2022 Q4 Credit Risk Review

Trends and Early Risk Indicators in Consumer Credit

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February 9th, 2023

Executive Summary - Credit Cards

Credit Cards

- For most of 2022, the increase in credit risk was concentrated in populations especially squeezed by inflation -- subprime and lower-income consumers (higher risk levels than pre-pandemic levels). We are now starting to see the impact on more prime consumers too

- There is a ~50% increase in year-over-year card delinquencies, contributed mainly by subprime, near-prime, and 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 dq rates during government support payments

- We see a record increase in balances as consumers borrow more in the face of economic uncertainty. Card balances increased across risk tiers, but especially sharp increases for subprime and near-prime consumers

- We also see record card origination volumes. However, as some lenders tightened their underwriting, we can see a decrease in subprime originations. Both increases in balances and originations may seem concerningly steep, but they fall within the pre-pandemic trendlines for now

- Despite several lenders tightening their underwriting standards in 2022, we are seeing increased risk (higher than pre-pandemic) in more recent vintages. Lenders who tightened more heavily in early 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

- For most of 2022, the increase in credit risk was concentrated to populations especially squeezed by inflation -- subprime and lower income consumers (higher risk levels than pre-pandemic levels)

- In the last few months, we are also seeing an uptick in risk in prime and higher-income customers which are trending above pre-pandemic levels now. We have observed that the lower the income, the steeper the increase in risk

- Despite some lenders tightening their underwriting standards in 2022 (increase in average origination FICO and income), we are seeing increased risk (higher than pre-pandemic) in more recent vintages. Lenders who tightened more heavily in early 2022 are seeing better performance

- Prepayment rates – a leading indicator of consumer health - are dropping rapidly for PL with lower income and subprime consumers trending below pre-pandemic levels

Executive Summary – Auto Loans

Auto

- Originations have dropped, especially for super-prime consumers. Consumers shifting to longer terms to attempt to maintain monthly payment amounts as they deal with inflationary pressures and rising interest rates
- Despite shifts to longer term loans, rising auto interest rates are driving up the payment amounts -- 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
- Credit Unions continue to capture more market share as they choose to offer more competitive deals in a period of elevated interest rates
- The performance of used auto has worsened in recent vintages whereas the performance of new auto has improved, likely driven by the rapid fall-off of used auto prices from the records reached in Q2. We do see an increase in used car prices in January 2023 after a period of price drops
- There is an increase in delinquencies but still within pre-pandemic levels. Attributes like LTV appear to be stronger differentiators of risk compared to pre-pandemic trends
- Prepayment rates are dropping rapidly. Lower income consumers show the largest decline and trending below pre-pandemic levels
- Subprime Auto had far 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)
- There is an increase in accounts and balances as consumers grapple with inflation and financial stress
- Borrowers in their first year of private student loan repayment — borrowers who are often recent college graduates — are having a harder time paying their 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
- Drop in origination volumes with the rise in interest rates but this can be a reversion-to-mean to pre-pandemic levels
- There has been a significant increase in HELOC originations, another sign of financial stress as consumers borrow more. The rise in home values during the pandemic has allowed more consumers to dip into their home equity

Executive Summary – Small Business and Impacts of Inflation on Lending

Small Business

- Increase in delinquencies across all account types but still below pandemic levels. The increase is led by transportation and healthcare industries. Delinquencies are expected to rise more as businesses grapple with inflation and wage pressure
- Small businesses also facing pressures from declining consumer spending, supply chain constraints, labor shortages. increasing employee compensation and rising interest rates that increase the cost of borrowing. All of these are closely linked to inflation
- Utilization continues to increase due to both decreasing limits (originations tightening) and increasing balances
- Charge-offs remain stable. Unsecured accounts have levelled after higher losses during the pandemic

Impacts of Inflation on Lending

- Consumers are increasingly borrowing from Credit Cards, HELOC (home equity lines of credit), and dipping into 401K retirement savings to deal with financial stress
- Inflation is disproportionately impacting lower-income consumers as their effective income has reduced. We see a much steeper increase in risk for income < $50k. In recent months, there is also a risk uptick for higher income customers
- High inflation is forcing consumers to dip into their savings leading to historic low personal savings rate. However, a large portion of customers remain flush with excess cash accumulated during the pandemic. Lenders who can leverage internal customer savings + deposit data hold significant advantage and can differentiate risk much better than the competition

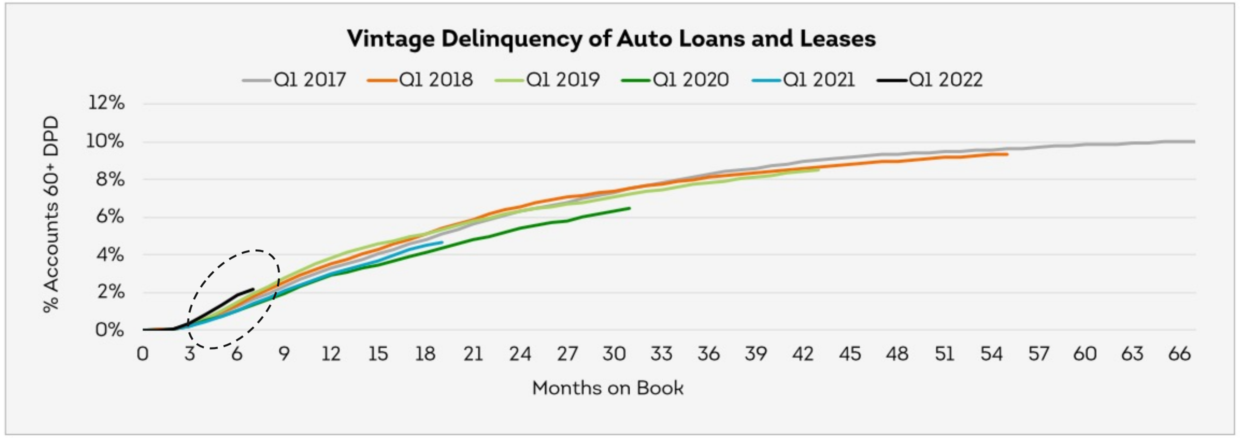
Executive Summary – Risk Score Warping

Risk Score Warping

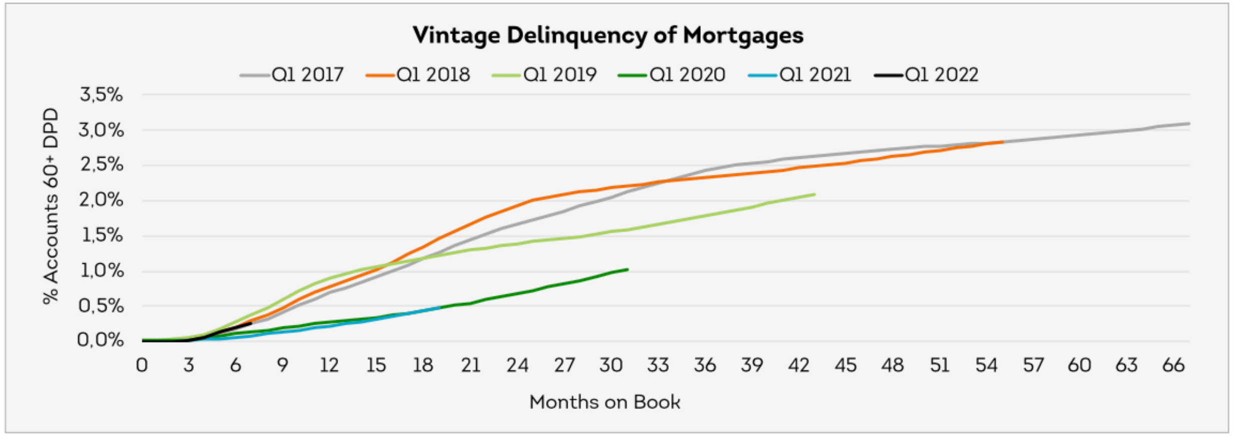
- We continue to see warping and spoofing of risk scores. This means that some of the risky subprime customers can appear as near-prime. Some contributors are:
  - Student Loan Deferrals
  - Buy-Now-Pay-Later (BNPL) trades
  - Credit builder trades
  - COVID data degradation
- Consumers with student 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

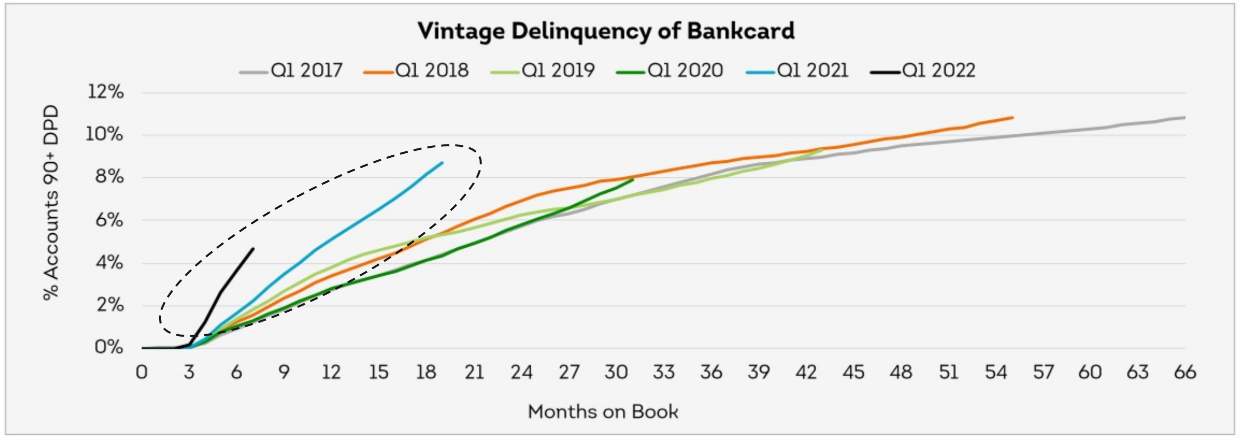
AUTO



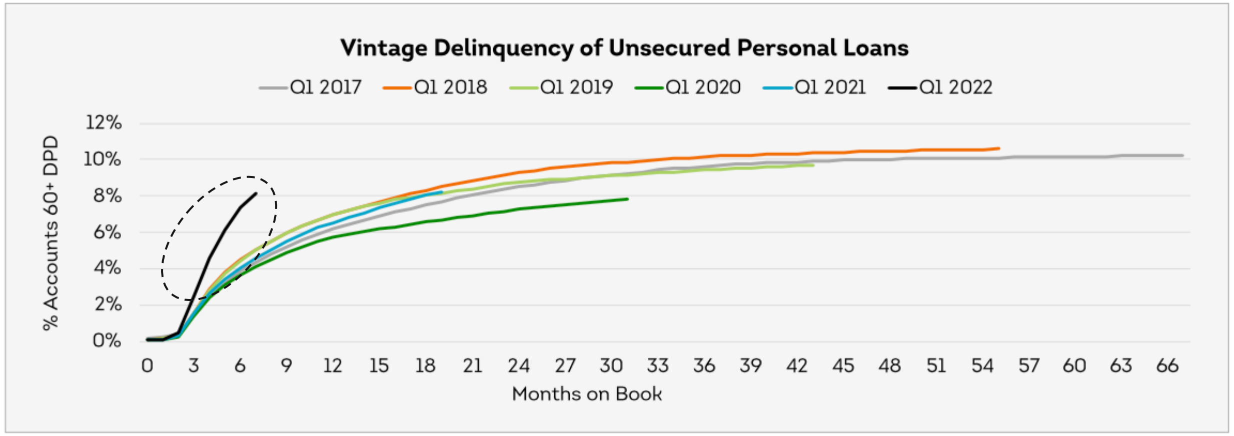
MORTGAGE



BANKCARD



UNSECURED PERSONAL LOAN

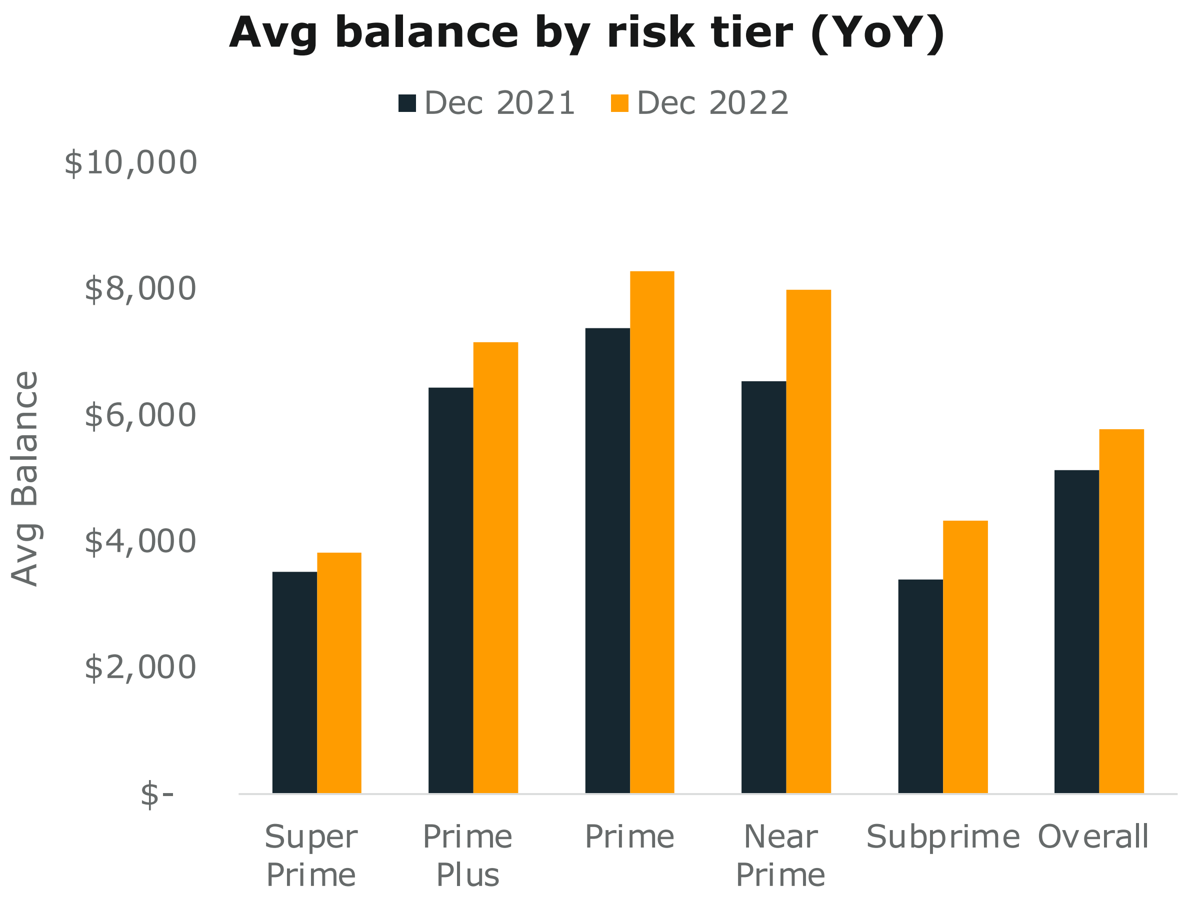


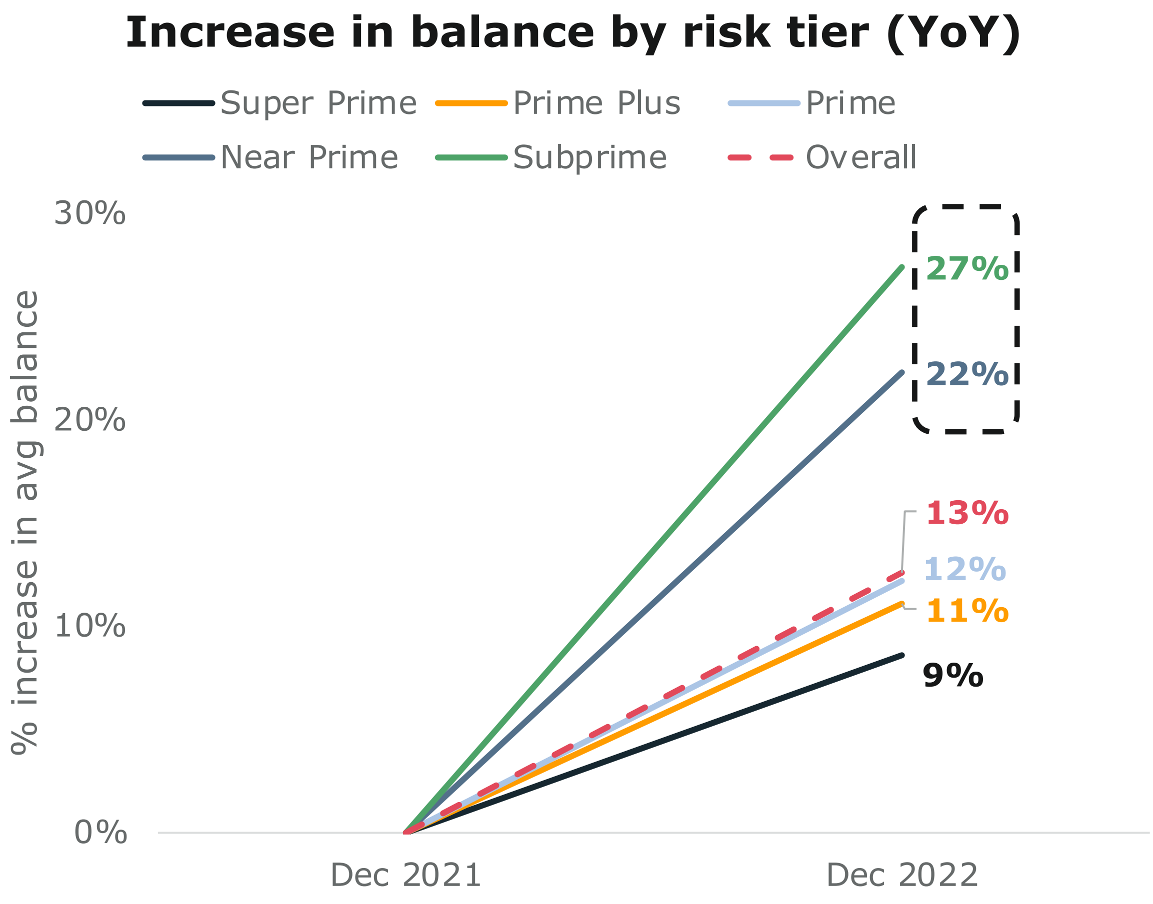
Source: Transunion, data as of December 2022

2nd Order solutions

- Credit Card
- Personal Loan
- Auto
- Student Loans
- Mortgage
- Small Business
- Risk Score Inflation

