# COVID-19 Impact to Personal Credit & Mortgage

Behavior of 2 million U.S. consumers

From April 2020 – Dec 2020

# Research Objective & Data Sampling

**Research Objective:**

We've seen a tremendous amount of unprecedented changes in our country and in consumer credit behavior during this tumultuous period. Our research objective combines **FICO Score**, **revolving balance**, **payment default rates** and **macroeconomics**. We've followed over 2 million Americans for the past 10 months to study the changes in their credit and spending behavior. The insights we've gained subprime to super-prime behavior is full of surprises and sometimes contradictions. As a follow up from our initial analysis, we've added mortgage related attributes. We wanted to see if historical low interest rates can overpower the effect of COVID,

**Data Sample:**

We observed 155 million US population over a period of 10 months from April 2019 to Dec 2020. For ease of data processing and speed, we down sampled to **2 million consumers per vintage month** at about 1.29% to 1.32% random sampling rate.

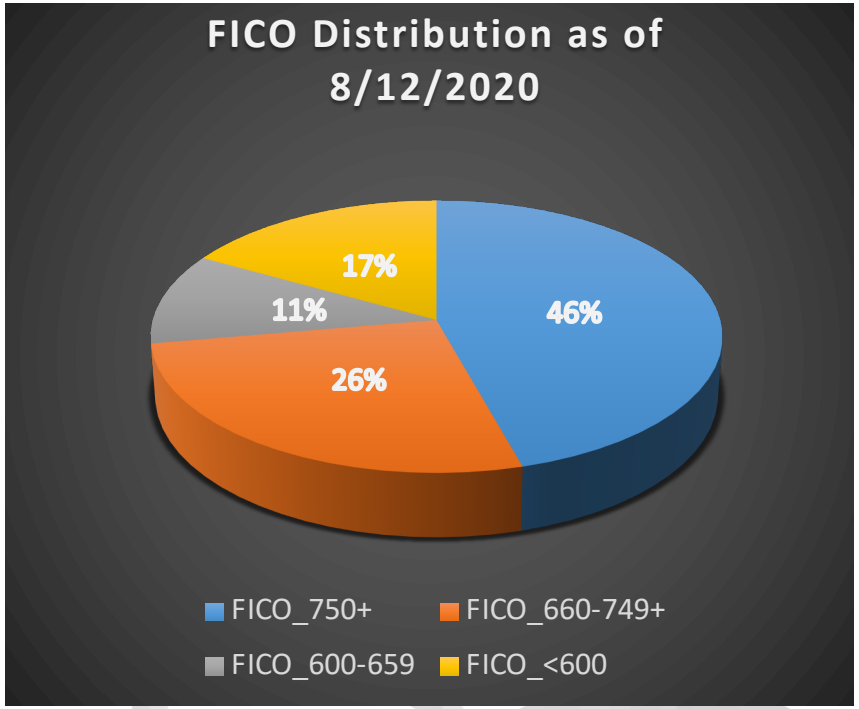
| created_dt | Select Number | Total Population | Sel_Rate |
|---|---|---|---|
| 4/24/19 | 2,000,000 | 151,642,426 | 1.32% |
| 6/3/19 | 2,000,000 | 151,852,229 | 1.32% |
| 8/29/19 | 2,000,000 | 152,102,167 | 1.31% |
| 12/17/19 | 2,000,000 | 152,915,922 | 1.31% |
| 2/17/20 | 2,000,000 | 153,303,342 | 1.30% |
| 4/13/20 | 2,000,000 | 153,763,242 | 1.30% |
| 6/8/20 | 2,000,000 | 153,943,347 | 1.30% |
| 8/12/20 | 2,000,000 | 154,359,662 | 1.30% |
| 9/28/20 | 2,000,000 | 154,692,799 | 1.29% |
| 12/1/20 | 2,000,000 | 155,027,791 | 1.29% |

# Personal Credit Scores and Credit Attributes

**Credit score and other attributes:**
There are a few data points that are particularly interesting to us. First, we wanted to track how **credit scores** is trend over time during COVID19. Our hypothesis is that there would be deteriorations of credit quality due to the pandemic. In this sample set, we tracked, **FICO Credit Score v9**

Other credit attributes of interest are related to **consumer spending**. We assumed that consumers have stopped spending due to restrictions from COVID. We tracked 2 million consumer's **revolving balance**. The higher the balance the more debt consumer is carrying.

Perhaps the most interesting attributes are related to consumer's credit delinquencies. To gain a deeper look at credit delinquencies, we tracked **30, 60, 90 and 120 days past due** situations.




| Name | Variables | Description: |
|---|---|---|
| Revovling Balance | | Total balance of open revolving trades verified in past 12 months |
| 30 dpd | | Number of credit card trades verified in the past 12 months that are currently 30 days or more past due |
| 60 dpd | | Number of credit card trades verified in the past 12 months that are currently 60 days or more past due |
| 90 dpd | | Number of credit card trades verified in the past 12 months that are currently 90 days or more past due |
| 120 dpd | | Number of credit card trades verified in the past 12 months that are currently 120 days or more past due |

# Mortgage Trends

**Mortgage Trends:**
For our follow up analysis, we analyzed mortgage trends and behaviors. We examined how 2 million Americans are shopping for mortgages during the past 10 months and whether historical low interest rates can overcome the effect of COVID.

We tracked **Number of currently satisfactory open mortgage trades**. We wanted to see if COVID-19 caused any deterioration across the board.

We also looked at the impact of multiple Federal policies that encouraged a new wave of mortgage refinance boom. Attributes such as "**Months since most recent mortgage inquiry**" and "**Number of mortgage inquires**" could give us insights into who is still shopping for mortgages during this global pandemic.

