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# Consumer Credit Score Migration

## Will the consumer I approve today still be credit-worthy tomorrow?



### Contents

Summary insights

How stable or volatile are consumer scores?

How do scores change over a 3-month period?

How do scores change over a 12-month period?

Score movement around a specific cut-off

What is a “meaningful” credit score change?

What is the true risk implication of typical credit score change over a 24-month period?

Improving economic conditions

Conclusion

# Consumer Credit Score Migration

## INTRODUCTION

A credit score model incorporates consumers' history of managing credit to determine how likely they are to manage credit going forward. Consumers' behaviors in the distant past contribute less to a credit score while recent behaviors contribute more significantly. Consumers with stable credit management practices have more stable credit scores and typically experience only small changes in their scores as a result of individual trade lines. Conversely, volatile practices generally result in more significant changes to consumers' credit scores.

A key question for lenders using credit scores is: How will future events impact a consumer's credit score? An obvious concern is that the consumer was approved for credit given their score exceeded the lender cut-off at the time of evaluation, but may fall below the cut-off soon after the evaluation time. Lenders are also interested in the number of consumers who fail to obtain credit because their scores fall below a lender's minimum, but then improve their credit scores to a level greater than the lender's minimum either 3 or 12 months later.

This study analyzes consumer score migration.<sup>1</sup> Two million consumers were randomly selected from the Experian<sup>®2</sup> consumer credit database. Their credit scores were determined every quarter during a two-year period between 2011 and 2013. Score changes were evaluated to determine the following insights:

- How stable or volatile are consumer credit scores?
- How do credit scores change over a 3-month and 12-month period?
- For consumers that fail a score cut-off, what percentage of consumers experience score improvements such that they would pass the cut-off at some point in the future?
- Conversely, what percentage of consumers who pass a cut-off subsequently exhibit deterioration in their credit score?
- What is the true risk implication of typical score changes over a 24-month period?

<sup>1</sup> The study used the VantageScore 3.0 model, which has a range of 300-850.

<sup>2</sup> Experian<sup>®</sup> is a registered trademark of Experian Information Solutions, Inc.

## SUMMARY INSIGHTS

- Over a 3-month period, 49 percent of the consumers experienced an average credit score improvement of 19 points, while 30 percent of consumers experienced an average score decrease of 24 points. The remaining 21 percent of consumers had credit scores that stayed level in that time frame.
  - At 12 months, 51 percent of consumers in the study had credit score increases averaging 27 points, 38 percent had their scores decline by an average of 34 points, and 11 percent showed no change in their credit scores.
- Of the 65 percent of consumers who initially passed a 620 credit score cut-off, 3 percent of that group failed the cut-off when they were re-scored 3 months later. At 12 months, the percentage of that initial group who now failed the 620 credit score cut-off increased to 6 percent.
- 53 percent of consumers studied experienced meaningful score swings of more than 40 points over a 12-month period, reflecting higher risk behavior such as high utilization and/or delinquencies.

Figure 1: Score change from starting score after 3 months

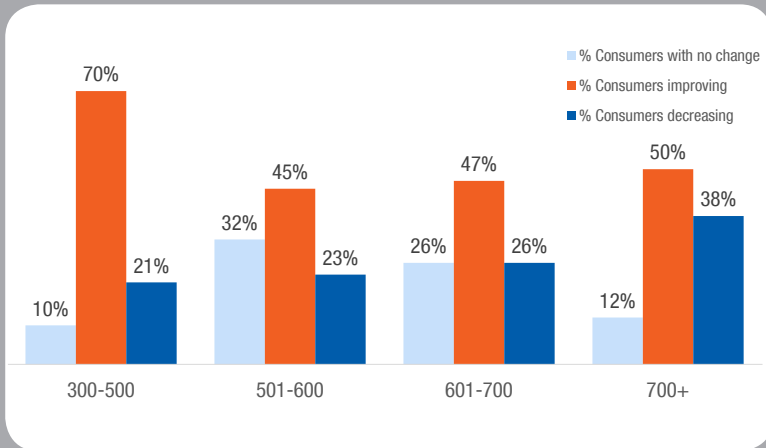
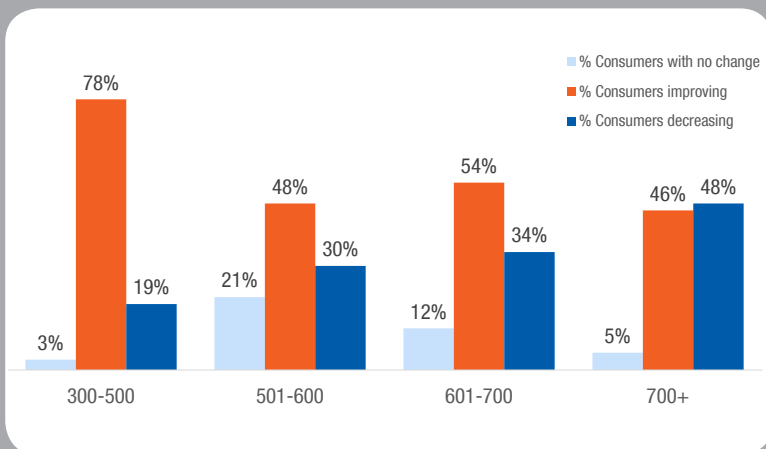