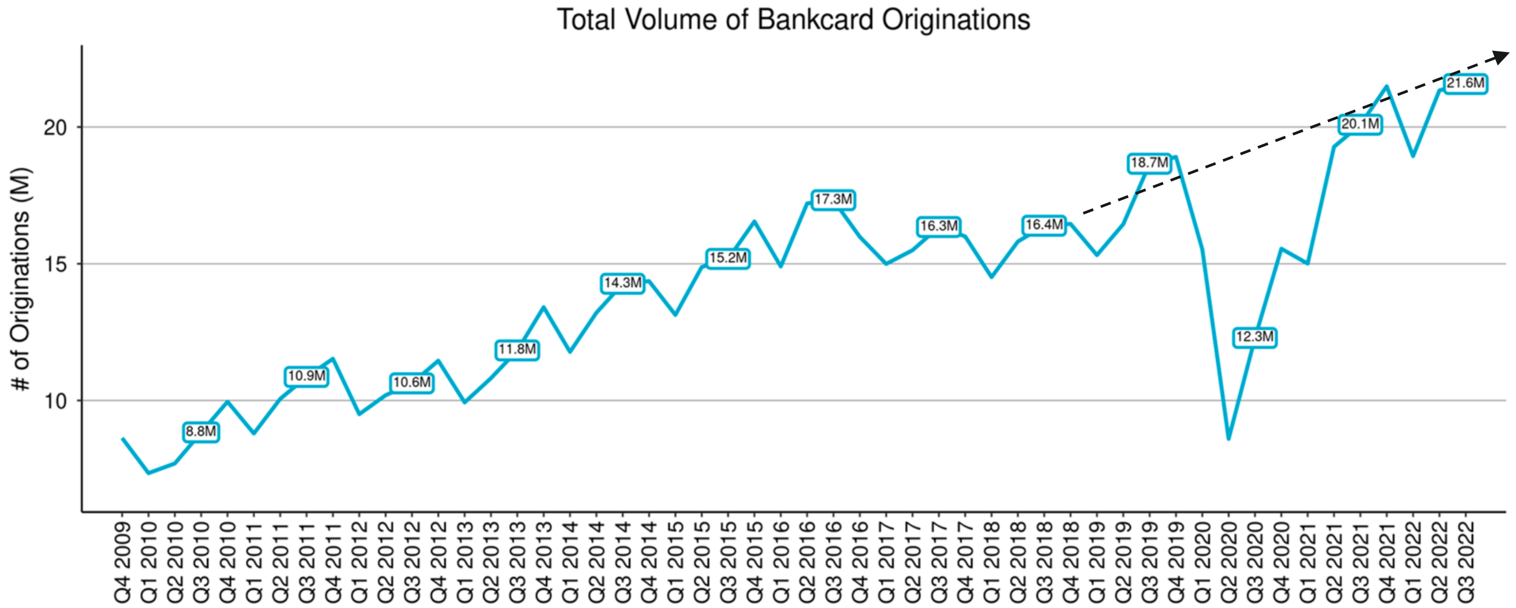
Card balances increased across risk tiers with a sharper increase for subprime and near-prime consumers as they deal with economic uncertainty

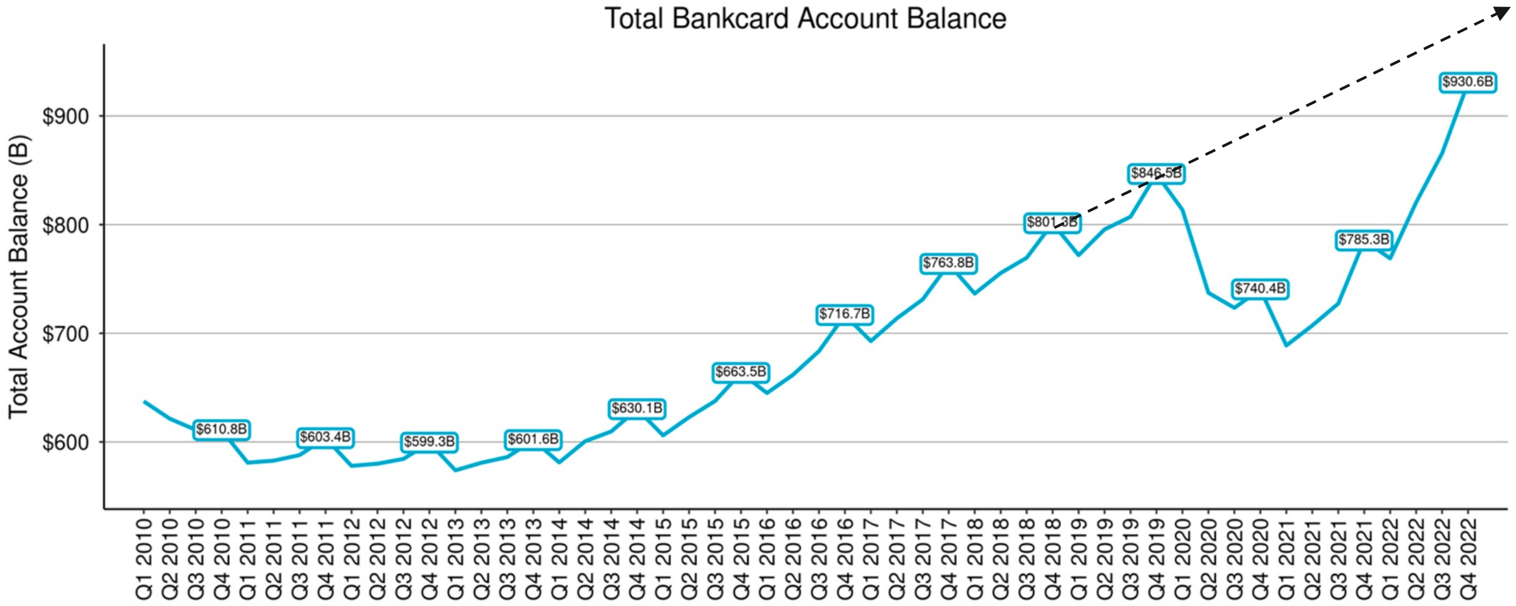




- Source: Transunion, data as of December 2022
- Tiers based on Vantage 4.0: Super prime (781–850), Prime plus (721–780), Prime (661–720), Near prime (601–660), Subprime (300–600)
- Population distribution Dec 2022 by tier: Super prime (41.5%), Prime plus (20.4%), Prime (17.3%), Near prime (11.0%), Subprime (9.8%)

Although the YoY increase in originations and balance growth appears to be concerningly steep, they are still within the pre-pandemic trendlines

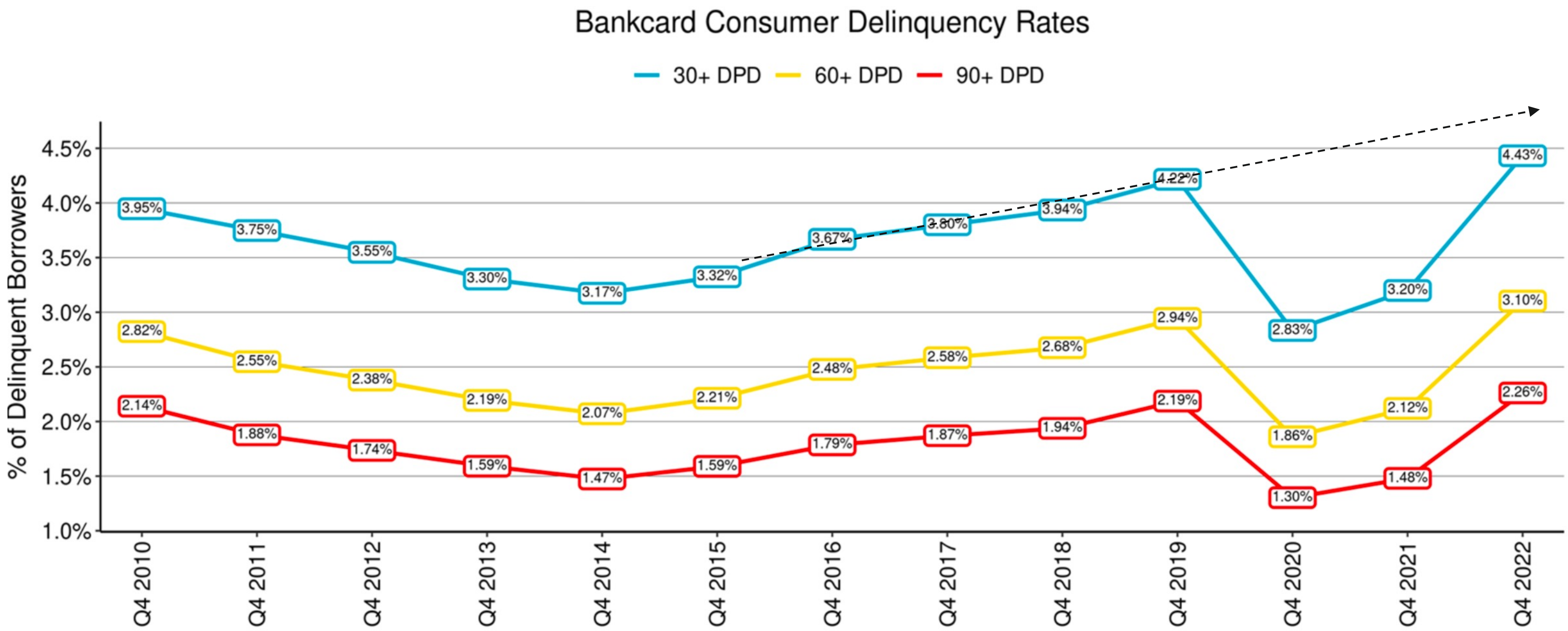




Source: TransUnion US consumer credit database

- Source: Transunion Q4 2022 Credit Industry Insights

The increase in delinquencies is steep and creeping above pre-pandemic levels but still within the pre-pandemic trendlines

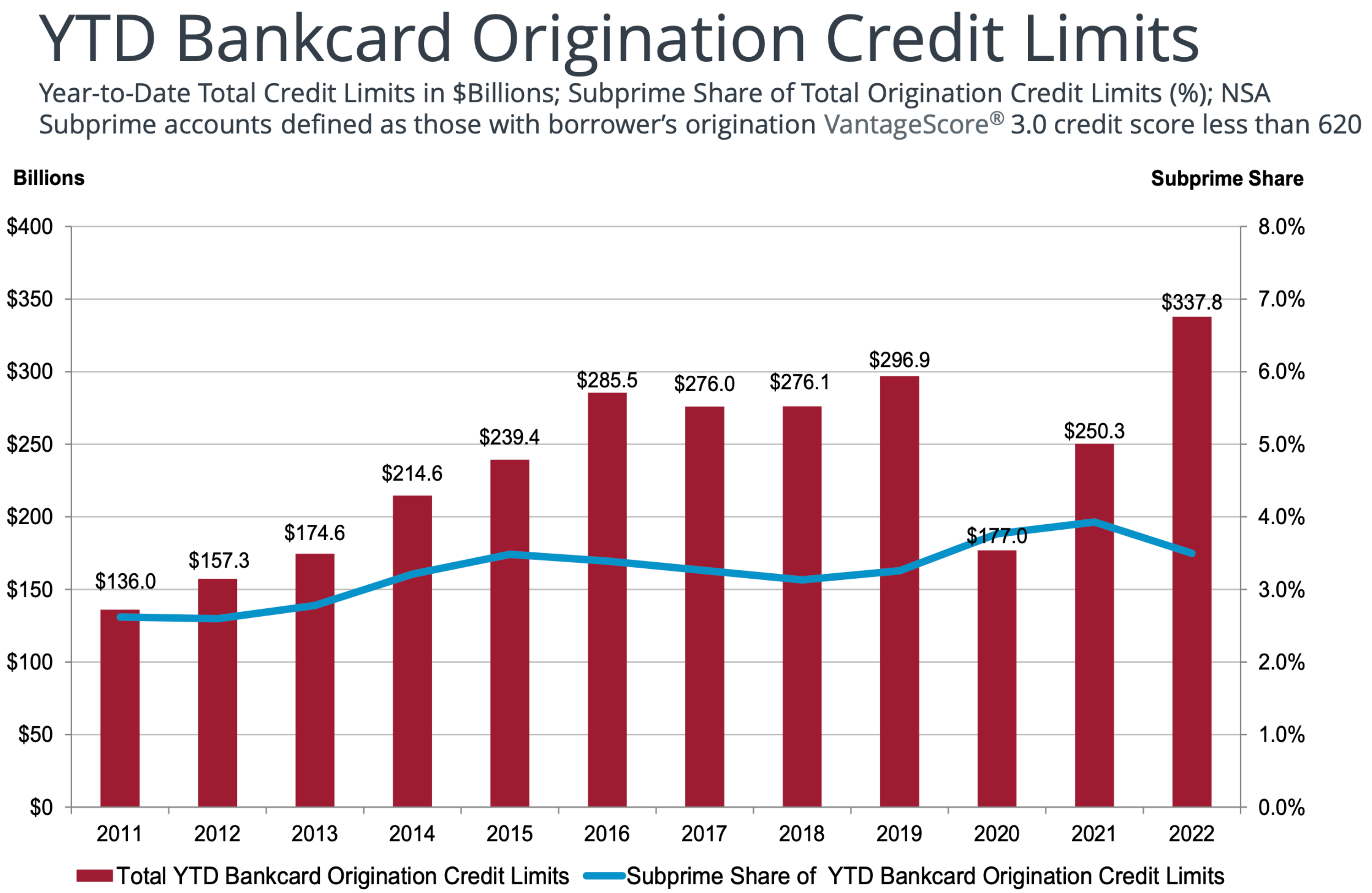


*Serious delinquency considered as 90+DPD for card, mortgage and home equity, 60+ DPD for all other products

Source: TransUnion US consumer credit database

- Source: Transunion Q4 2022 Credit Industry Insights

As some lenders tightened their underwriting standards in 2022, we see a drop in the subprime concentration

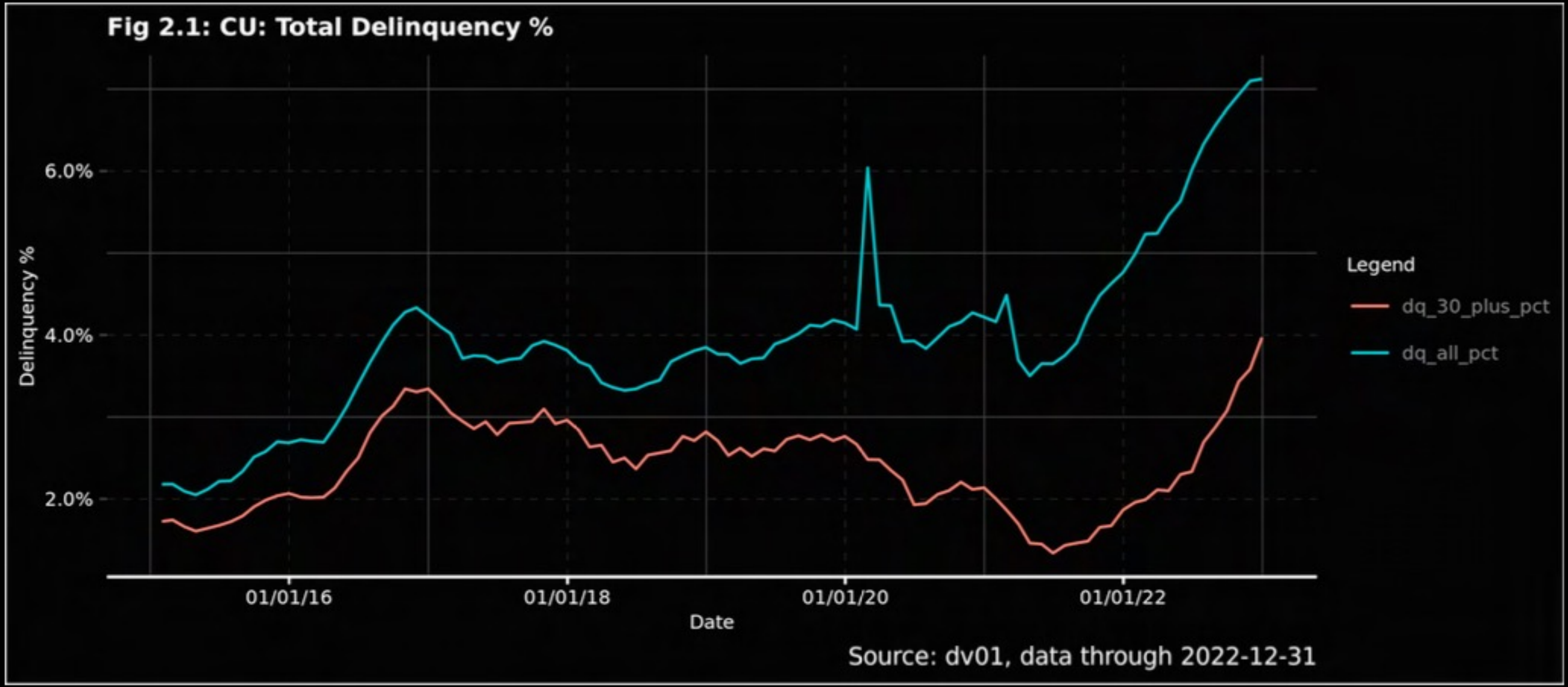


- Source: Equifax Consumer Credit quarterly. Originations through Oct 2022 reported as of Dec 2022

- Credit Card
- Personal Loan
- Auto
- Student Loans
- Mortgage
- Small Business
- Risk Score Inflation

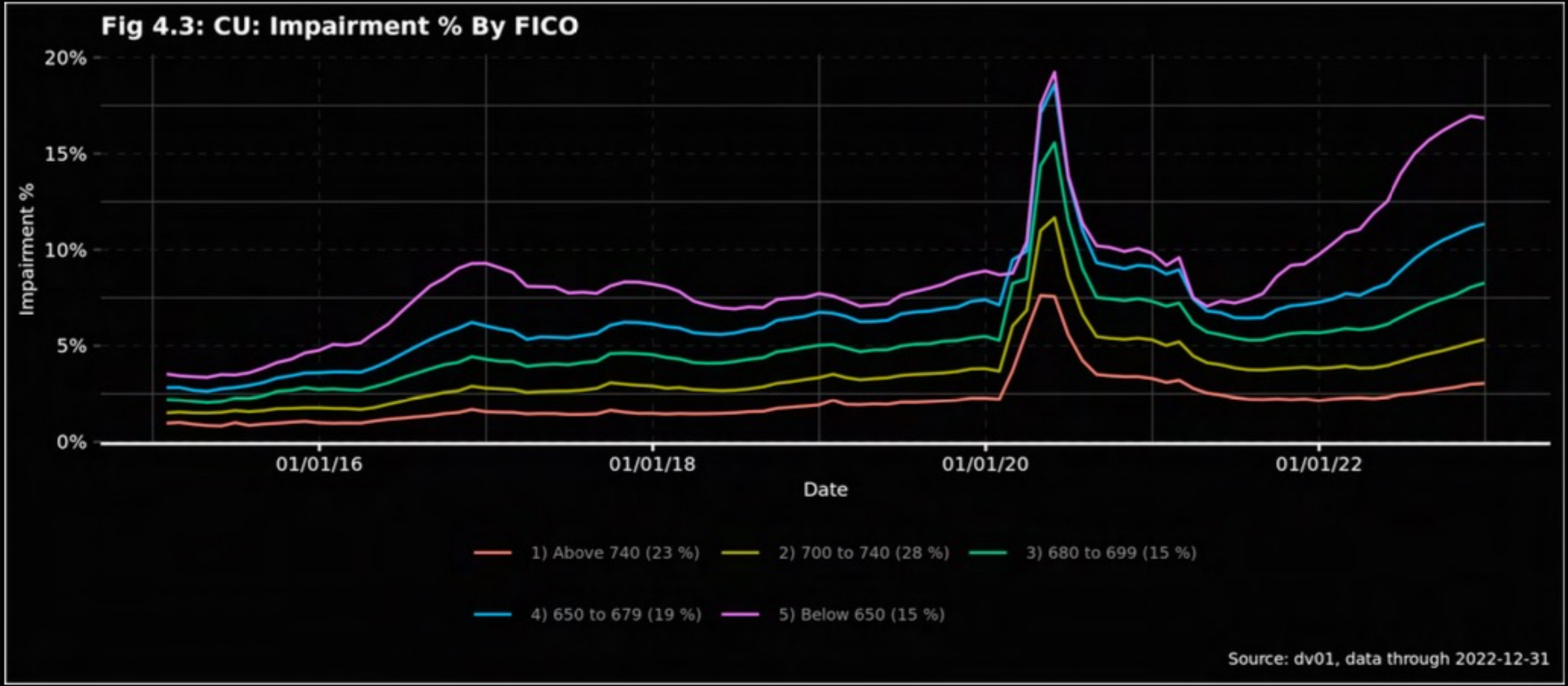
Soaring delinquencies (much higher than the pre-pandemic levels) with especially weak credit performance in the last few months