Here are all the credit attributes we have included in our analysis:

| Description: |
|---|
| Number of deduped inquiries in past 6 months (excluding auto and mortgage inquiries) |
| Number of open revolving trades |
| Total balance of open revolving trades verified in past 12 months |
| Utilization for open revolving trades verified in past 12 months |
| Number of credit card trades verified in the past 12 months that are currently 30 days or more past due |
| Number of credit card trades verified in the past 12 months that are currently 60 days or more past due |
| Number of credit card trades verified in the past 12 months that are currently 90 days or more past due |
| Number of credit card trades verified in the past 12 months that are currently 120 days or more past due |
| Number of trades 30 or more days past due in past 3 months |
| Number of trades 60 or more days past due in past 6 months |
| Number of 60 or more days past due trades (current MOP only) with balance > $0 opened in past 24 months |
| Number of 90 days past due or worse items in the past 24 months (excluding medical collection items) |
| Number of currently satisfactory open mortgage trades |
| Months since most recent mortgage inquiry |
| Number of mortgage inquiries |

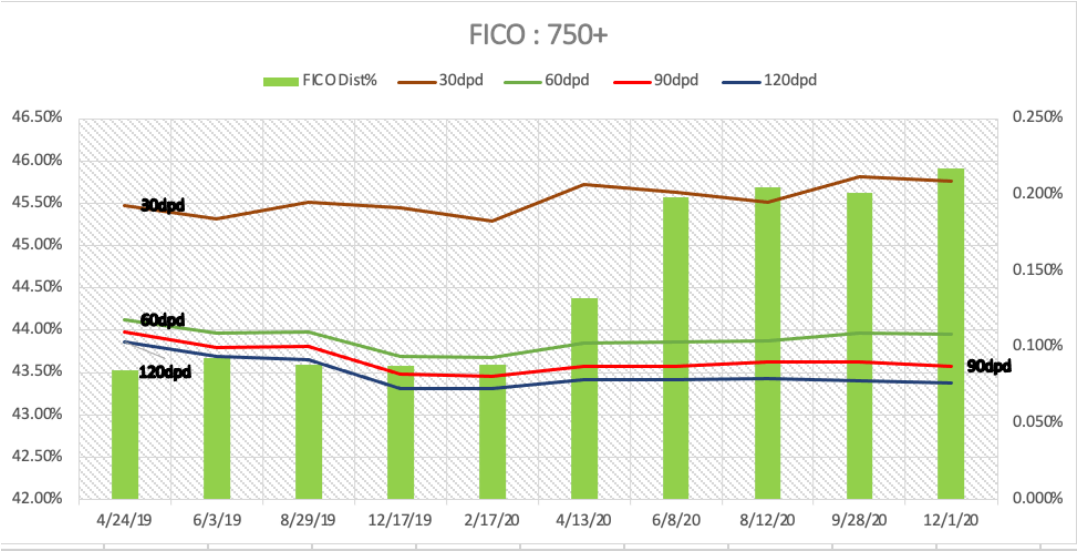
# Credit Score 750+

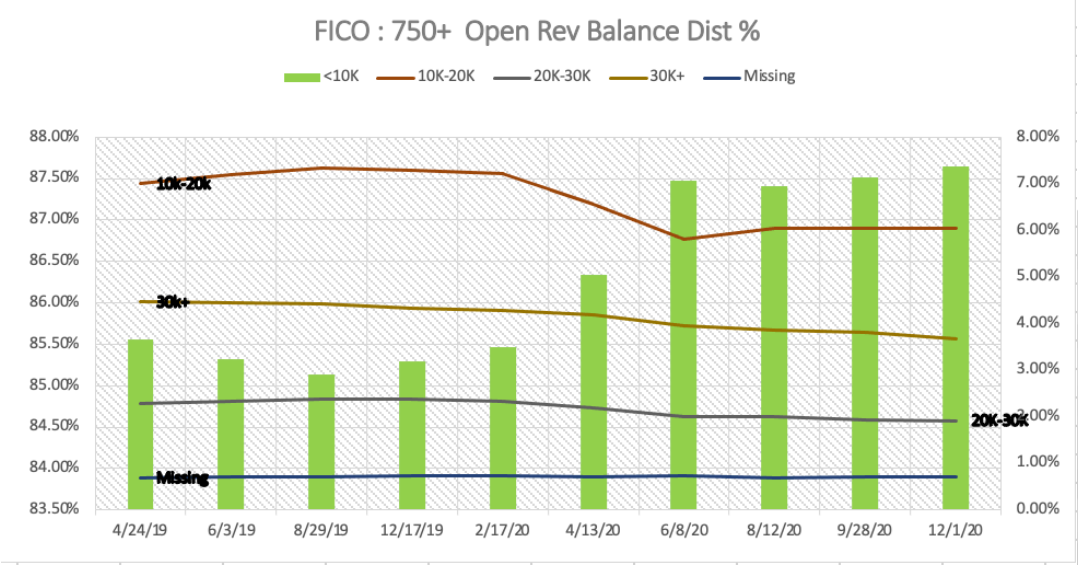
**Observation of Credit Score trend:**
From a social and economics perspective, we now know that **COVID** has had a different effect on population from all walks of live. To see this disparate impact, we segmented our analysis into credit score bands that corresponded to prime credit to subprime credit. **It looks like a lot more people joined the 750+ credit band. In other words, a good amount of people's credit improved. This is rather counter intuitive.**

**Credit Score 750+ spending behavior:**
One of the reasons why more people moved into the super prime segment is because spending has dropped significantly. When people's spending drops, their utilization of their line of credit also drops. And utilization is one of the important attributes influencing credit score score.