Figure 2: Score change from starting score after 12 months



- 47 percent of consumers who were considered “low risk” exhibited stable behavior using low risk day-to-day credit management actions, such as little change in their level of utilization, infrequent inquiries and few account openings. These consumers experienced relatively small score swings, falling within a 40-point range throughout the year.
- Improving risk levels as a result of a more stable economy partially offset the risk from consumers with decreasing credit scores, thus providing lenders with an opportunity to relax their credit score cut-offs and thus approve more loans.

## HOW STABLE OR VOLATILE ARE CONSUMER SCORES?

Consumers were categorized into four bands according to their starting score, 300-500, 501-600, 601-700 and 700+. The change in their scores was determined after 3 months (Figure 1) and 12 months (Figure 2).

For consumers with starting credit scores between 601 and 700, 26 percent of consumers exhibited no change in score over a 3-month period. 47 percent experienced a credit score improvement while 26 percent experienced a credit score decrease.

For consumers with starting credit scores between 601 and 700, 12 percent of consumers exhibited no change in score over a 12-month period. 54 percent experienced a credit score improvement while 34 percent experienced a credit score decrease.

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## HOW DO SCORES CHANGE OVER A 3-MONTH PERIOD?

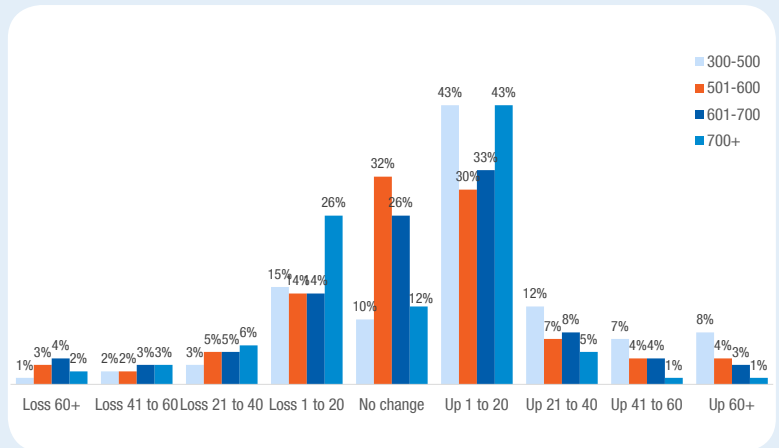
27 percent of the population had starting credit scores between 601 and 700 (Figure 3). For those consumers whose credit scores increased, the average increase was 21 points. For those whose credit scores decreased, the average reduction was 29 points.

For consumers with starting score between 601 and 700, 33 percent experienced a score improvement between 1 and 20 points, while 14 percent experienced a score reduction between 1 and 20 points (Figure 4).

**Figure 3: Score changes at 3 months**

Change at 3 months	Percent of population	Average of increase	Average of decrease	Overall average
300-500	6%	26	-20	14
501-600	25%	23	-26	4
601-700	27%	21	-29	2
700+	42%	14	-21	-1

**Figure 4: Score migration profile at 3 months**



## HOW DO SCORES CHANGE OVER A 12-MONTH PERIOD?

27 percent of the population had starting credit scores between 601 and 700 (Figure 5). For those consumers whose scores increased, the average increase was 29 points. For those whose scores decreased, the average reduction was 42 points.

