captured.
- This is leading to some muted risk signal among BNPL customers, as in-good- standing BNPL customers aren't getting credited for that performance while BNPL customers that go delinquent aren't seeing any impact to their overarching credit profile

Credit Builder Trades

- Risk signals on subprime customers are being gamed by credit builder tradelines as well. These new platforms (e.g., Chime) create opportunities for subprime customers to get secured credit cards that feature selective bureau reporting, which (similar to BNPL) can both help and harm credit builder customers in different ways depending on their behavior on the card. Both credit builder & BNPL trades have also served as catnip for fraudsters

The pandemic-driven score inflation seems to be plateauing due to the rise in risk – rising delinquencies, utilization, balances, etc.



- Source: Transunion Q4 2022 Credit Industry Insights

Acknowledgments

This report was prepared by Syed Raza, Chase Nielsen, and Scott Barton.

- **Syed Raza, PhD** is a Data Science Manager 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
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- **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/

Appendix

Similarly, Card balances also rose across the board in Q1 but flattened in March 2023

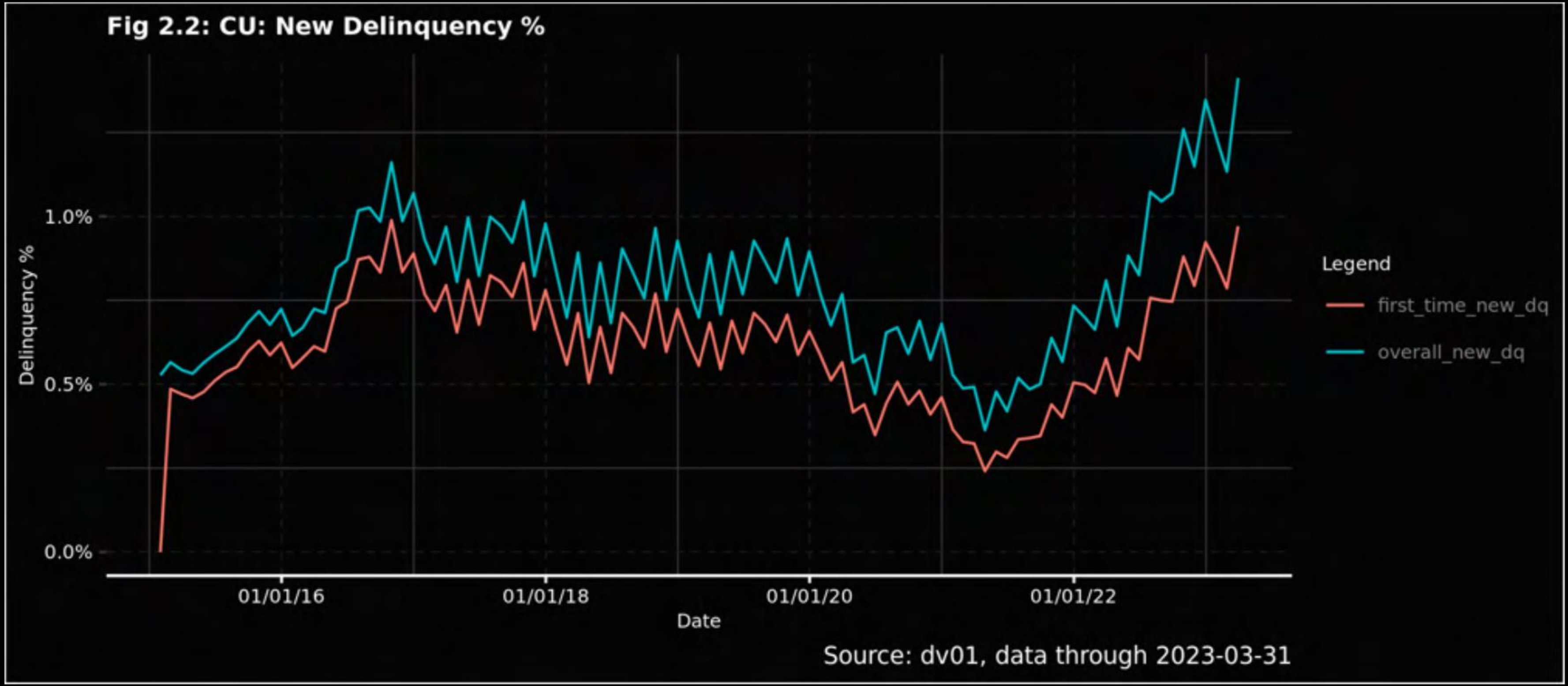
Average Balance by Risk Tier

	Mar 2023	Feb 2023	Mar 2022
Super prime	$3,590	$3,584	$3,279
		0.2%	9.5%
Prime plus	$7,176	$7,168	$6,408
		0.1%	12.0%
Prime	$8,304	$8,433	$7,324
		-1.5%	13.4%
Near prime	$8,114	$8,140	$6,548
		-0.3%	23.9%
Subprime	$4,645	$4,564	$3,515
		1.8%	32.1%
Total	$5,719	$5,743	$5,014
		-0.4%	14.1%

The year-on-year balances remain elevated but but did not increase much in March 2023

- Source: Transunion, data as of March 2023
- Vantage 4.0 Tiers: Super prime (781–850), Prime plus (721–780), Prime (661–720), Near prime (601–660), Subprime (300–600)
- Population March 2022 by tier: Super prime (42.7%), Prime plus (20.1%), Prime (17.1%), Near prime (10.8%), Subprime (9.2%)

Increase in first-time delinquencies with especially weak credit performance in the last few months



Source: dv01, data as of March 31, 2023