**Credit Score 750+ Delinquency:**
We did see a slight uptick in delinquency starting around Feb 2010, especially in 30,60dpd range. We've seen an increase of 10%+ and remain elevated towards the end of 2020.

| | | | Credit card DPD | | | |
|---|---|---|---|---|---|---|
| Month | FICO Dist% | # of records | 30dpd | 60dpd | 90dpd | 120dpd |
| 4/24/19 | 43.53% | 870,586 | 0.193% | 0.118% | 0.110% | 0.103% |
| 6/3/19 | 43.67% | 873,334 | 0.184% | 0.109% | 0.100% | 0.094% |
| 8/29/19 | 43.60% | 871,953 | 0.195% | 0.110% | 0.101% | 0.092% |
| 12/17/19 | 43.58% | 871,677 | 0.192% | 0.094% | 0.082% | 0.073% |
| 2/17/20 | 43.60% | 871,916 | 0.183% | 0.093% | 0.081% | 0.073% |
| 4/13/20 | 44.37% | 887,490 | 0.207% | 0.103% | 0.088% | 0.079% |
| 6/8/20 | 45.58% | 911,535 | 0.201% | 0.104% | 0.088% | 0.079% |
| 8/12/20 | 45.69% | 913,772 | 0.195% | 0.104% | 0.091% | 0.079% |
| 9/28/20 | 45.62% | 912,402 | 0.212% | 0.109% | 0.090% | 0.078% |
| 12/1/20 | 45.91% | 918,217 | 0.209% | 0.108% | 0.088% | 0.076% |




Note: For the bar chart, please refer to the left Y axis. For the line graph, please refer to the right Y axis.

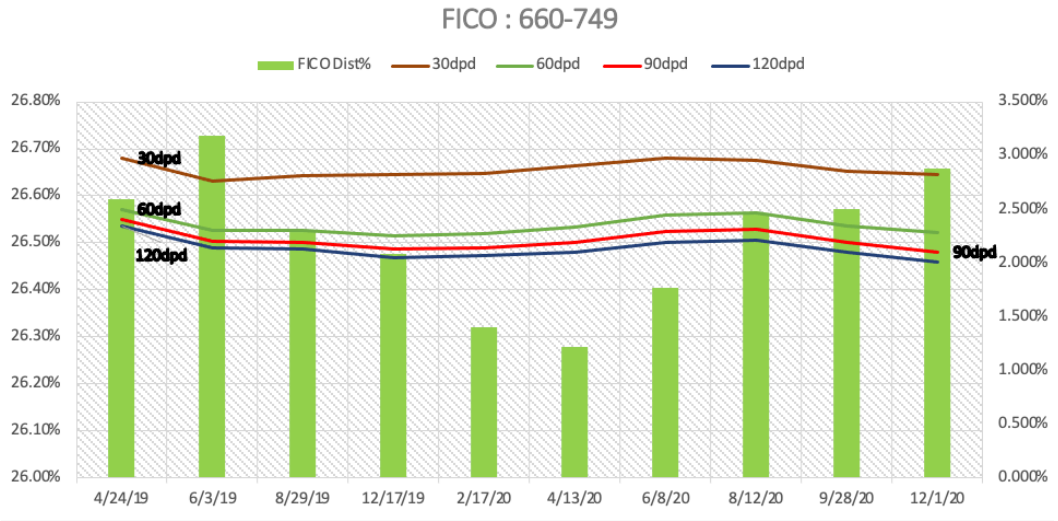
# Credit Score Band: 660 - 749

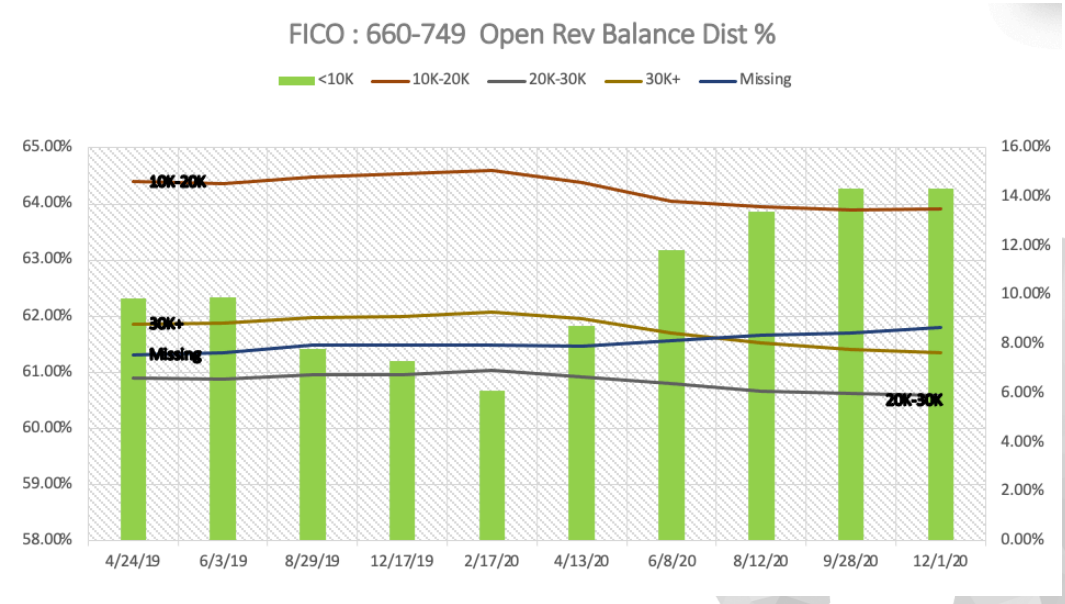
**Observation of Credit Score trend:**
We've seen a similar trend in the prime credit segment. Just like super prime consumers, there is a dramatic drop in spending and a slightly higher delinquency rate right after COVID hit. **We also see more people moving into this credit band. In other words, people's credit is improving. Which is contradictory to our research thesis.**

**Credit Band 660-749 spending behavior:**
We see a drop in spending across all spending bands $10-20k, $20-30k and $30k+ of credit card balances, we see a drop starting in Feb 2021 and continue to fall well into the end of 2020. This drop decreased the utilization rate which in tern improved people's credit score.

