2022 Q3 Credit Risk Review

Trends and Early Risk Indicators in Consumer Credit

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2nd Order solutions

Executive Summary - Overall State of Credit – November 2022

Unsecured Lending (Credit Card & Personal Loans)

- For most of 2022, the increase in credit risk was concentrated in subprime and lower income (higher risk levels than pre-pandemic levels). In the last 2-3 months, we are also seeing an uptick in risk in prime and higher-income customers (still below pre-pandemic levels). This trend could be a correction to pre-pandemic levels or something more concerning
- We are seeing increased risk (higher than pre-pandemic) in vintages from Q3-Q4 2021. As lenders tightened the underwriting standards in 2022, we see a slight improvement in performance in early 2022 vintages but still higher risk than pre-pandemic levels. Lenders who tightened more heavily in early 2022 are seeing better performance
- The lower income and subprime customers are getting squeezed by inflation. We have observed that the lower the income, the steeper the increase in risk
- Due to the all-time low unemployment rates and significant excess savings accumulated from the pandemic, the prime/near-prime consumers continue to do well
- We continue to see the tightening of underwriting standards. For personal loans we see an increase in average origination FICO and income. For Credit Cards - we see an overall increase in originations as consumers borrow more to deal with inflation. However, as lenders tighten their underwriting, we can see a decrease in subprime originations
- The Credit Card balances continue to steeply increase in 2022 Q3 as consumers grapple with inflation and increased expenditures
- Given the trend of consumers using neo-banks to game credit scoring - we are seeing more lenders differentiating acquisition policies for existence of neo-bank accounts, particularly Chime

Executive Summary Continued

Auto

- In the last few months, charge-offs increased but the severity decreased because of higher recoveries due to inflation of underlying assets. However, this unusual trend is reversing as used vehicles are decreasing in value
- The increased value of underlying assets created another incentive for consumers to make payments. For subprime auto, we are seeing attributes like LTV (loan-to-value) ratio becoming stronger differentiators of risk
- 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

Student Loans

- Student loans make up ~30% of non-mortgage consumer debt but the delinquencies have been non-existent because of deferral programs. As the deferrals are set to expire at the end of this year, we can expect an increase in risk across asset classes as payment burdens rises
- For the immediate impact of the $10k student debt cancellation on consumer credit risk tiers - ~88% would have no impact, and 9% would have a positive impact

Mortgage

- Mortgage delinquencies remain low. Mortgages are higher up in the payment hierarchy, and a large majority of them are fixed-rate so the payment burden remains the same even though the interest rates are rising

Executive Summary Continued

Impacts of Inflation on Lending

- 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 the last 2-3 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

Macroeconomic Outlook

- Unemployment remains at an all-time low. However, as the Fed continues to raise rates to quell inflation, the job market is expected to cool off. There is a possibility of a hard landing where unemployment increases and subsequently worsens consumer credit risk, and in the 2008 recession, higher unemployment disproportionately affected more prime borrowers

- Another tailwind for consumer credit is the excess liquidity. Although the personal savings rate is at an all-time low, consumers – especially the higher income - still have significant amounts of excess accumulated savings from the pandemic

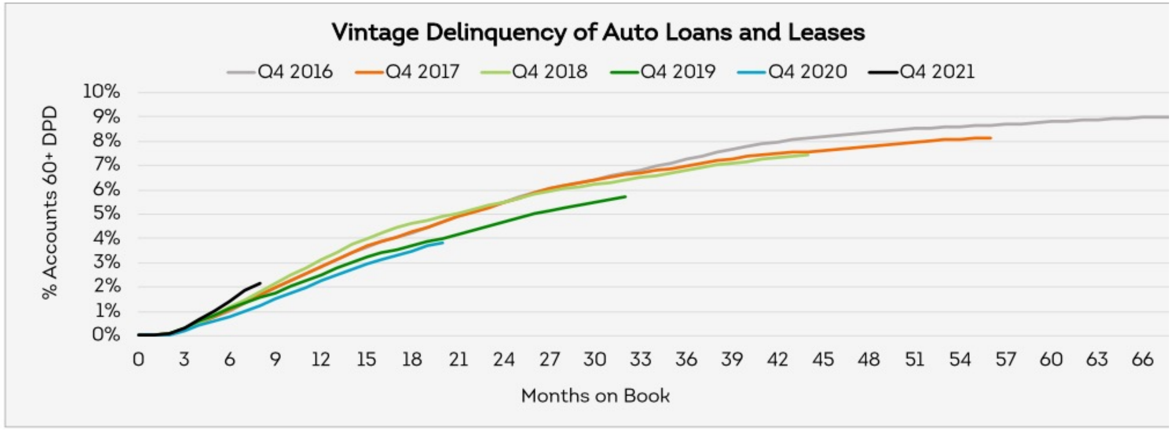
- Investors are more inclined to bet on the health of consumer credit now than the strength of companies based on bond market sales. The bond market for consumer credit ABS is going steady while other volumes have plummeted

Risk Score Warping

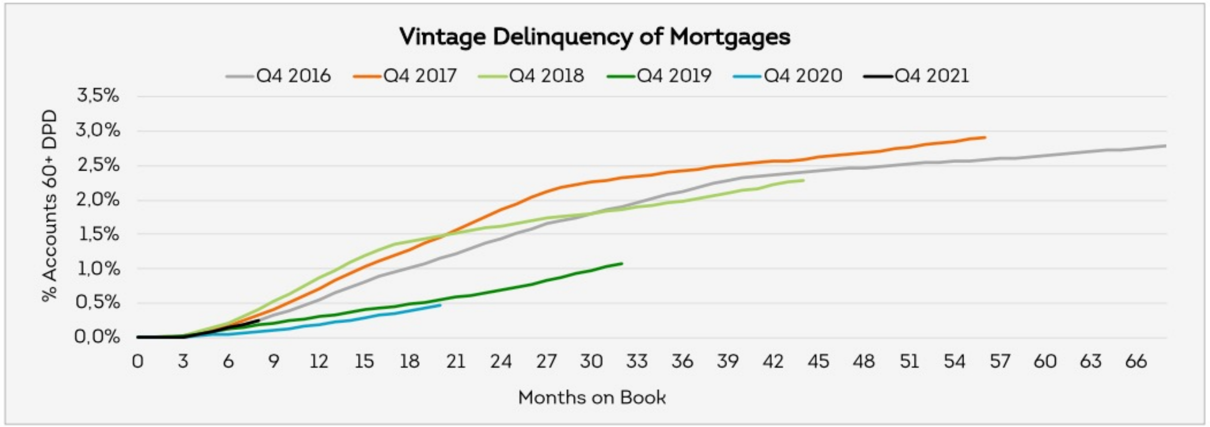
- We continue to see warping and spoofing of risk scores. This means that some of the risky subprime customers can appear as near-prime. Some contributors are:
    - Student Loan Deferrals
    - Buy-Now-Pay-Later (BNPL) trades
    - Credit builder trades
    - COVID data degradation

Recent vintages for Bankcard and PL are experiencing significantly higher delinquency rates

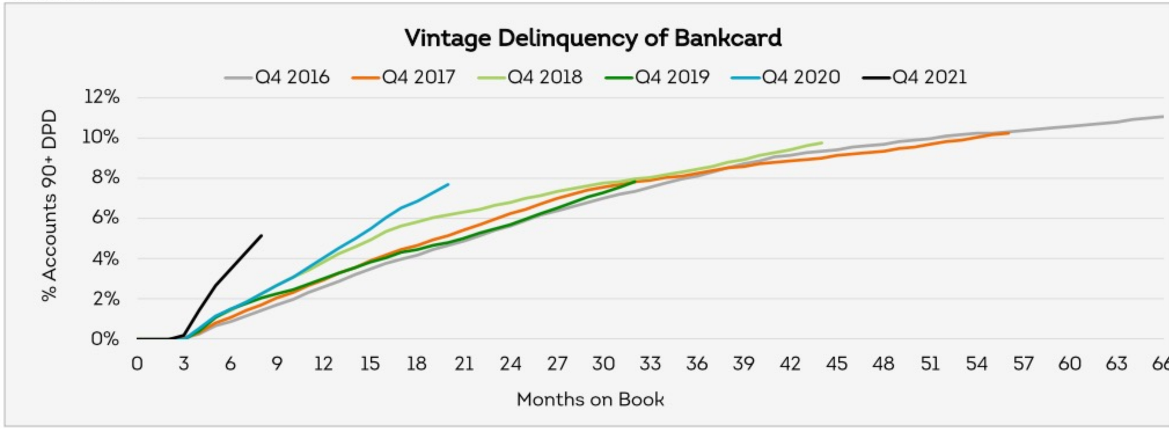
AUTO



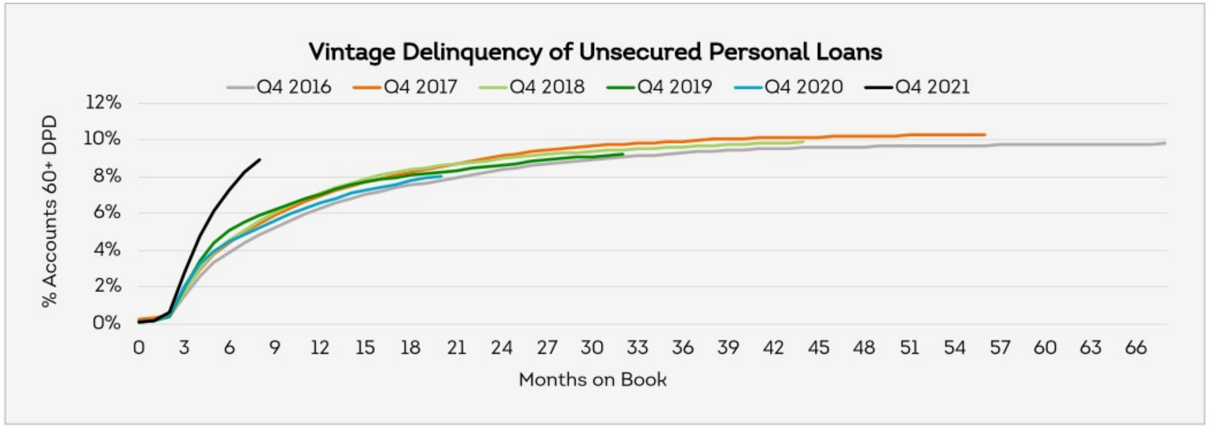
MORTGAGE



BANKCARD



UNSECURED PERSONAL LOAN

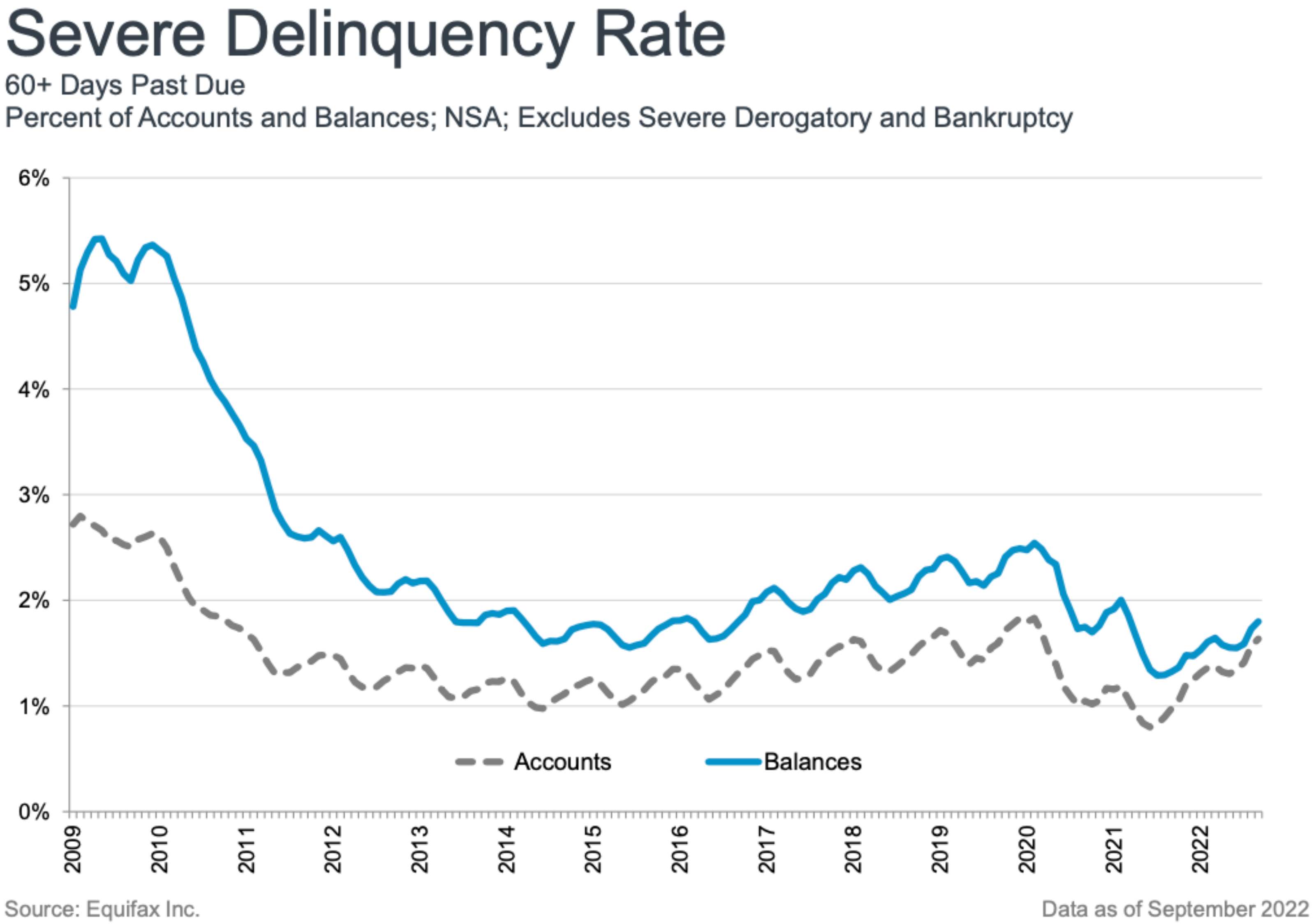


- As Mortgage & Auto are higher up in the customers’ payment hierarchy, there increase in risk is relatively curtailed
- Q4 2021 vintages also exhibit higher risk due to the relatively loose underwriting standards in 2021. For lenders that tightened in early 2022, we are seeing better performance curves

