

# The Fall of the False Positive

*Why a Low False Positive Score Doesn't Mean Lower Losses*



Measuring the success of financial institutions' fraud department is anything but straightforward. The traditional method has been to aim for a reduction in losses and a low false-positive ratio. The false-positive ratio is the number of transactions the system flags as suspicious compared to the number of transactions that are actually fraudulent. However, many financial institutions find that despite keeping a low false-positive ratio, their losses continue to escalate.

Although the low false-positive ratio is not the direct cause of escalating losses, by focusing on false positives a financial institution risks becoming blinded to the real impact of fraudulent transactions. Furthermore, focusing on false positives can prevent a financial institution from finding the right solution to stem its increasing fraud losses.

## Why a Low False-Positive Ratio is Beneficial

There is nothing like having a number to prove that an organization is working in the most efficient way possible, and this is the allure of the low false positive. A low false-positive ratio means that when the fraud detection system creates an alert about a suspicious transaction, the transaction is likely to be fraudulent. Such systems reduce the number of legitimate transactions the fraud team must review, and they also reduce the number of times customers are contacted about genuine transactions.

Technically speaking, if a financial institution achieves a 1:1 false-positive ratio, then every transaction flagged will be fraudulent; therefore, the fraud team's time is well spent assessing and processing those transactions. Moreover, the fraud team is efficient — not one unneeded keystroke or mouse click occurs. Every manager dreams of this kind of efficiency; however, when the end of the month arrives and losses are still climbing, that dream may become a nightmare.

## How Financial Institutions Came to Depend on Low False Positives

When payment fraud first began to take off, suppliers stepped in with easy-to-use packaged solutions that were plugged in and turned on, and everyone kept their fingers crossed that they would work. When a transaction went into the system, a number came out declaring the likelihood that the transaction was genuine. These solutions worked for quick and basic fraud reduction, especially when payment fraud was still too new for the majority of people to tackle without expert help.

During that time, a fraud department was judged on the accuracy of its solution and how often it correctly identified fraud. Thus, financial institutions put heavy reliance and importance on how good their systems were. If Bank A's system is right two in three times and Bank B's system only one in four, then Bank A must be doing a better job than Bank B. Nevertheless, many fraud

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departments like Bank A found that their losses were still increasing.

## What Does the False-Positive Ratio Actually Mean?

One of the most apparent and common uses of a false-positive ratio is to measure system accuracy or performance. This is one reason that false positives are still treated with such importance. If a system is alerting its users with a high certainty of fraud, then it is considered to be working efficiently. If the percentage of flagged transactions that actually are fraudulent increases, then the system is considered to have improved.

This may seem obvious, but it provides a narrow view of the fraud problem. An understanding of false positives is most powerful in workload and staffing requirements, which are also the areas that experience the most direct impact. The greater the number of false positives, the more frequently legitimate transactions must be assessed by reviewers to discover the fraud. To use another analogy, as the number of false positives increases, so increases the size of the pond in which a fraud team fishes for fraud.

This may seem like a drawback and something to avoid; however, as the size of the pond increases, so does the number of fish that inhabit the pond. If a financial institution has a low false positive of 3:1 but is detecting only 10 percent of its fraud, then the bank is sacrificing a huge amount of detection potential for the appearance of an accurate detection system. This is the most common misconception found in fraud departments, and it ties back to the days when financial institutions had very little control over their fraud detection systems. If a bank has the staff to work more alerts, then increasing false positives is a benefit.

## Don't Rely Solely on False Positives

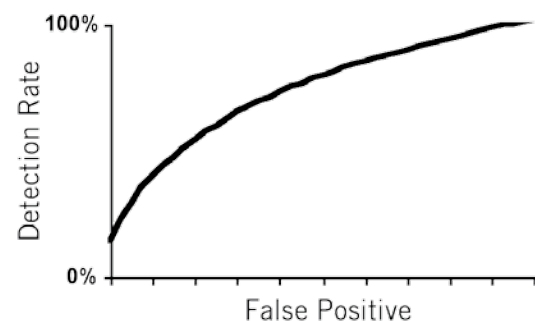
Focusing only on a low number of false positives can result in tunnel vision, causing financial institutions to miss out on other key measures that may be more effective in reducing fraud losses.

One important measure is the detection rate — the number of fraudulent transactions on which a system actually alerts.