For consumers with a starting credit score between 601 and 700, 30 percent experienced a score improvement between 1 and 20 points, while 12 percent experienced a score reduction between 1 and 20 points (Figure 6).

**Figure 5: Score changes at 12 months**

Change at 12 months	Percent of population	Average of increase	Average of decrease	Overall average
300-500	6%	44	-28	29
501-600	25%	37	-36	7
601-700	27%	29	-42	2
700+	42%	18	-29	-6

**Figure 6: Score migration profile at 12 months**

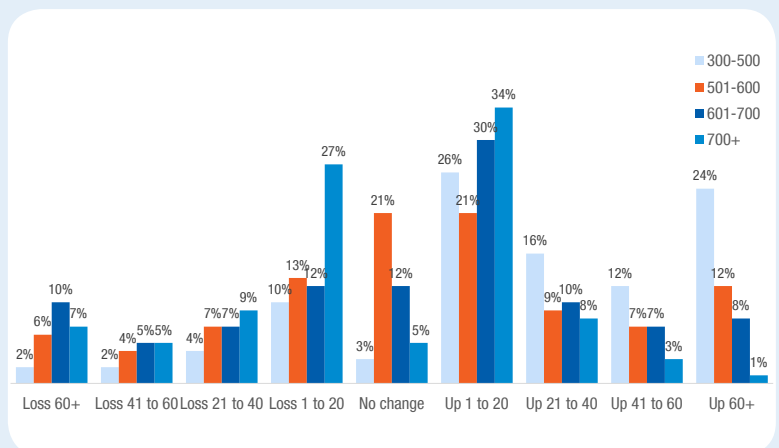
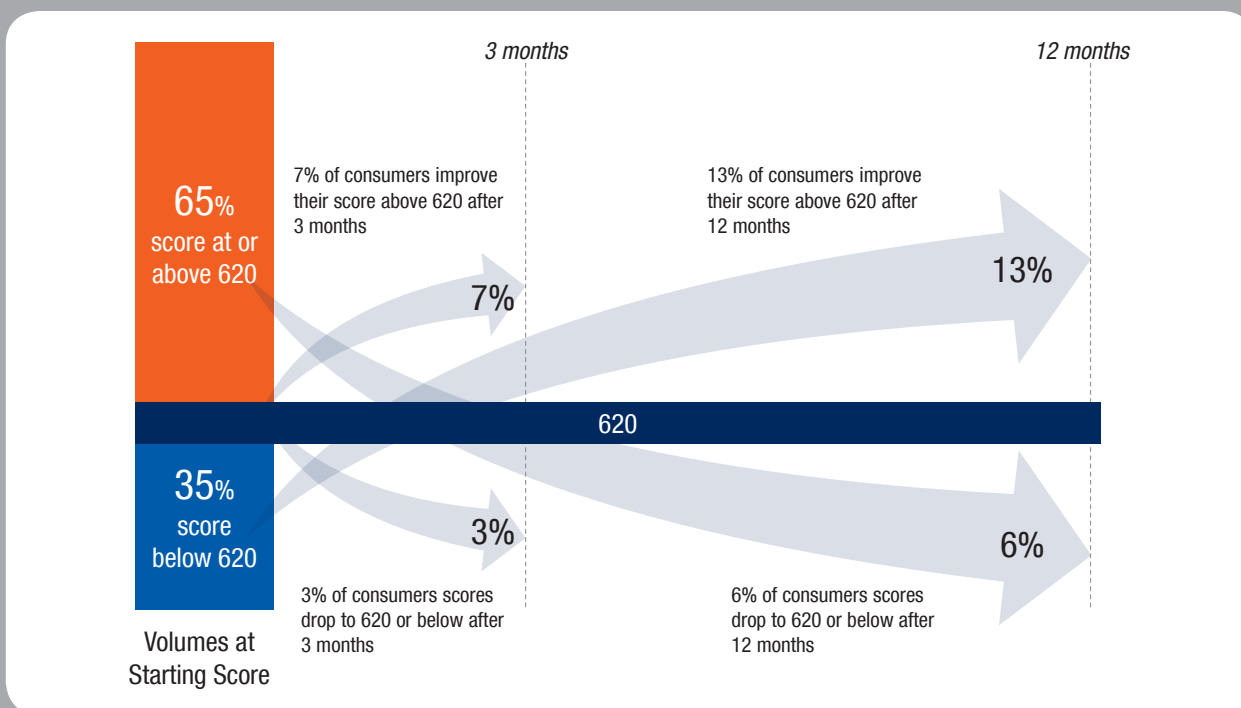