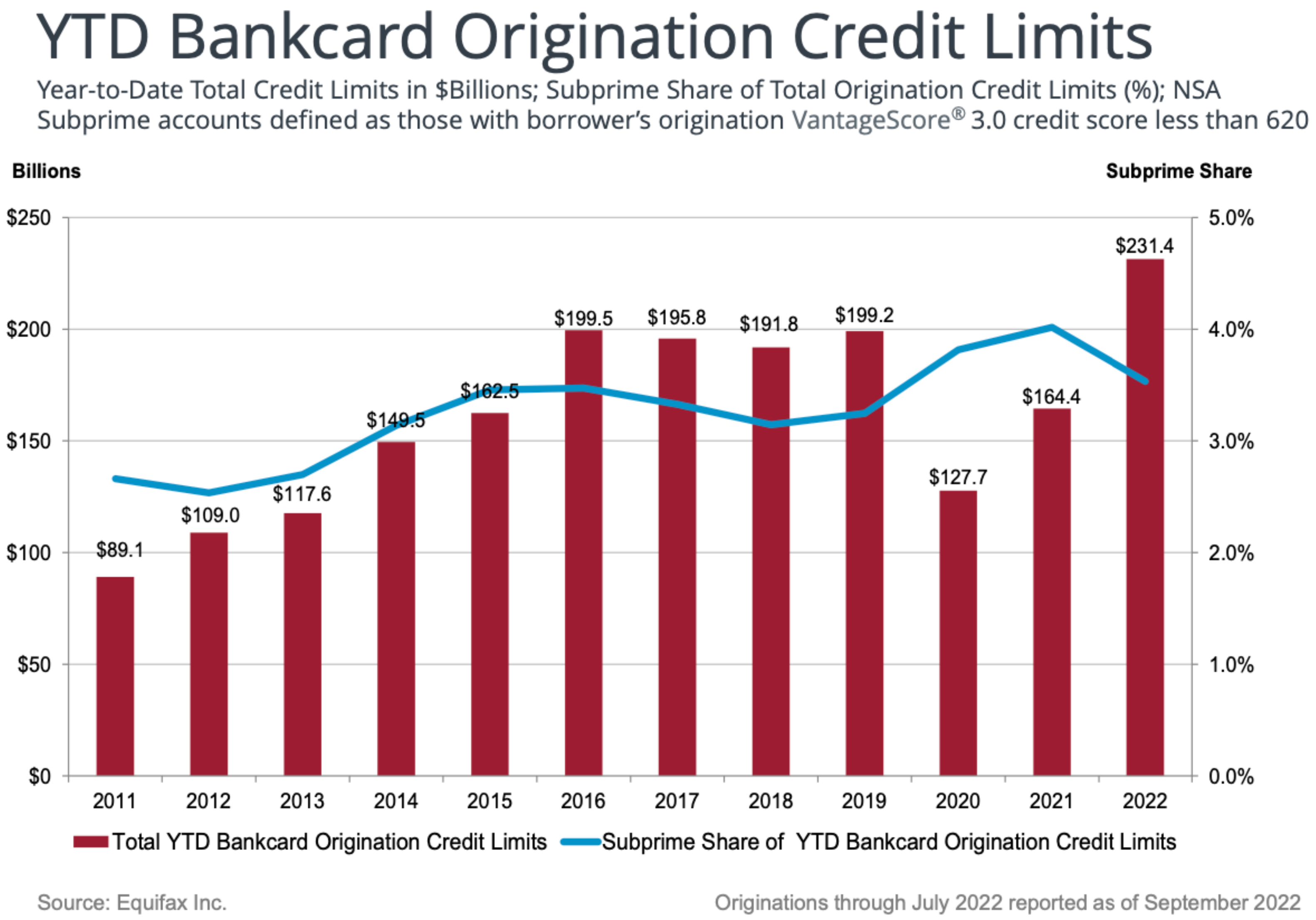
Source: Transunion, data as of September 2022

Table of Contents

Although the delinquency rates are rising – especially in recent vintages – the overall rates are still below pre-pandemic levels



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



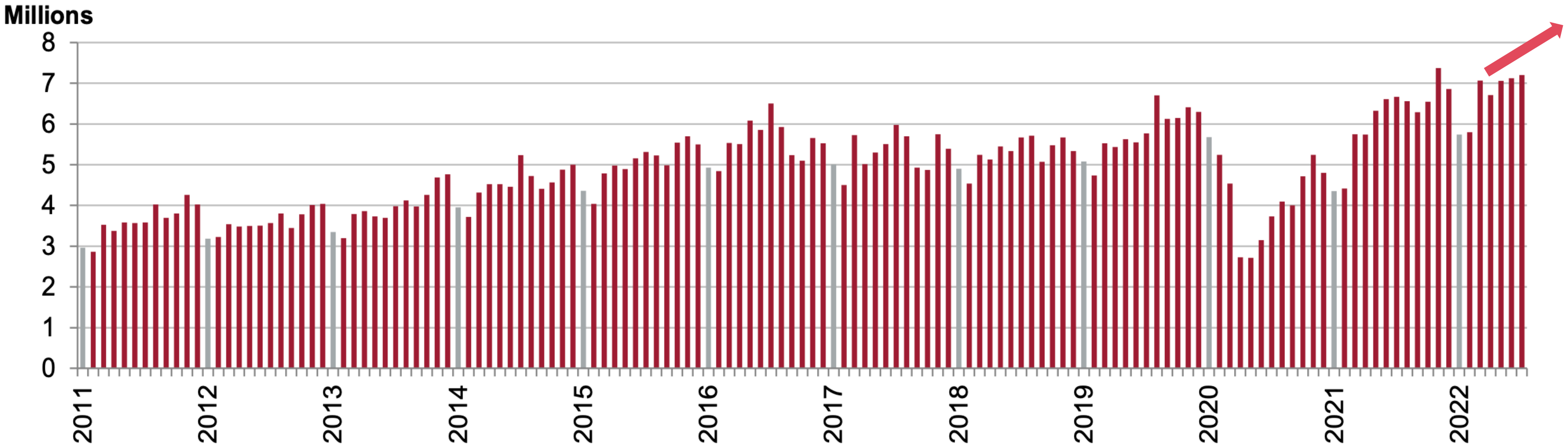
- Source: Equifax Consumer Credit quarterly

We continue to see an increase in Credit Card originations

However, as lenders tighten their underwriting, we can see a decrease in subprime originations

Bankcard Originations: Accounts

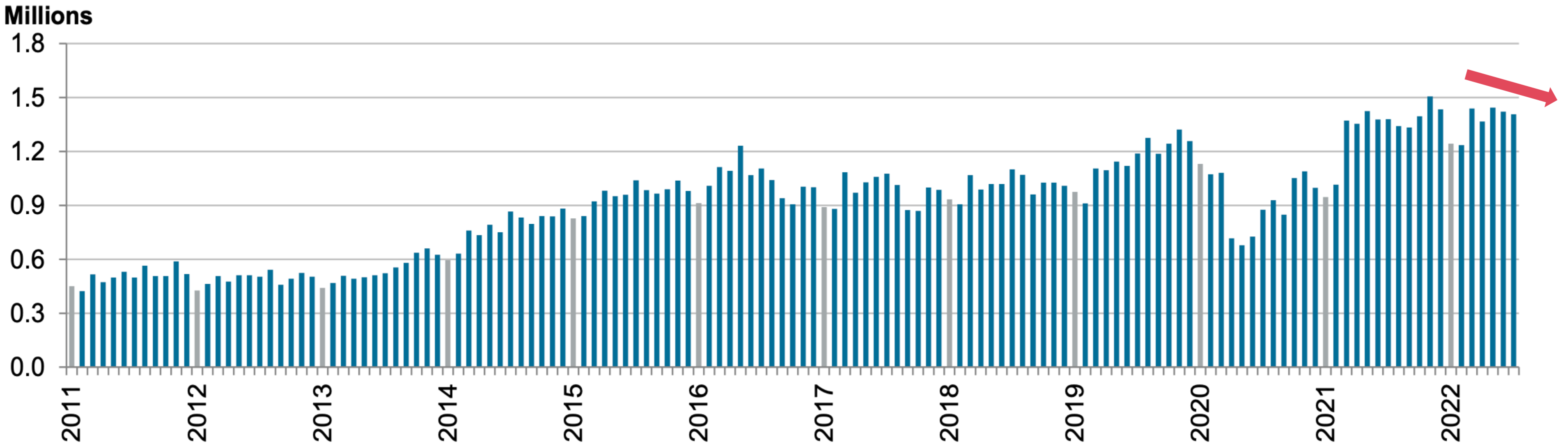
Number of Accounts in Millions; NSA



Subprime Bankcard Originations: Accounts

Number of Accounts in Millions; NSA

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



- Source: Equifax – originations through July 2022 reported as of September 2022

The CC balances continue to increase in 2022 Q3 as consumers grapple with inflation and increased expenditure