**Credit Band 660-749 Delinquency:**
The impact of delinquency for prime customers is higher than super prime customers. Across all delinquency rates, we see at least 10% increase in across the board. However we do see a tampering off (still elevated) affect starting in Aug 2020 and continues to fall well into the end of 2020.

| | | | Credit card DPD | | | |
|---|---|---|---|---|---|---|
| Month | FICO Dist% | # of records | 30dpd | 60dpd | 90dpd | 120dpd |
| 4/24/19 | 26.59% | 531,868 | 2.975% | 2.499% | 2.404% | 2.347% |
| 6/3/19 | 26.73% | 534,574 | 2.763% | 2.303% | 2.198% | 2.136% |
| 8/29/19 | 26.52% | 530,466 | 2.814% | 2.302% | 2.194% | 2.127% |
| 12/17/19 | 26.48% | 529,528 | 2.822% | 2.254% | 2.127% | 2.053% |
| 2/17/20 | 26.32% | 526,385 | 2.835% | 2.278% | 2.145% | 2.069% |
| 4/13/20 | 26.28% | 525,592 | 2.909% | 2.330% | 2.188% | 2.097% |
| 6/8/20 | 26.40% | 528,067 | 2.980% | 2.445% | 2.290% | 2.192% |
| 8/12/20 | 26.56% | 531,272 | 2.956% | 2.467% | 2.313% | 2.215% |
| 9/28/20 | 26.57% | 531,418 | 2.854% | 2.342% | 2.190% | 2.100% |
| 12/1/20 | 26.66% | 533,161 | 2.818% | 2.278% | 2.100% | 2.003% |




Note: For the bar chart, please refer to the left Y axis. For the line graph, please refer to the right Y axis.

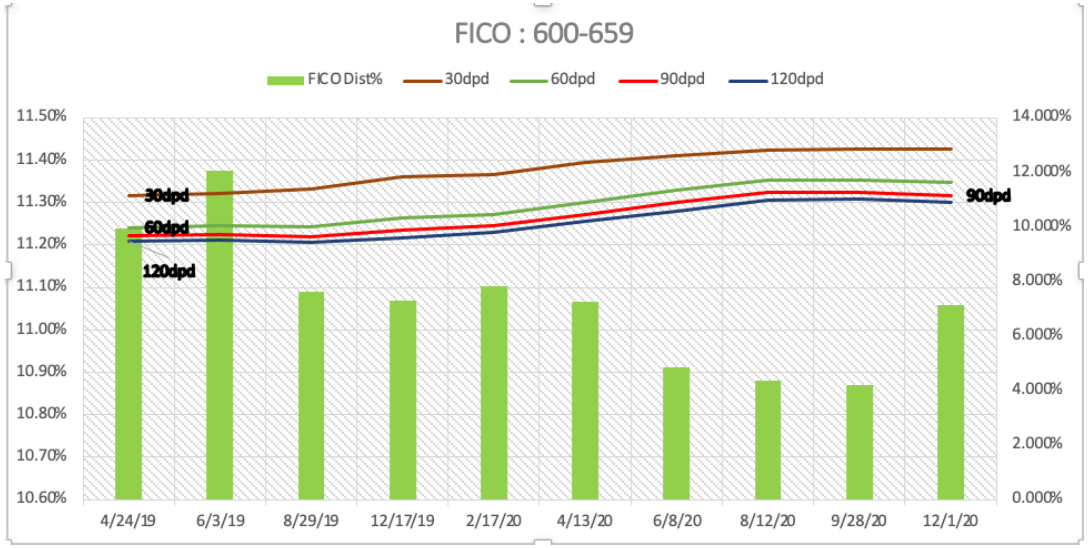
# Credit Score Band: 600-659

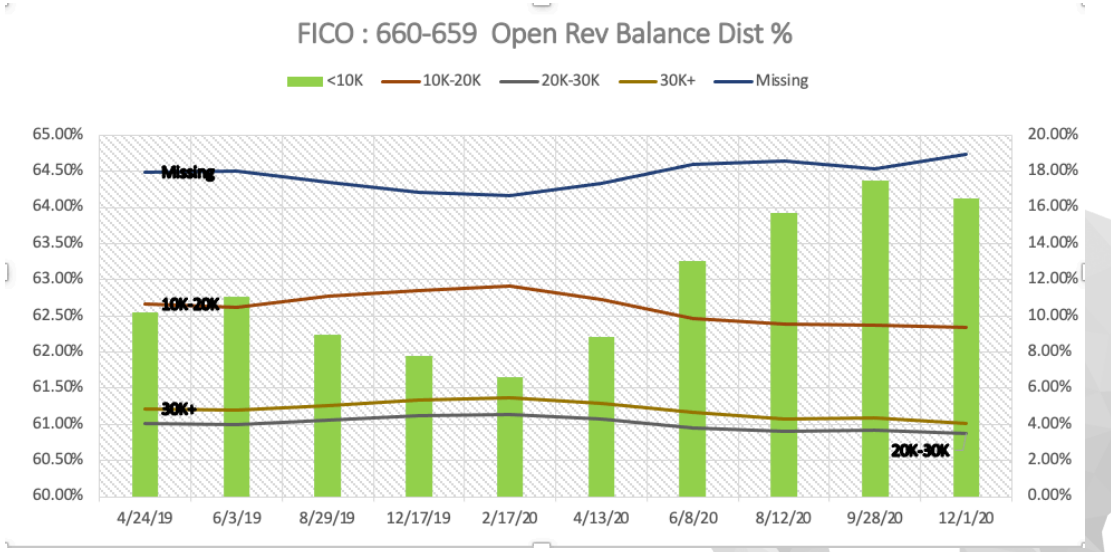
**Observation of Credit Score trend:**
The near prime customers is experiencing COVID in a different way. Their delinquency rate started rising around January 2020. We can argue that during the holiday season, people tend to overspend. However, we didn't see this delinquency rate come down after the holiday season. Instead the delinquency rate keeps going amplified by COVID. **Unlike prime and super prime credit bands, instead of gaining consumers into their credit band, near prime credit band is losing people. In other words, this segment of consumers' credit is declining. Not all is doom and gloom, we see an improvement in Dec 2020.**

**Credit Band 600-659 spending behavior:**
Spending is dropping across the board just like prime and super prime segment, well into the end of 2020.