Figure 7: Score movement above and below a cut-off over time



## SCORE MOVEMENT AROUND A SPECIFIC CUT-OFF

Credit and risk strategies often include a binary decision on the consumer's credit score. Access to credit therefore hinges upon the score value at the time of evaluation. What is the likelihood that a consumer who failed the credit score cut-off at time of evaluation, later exceeds the cut-off because of improvements in their credit management behaviors? Conversely, how many consumers who initially exceed the score cut-off would fail at some time in the near future?

Using a credit score cut-off of 620, the percentage of consumers who exceed and fail the cut-off based on their starting score was determined (Figure 7). 65 percent of the total population scored above 620 and 35 percent scored 620 or below.

After 3 months, consumers with starting credit scores below 620 were re-scored. Seven percent of this population improved their scores above 620. After 12 months, 13 percent of the population who had originally failed the credit score cut-off subsequently improved

their scores to a level greater than 620. Finally, 3.4 percent of the population raised their credit score above 620 and then maintained a credit score above 620 for the next four quarters.

Of the 65 percent who initially had exceeded a 620 credit score cut-off, 3 percent of that group failed the credit score cut-off when they were re-scored 3 months later. After 12 months, 6 percent of the population who originally passed the credit score cut-off now failed. Finally, 1.4 percent of the population who originally passed the credit score cut-off failed the credit score cut-off in each of the next four quarters.

Accounting for score migration above and below the credit score cut-off, the study revealed that 6.4 percent of the total population would have received the opposite credit decision if they had been reviewed 3 months later because of the change in their score.

Given these migration trends, a strategy which relies on point-in-time evaluation of credit scores may not be optimal from a risk management perspective. At a minimum, lenders would benefit by capturing

consumer credit scores on a quarterly or monthly basis in order to separate consumers with substantial credit score volatility, say 40 points or more per quarter, as compared to those with more stable credit scores (i.e., those whose credit scores fluctuate within a range of 40 points or fewer). Lenders could also reduce risk exposure by using time series analysis of credit scores to identify consumers who experience “volatile-to-deteriorating” score trends.

## WHAT IS A “MEANINGFUL” CREDIT SCORE CHANGE?

Combining insights from two components of credit score model design can provide a framework for defining whether a change in credit score is meaningful. First, it is helpful to examine how a credit score varies with the risk (or odds) that a consumer will default. Second, typical credit score impacts associated with credit management behaviors can be classified depending on whether those credit management behaviors are low- or high-risk.

### **Risk-to-Score relationship:**

For VantageScore 3.0, a 40-point reduction in a consumer’s score indicates that the odds that the consumer will default have doubled. A 40-point improvement indicates that the odds of default have been cut in half. Note, however, that the relationship between risk of default and score level varies by credit score model developer.

### **Typical credit score impact ranges:**

Given their unique design, each credit score model measures the specific impact of a behavior on a credit score in a particular manner. However, given that credit scoring models are all developed using similar credit file data, using similar mathematical techniques, it’s possible to classify behaviors into general impact categories. For example, inquiries and opening new accounts typically result in a decline of between 5 to 30 points in a score, changes in bankcard utilization can have a 5 to 80 point impact on a score depending on the actual utilization level, early delinquency can impact a score by 60 to 80 points, severe delinquency and derogatory events generally result in a decline of more than 100 points. From these categories, we can generally understand that score changes of 40 points or less are likely related to lower risk behaviors such as small shifts in card utilization, credit applications and so forth. Score changes that are greater than 40 points signal higher risk behaviors, such as delinquency, that should trigger greater attention by the lender.

By associating these two components, we understand that activities such as inquiries and opening an account do not significantly increase the likelihood that the consumer will default. Therefore, consumers who experience score

changes within a 40-point range may be considered stable. Conversely, score changes that are greater than 40 points likely demonstrate more troubling consumer behaviors and thus represent a higher risk of default.

Figure 8 shows the percentage of consumers by score bands who had a change in credit score over a 12-month and a 24-month period of forty points or less (i.e., stable behavior).

Clearly, this is a general framework. Ultimately, the lender-specific P&L structure, risk tolerance and product strategy must be incorporated to determine an appropriate order of magnitude for score change tolerance.