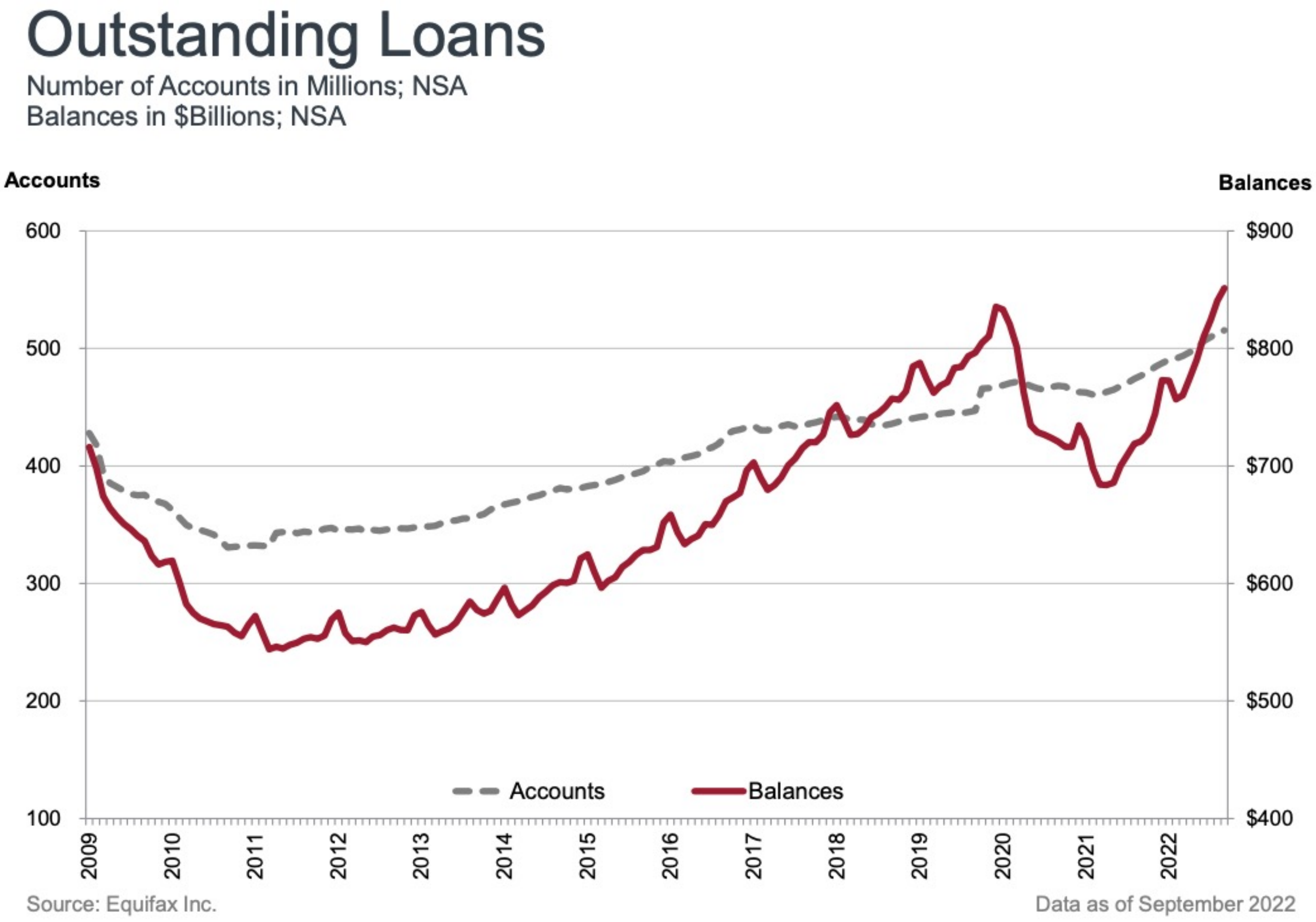
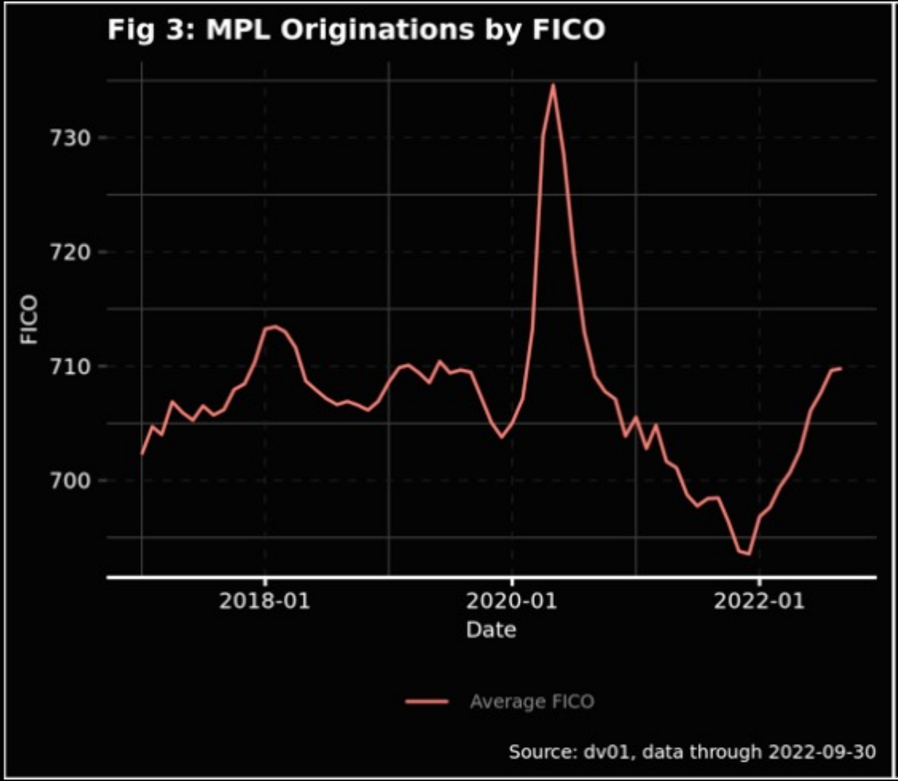
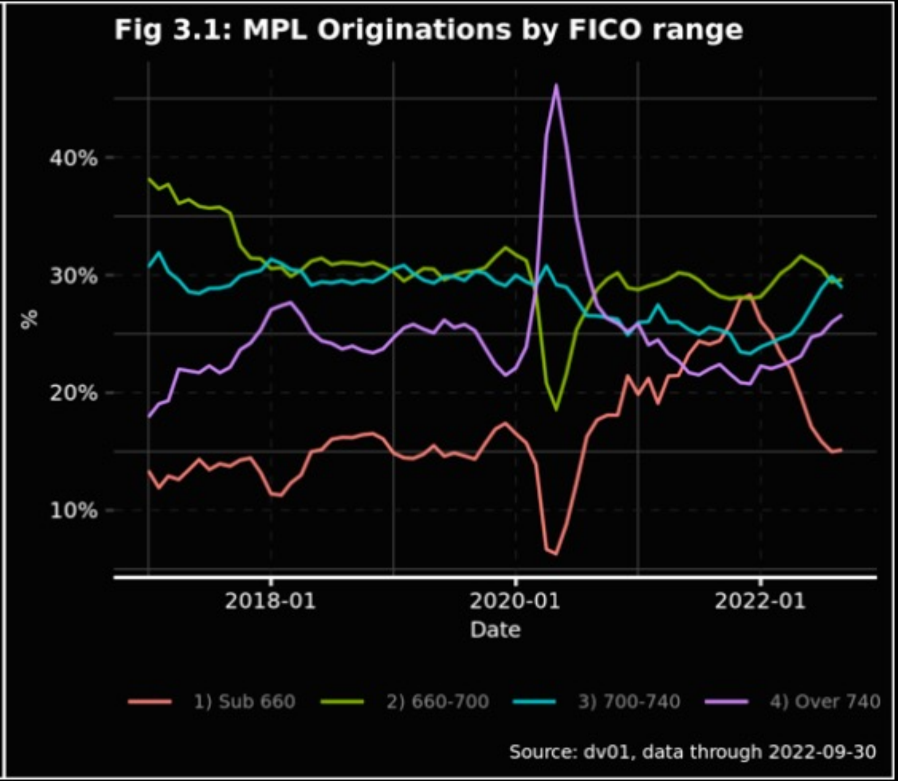


Table of Contents

Tightening of Underwriting

Avg origination FICO continues to increase and there is a significant drop in sub-660 FICOs



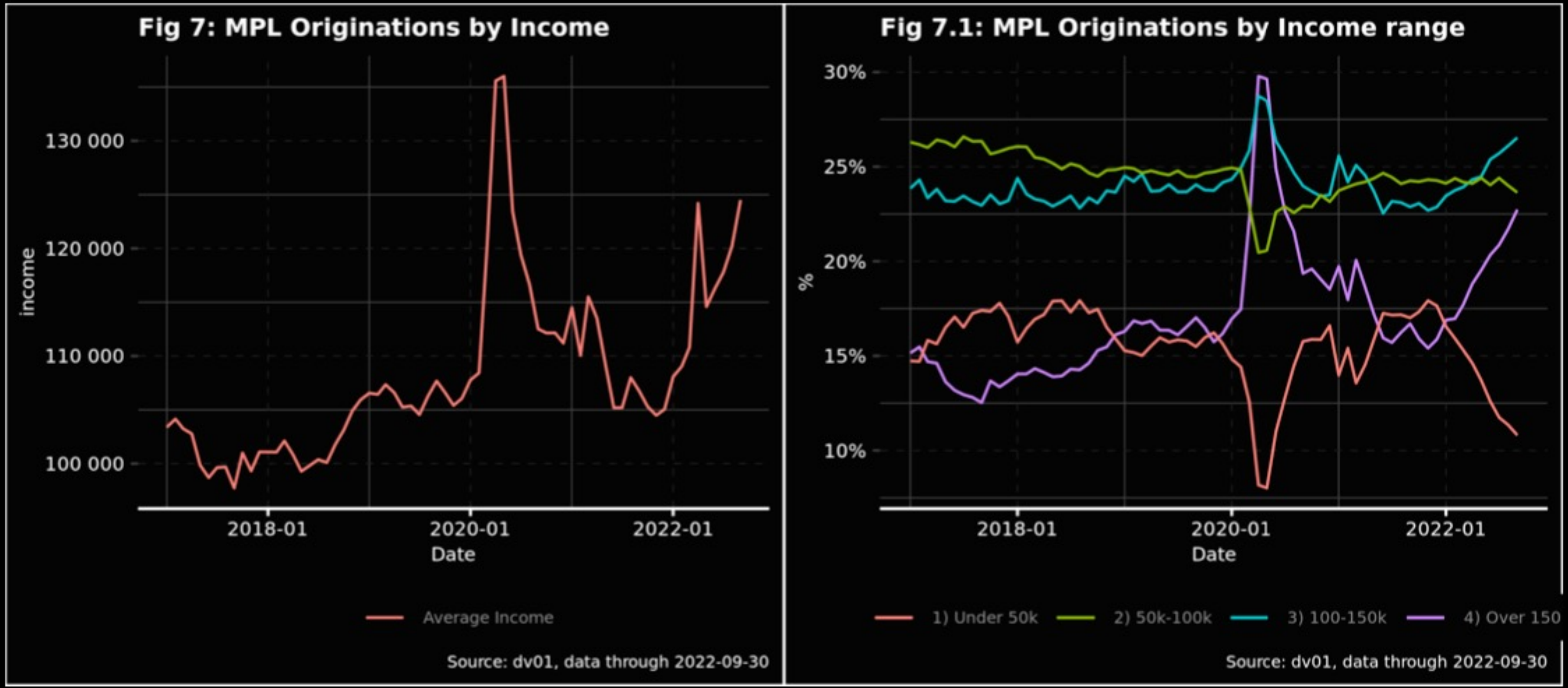


These FICO scores are also warped by COVID impacts and suppression of various risk signals

Source: dv01, data as of September 2022

Tightening of Underwriting

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



Source: dv01, data as of September 30, 2022

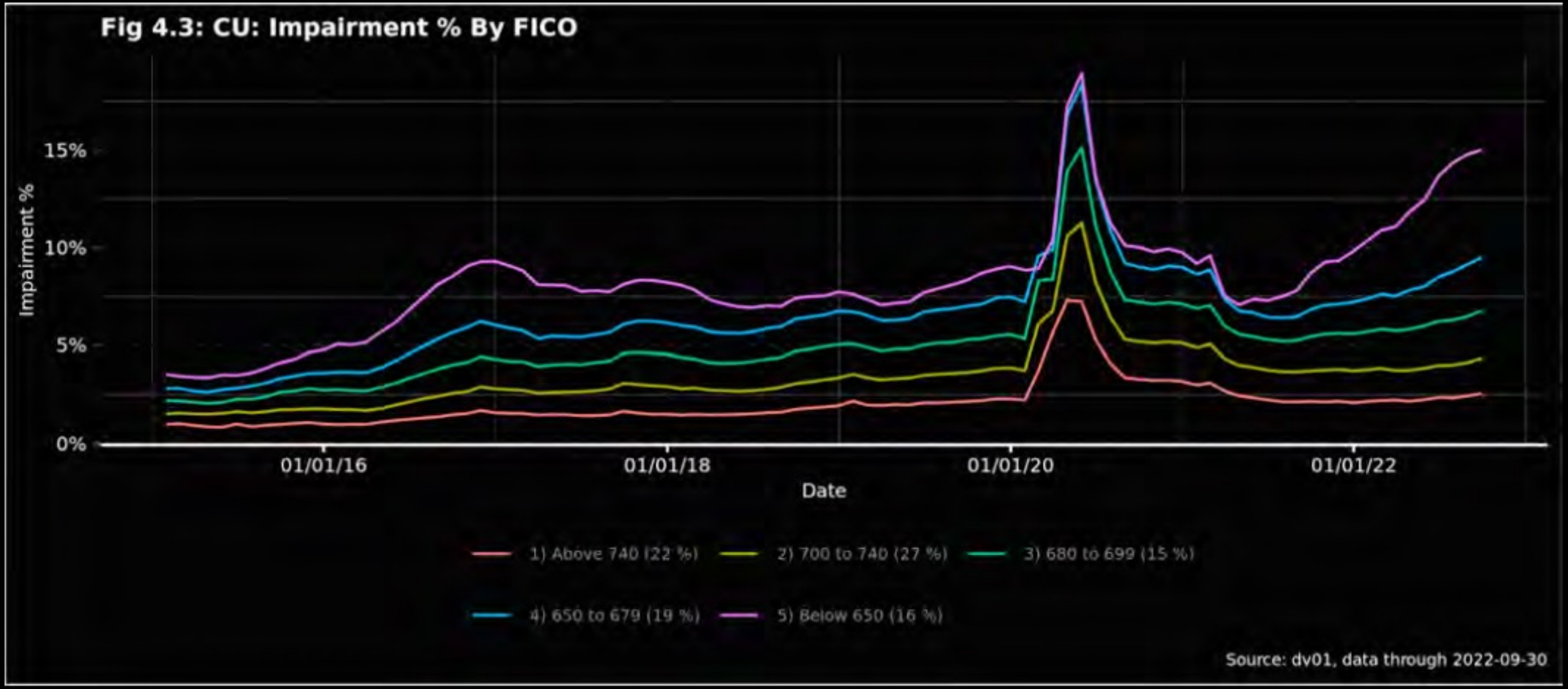
Increase in delinquencies with especially weak credit performance in the last few months