There is also a surge in first time delinquencies*



Source: dv01, data as of December 31, 2022
*see appendix

Impairment = Delinquencies + Modification



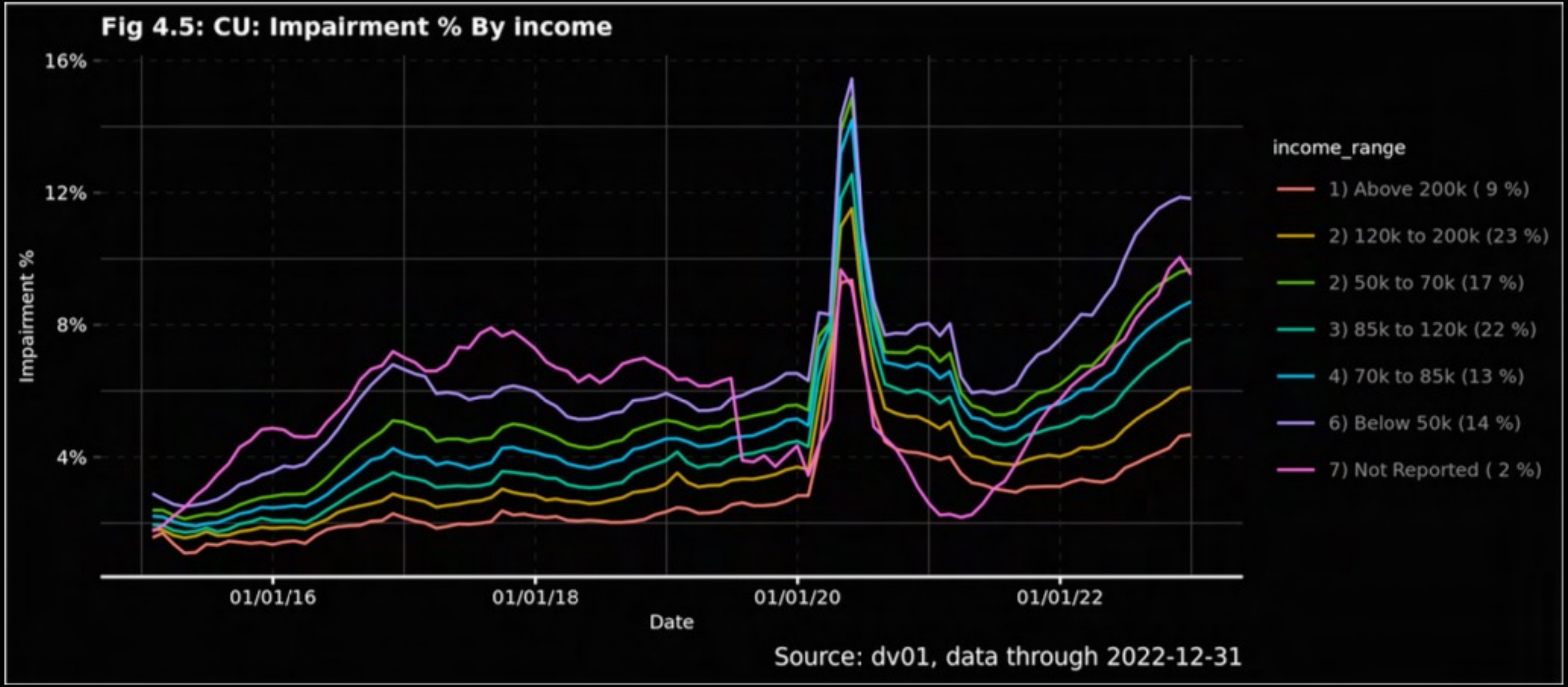
Steep increase in risk across the board – higher than pre-pandemic levels – especially in subprime and near-prime

The increase in risk was concentrated to subprime for most of 2022 but we can see an uptick in prime/near-prime in recent months

Source: dv01, data as of December 31, 2022

Similarly, delinquencies across all income buckets are above pre-pandemic levels with particular worsening in lower income buckets

Impairment = Delinquencies + Modification

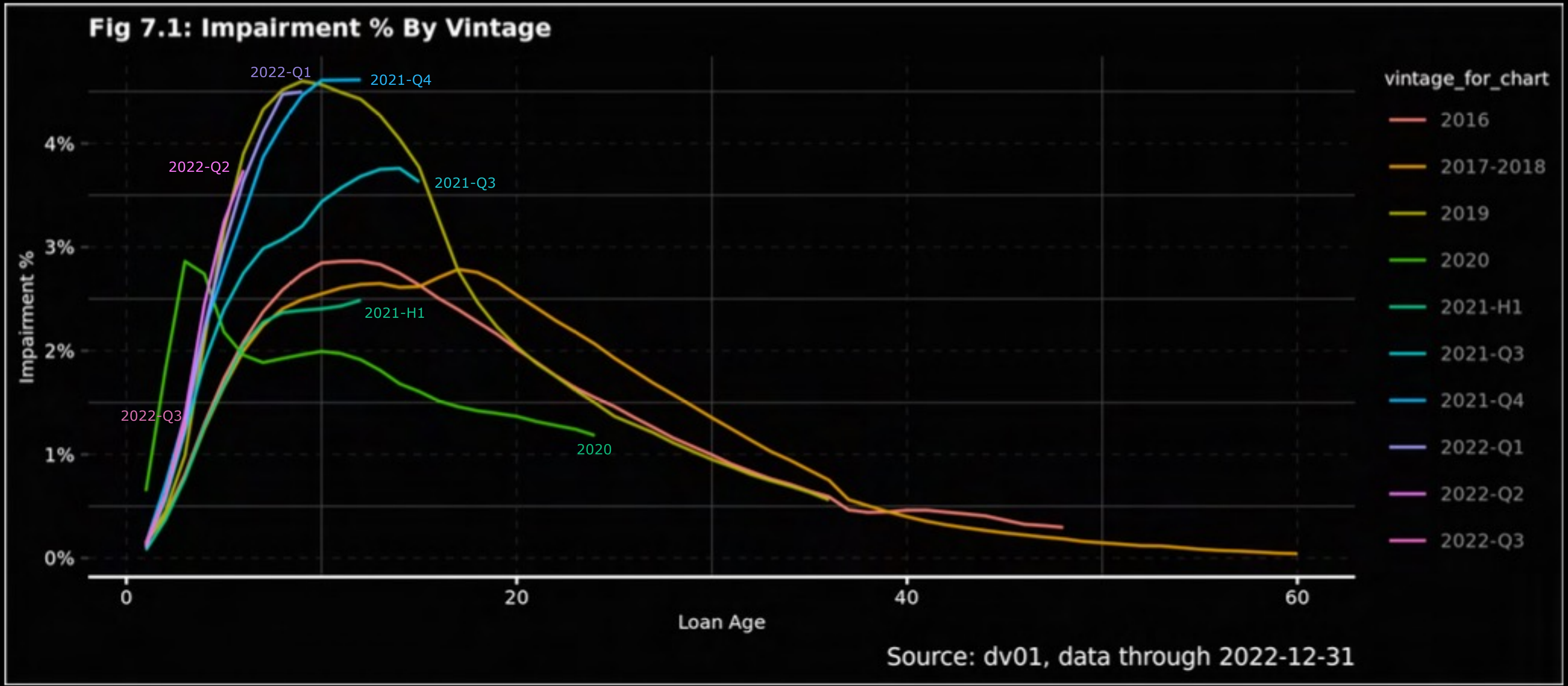


There is an uptick in risk across the other income bands too with lower the income, the steeper the rise in risk. There is some flattening of risk in recent months due to significant tightening in 2022 underwriting standards

Source: dv01, data as of December 31, 2022

We continue to see worsening of risk in more recent vintages despite evidence of credit tightening in 2022

Impairment = DQ + Modification

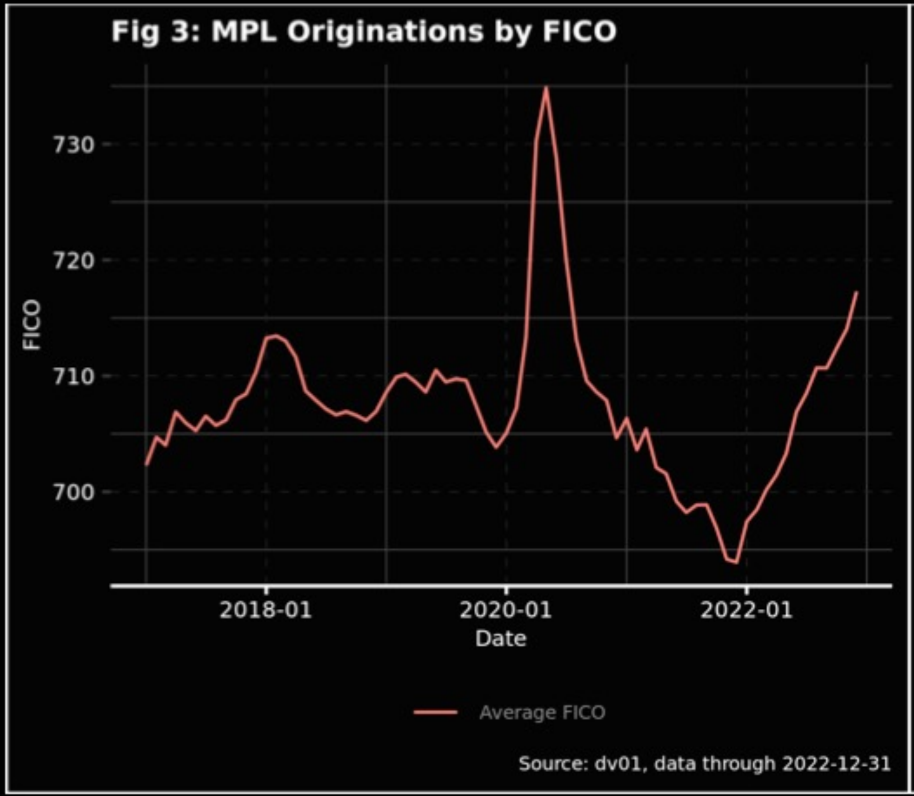


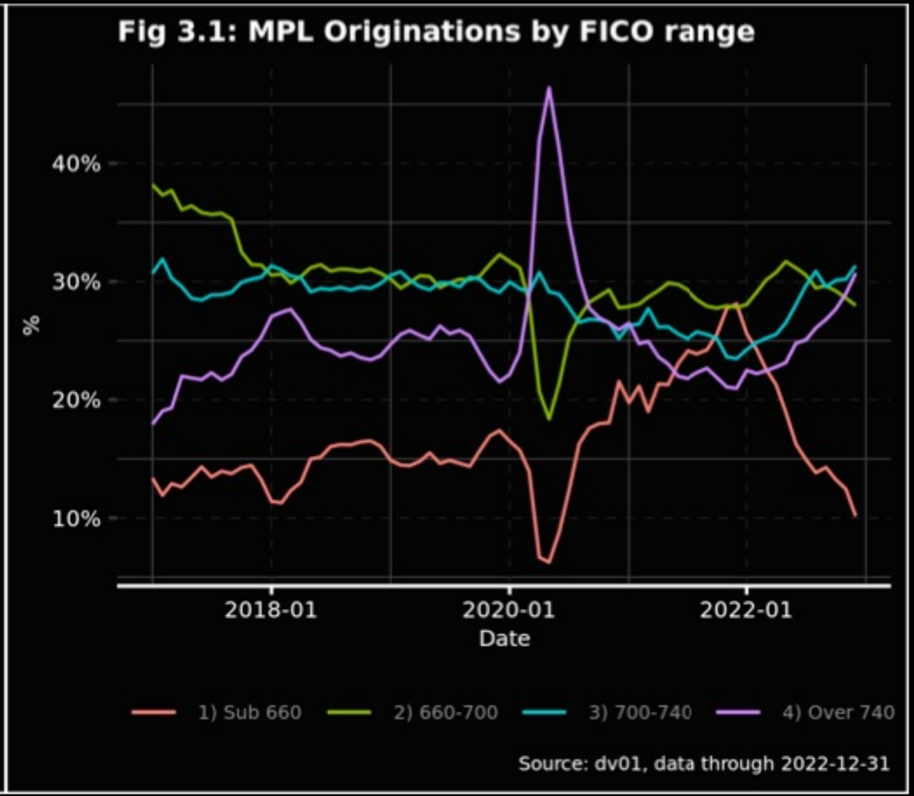
There is despite the significant tightening by some lenders at origination for 2022 vintages. Lenders who tightened more heavily in 2022 are seeing better performance

Source: dv01, data as of December 31, 2022

Tightening of Underwriting

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



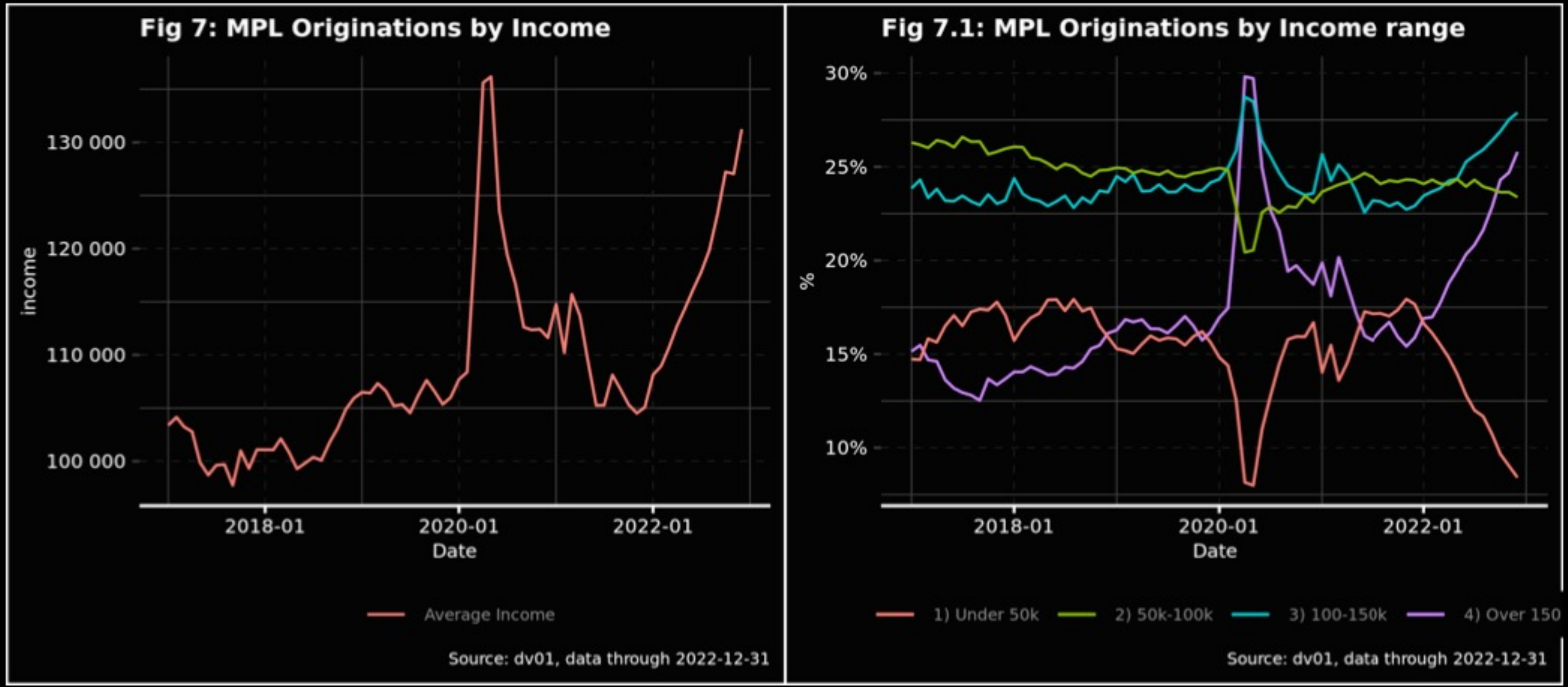


These FICO scores are also inflated by suppression of various risk signals like FICO-spoofing with credit builder trades, invisibility of BNPL trades, and student loan deferrals

Source: dv01, data as of December 31, 2022

Tightening of Underwriting

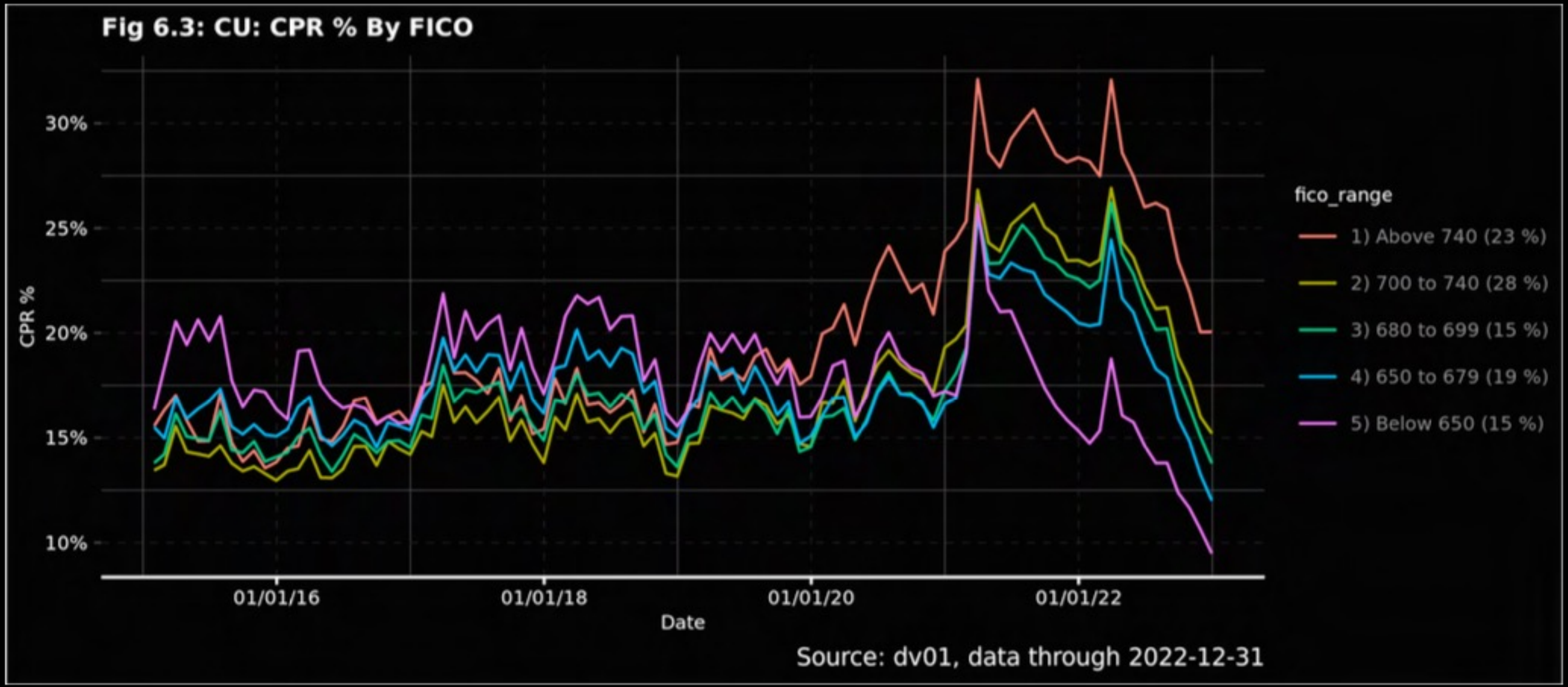
Avg origination Income continues to increase and with a significant drop in sub-$50k income



Source: dv01, data as of December 31, 2022

Prepayment rates are dropping rapidly

Subprime consumers show the largest decline and trending below pre-pandemic levels