## WHAT IS THE TRUE RISK IMPLICATION OF TYPICAL CREDIT SCORE CHANGE OVER A 24-MONTH PERIOD?

With the understanding that a credit score is simply a proxy for risk, the fact that a consumer’s credit score changes or doesn’t change is only meaningful in the context of understanding the actual risk estimate associated with the credit score at any given point in time. Depending on the overall risk dynamics of the economy, a consumer may experience an improvement in credit score over time but still represent a higher risk under the current economic environment. This was clearly evident during the recession: even if a consumer maintained a score in the 621-640 range during that period of time, the actual risk represented by that score range peaked at a probability of default (PD) of 5.8 percent; on the other hand, in 2012, the same credit score represented a probability of default of 3.5 percent (Figure 9).

This factor has obviously been less significant in the last several years, when the economy has been relatively stable. There is an opportunity to lower cut-offs and increase access to credit because risk levels have declined as a result of the improved economy.

Converting the score to PD values allows the lender to understand the actual risk impact of score migration where there is variation as a result of both score migration as well as an increase of risk, based on the decline in credit score levels.

### **Example**

Suppose a cohort of consumers were approved for a particular strategy given their credit scores fell between 621 and 640. PD for this cohort at time of evaluation was estimated to be 4.0 percent. Over time the credit scores migrated based on more recent consumer behaviors (Figure 10).

As a result, the overall risk level associated with that cohort

Figure 8: Volume of consumers with insignificant change in scores

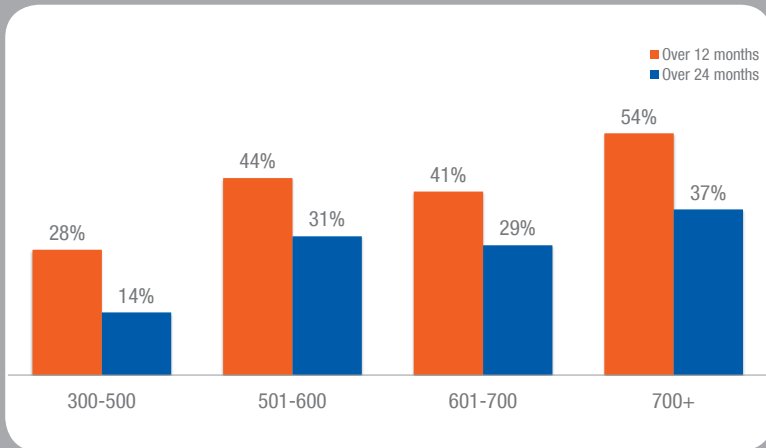


Figure 9: Default rate variance over time

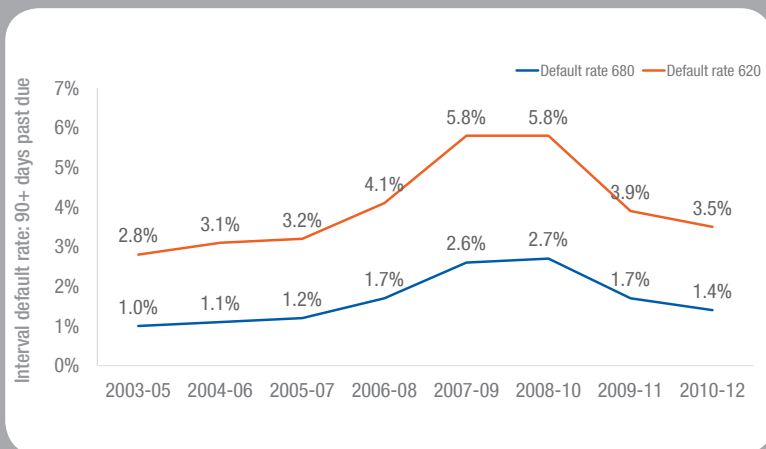
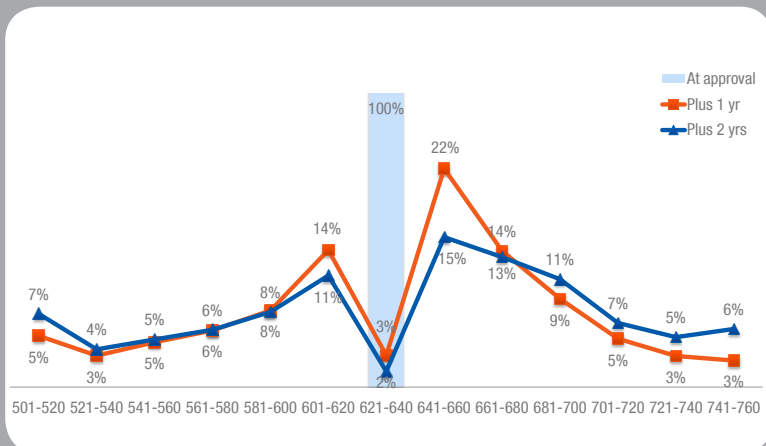