There is also a surge in first time delinquencies & drop in cure rates*

Source: dv01, data as of September 30, 2022
*see appendix

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

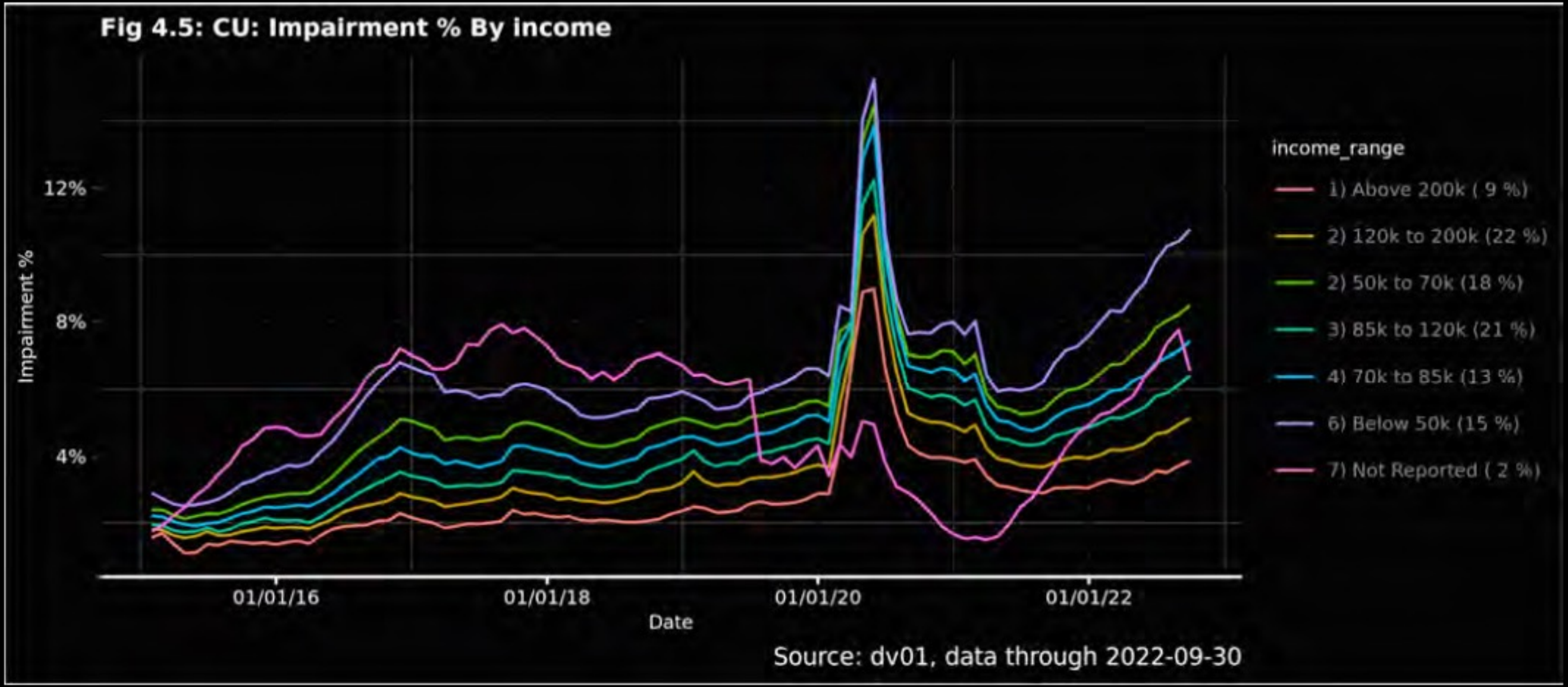
Impairment = DQ + Modification



Source: dv01, data as of September 30, 2022

Inflation is disproportionately impacting the lower income. We see a much steeper increase in risk for customers with income < $50k

Impairment = DQ + Modification

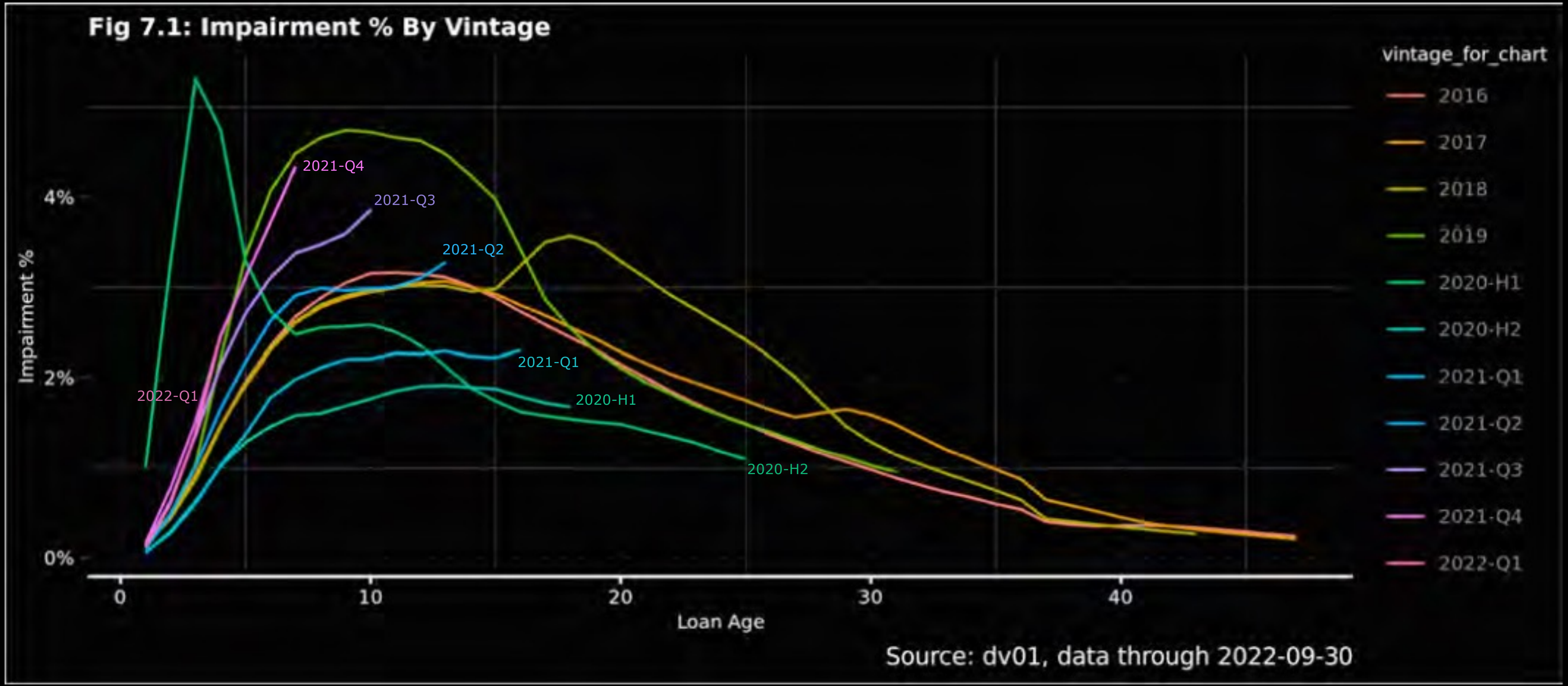


There is an uptick in risk across the other income bands too. The lower the income, the steeper the rise in risk

- Source: dv01, data as of September 31, 2022
- For commentary on inflation's impact on lending, refer to our whitepaper https://2os.com/wp-content/uploads/2022/05/Credit-Risk-Quarterly-Q1-2022-in-Review.pdf

Due to the loosened underwriting with a higher proportion of subprime, we see increased risk (even higher than pre-pandemic) in vintages of Q3 & Q4 2021

Impairment = DQ + Modification

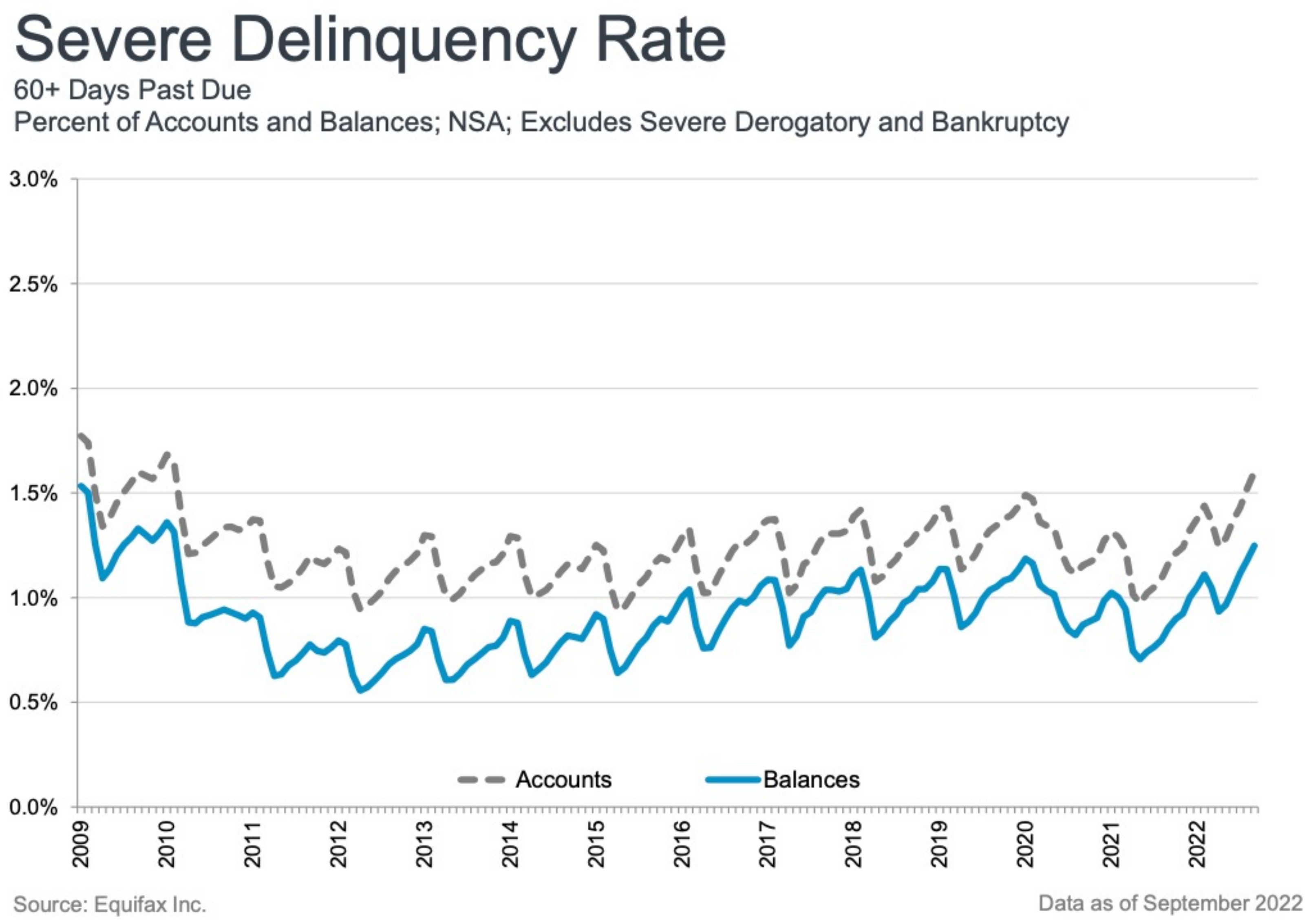


As lenders tightened the underwriting standards in 2022, we see a slight improvement in performance in early 2022 vintages but still higher risk than pre-pandemic levels. Lenders who tightened more heavily in early 2022 are seeing better performance