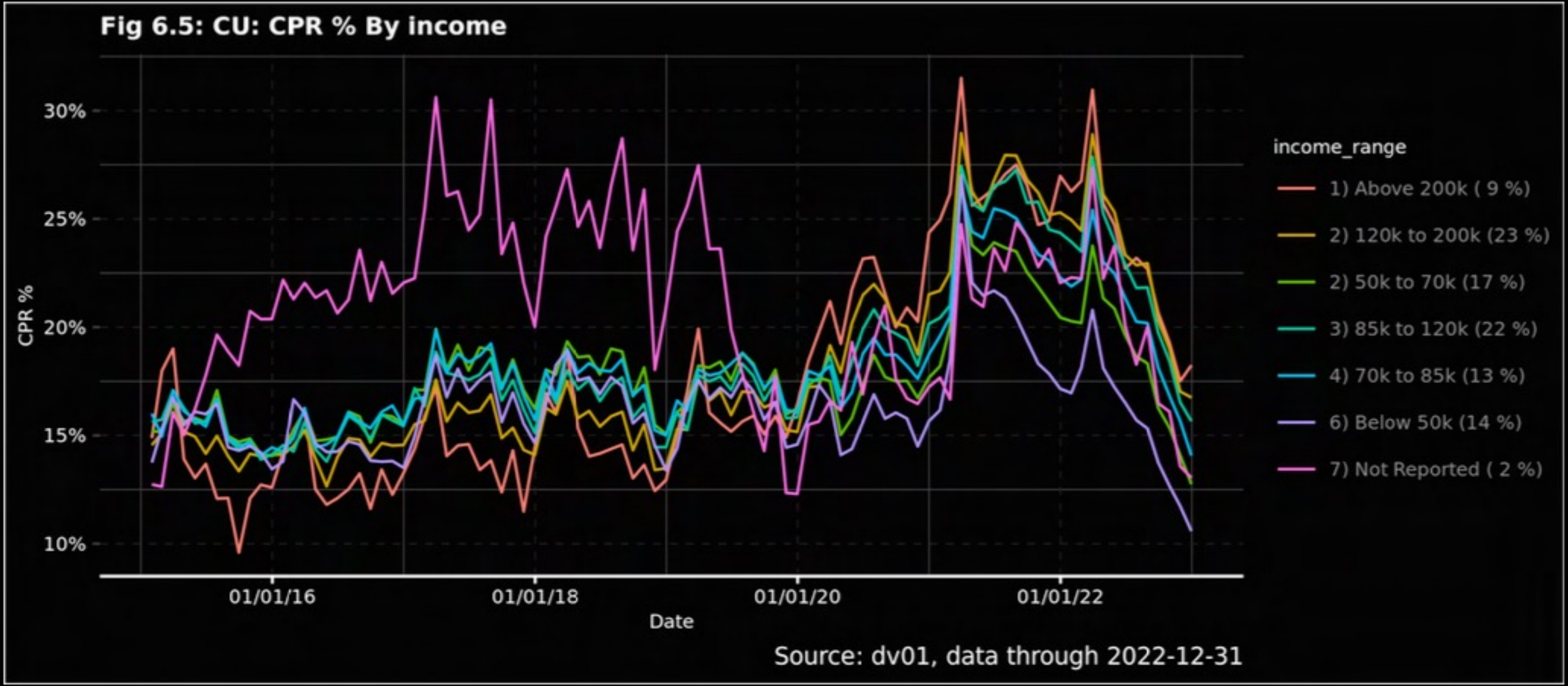


A lot of this drop can be attributed towards reversion-to-mean to pre-pandemic levels but there are pockets like subprime and lower income where the drop is more drastic

Source: dv01, data as of December 31, 2022

Prepayment rates are dropping rapidly

Lower income consumers show the largest decline and trending below pre-pandemic levels



Source: dv01, data as of December 31, 2022

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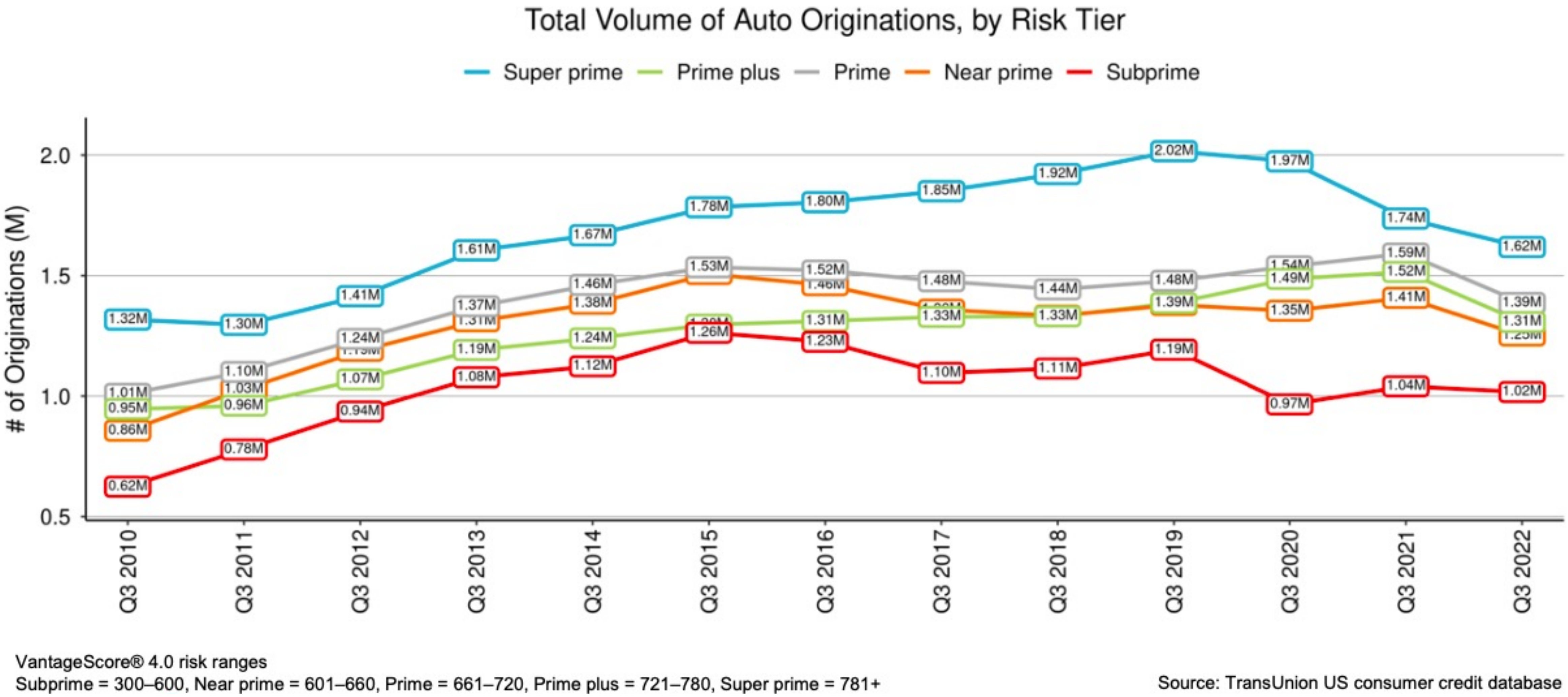
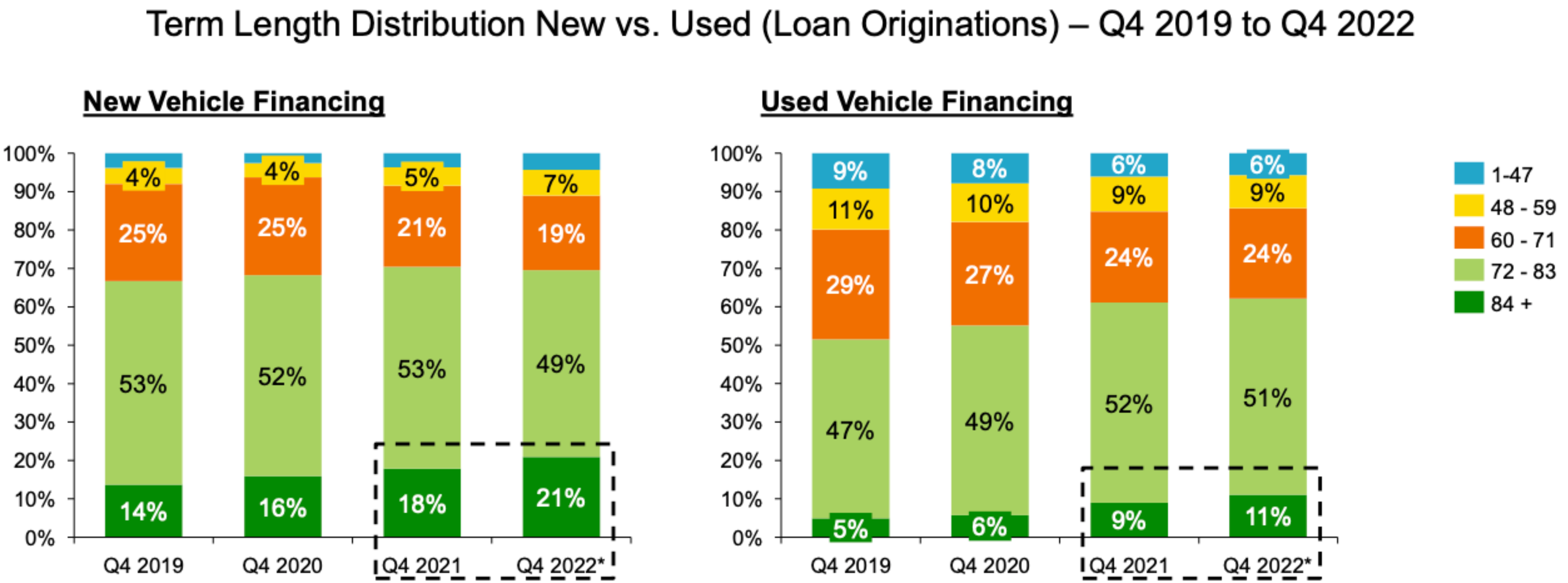
Originations dropped across the board but especially for super-prime



- Source: Transunion Q4 2022 Credit Industry Insights

Consumers shifting to longer terms to reduce the payment amount as they deal with inflationary pressures and rising interest rates

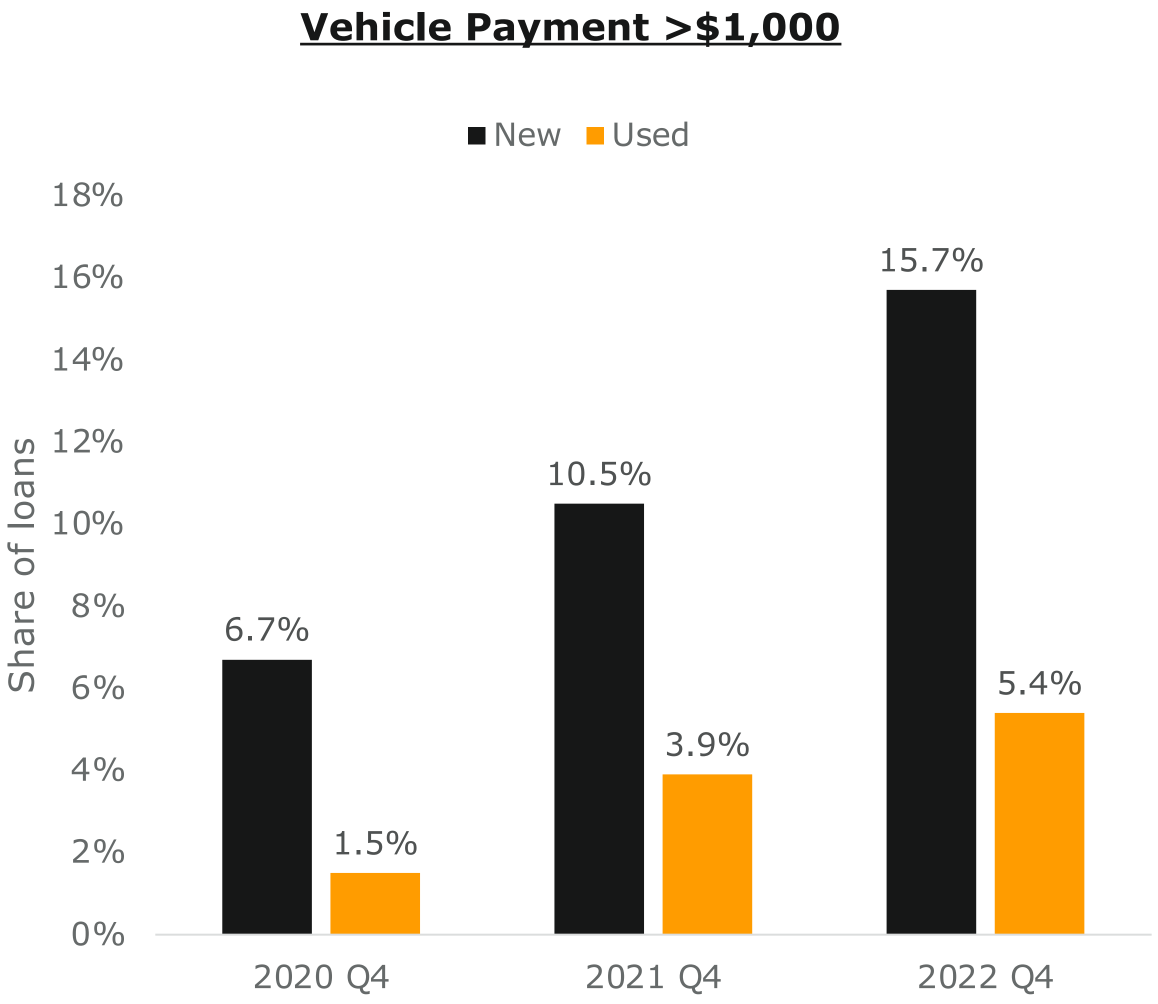


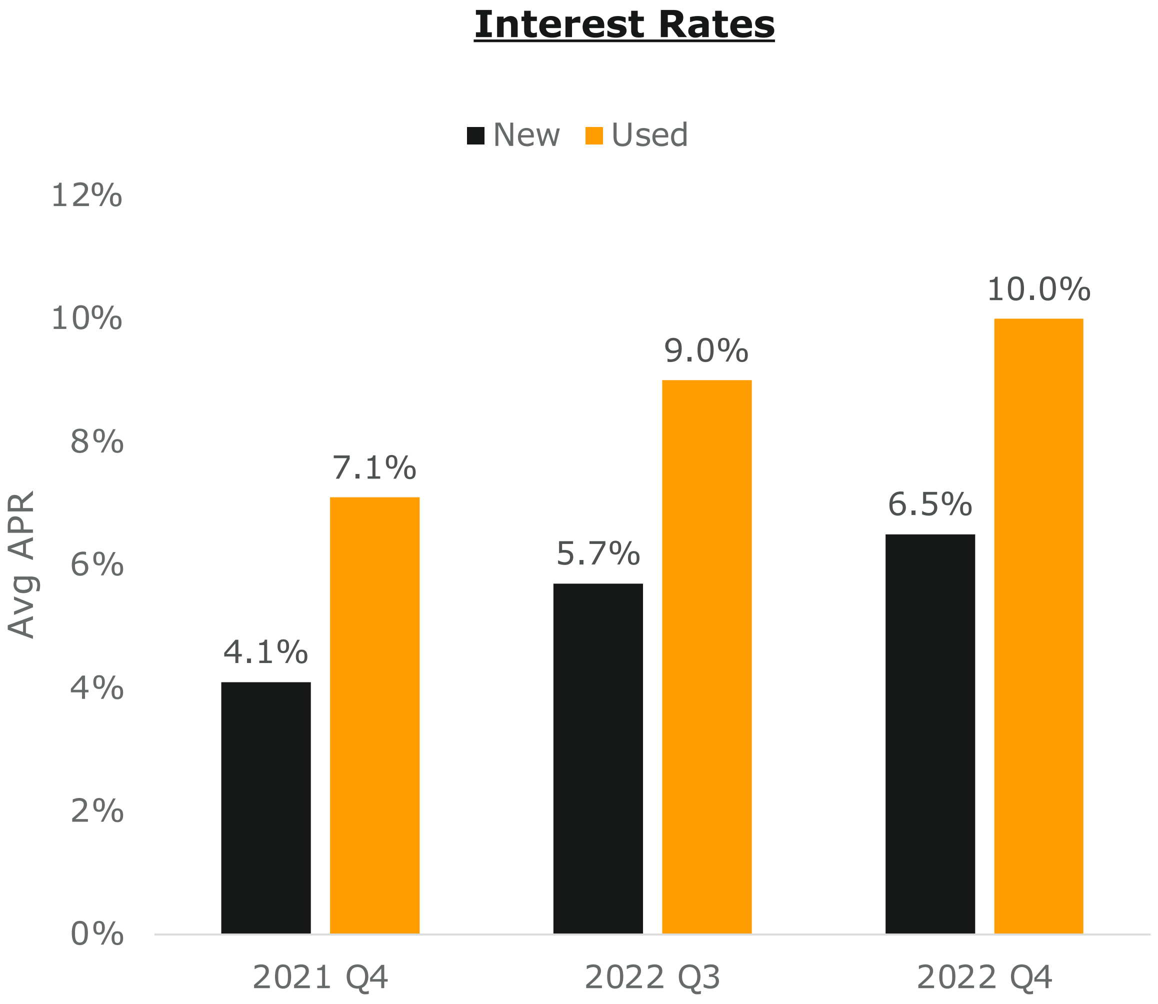
*Q4 2022 Reflects partial quarter data

Source: AutoCreditInsight™ by S&P Global Mobility, TransUnion

- Source: Transunion Q4 2022 Credit Industry Insights

Consumers were already facing increasing vehicle prices, and increasing rates have further increased payment amounts for recent vintages

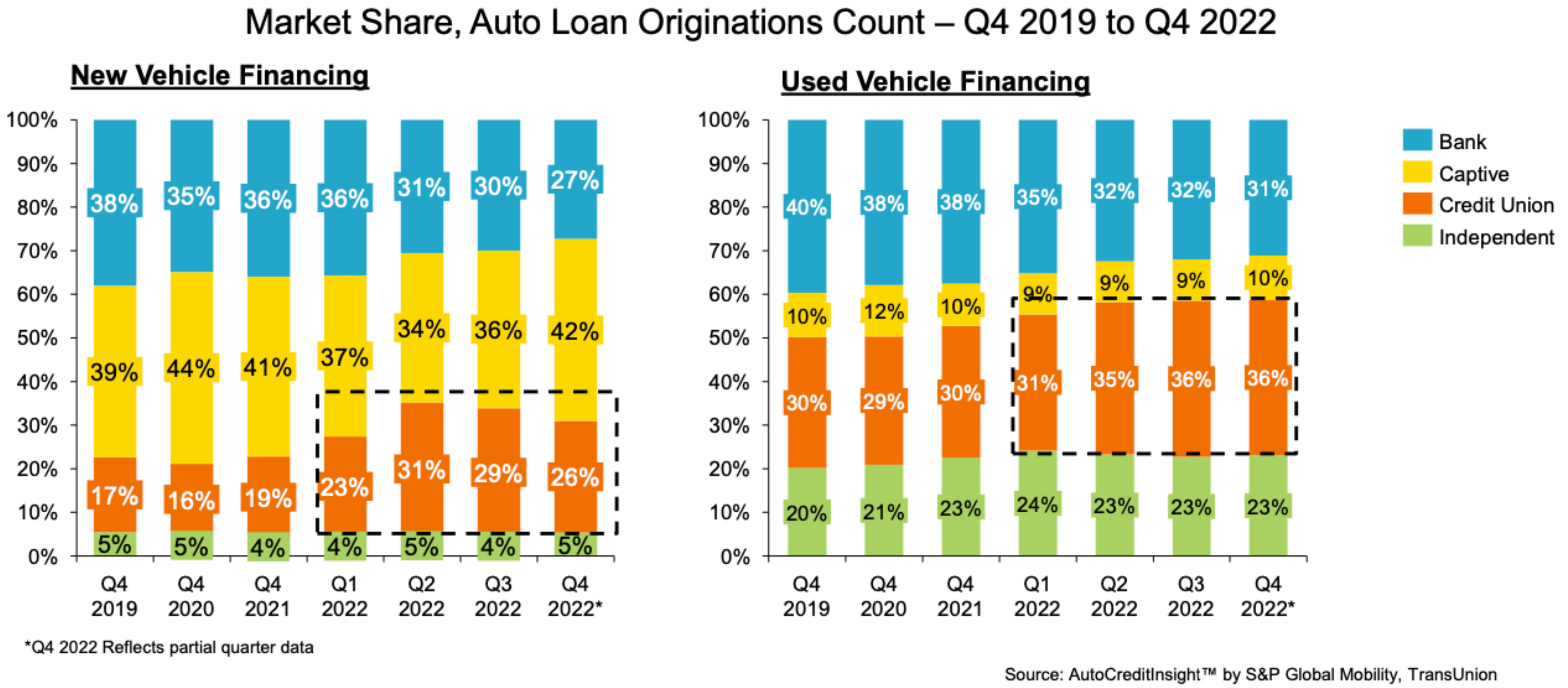




Customers buying at these rates are at risk of going underwater down the road as financing costs rise and car values decline