**Credit Band 600-659 Delinquency:**
We see a 10%+ increase in credit card delinquency across the board. Delinquencies continues to rise towards the end of 2020. We do see a slightly improvement in Dec 2020. However, it not clear that this population's credit is truly improving.

| | | | Credit card DPD | | | |
|---|---|---|---|---|---|---|
| Month | FICO Dist% | # of records | 30dpd | 60dpd | 90dpd | 120dpd |
| 4/24/19 | 11.24% | 224,784 | 11.144% | 9.973% | 9.656% | 9.472% |
| 6/3/19 | 11.38% | 227,517 | 11.225% | 10.036% | 9.714% | 9.511% |
| 8/29/19 | 11.09% | 221,806 | 11.364% | 9.997% | 9.640% | 9.442% |
| 12/17/19 | 11.07% | 221,397 | 11.833% | 10.304% | 9.871% | 9.604% |
| 2/17/20 | 11.10% | 222,078 | 11.896% | 10.454% | 10.049% | 9.790% |
| 4/13/20 | 11.07% | 221,317 | 12.347% | 10.909% | 10.466% | 10.197% |
| 6/8/20 | 10.91% | 218,218 | 12.602% | 11.349% | 10.905% | 10.587% |
| 8/12/20 | 10.88% | 217,631 | 12.813% | 11.692% | 11.280% | 10.986% |
| 9/28/20 | 10.87% | 217,409 | 12.848% | 11.705% | 11.268% | 10.999% |
| 12/1/20 | 11.06% | 221,159 | 12.865% | 11.616% | 11.139% | 10.875% |

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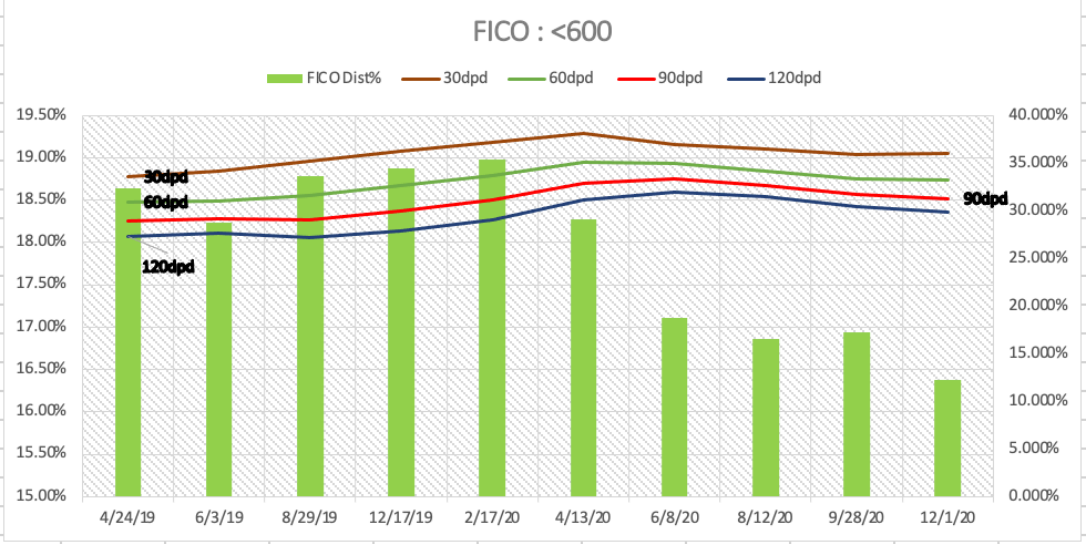
# Credit Score <600

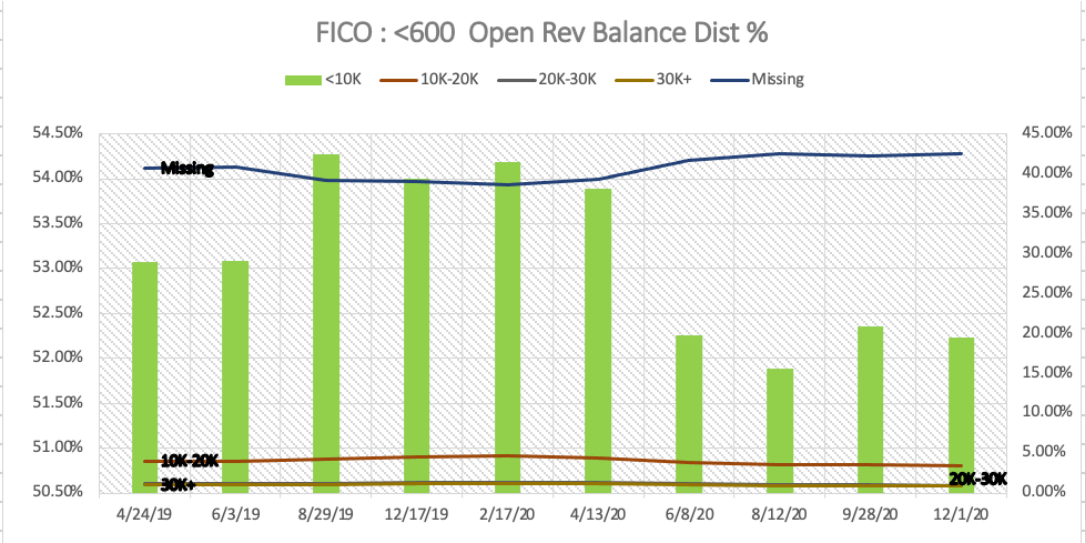
**Observation of Credit Score trend:**
The sub prime segment's delinquency started to increase around the 2nd half of 2019. The delinquency rate peaked around April/May, this is when the first round of government stimulus checks was delivered. We do see the government stimulus helped this population. We can clearly see that there is a good amount of people moving out of the sup prime category into near prime segment.