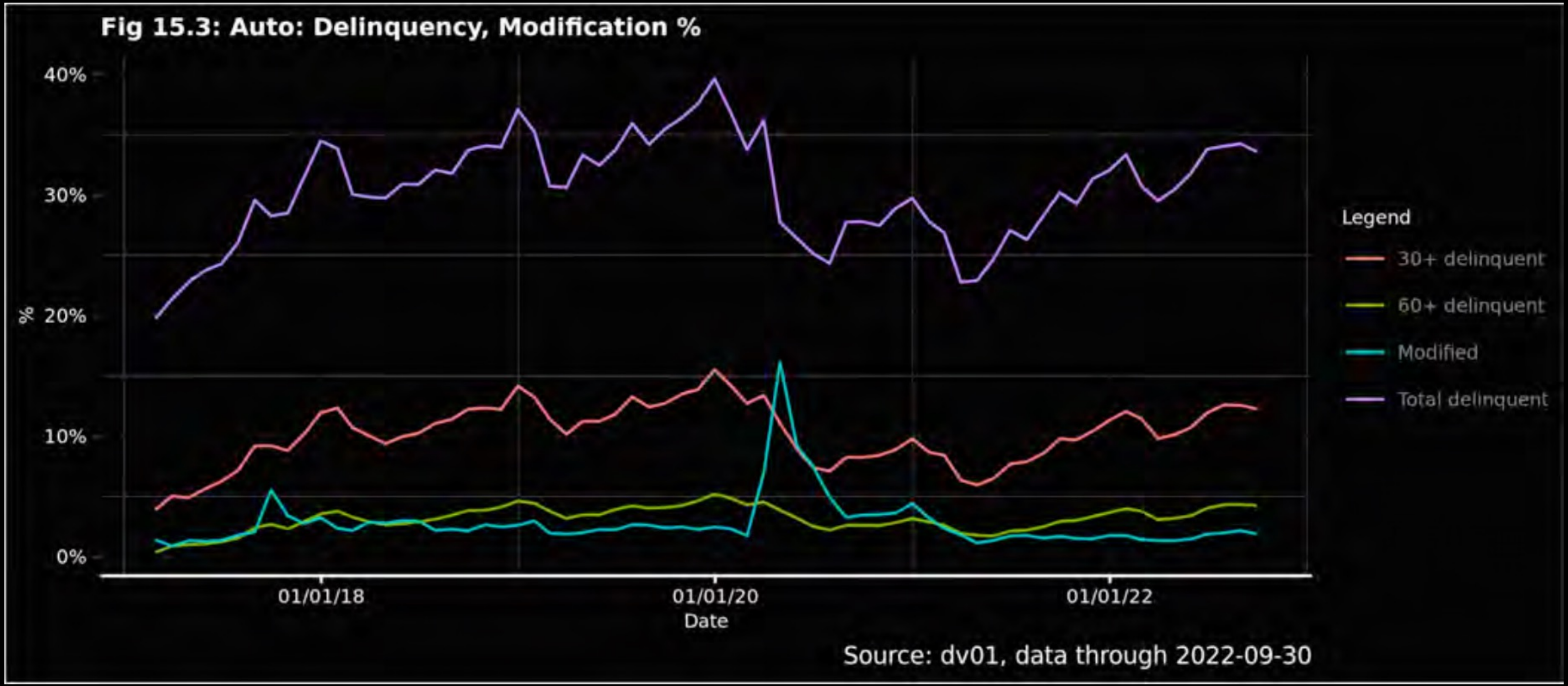
Source: dv01, data as of September 30, 2022

Table of Contents

Auto delinquencies are on the rise but still within the pre-pandemic level range



Subprime Auto is also seeing an increase in delinquencies but still within pre-pandemic ranges



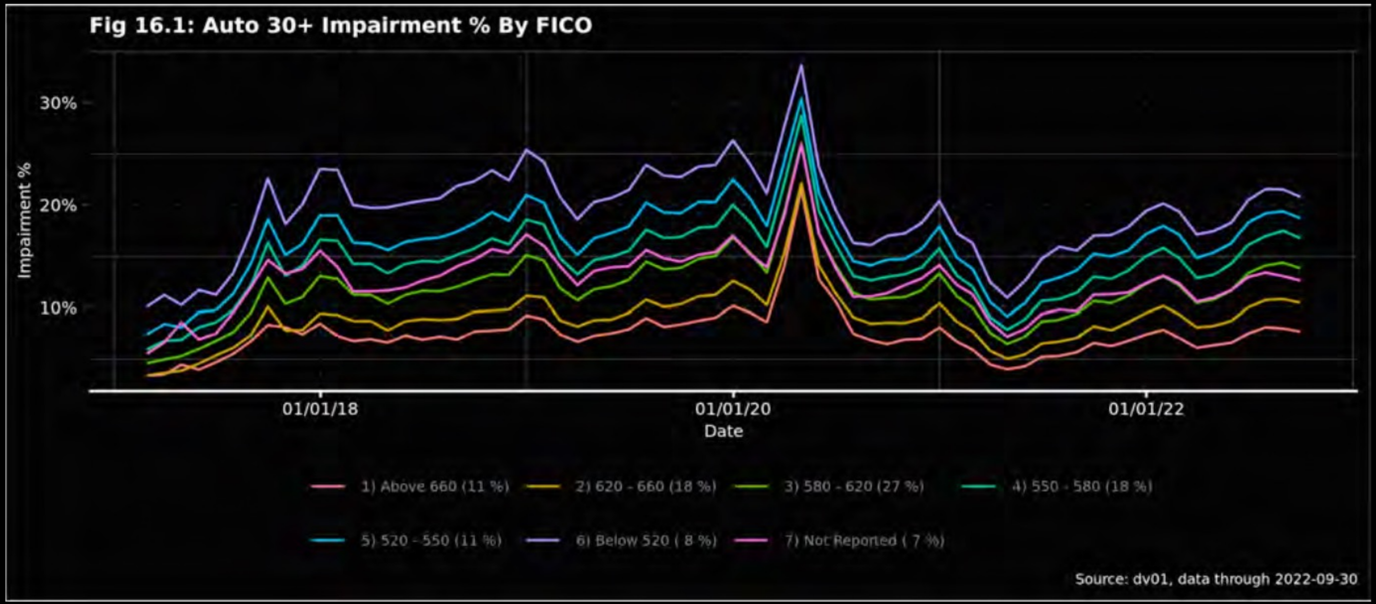
Source: dv01 Subprime Auto, data as of Sep 30, 2022

Impairment = DQ + Modification

Attributes like LTV can be stronger differentiators of risk as consumers have another incentive to make payments with the increased asset value

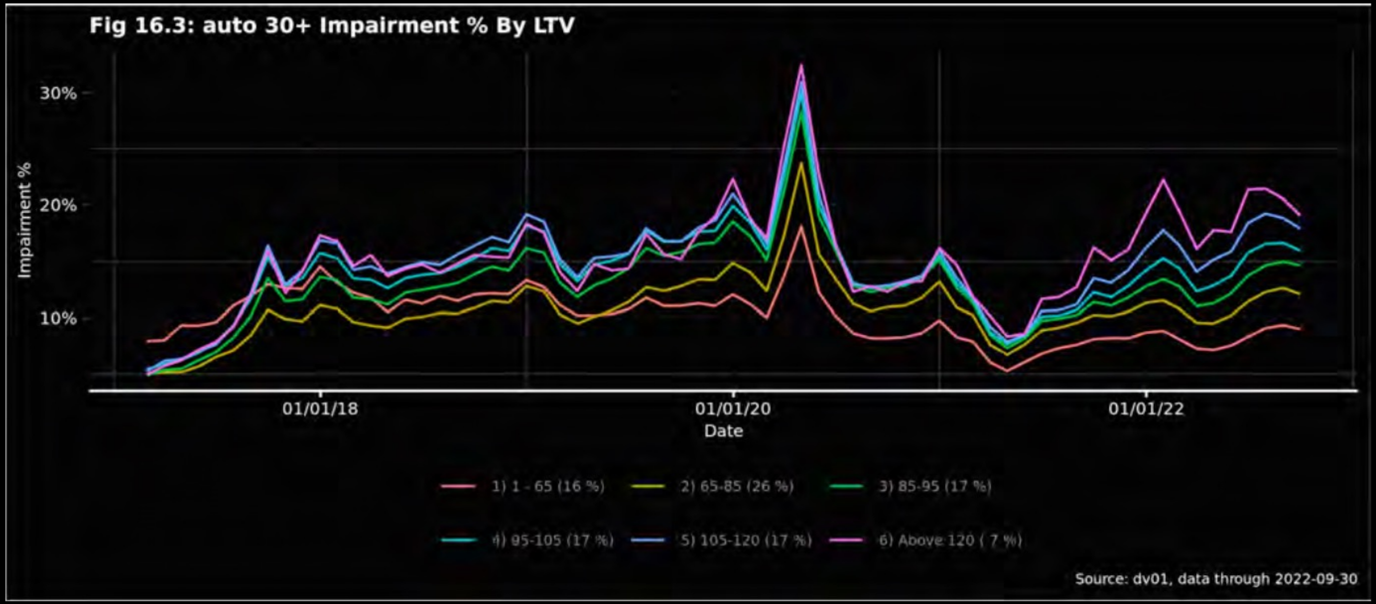
FICO

Delinquencies returning to pre-pandemic levels



LTV

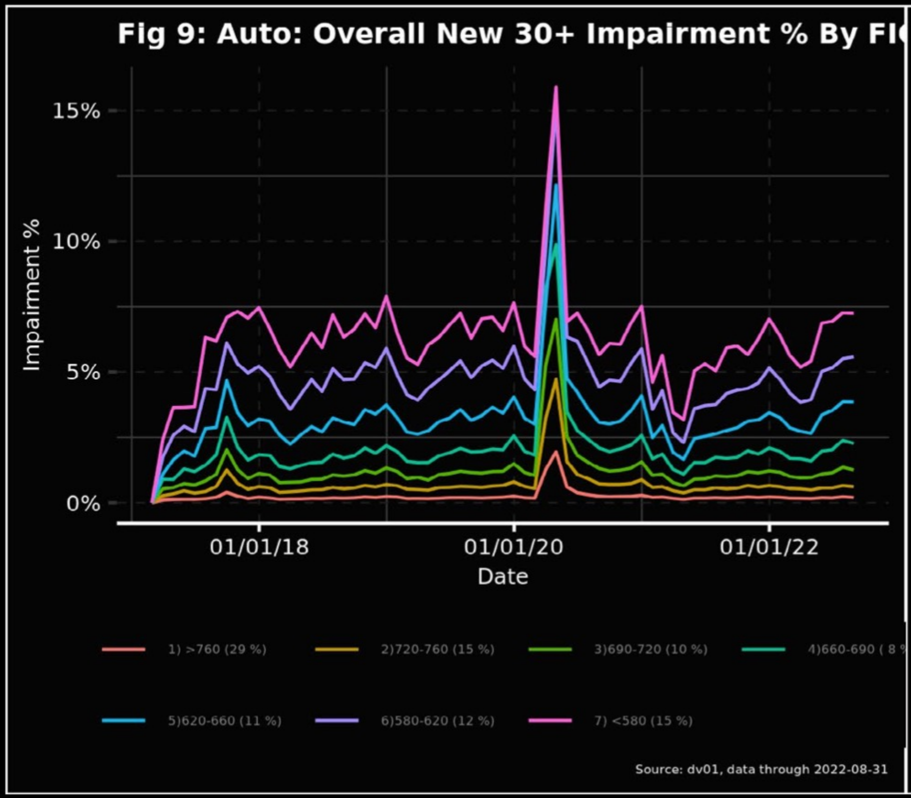
More pronounced fanning after COVID as vehicle values increased in value. Less pronounced in the last 2 months as lenders give more importance to LTV in their origination

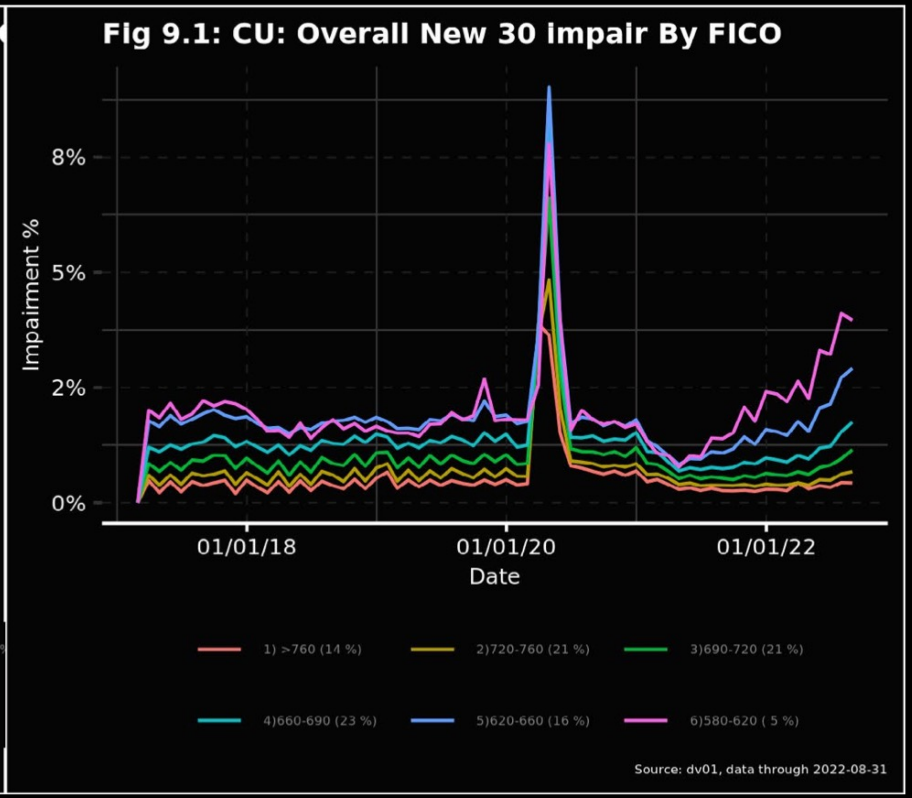


Source: dv01 Subprime Auto, data as of Sep 30, 2022

Auto is higher in the payment hierarchy than Personal loans

Impairment = DQ + Modification





We see new delinquencies in Consumer-Unsecured leading the delinquencies for auto

- Source: dv01 - Comparing Auto & Consumer Unsecured Sectors, data as of Aug 31, 2022
- New 30+ DQ are newer delinquencies. CU = Consumer Unsecured for Personal Loans