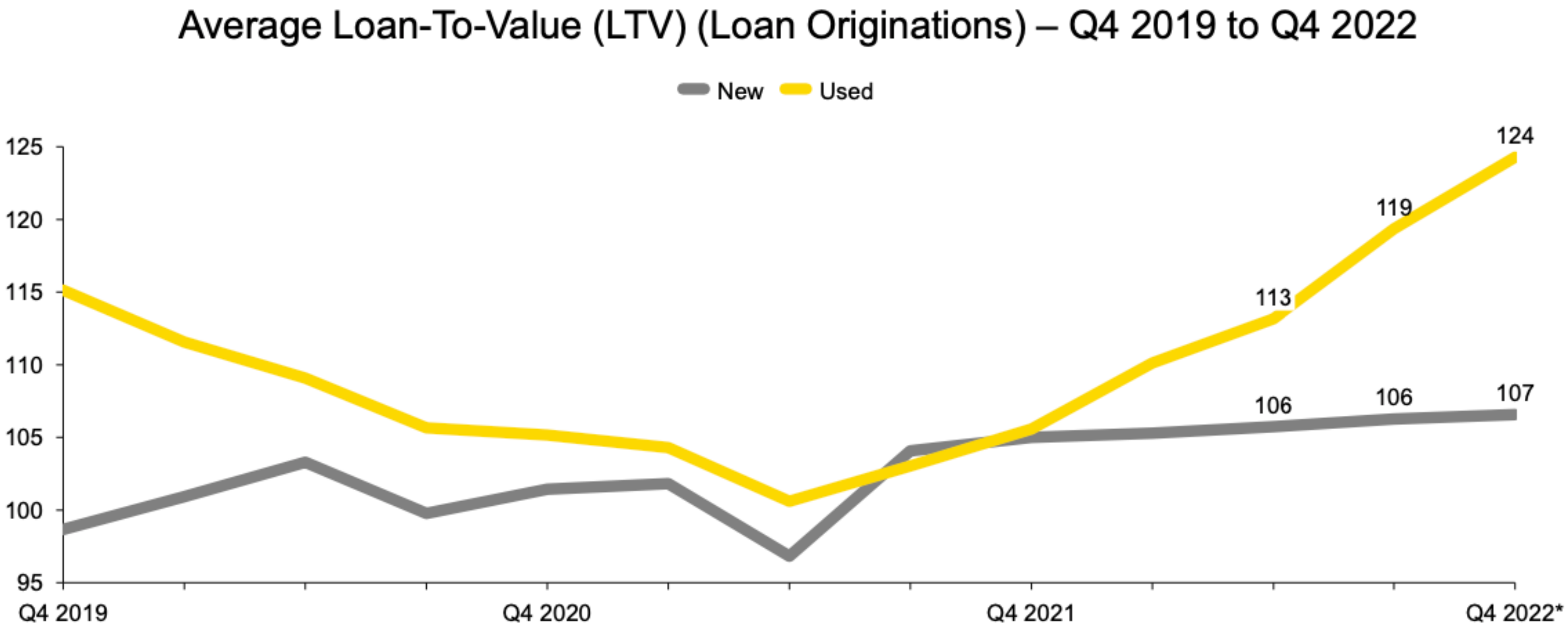
- Source: Edmunds

Credit Unions continue to capture more market share as they choose to offer better rates in a period of elevated interest rates



- Source: Transunion Q4 2022 Credit Industry Insights

Due to the high interest rates and inflation of car prices, the LTV is trending higher than pre-pandemic levels especially for used cars

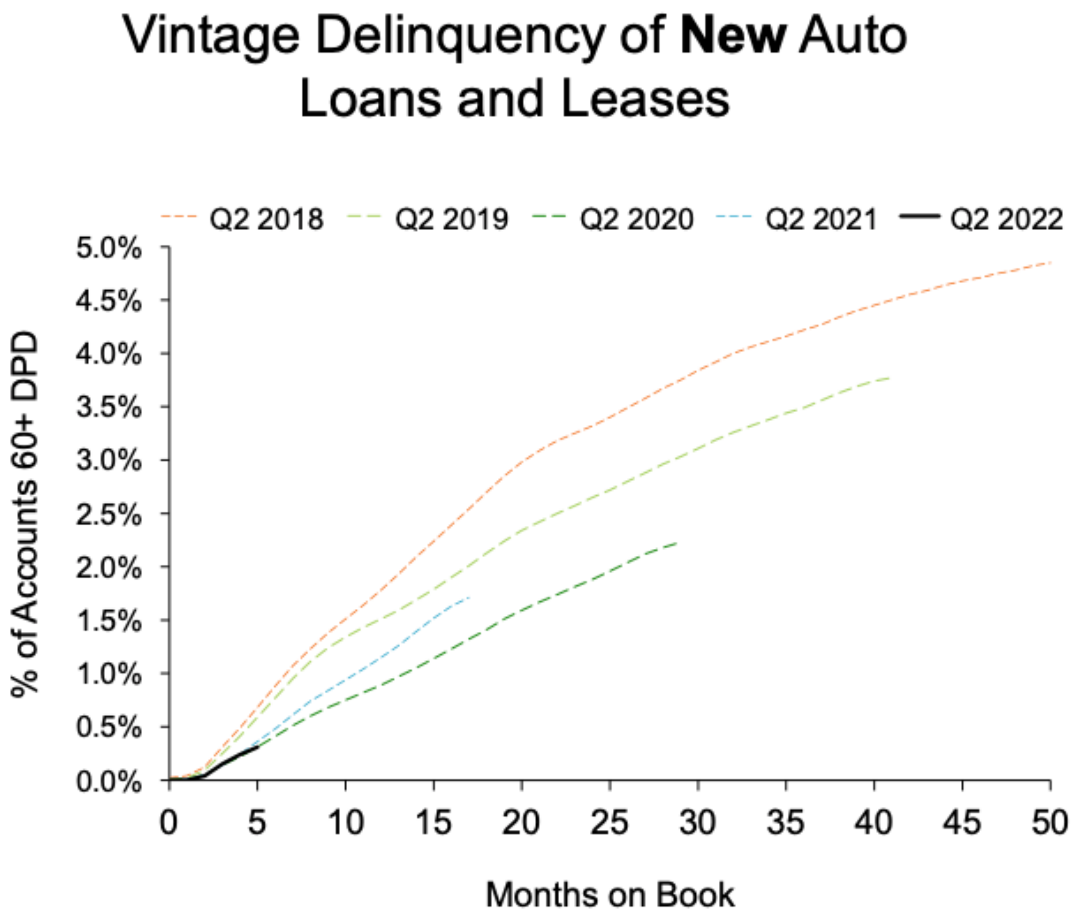


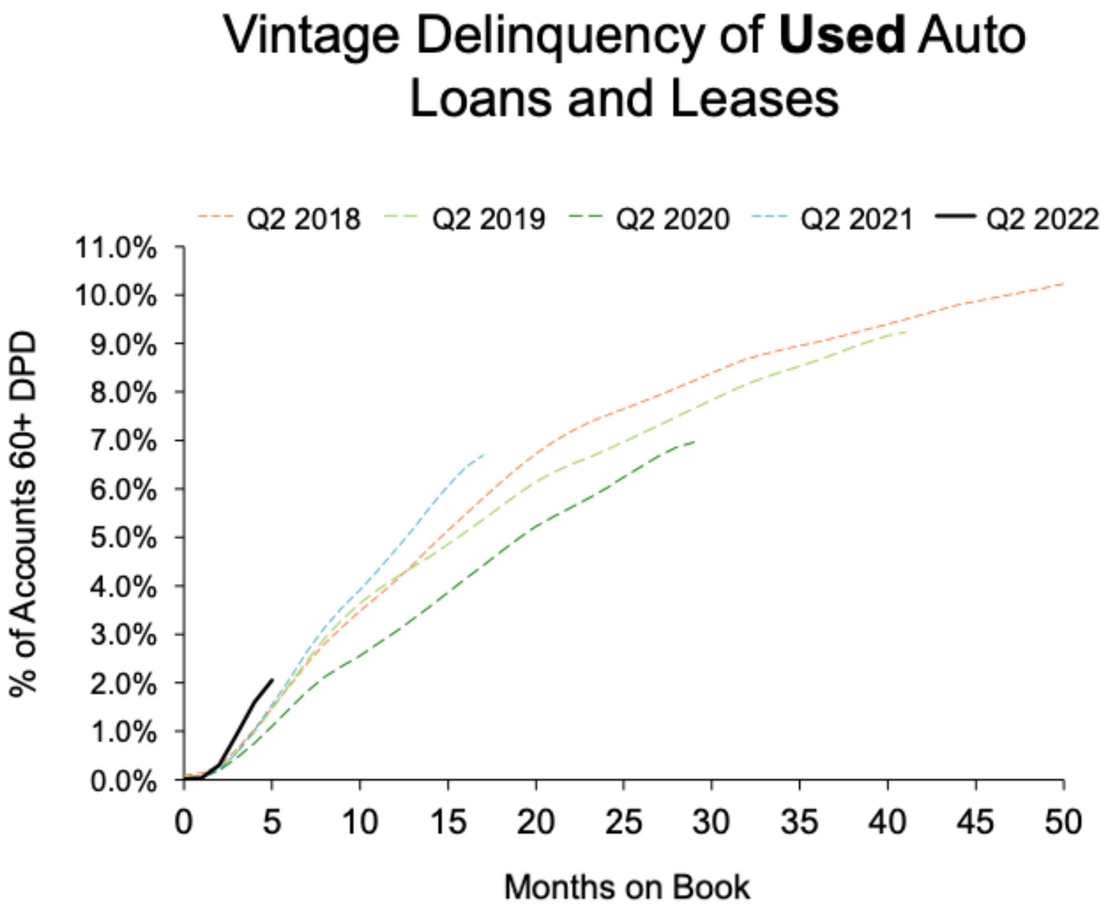
*Q4 2022 Reflects partial quarter data

Source: AutoCreditInsight™ by S&P Global Mobility, TransUnion

- Source: Transunion Q4 2022 Credit Industry Insights

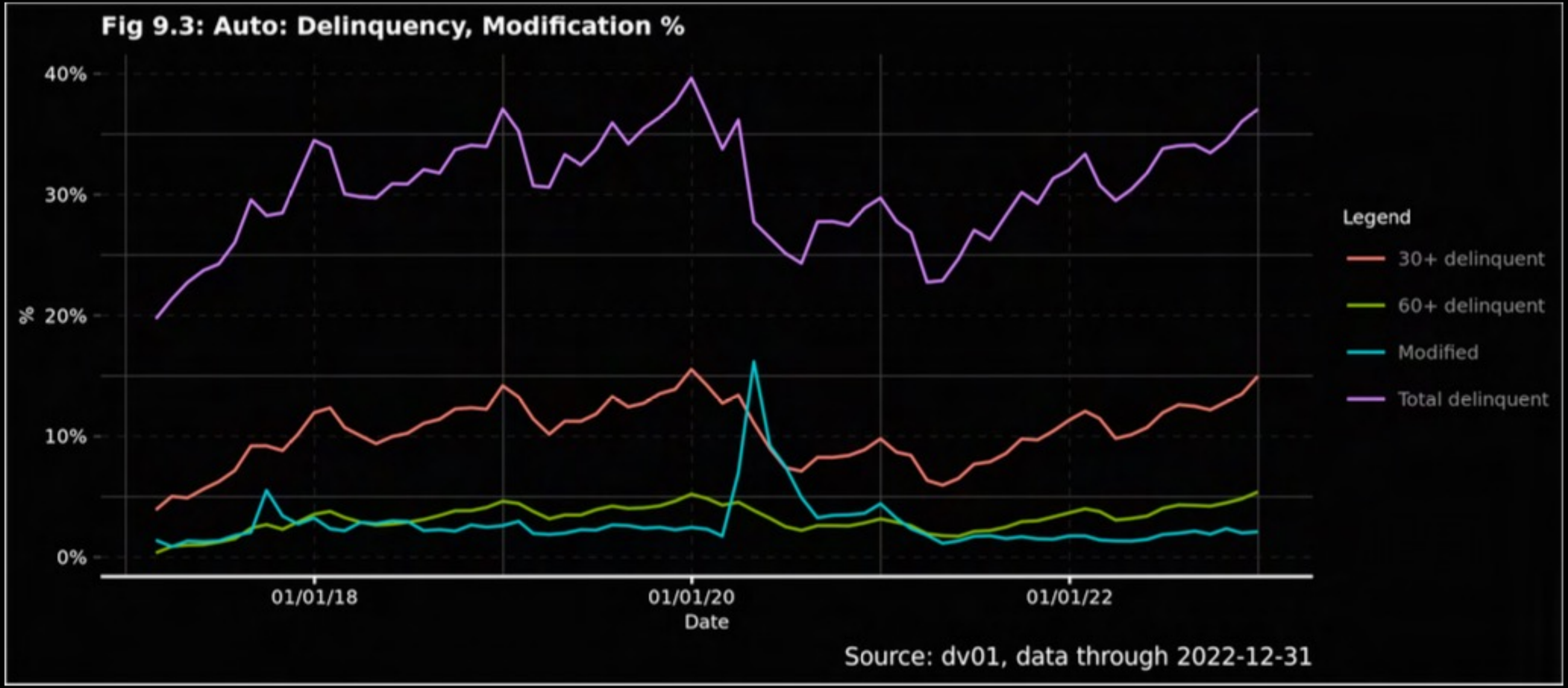
The performance of Used Auto has worsened in recent vintages whereas the performance of New Auto has improved





- Source: Transunion Q4 2022 Credit Industry Insights

Subprime Auto is seeing an increase in delinquencies approaching pre-pandemic highs



Source: dv01, data as of December 31, 2022

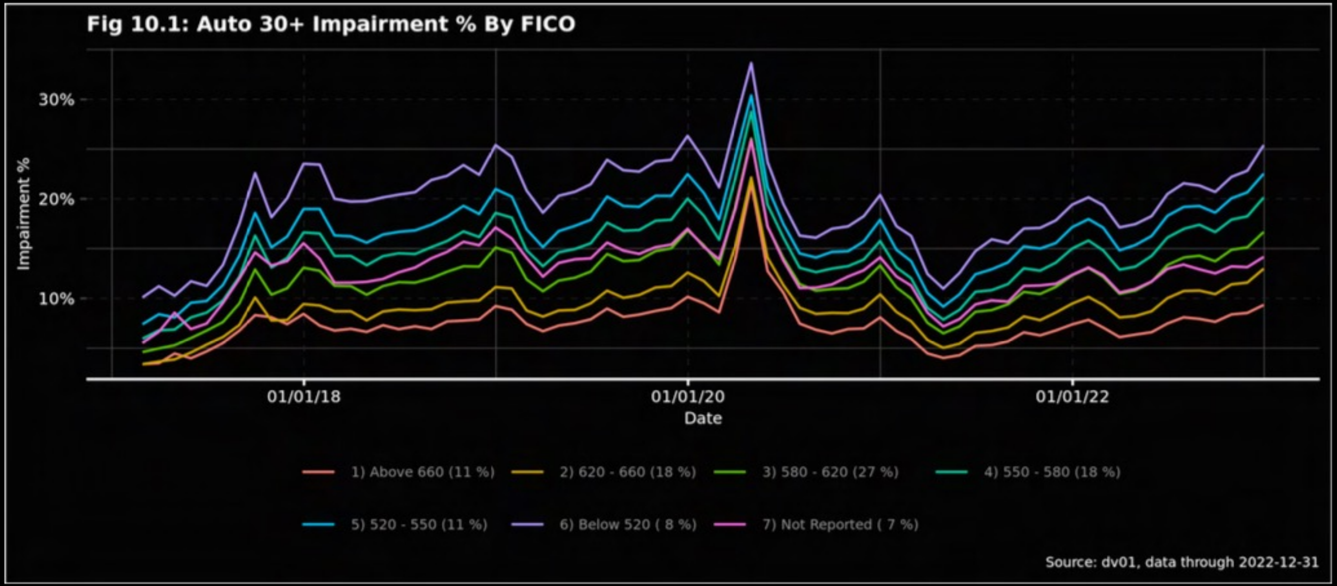
Impairment = DQ + Modification

Subprime Auto

Attributes like LTV appear to be stronger differentiators of risk compared to pre-pandemic trends