**Credit Score <600 Spending:**
We see an increase in spending leading up to the typical tax season and a dramatic drop right after COVID restrictions. Spending continues to drop through out the 2nd half of 2020.

**Credit Score <600 Delinquency:**
We see a a small increase in credit card defaults, but the stimulus check helped the curb delinquencies after April/May 2020. The stimulus program, coupled with reduction on spending helped to improve delinquency rates in this credit segment.

| | | | Credit card DPD | | | |
|---|---|---|---|---|---|---|
| Month | FICO Dist% | # of records | 30dpd | 60dpd | 90dpd | 120dpd |
| 4/24/19 | 18.64% | 372,762 | 33.550% | 30.887% | 28.924% | 27.277% |
| 6/3/19 | 18.23% | 364,575 | 34.122% | 31.027% | 29.165% | 27.674% |
| 8/29/19 | 18.79% | 375,775 | 35.173% | 31.629% | 29.097% | 27.202% |
| 12/17/19 | 18.87% | 377,398 | 36.301% | 32.675% | 29.991% | 27.865% |
| 2/17/20 | 18.98% | 379,621 | 37.213% | 33.675% | 31.143% | 29.095% |
| 4/13/20 | 18.28% | 365,601 | 38.078% | 35.123% | 32.939% | 31.140% |
| 6/8/20 | 17.11% | 342,180 | 36.966% | 34.928% | 33.385% | 31.901% |
| 8/12/20 | 16.87% | 337,325 | 36.481% | 34.144% | 32.658% | 31.476% |
| 9/28/20 | 16.94% | 338,771 | 35.897% | 33.392% | 31.680% | 30.413% |
| 12/1/20 | 16.37% | 327,463 | 36.071% | 33.286% | 31.260% | 29.855% |




Note: For the bar chart, please refer to the left Y axis. For the line graph, please refer to the right Y axis.

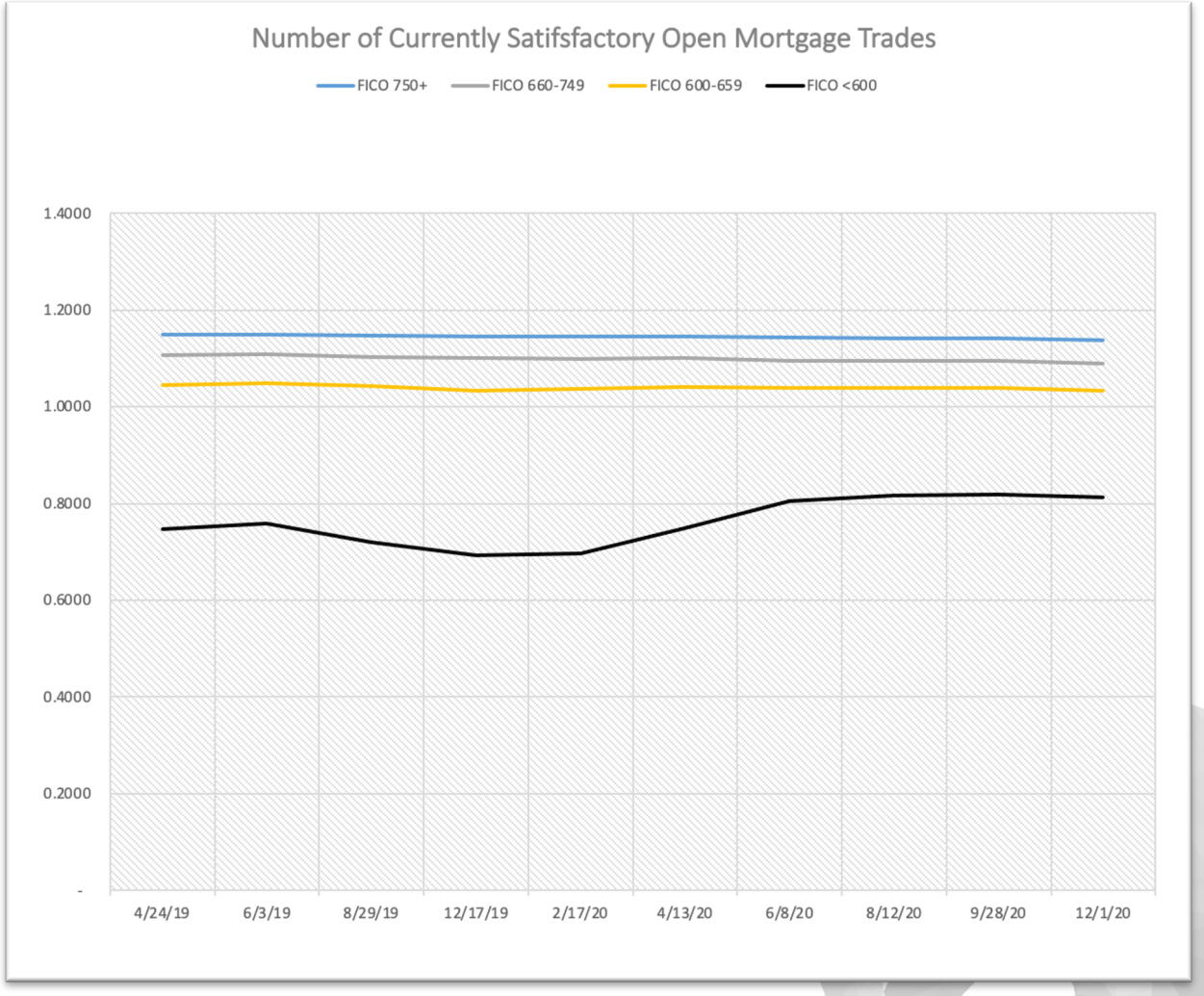
# Mortgage Delinquency Trends (newly updated)

**Observation of mortgage trends:**
We also wanted to see if COVID-19 has had any impact on mortgage delinquency rates. And if this impact is felt differently across various credit bands.