Subprime Auto had far higher cure rates than Consumer Unsecured

Impairment = DQ + Modification

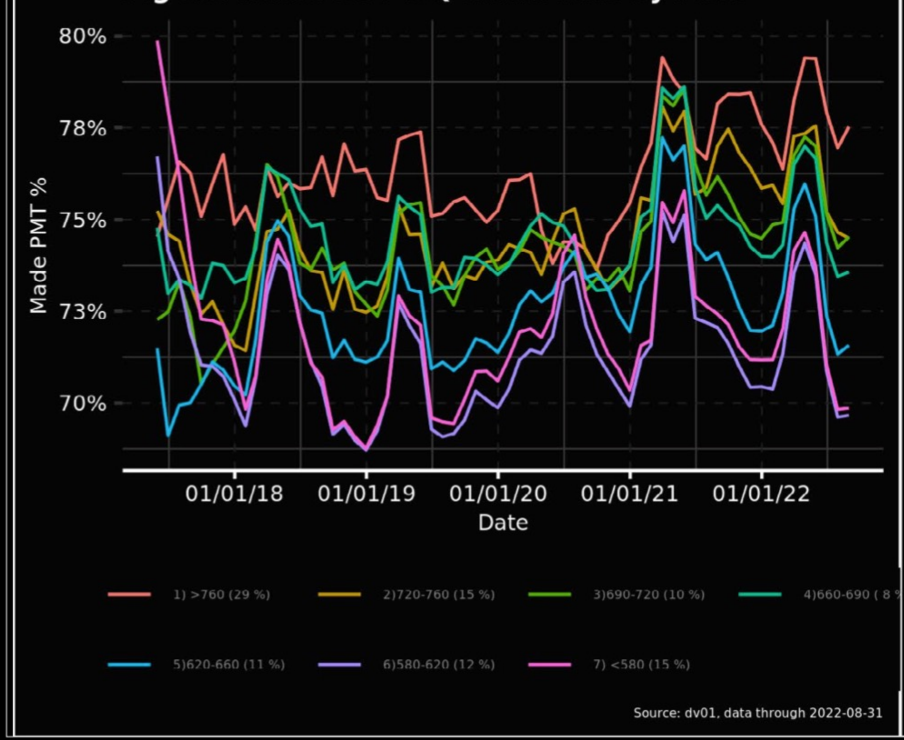


Fig 13: Auto: 30+ DQ Made Pmt By FICO

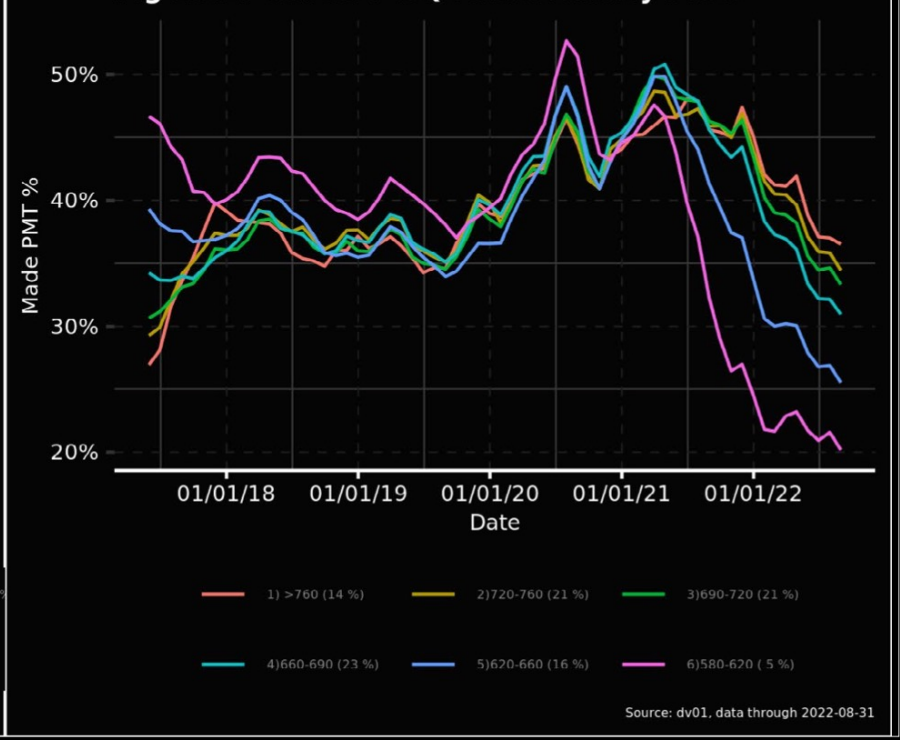
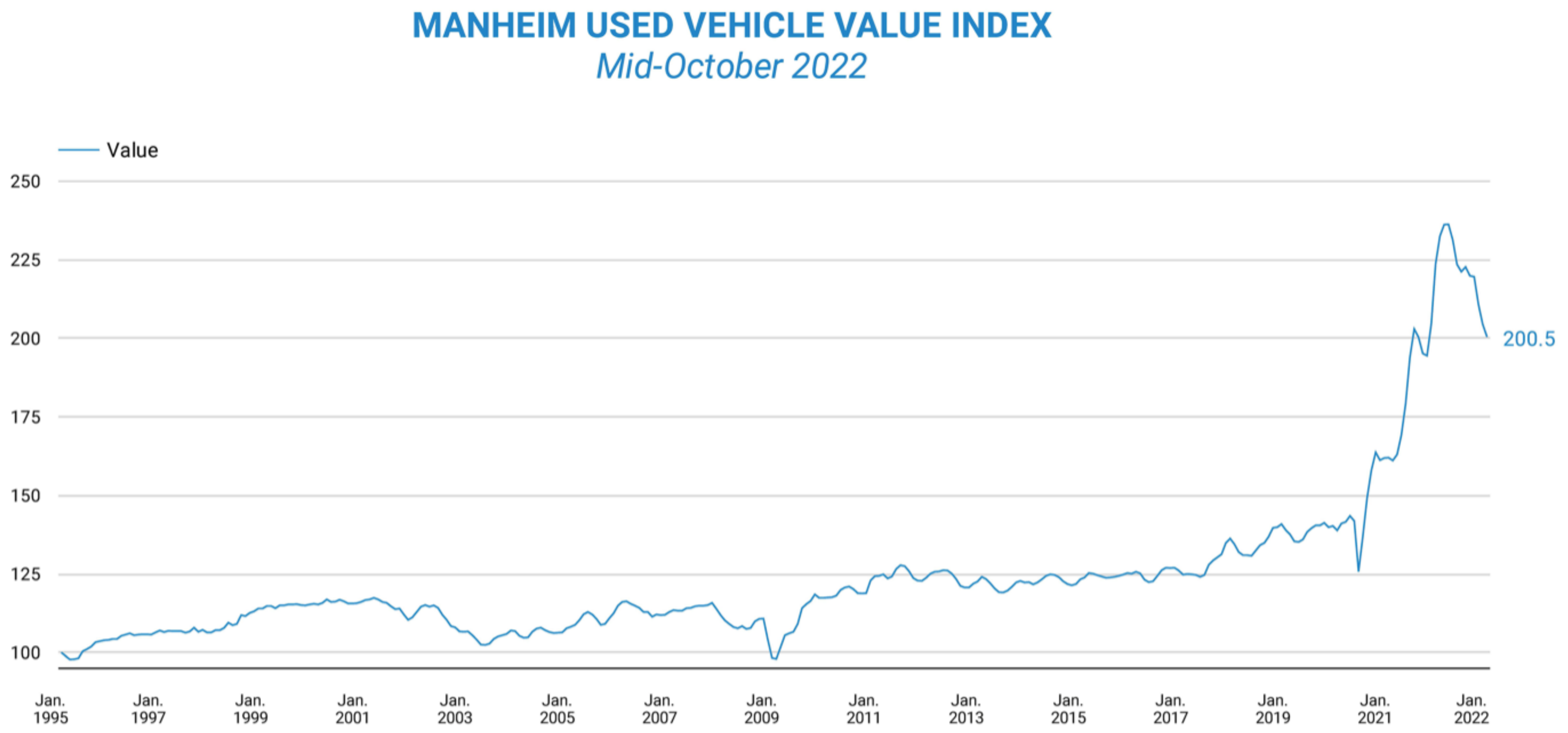


Fig 13.1: CU: 30+ DQ Made Pmt By FICO

This suggests subprime borrowers continue to effectively manage their payments to avoid losing their vehicles, even as the economy deteriorates for consumers as a whole

- Source: dv01 - Comparing Auto & Consumer Unsecured Sectors, data as of Aug 31, 2022
- PMT = Payment, CU = Consumer Unsecured for Personal Loans

This lowered severity trend is facing headwinds as used vehicles are decreasing in value



Data as of Mid-October 2022

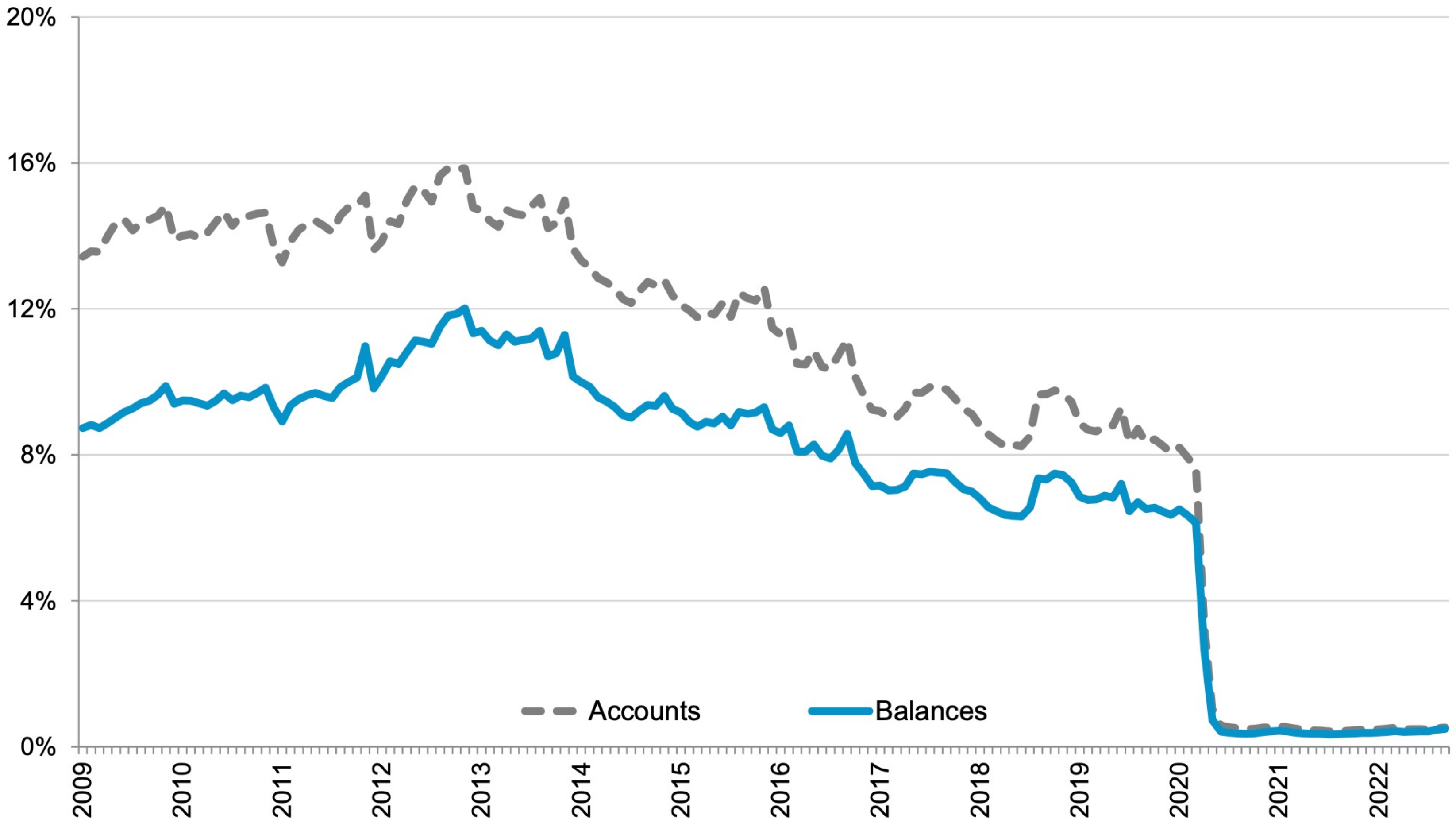
Table of Contents

Delinquencies have been non-existent because of deferral programs

As deferrals are set to expire at the end of this year, we can expect an increase in risk across 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

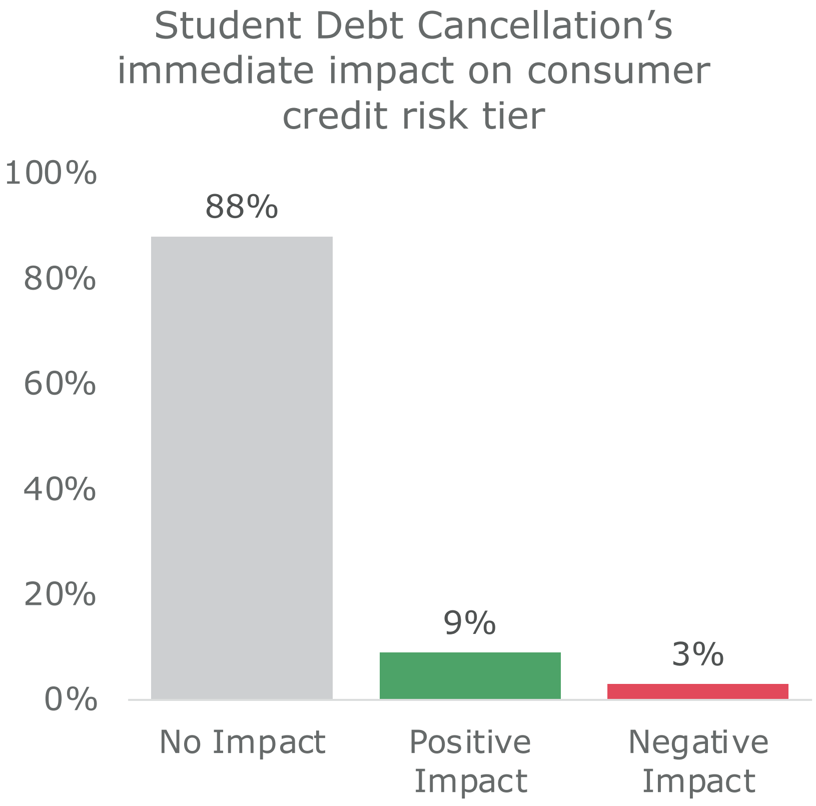


Source: Equifax Inc.