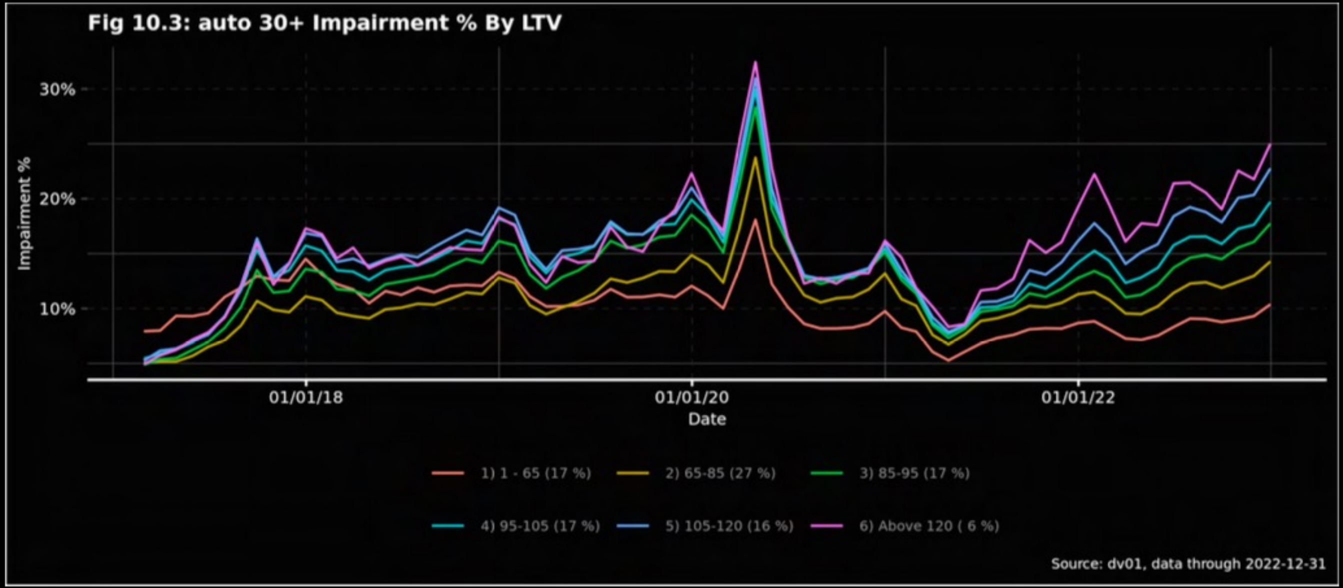
FICO

Delinquencies returning to pre-pandemic levels and trending up



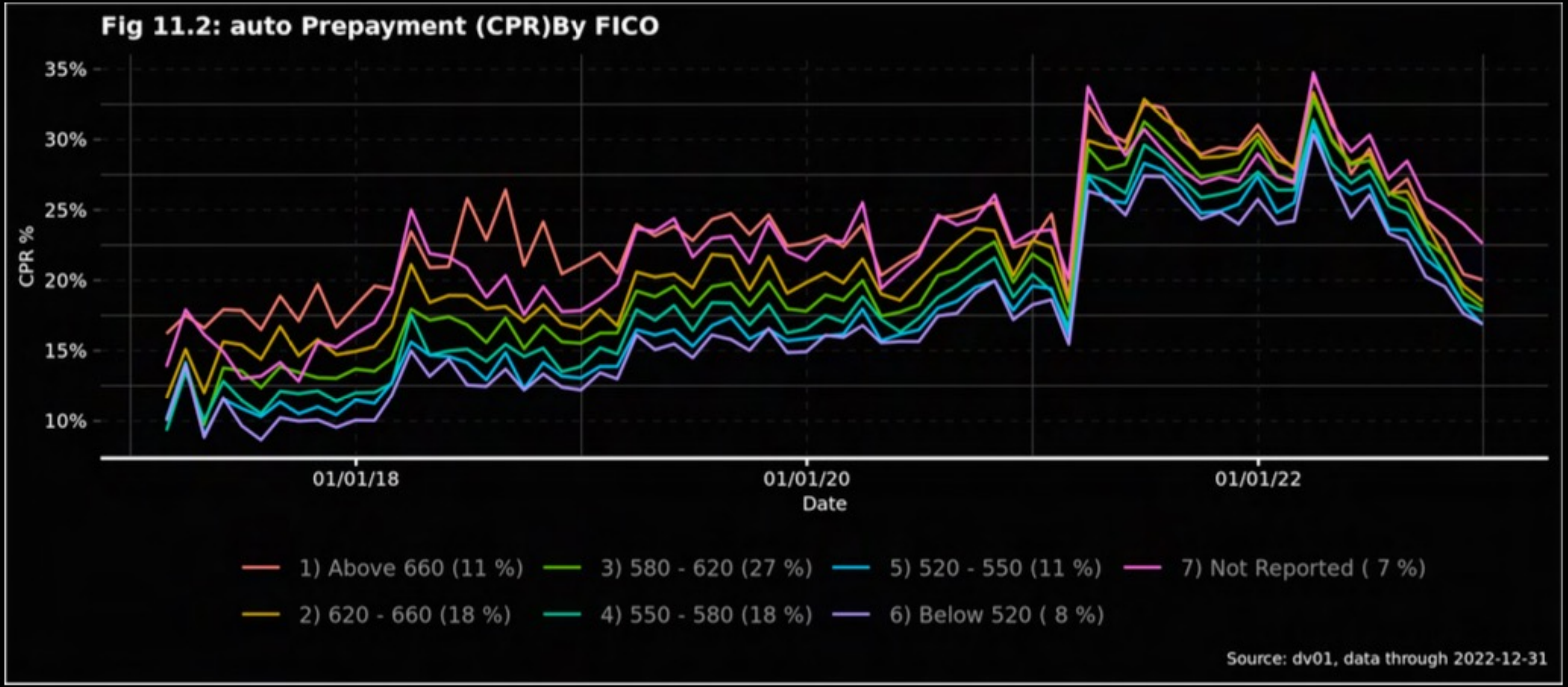
LTV

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



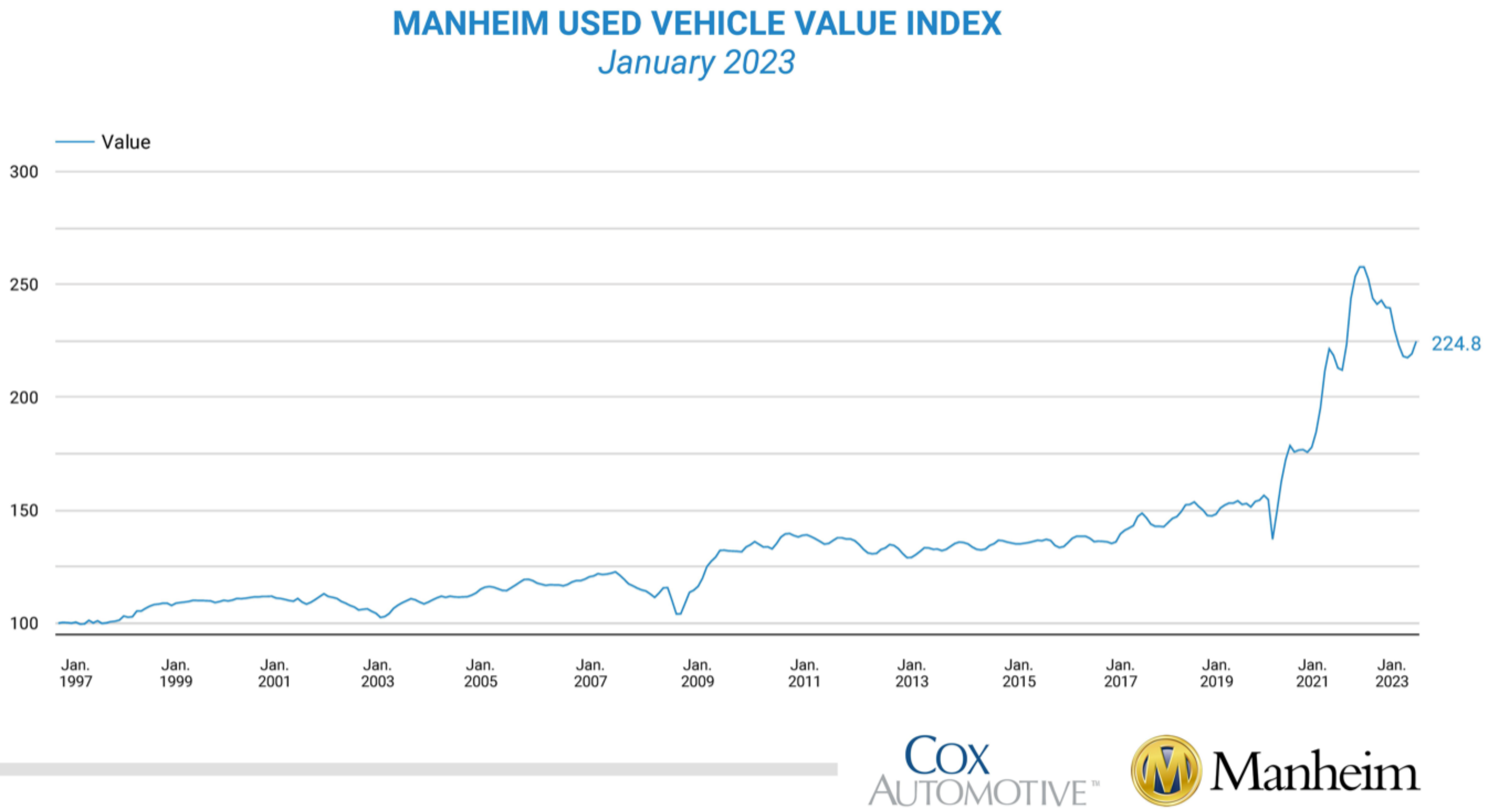
Source: dv01 Subprime Auto, data as of Dec 31, 2022

Prepayment rates dropping rapidly but still within pre-pandemic ranges



Source: dv01, data as of December 31, 2022

Wholesale used-vehicle prices were on a downward trend for the last few months but have increased in January 2023



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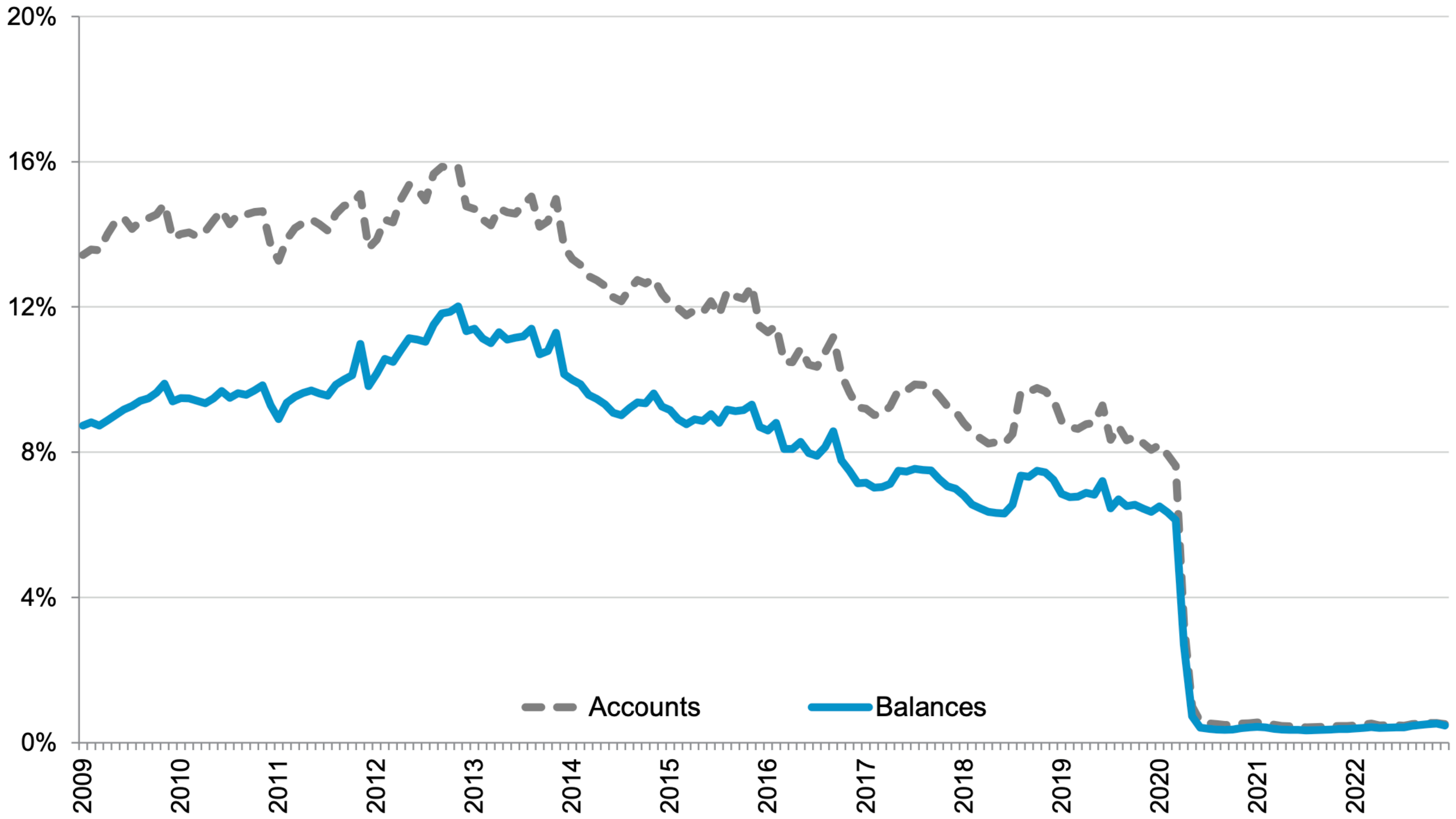
Federal student loan delinquencies have been non-existent because of deferral programs

As deferrals are set to expire in June 2023, we can expect an increase in risk across their 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



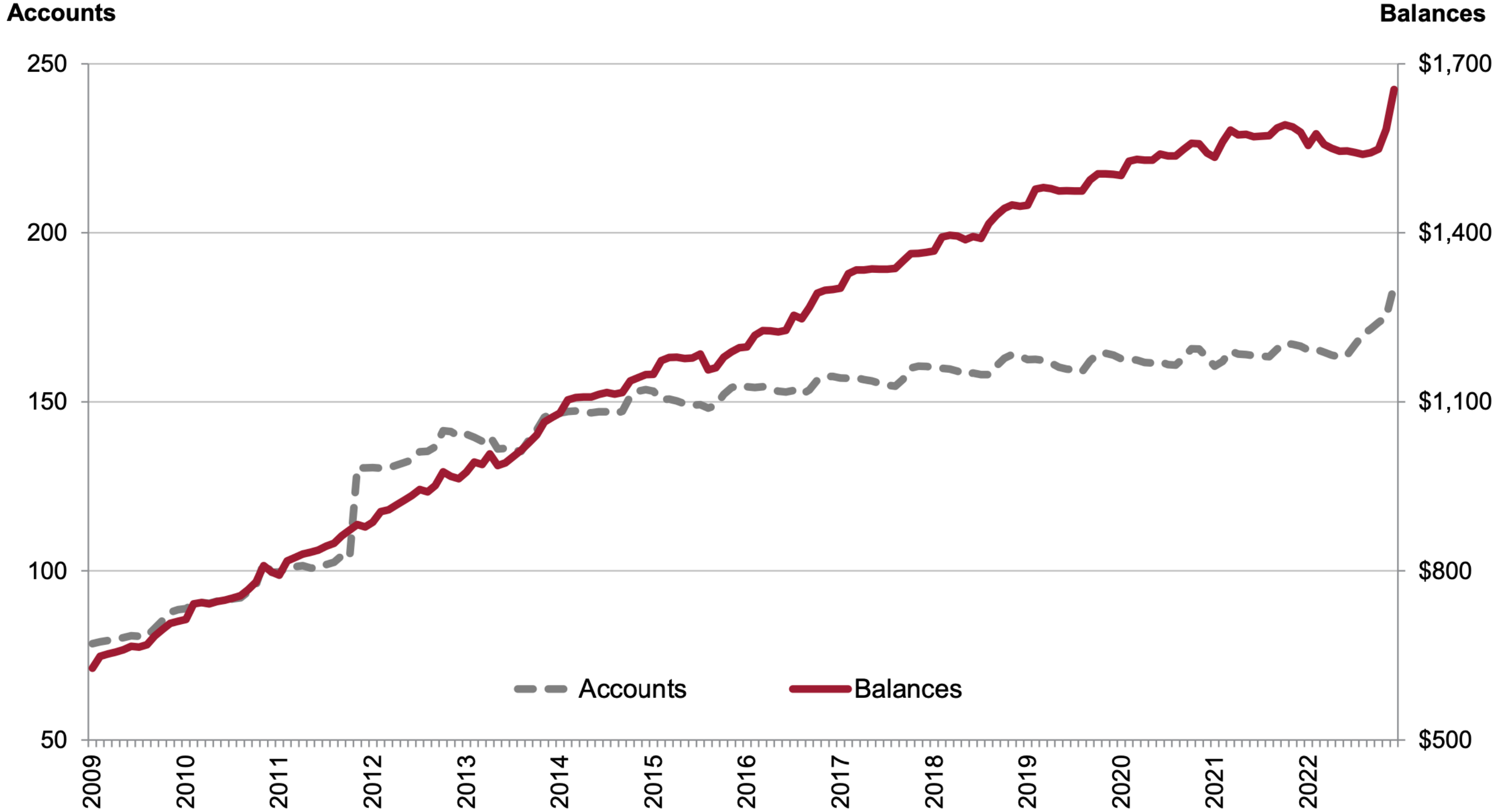
Source: Equifax Inc.

Data as of December 2022

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

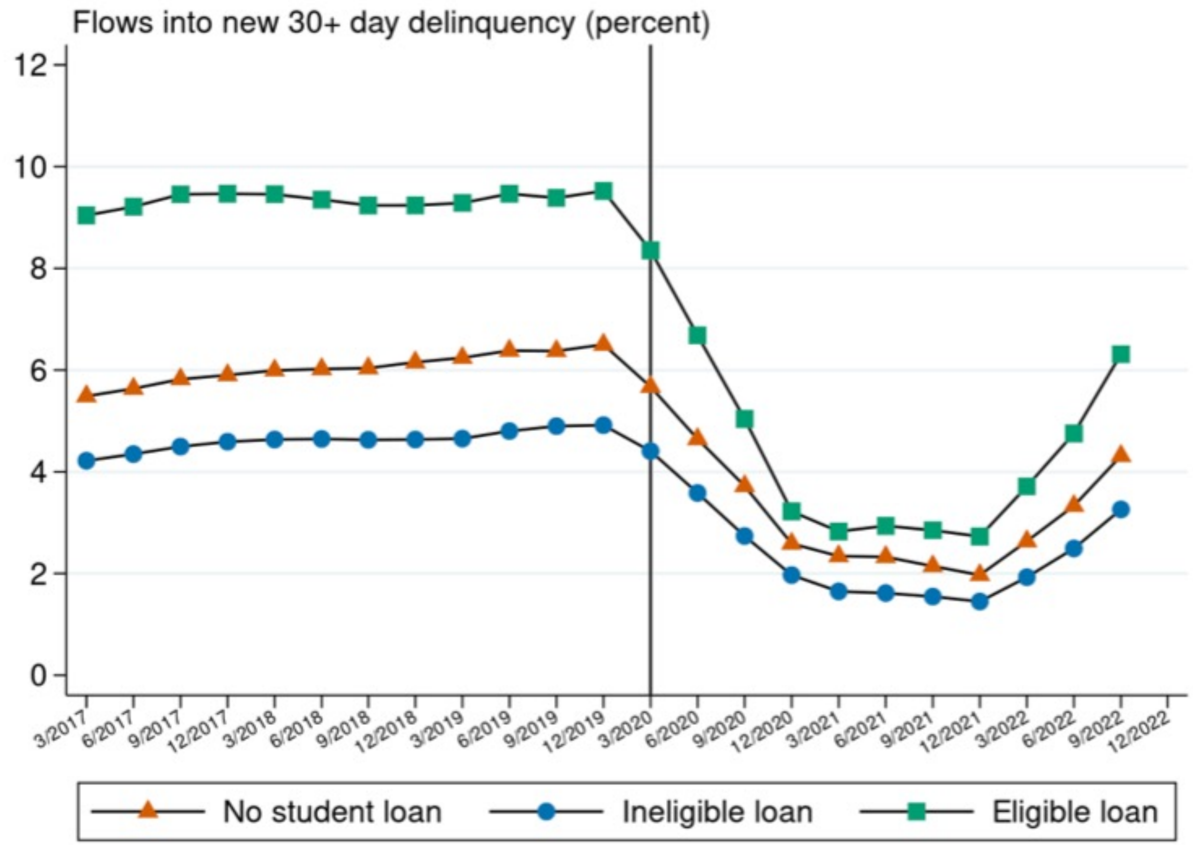


Source: Equifax Inc.