Figure 10: Score migration pattern for consumers with starting scores of 621-640



changed based on the score migration. Consumers with higher credit scores now represent lower risk and those with lower credit scores represent higher risk. If PD rates remained at the identical levels at the time of evaluation, the cohort risk would be associated solely with the score migration.

Figure 11 reflects the new cohort risk given scores migrated but where, in subsequent years, PD rates at each score band remained nearly identical with the evaluation time frame. Under this scenario, cohort risk for consumers with a score between 621 and 640 was 4.0 percent at time of evaluation. Incorporating risk adjustment due to score migration, the cohort risk becomes 5.2 percent one year later and 5.3 percent two years later.

## IMPROVING ECONOMIC CONDITIONS

Overall risk levels have improved with increased economic stability. For example, a credit score between 621 and 640 in 2011 represented a PD of 4 percent while it represented a PD of 3.2 percent and 3.1 percent in 2012 and 2013, respectively (Figure 12). The true cohort risk profile must factor this overall improvement in the economy into the calculation by using the performance charts updated for the relevant timeframe.

Annually updated performance charts, published by score developers, show the PD rates associated with scores based on consumer behaviors in any given year. These performance charts are available through the score developers and from the CRCs.

Factoring this risk improvement into the cohort risk profile revealed that after one year, risk increased by only 12 percent to 4.5 percent (Figure 13), and not the anticipated 29 percent associated solely with score migration.

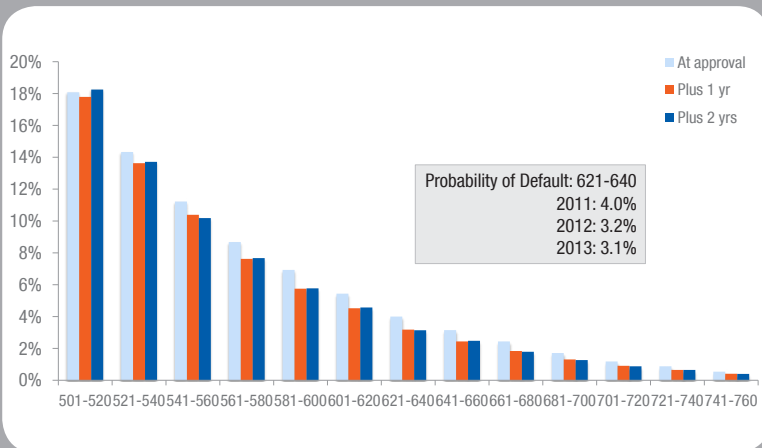
## CONCLUSION

Consumer credit scores clearly change with some degree of frequency. Several clarifications can help in determining whether these changes are meaningful:

**Figure 11: Cohort risk given score migration and stable PD rates**

Evolving risk profile (621-640)		
	PD	Percent of increase
At approval	4.0%	
Plus 1 year	5.2%	29%
Plus 2 years	5.3%	33%

**Figure 12: Systemic risk profiles, 2011-2013**



**Figure 13: Cohort risk factoring variances in PD rates over time and score migrations**

Evolving risk profile (621-640)		
	PD	Percent of increase
At approval	4.0%	
Plus 1 year	4.5%	12%
Plus 2 years	4.7%	18%

- Variations of less than 40 points are more likely the result of low risk, day-to-day credit management actions which do not necessarily reflect a substantial increase in risk exposure.
- Using a quarterly or monthly score trends for credit-approval analytics, rather than a conventional, single point-in-time credit score cut-off, can enhance credit strategies by improving population selection.
- The current improvement in economic conditions should be accounted for when analyzing score migration impact, which may in turn present an opportunity to relax credit standards and expand the number of credit-worthy consumers.

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