Data as of September 2022

Immediate impact of the $10k student debt cancellation on credit risk

Biden admin announced in Aug 2022 the cancellation of student debt



- Credit risk tiers of a vast majority of consumers will not be impacted
- ~9% would shift to lower risk tiers as their debt is paid
- ~3% will see a negative impact. These are consumers with less than $10k in total debt, the closing of the account will impact their credit mix and hence the credit score
- Credit score models like Vantage 4.0 which use trended data will have less of a negative impact compared to Vantage 3.0 as the trended scores consider credit behavior over several months

The long-term impact of the debt cancellation would be more positive as the overall payment burden of a lot of consumers will be reduced

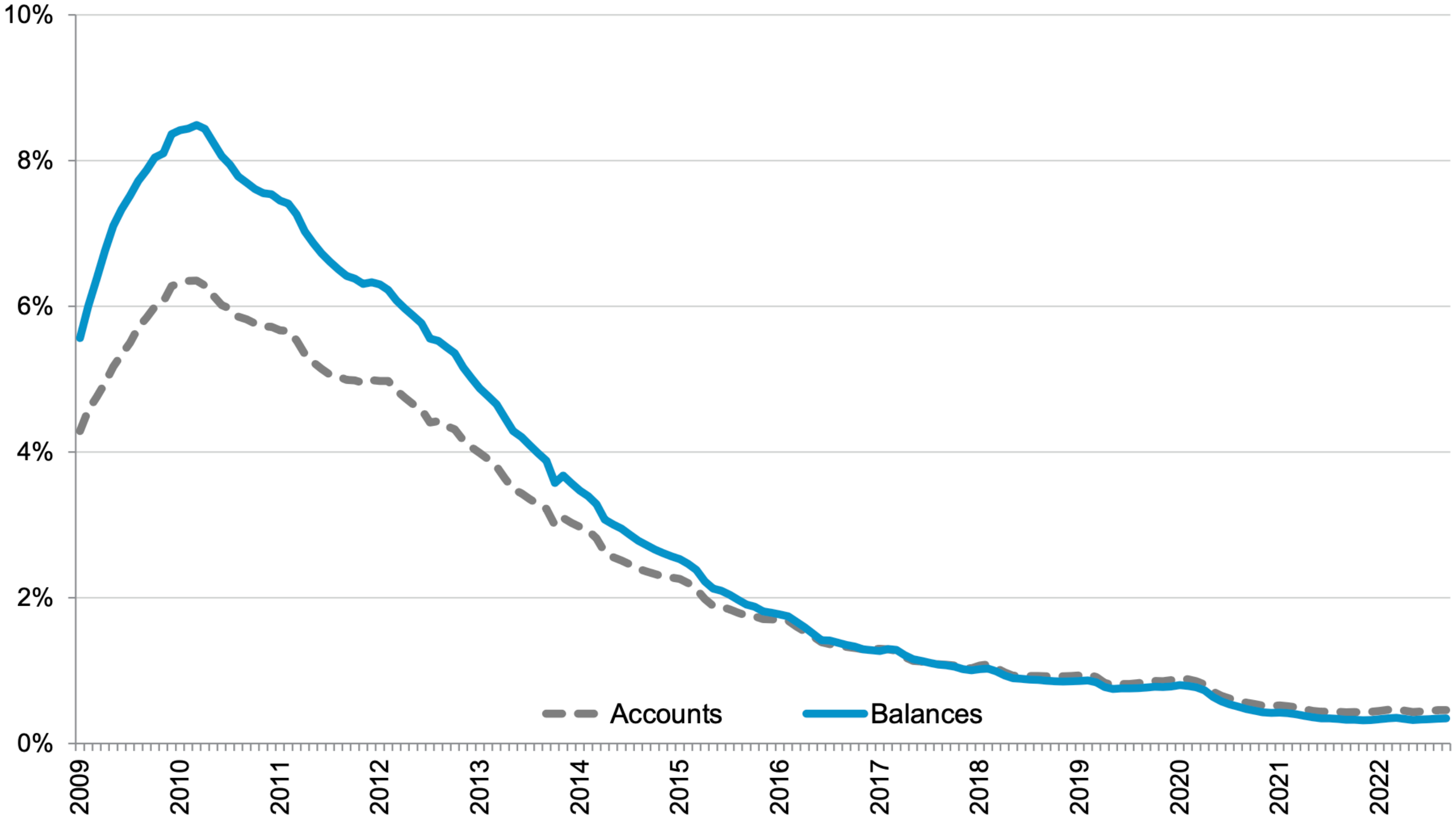
- Source: Transunion study on student debt cancellation

Delinquencies remain low for First Mortgages

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

Severe Delinquency Rate

90+ Days Past Due, in Bankruptcy and In Foreclosure
Percent of Accounts and Balances; NSA; Excludes Severe Derogatory



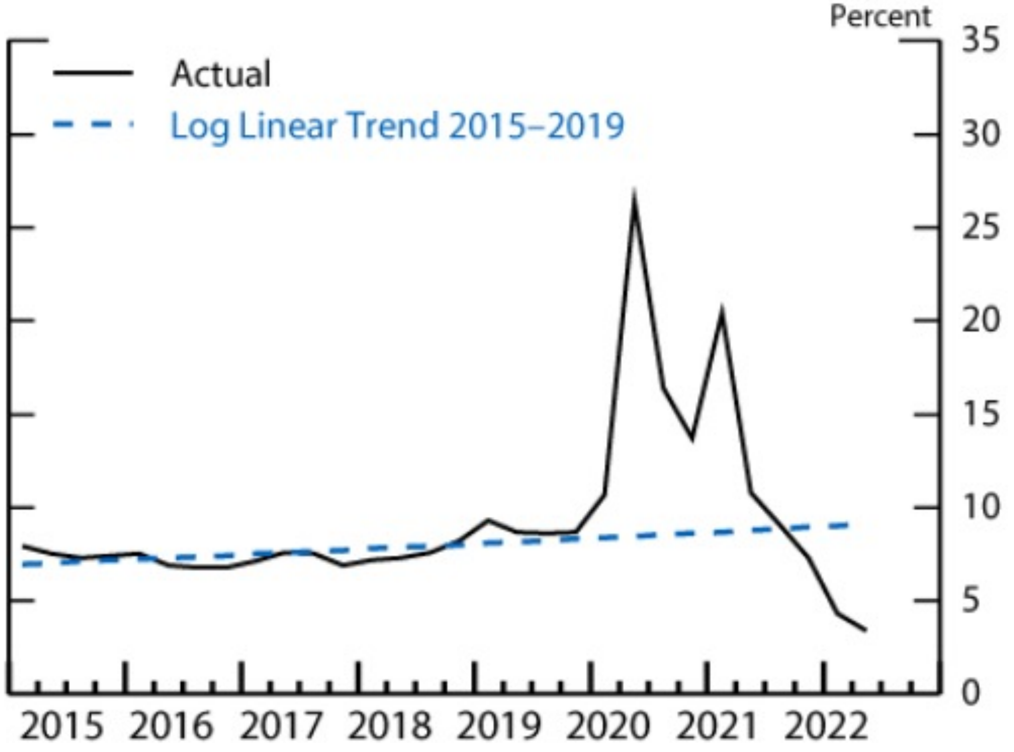
Source: Equifax Inc.

Data as of September 2022

Table of Contents

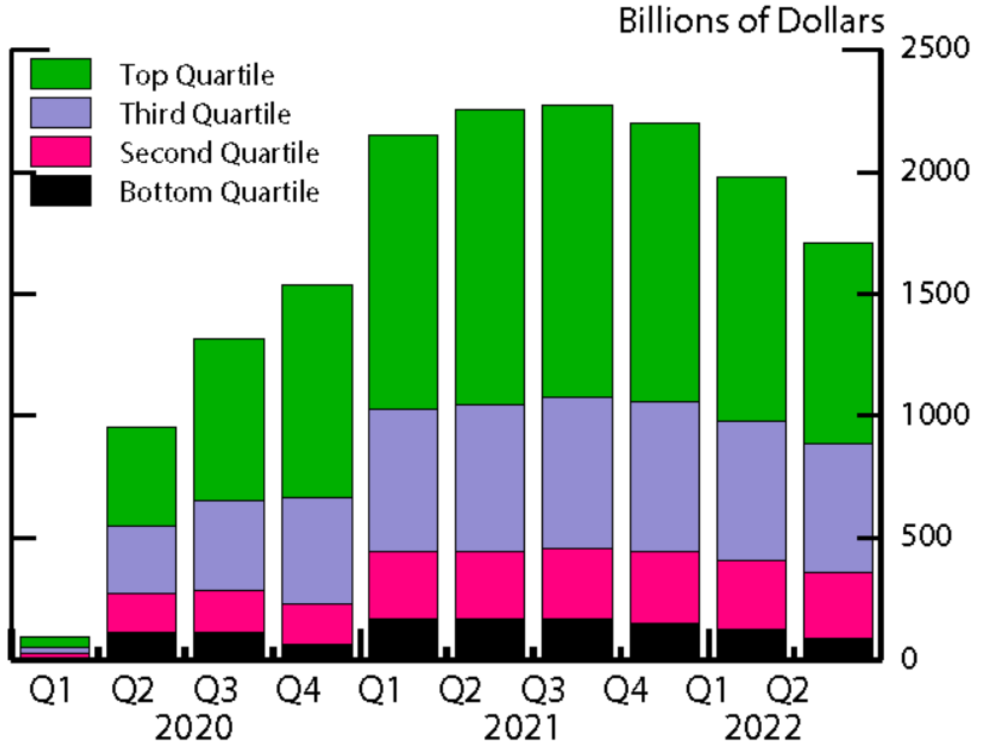
Although the personal savings rate are at an all time low, consumers still have significant amounts of accumulated excess savings