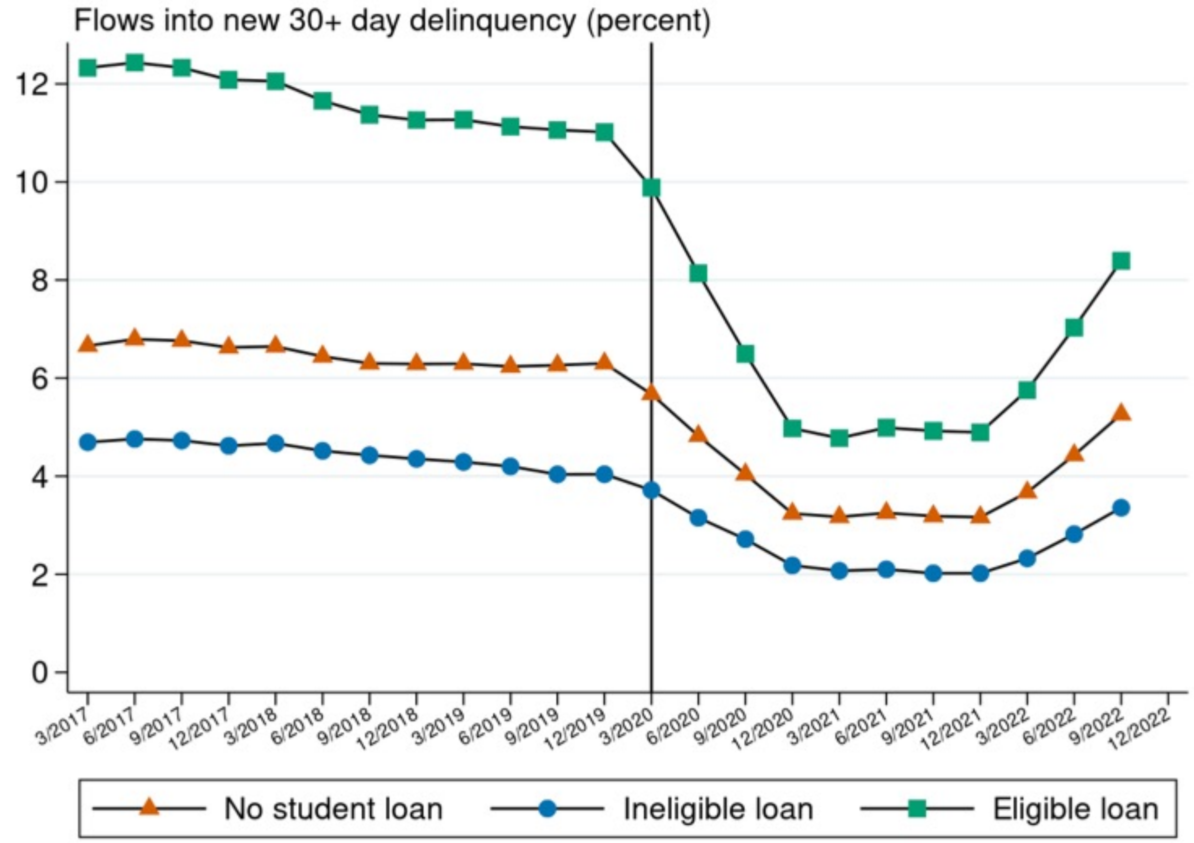
Data as of December 2022

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 can 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

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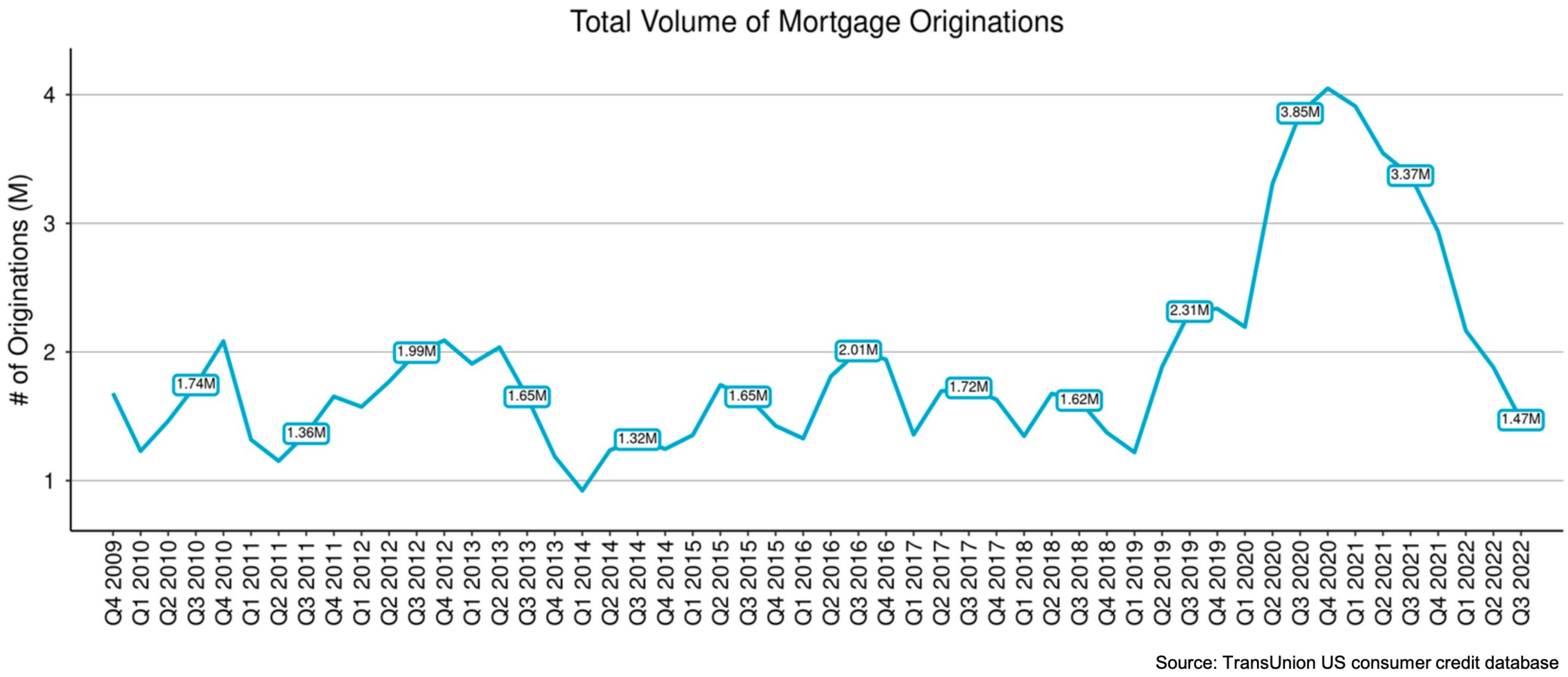
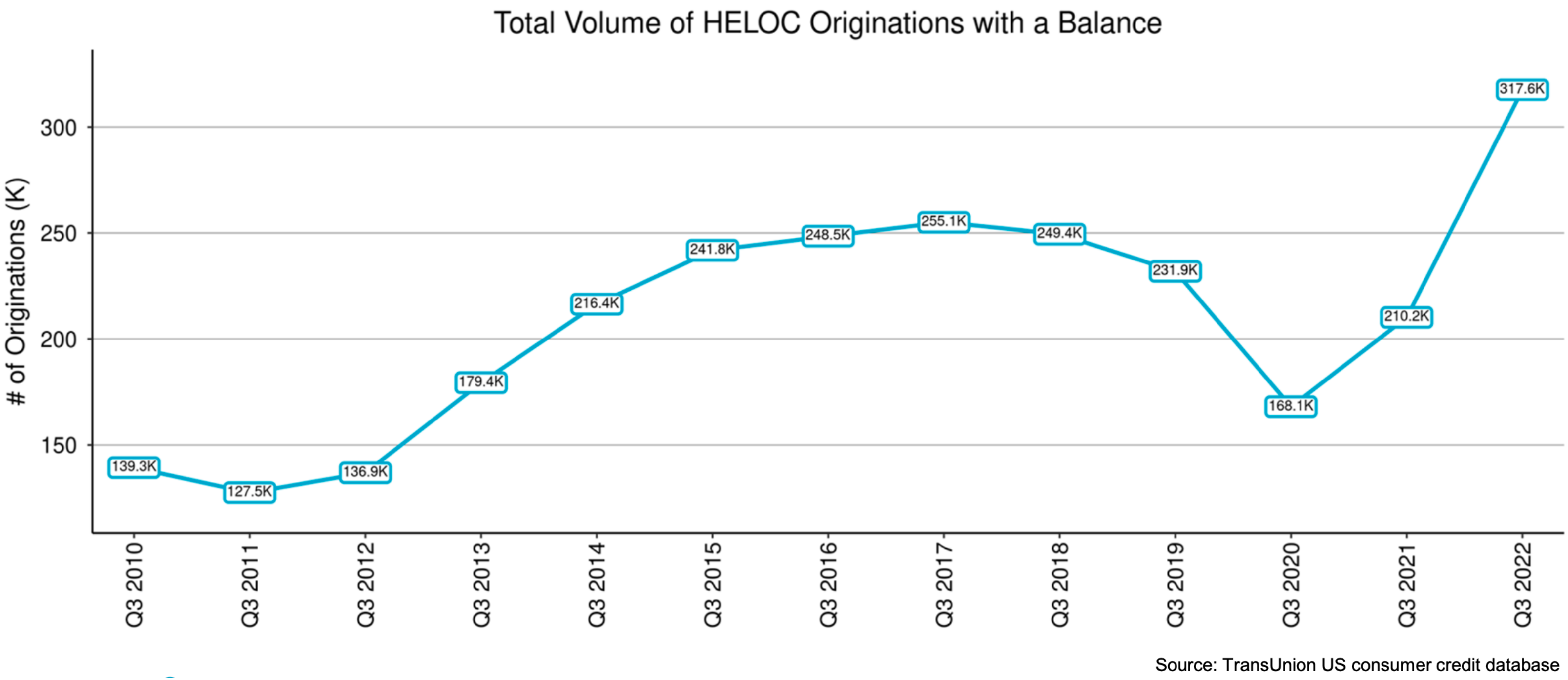
Drop in originations with the rise in interest rates



- Source: Transunion Q4 2022 Credit Industry Insights

Significant increase in HELOC originations, another sign of financial stress as consumers borrow more to grapple with inflation

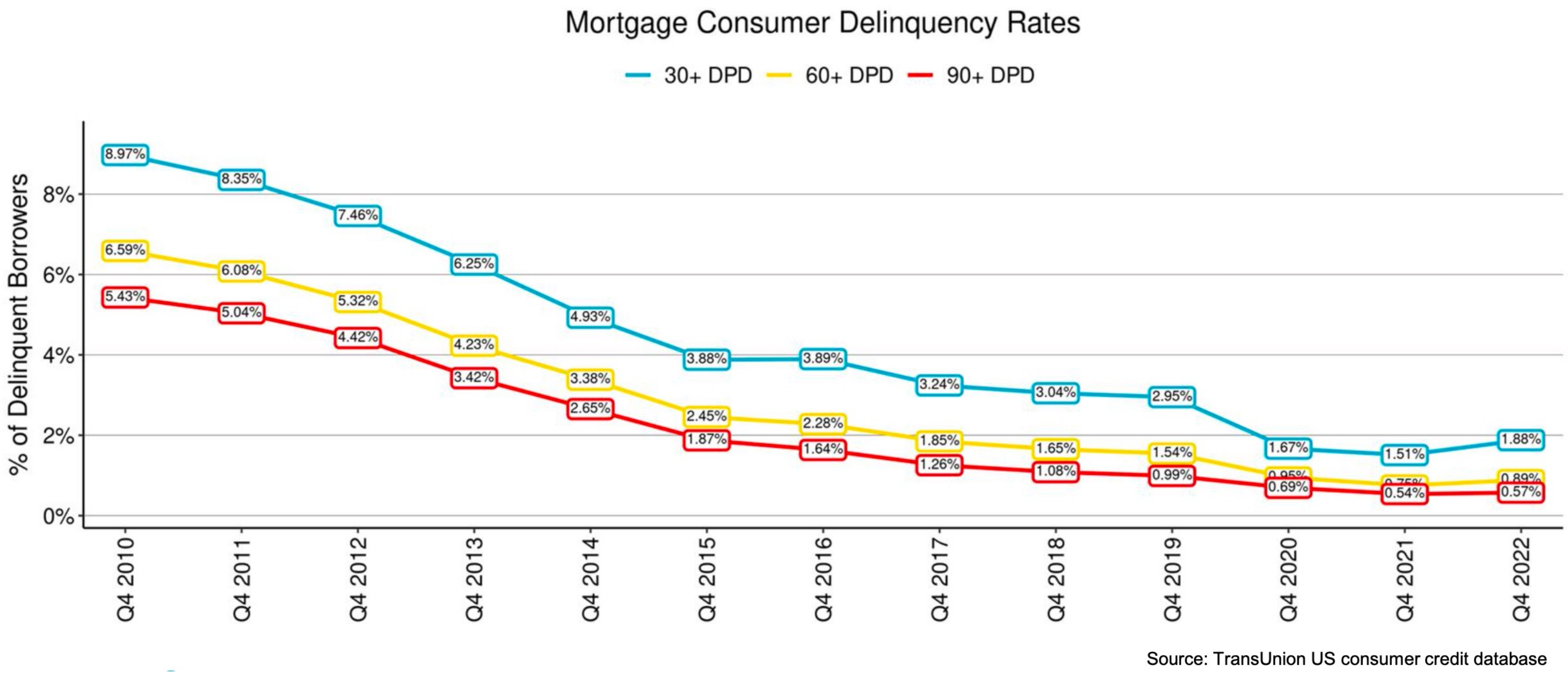


The rise in home values during the pandemic has allowed more consumers to dip into their home equity

- Source: Transunion Q4 2022 Credit Industry Insights

Delinquencies remain low for Mortgages

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



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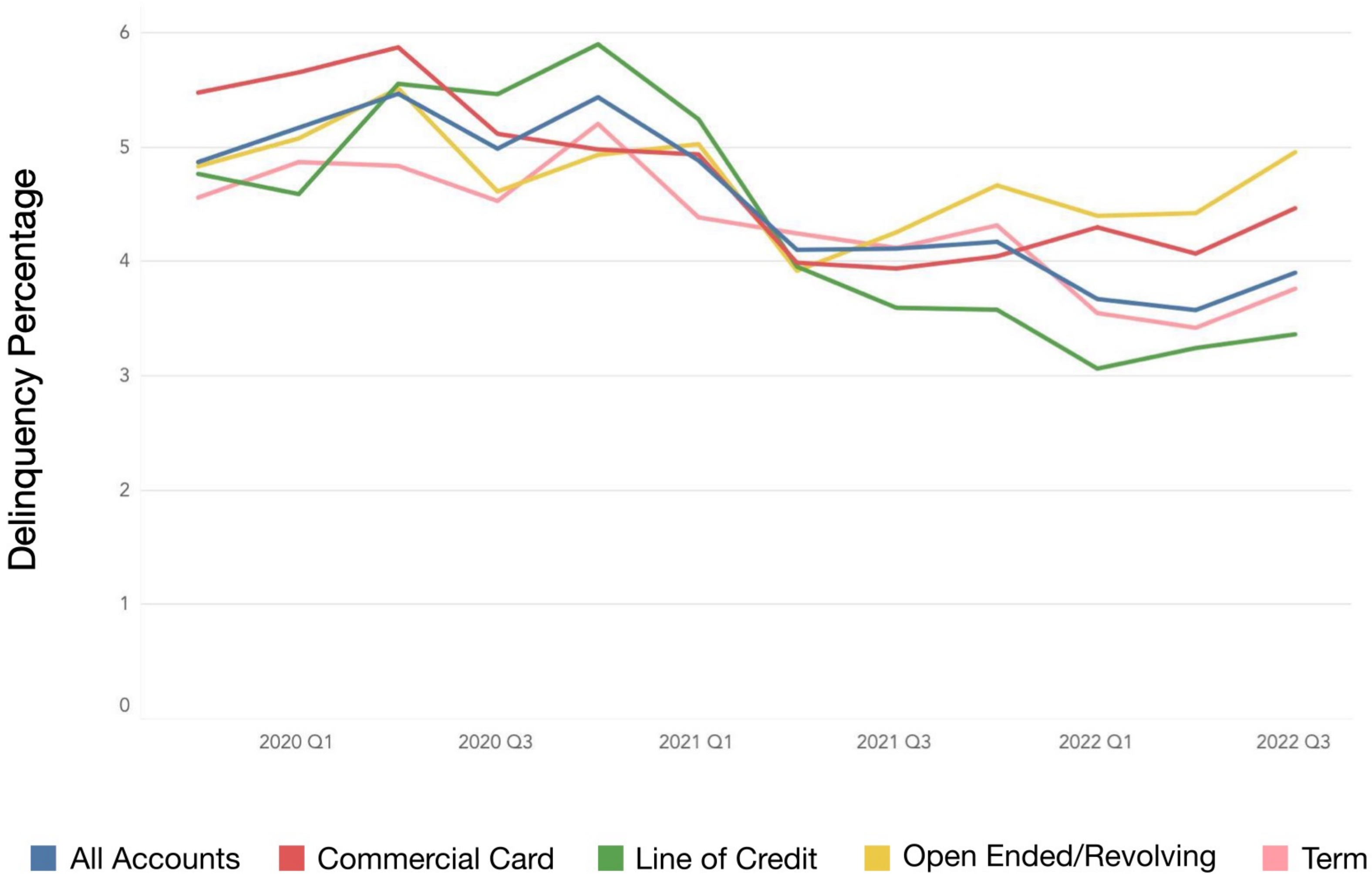
Increase in delinquencies across all account types but still below pandemic levels

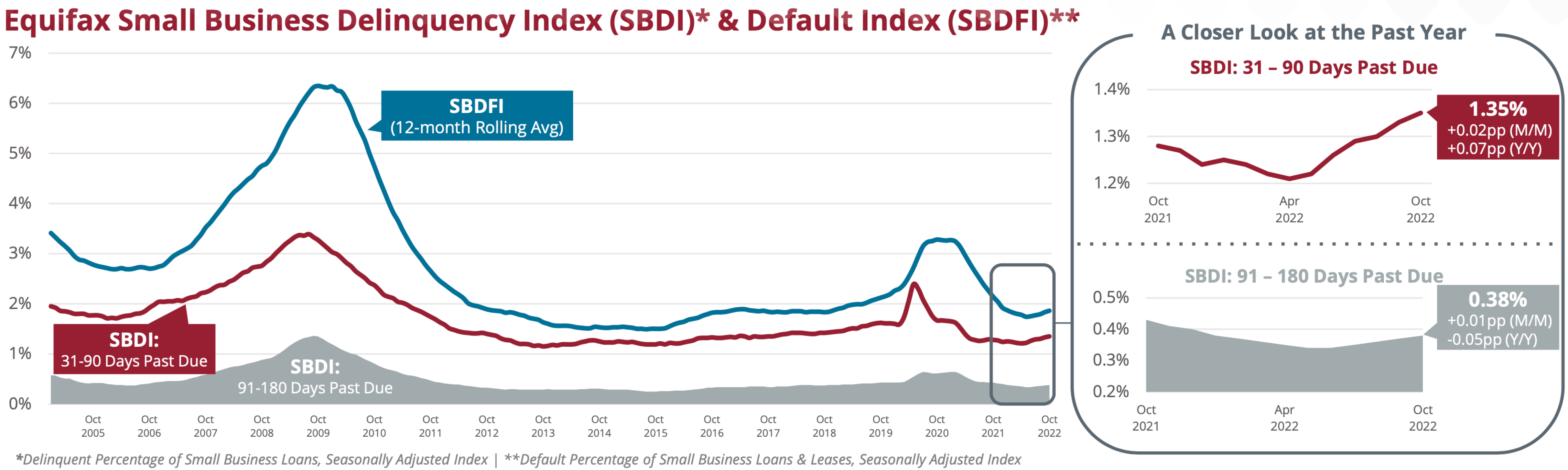
Delinquency Rates for Small Business Lending



Data source: SBFE Data from the Small Business Financial Exchange

- Small Business Lending Trends Q3 2022. Jan 12th, 2023

Delinquencies still below pre-pandemic levels but expected to rise. The increase is led by transportation and healthcare industries.