**Credit Score <600 Mortgage Delinquency:**
Subprime consumer's mortgage delinquency rate was impacted the most by COVID19 and continues to decline towards the end of 2020

**Near Prime, Prime, Super Prime:**
Americans with 600+ FICO score had virtually no impact to their mortgage obligations from the pandemic. Their delinquency rate showed no signs of significant deterioration.

| Date | Fico_bin | | | | |
|---|---|---|---|---|---|
| | FICO 750+ | FICO 660-749 | FICO 600-659 | FICO <600 | All |
| 4/24/19 | 1.1482 | 1.1069 | 1.0438 | 0.7473 | 1.0966 |
| 6/3/19 | 1.1486 | 1.1088 | 1.0494 | 0.7583 | 1.0998 |
| 8/29/19 | 1.1478 | 1.1029 | 1.0425 | 0.7194 | 1.0933 |
| 12/17/19 | 1.1450 | 1.1001 | 1.0337 | 0.6930 | 1.0875 |
| 2/17/20 | 1.1451 | 1.0986 | 1.0368 | 0.6968 | 1.0871 |
| 4/13/20 | 1.1447 | 1.1001 | 1.0412 | 0.7492 | 1.0944 |
| 6/8/20 | 1.1431 | 1.0952 | 1.0386 | 0.8040 | 1.0988 |
| 8/12/20 | 1.1423 | 1.0943 | 1.0395 | 0.8167 | 1.0996 |
| 9/28/20 | 1.1410 | 1.0945 | 1.0392 | 0.8179 | 1.0994 |
| 12/1/20 | 1.1384 | 1.0892 | 1.0325 | 0.8120 | 1.0969 |
| All | 1.1444 | 1.0991 | 1.0398 | 0.7575 | 1.0953 |



# Mortgage Inquiry Trends

**Observation of mortgage trends:**
Are Americans still shopping for mortgages during COVID? Are historical low rates overcoming the pandemic impact?

The attribute we looked at is the **"Number of month since most recent mortgage inquiry"**. **We can see that Americans are looking for mortgages about a month earlier than usual.** This means that most of us are looking into some sort of refinancing or new purchase faster than before. Except for the subprime consumers.

**Credit Score <600 mortgage inquires:**
Subprime consumers are not looking for mortgages at the same pace. They are still looking for mortgage at the same pace as before. They don't have the credit or spending power perhaps to take advantage of this historical low rates. It's a shame but it is our reality.

**Near Prime, Prime, Super Prime:**
Everyone else is in a big hurry to refinance.

**State by state variance?**
Residents from all sampled states are looking for mortgages. Especially for those state residents fleeing to other states such as FL and UT.

| Date | Fico_bin | | | | |
|---|---|---|---|---|---|
| | b 750+ | c 660-749 | d 600-659 | e <600 | All |
| 4/24/19 | . | . | . | . | . |
| 6/3/19 | . | . | . | . | . |
| 8/29/19 | . | . | . | . | . |
| 12/17/19 | . | . | . | . | . |
| 2/17/20 | . | . | . | . | . |
| 4/13/20 | 8.760 | 9.140 | 9.610 | 11.060 | 9.310 |
| 6/8/20 | 8.470 | 8.990 | 9.540 | 10.990 | 9.070 |
| 8/12/20 | 7.830 | 8.530 | 9.110 | 10.650 | 8.520 |
| 9/28/20 | 7.270 | 7.930 | 8.550 | 10.060 | 7.930 |
| 12/1/20 | 7.530 | 8.130 | 8.800 | 10.140 | 8.120 |
| All | 7.920 | 8.520 | 9.120 | 10.600 | 8.560 |

| Date | CA | FL | NY | TX | UT |
|---|---|---|---|---|---|
| 4/24/19 | . | . | . | . | . |
| 6/3/19 | . | . | . | . | . |
| 8/29/19 | . | . | . | . | . |
| 12/17/19 | . | . | . | . | . |
| 2/17/20 | . | . | . | . | . |
| 4/13/20 | 8.522 | 9.722 | 10.211 | 9.621 | 8.399 |
| 6/8/20 | 8.408 | 9.410 | 10.032 | 9.277 | 8.370 |
| 8/12/20 | 7.730 | 8.950 | 9.263 | 8.760 | 7.750 |
| 9/28/20 | 7.136 | 8.374 | 8.449 | 8.264 | 7.252 |
| 12/1/20 | 7.397 | 8.490 | 8.458 | 8.529 | 7.587 |
| All | 7.800 | 8.963 | 9.252 | 8.867 | 7.840 |

# Mortgage Inquiry Trends

**Observation of mortgage trends:**
Are Americans still shopping for mortgages during COVID? Are historical low rates overcoming the pandemic impact?

The variable we looked at this time is the **number mortgage inquiries**. We can see that almost everyone had an inquiry if you are a super prime, prime, and near prime customer. And this trend sped up since April 2020, leading into Dec 2020, a remarkable **15% increase.**

**Credit Score <600 mortgage inquires:**
Subprime consumers are not actively looking for mortgage. In fact, it looks like subprime consumers have slowed down a bit in terms of seeking to refinance.