Personal Savings Rate*



Personal savings soared during COVID and have dopped to an all time low

Stock of excess savings by income percentile**

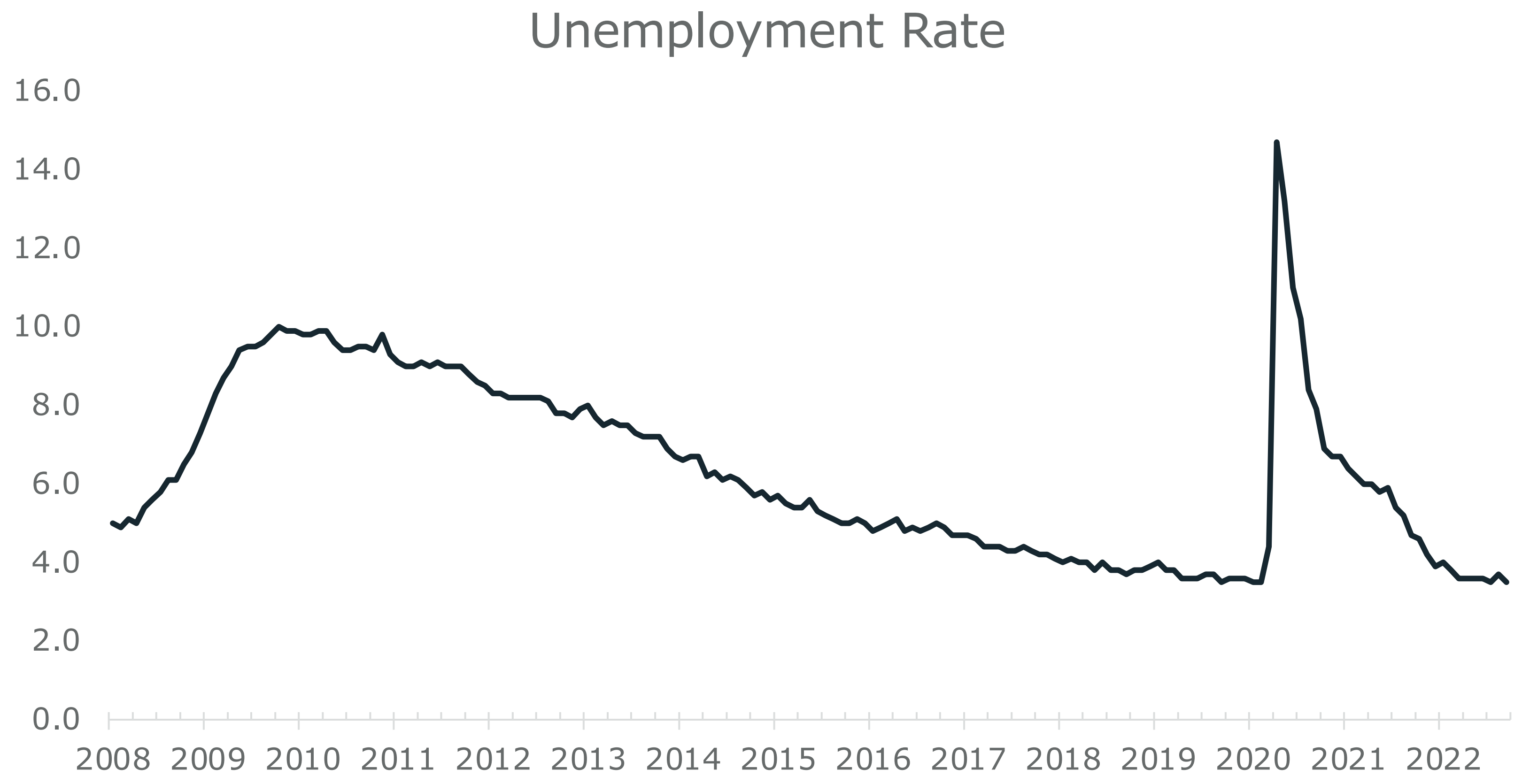


Consumers – especially the higher income - still hold significant liquidity from the accumulated pandemic savings and it can act as a buffer during economic hardship

Lenders who can access and leverage customer savings + deposit data hold significant advantage, and can differentiate risk much better than their competition

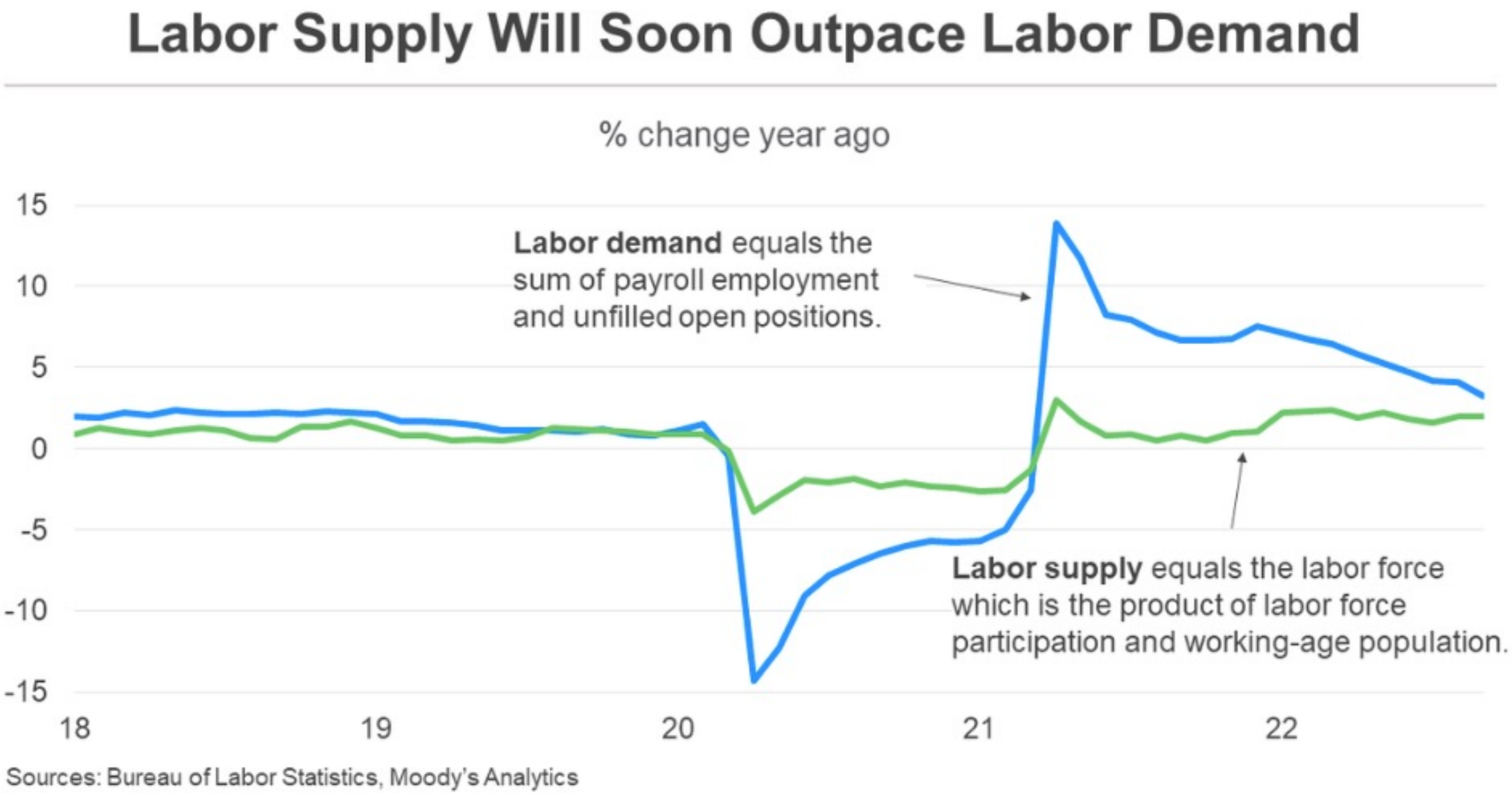
- *Source: Bureau of Economic Analysis, data as of September 2022. Personal Saving Rate = % of income left after consumers pay taxes and spend money
- **FED Research – Excess savings during COVID-19 Pandemic. October 2022. Excess Savings = aggregated (disposable personal income – consumption – other outlays)

Strong tailwinds for consumer credit as unemployment rates remain at all time lows



- Source: U.S. Bureau of Labor Statistics, data as of September 2022

As the Fed raises rates to quell inflation, the labor demand is expected to drop further



If there is a hard-landing and the labor demand dips lower than the supply, unemployment can increase and lead to worsening of consumer credit risk

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 credit risk models for both big banks an fintechs, and advised clients across the consumer credit lifecycle. He specializes in credit research & COVID's impact on 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.

The authors would like to thank dv01, PeerIQ, Equifax, Experian, Transunion and the New York Fed for providing the data used to generate insights in this work.

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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

We continue to see warping of risk scores due to the suppression of various risk signals

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

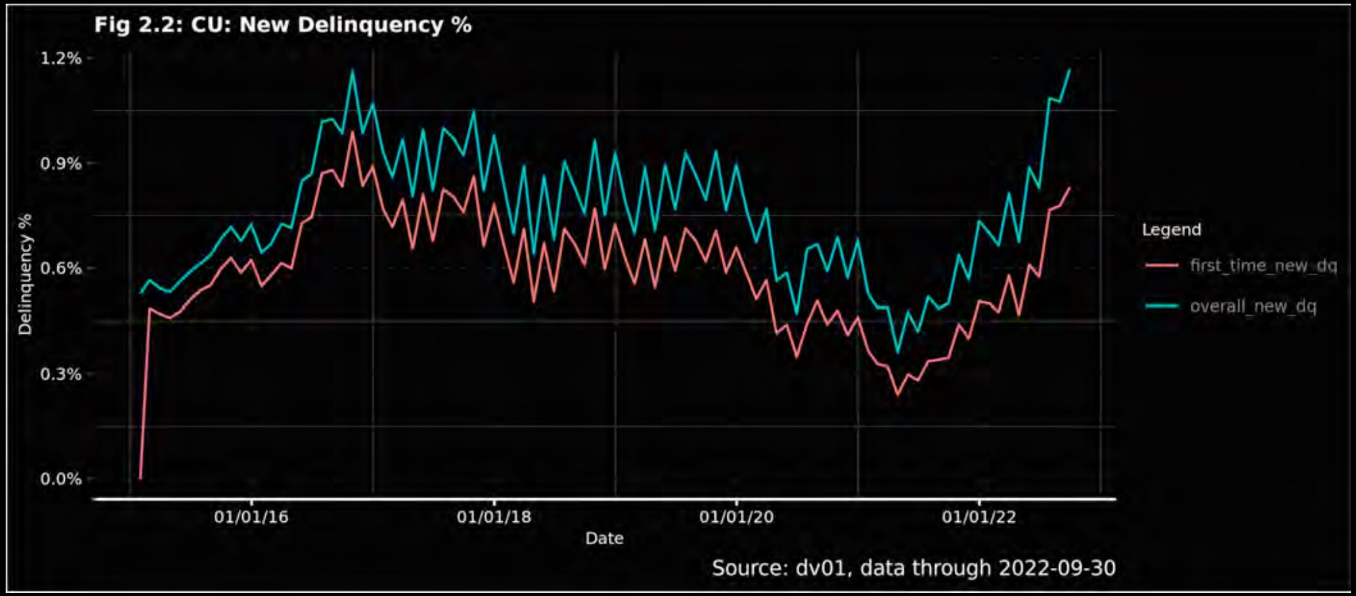
- Risk signals on subprime customers are being warped by credit builder tradelines as well. These new platforms (e.g., Chime) create opportunities for subprime customers to get secured credit cards that feature selective bureau reporting, which (similar to BNPL) can both help and harm credit builder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

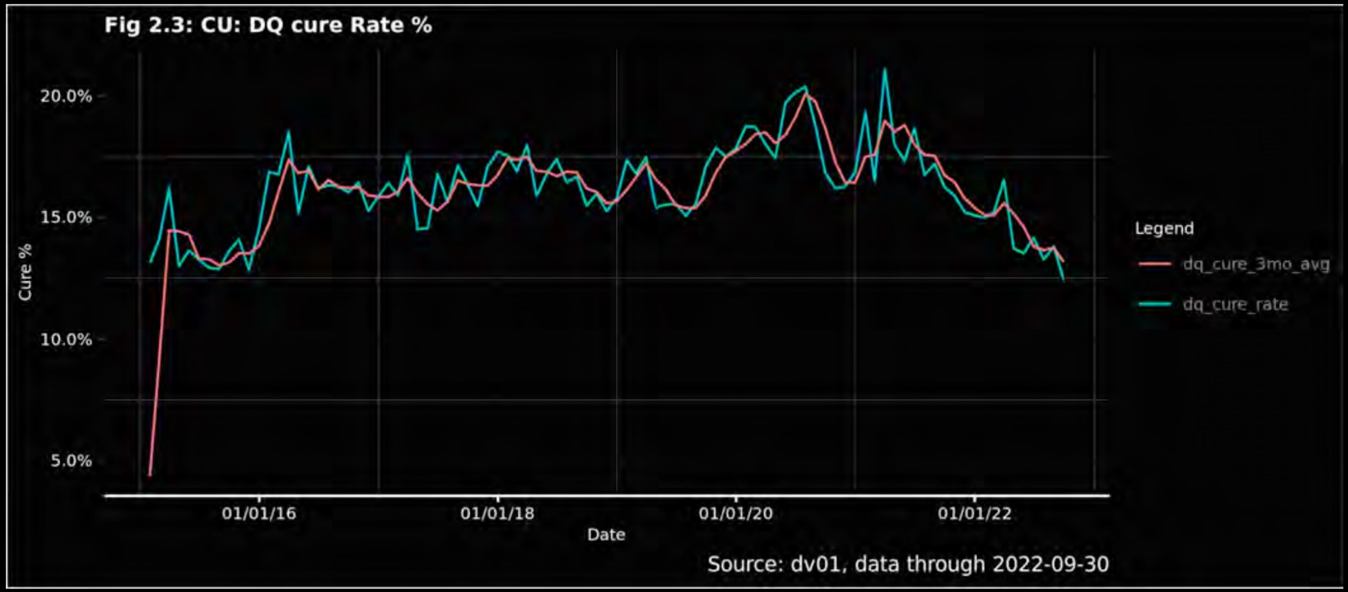
For more commentary and insights, please refer to the following 2OS whitepapers which discuss these in more detail

- https://2os.com/insights/credit-risk-quarterly-q1-2022-in-review/
- https://2os.com/insights/credit-risk-trends-in-the-covid-era/

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

There is also a surge in first time delinquencies & drop in cure rates*





Source: dv01, data as of September 30, 2022