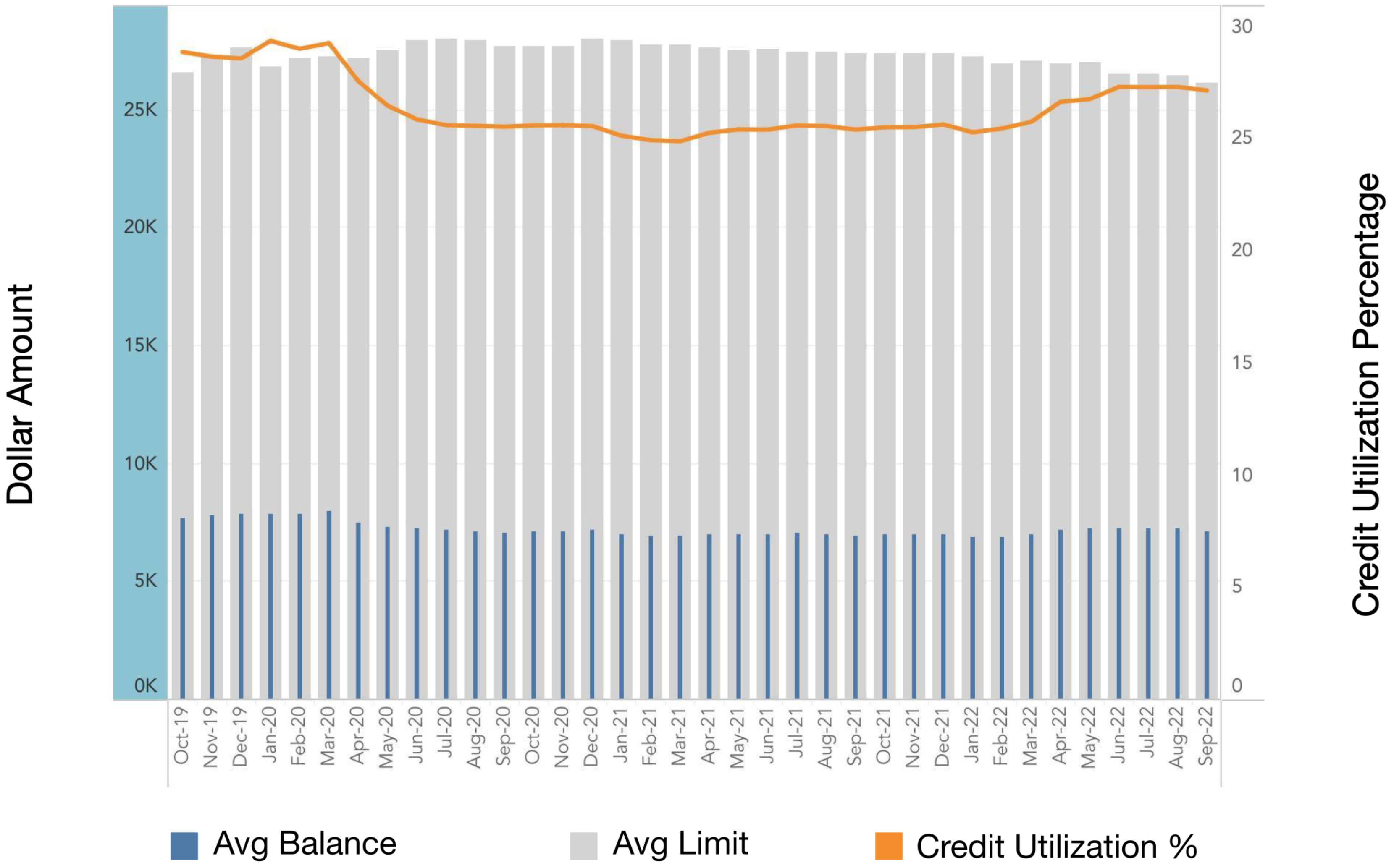


Small businesses also facing pressures from declining consumer spending, supply chain constraints, labor shortages. increasing employee compensation and rising interest rates that increase the cost of borrowing. All of these are closely linked to inflation

- Equifax Commercial Strategy Insights – December 2022

Utilization continues to increase due to both decreasing limits and increasing balances

Balance growth and tightening limits for Small Business



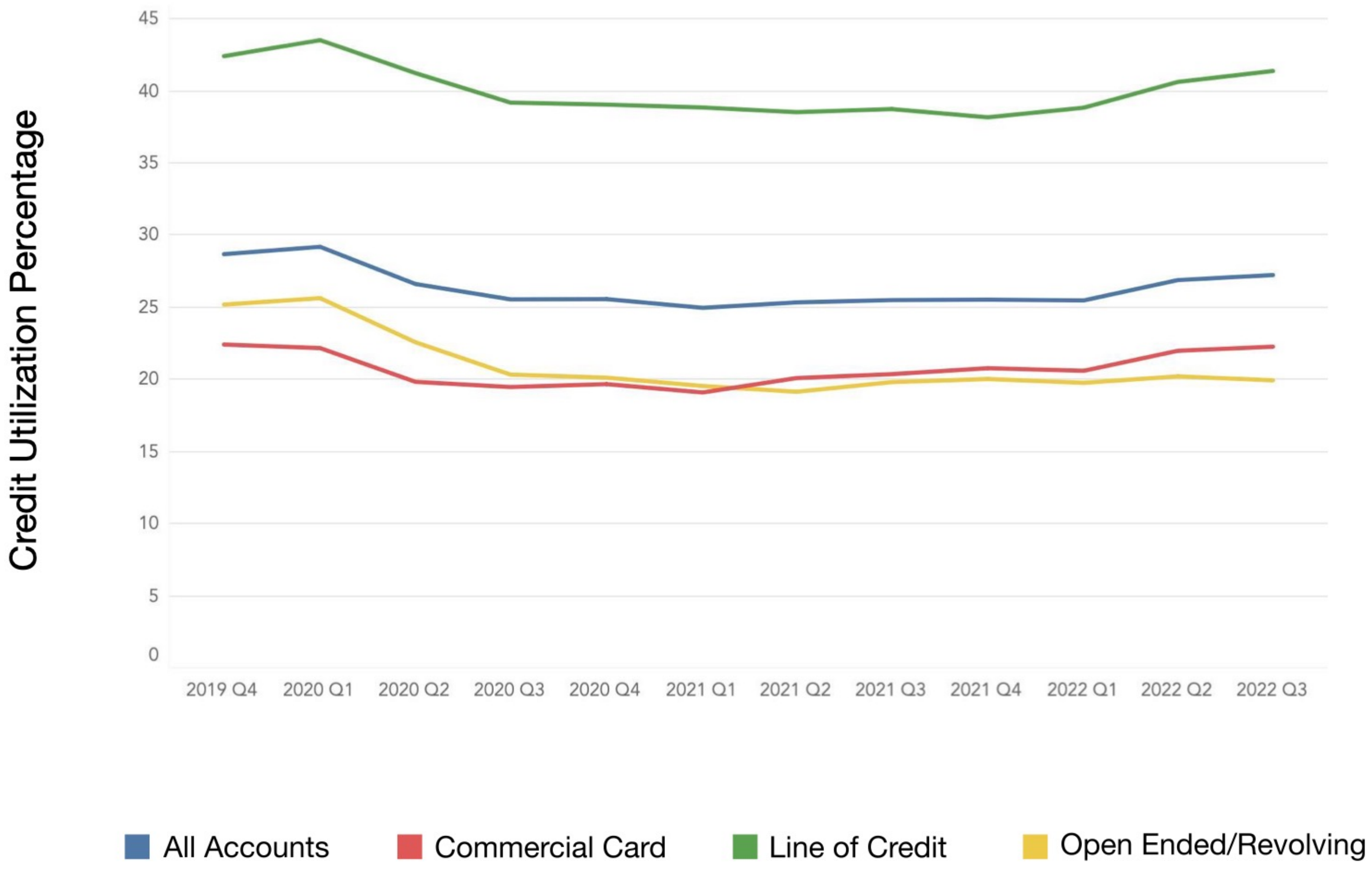
Data source: SBFE Data from the Small Business Financial Exchange

- Small Business Lending Trends Q3 2022. Jan 12th, 2023

Small Business

This increase in utilization is across all account types

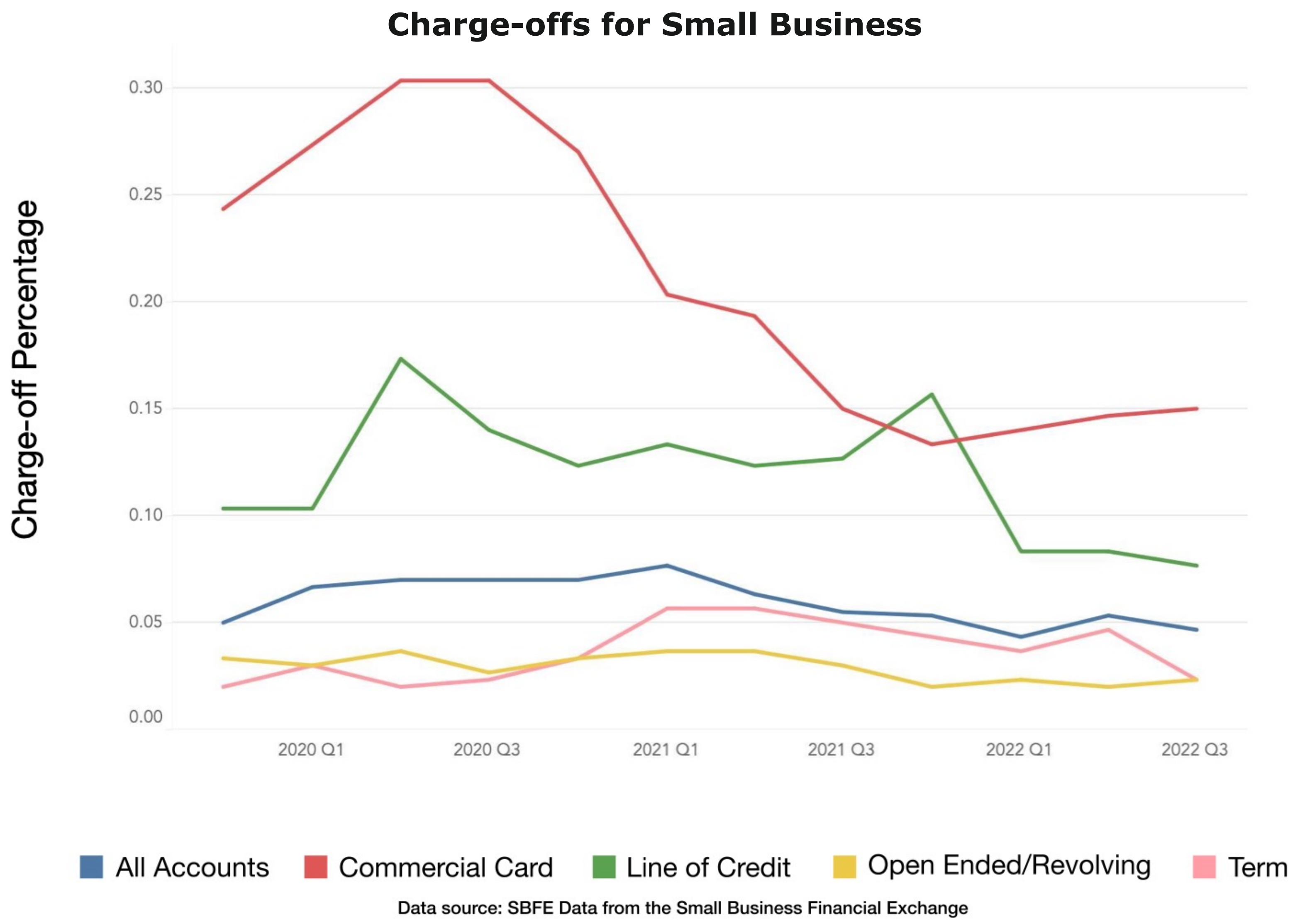
Credit utilization for Small Business



Data source: SBFE Data from the Small Business Financial Exchange

- Small Business Lending Trends Q3 2022. Jan 12th, 2023

Charge-offs remain relatively stable. Unsecured accounts have levelled after higher losses during the pandemic



- Small Business Lending Trends Q3 2022. Jan 12th, 2023

- Credit Card
- Personal Loan
- Auto
- Student Loans
- Mortgage
- Small Business
- Risk Score Inflation

We continue to see warping and spoofing of risk scores leading to some of the risky subprime customers appear as near-prime

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

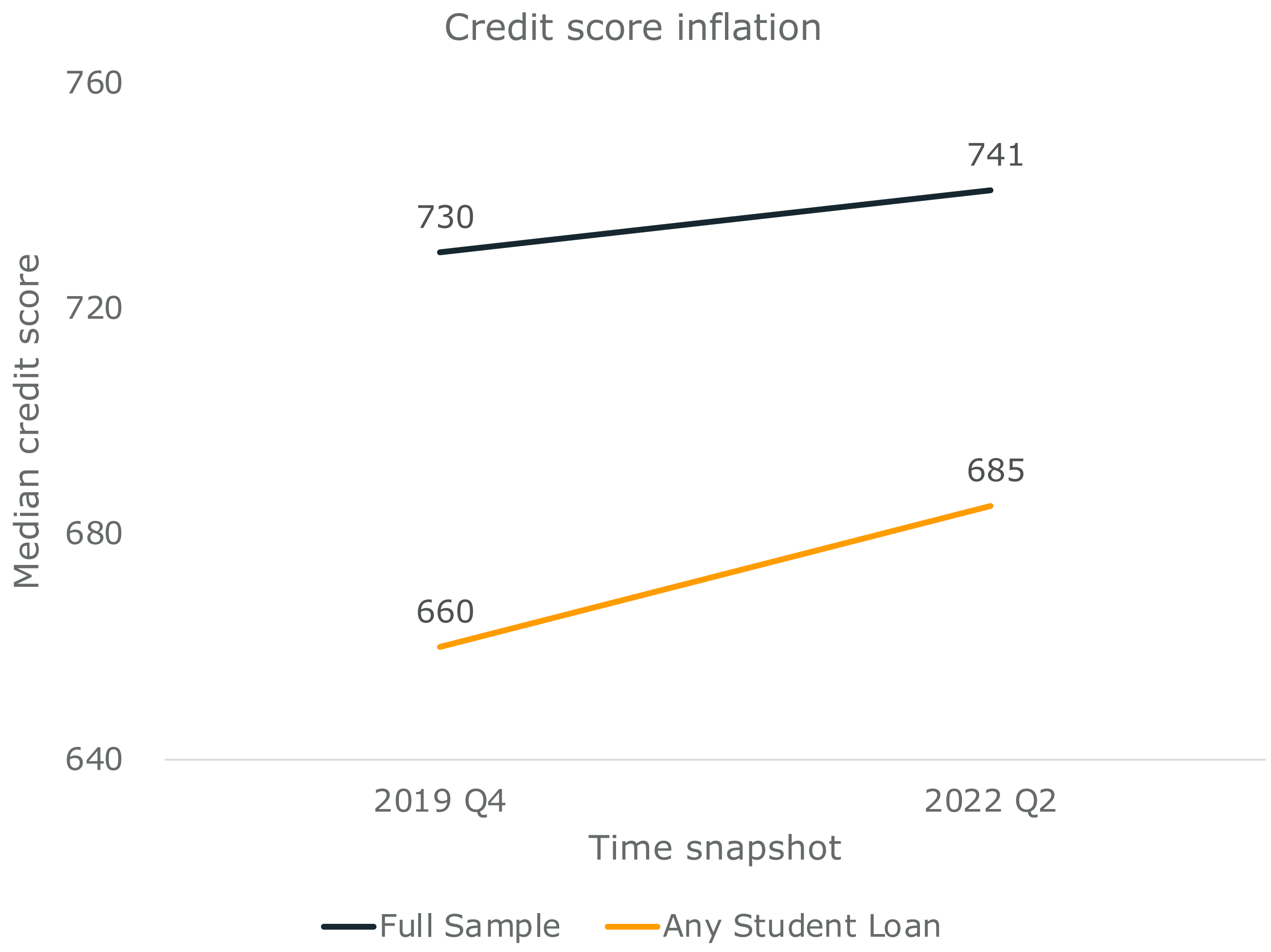
Buy-Now-Pay-Later (BNPL) trades

- 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

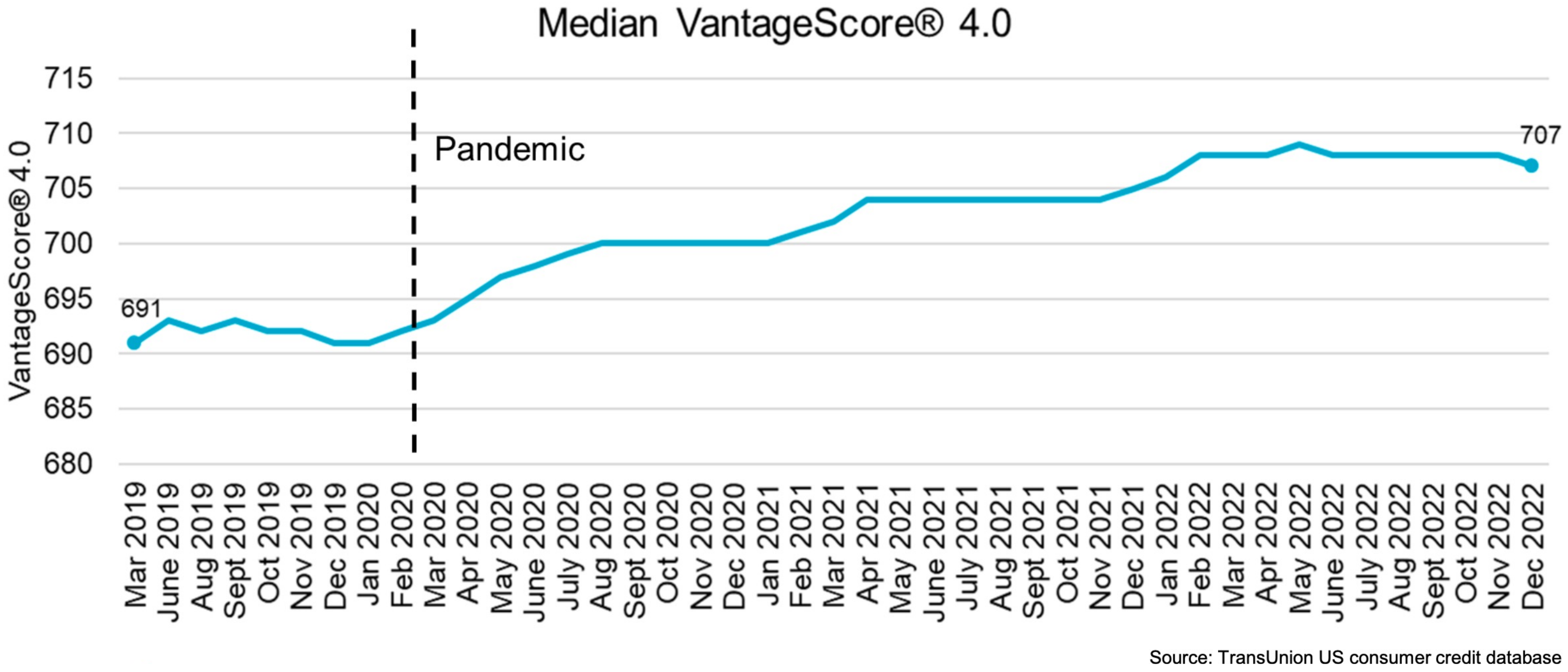
- Risk signals on subprime customers are being warped by credit builder tradelines as well. These new platforms (e.g., Chime) create opportunities for subprime customers to get secured credit cards that feature selective bureau reporting, which (similar to BNPL) can both help and harm credit builder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

Consumers with student loan deferrals had a ~25 point score inflation compared to 11 points overall



Source: New York Consumer Credit Panel/Equifax
Full Sample has 14.0MM borrowers and 2.1MM with student loans

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 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

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

Source: dv01, data as of December 31, 2022