**Near Prime, Prime, Super Prime:**
Everyone else is in a big hurry to refinance.

**State by state variance?**
Residents from all sampled states are looking for mortgages. Especially for those state residents fleeing to other states such as FL and UT.

| Date | Fico_bin | | | | |
|---|---|---|---|---|---|
| | b 750+ | c 660-749 | d 600-659 | e <600 | All |
| 4/24/19 | . | . | . | . | . |
| 6/3/19 | . | . | . | . | . |
| 8/29/19 | . | . | . | . | . |
| 12/17/19 | . | . | . | . | . |
| 2/17/20 | . | . | . | . | . |
| 4/13/20 | 0.730 | 0.720 | 0.620 | 0.400 | 0.630 |
| 6/8/20 | 0.760 | 0.730 | 0.630 | 0.380 | 0.660 |
| 8/12/20 | 0.820 | 0.770 | 0.640 | 0.380 | 0.690 |
| 9/28/20 | 0.860 | 0.790 | 0.650 | 0.380 | 0.710 |
| 12/1/20 | 0.900 | 0.810 | 0.640 | 0.370 | 0.730 |
| All | 0.820 | 0.770 | 0.640 | 0.380 | 0.690 |

| Date | CA | FL | NY | TX | UT |
|---|---|---|---|---|---|
| 4/24/19 | . | . | . | . | . |
| 6/3/19 | . | . | . | . | . |
| 8/29/19 | . | . | . | . | . |
| 12/17/19 | . | . | . | . | . |
| 2/17/20 | . | . | . | . | . |
| 4/13/20 | 0.709 | 0.665 | 0.481 | 0.648 | 0.964 |
| 6/8/20 | 0.732 | 0.680 | 0.492 | 0.679 | 1.002 |
| 8/12/20 | 0.790 | 0.713 | 0.514 | 0.708 | 1.085 |
| 9/28/20 | 0.823 | 0.731 | 0.532 | 0.728 | 1.100 |
| 12/1/20 | 0.858 | 0.754 | 0.551 | 0.746 | 1.158 |
| All | 0.783 | 0.709 | 0.514 | 0.702 | 1.064 |

# Mortgage Inquiry Trends (newly updated)

**Observation of mortgage trends:**
We also wanted to know what percentage of the population looked into refinancing at least once.

Other than the subprime population, almost 1 in 5 people has had an interest in mortgage refinancing.

Consumers in 660-749 credit band are most active, reaching 25%+ (1 in 4).

**FICO <600 % of people looking for mortgage:**
Subprime consumers are slowing down in terms of looking for mortgage solutions.

**Near Prime, Prime, Super Prime:**
Everyone else is in a big hurry to refinance.

**State by state variance?**
Residents from all sampled states are looking for mortgages. Especially for those state residents fleeing to other states such as FL and UT. Residence in Utah is especially active, almost 1 in 3 people are looking for mortgage or refinancing their mortgage.

| Date | Fico_bin | | | | |
|---|---|---|---|---|---|
| | b 750+ | c 660-749 | d 600-659 | e <600 | All |
| 4/24/19 | . | . | . | . | . |
| 6/3/19 | . | . | . | . | . |
| 8/29/19 | . | . | . | . | . |
| 12/17/19 | . | . | . | . | . |
| 2/17/20 | . | . | . | . | . |
| 4/13/20 | 18.766% | 22.164% | 20.743% | 15.424% | 19.267% |
| 6/8/20 | 20.042% | 22.944% | 20.882% | 15.016% | 20.040% |
| 8/12/20 | 21.758% | 23.982% | 21.431% | 15.059% | 21.183% |
| 9/28/20 | 22.913% | 24.526% | 21.751% | 14.923% | 21.862% |
| 12/1/20 | 24.212% | 25.167% | 21.818% | 14.811% | 22.662% |

| Date | CA | FL | NY | TX | UT |
|---|---|---|---|---|---|
| 4/24/19 | . | . | . | . | . |
| 6/3/19 | . | . | . | . | . |
| 8/29/19 | . | . | . | . | . |
| 12/17/19 | . | . | . | . | . |
| 2/17/20 | . | . | . | . | . |
| 4/13/20 | 18.821% | 19.644% | 13.710% | 20.103% | 28.171% |
| 6/8/20 | 19.728% | 20.170% | 13.938% | 21.226% | 29.799% |
| 8/12/20 | 21.375% | 21.223% | 14.439% | 22.031% | 32.351% |
| 9/28/20 | 22.273% | 21.794% | 15.097% | 22.641% | 33.580% |
| 12/1/20 | 23.230% | 22.548% | 15.517% | 23.258% | 35.333% |

Note: For the bar chart, please refer to the left Y axis. For the line graph, please refer to the right Y axis.

# Summary

- Credit Score:
  - Credit score improved for everyone. Even if there was a deterioration in credit delinquency, the drop in spending and utilization with government stimulus had a bigger impact at the end.
- Spending Behavior:
  - Everyone stopped spending. With rising unemployment and state COVID restrictions, it had a positive impact to people's credit scores. This improved credit score phenomena could give lenders a false sense of security. This credit score improvement is artificial and superficial.
- Credit Delinquencies:
  - During the early days of COVID, default rates increased across all the credit bands. However starting around August 2020, default rates dropped and continues to drop well into the end of 2020. Drop in consumer spending and various government relief programs are believed to be helping with credit delinquencies.
- Mortgage Behaviors
  - There is a significant uptick in mortgage inquiries except for subprime consumers.
  - COVID-19 had a significantly impact on subprime consumers' mortgage delinquency rate and it's not improving. Our government should to step in and help.
  - Wild card: COVID-19 vaccine distribution and various stimulus policies from the incoming administration will have a positive impact on overall credit. We believe consuers will start spending again in Q3 2021.