Financial institutions can achieve a 1:1 false-positive ratio quite easily if they target only the most obvious frauds; however, this type of monitoring will be at the expense of the fraud detection rate and losses. Conversely, an institution can achieve a detection rate of 100 percent without much effort, but this may come at the extreme sacrifice of the false positive, staff performance and workload — and ultimately it will affect the institution's losses again.

A financial institution's detection rate is a direct measure of the potential fraud loss avoidance toward which it is working; the larger the arena, the more fraud available to detect. If an institution examines both detection and false-positive ratios together, then it will come much closer to forming an accurate picture of its fraud avoidance challenge. Ideally, an institution wants to shrink the size of that arena to contain only frauds, giving it a detection rate of 100 percent with a false-positive ratio of 1:1. That, however, is an impossible feat.

Figure 1 is a graph plotting false positives compared to detection rate. As the detection rate increases, so too does the false positives — but not usually in a linear relationship. In most cases, the curve starts out steep and shows the most benefits in detection rate without huge increases in false positives. However, as the line passes the 50 percent mark, the curve generally flattens and will take a long time to reach 100 percent.



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When changing rules in a system or shifting scores, the ideal situation is to increase the detection rate with no increase in false positives, essentially shifting the curve upward.

The other and perhaps most important metric in fraud detection is one that has not yet become a staple in the fraud manager's repertoire: the point of detection. The point of detection measures how many missed fraudulent transactions occur prior to the system generating its first alert on an account. The point of detection is the metric most closely tied to fraud losses, as it directly describes the number of lost transactions that occur before an analyst has the chance to stop fraud.

For example, a point of detection of five means that the system detected suspicious activity on the fifth fraudulent transaction, then generated an alert. The four transactions prior to the point of detection are all losses, and if the system doesn't have real time prevention capabilities, then the fifth transaction is a loss, too.

The reason many vendors have not emphasized the point-of-detection metric is because it significantly affects how accurate some fraud detection solutions appear. An example would be that of a product that claims to have an extremely low false-positive ratio of 3:1 and an account detection rate of 60 percent.

On the surface this rate seems good; however, the point of detection — which is usually quite high in these claims — may be more like 10. This means the claim of 60 percent detection of fraud cases is true and the system can alert with an accuracy of 3:1; however, more than nine fraudulent transactions occur on an account before the system classifies the activity as suspicious and raises an alert. Those nine or 10 transactions make an enormous difference in the overall fraud losses. Even a small drop of half a transaction per account in the average point-of-detection metric can make more difference than increasing detection rate by a large percentage.

Point of detection plays the biggest role in direct loss avoidance. The sooner a financial institution can detect fraud on an account, the sooner it can take action on it and stem losses. Based on a financial institution's average loss per fraudulent transaction, the potential savings if fraud was detected in earlier transactions are evident.

## An Example of Fraud Detection in Use

Consider a financial institution that has 100 fraud accounts every month, 60 of which are detected by its system, while the remaining 40 are undetected until the customer contacts the bank. If the average loss per transaction is \$500 and the point-of-detection rate is five, then the institution's losses would be in the neighborhood of \$275,000 a month, assuming the fraudster gets away with slightly more transactions on an undetected account.

Using these numbers, a 10 percent increase in the detection rate would yield a loss reduction of more than \$6,200 a month, or 2.25 percent. If the fraud department instead focused on lowering its point-of-detection metric by as little as 0.5 transactions, the monthly savings would be \$15,000, or approximately 5.5 percent. In most cases, an increase in detection rate is much more resource intensive, as it generally means sacrificing false positives to improve detection. Reducing the point of detection is usually achieved with much less effort because it generally requires some analysis on these early transactions so that rules can be written to combat them. In most cases, fraud teams can develop a rule that is specific and does not increase false positives by a great amount.

When the point of detection is decreased in parallel with an increase in detection rate, then the benefits become even more evident because as the organization is now detecting more compromised accounts earlier. The key factor is that after financial institutions have targeted most of their fraud, the easiest way to increase their detection rate is by opening

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alerts to a higher rate of false positives — which must be balanced with staffing levels.

## Using False Positives as Part of a Comprehensive Countermeasure Strategy

Considering the whole fraud detection system, the benefits of a higher false-positive rate become apparent. The drawback of such an increase, which was previously considered to be poor system performance, is actually the need for increased staff.

The human mind is good at detecting patterns and easily outperforms most fraud detection software once trained. Thus, financial institutions that employ human analysts to review more alerts have a greater chance of catching fraud and as a result reducing losses.

In contrast to the old methodology of a “smile-and-dial” fraud department where a low false-positive rate is required because any alert is automatically given action, financial institutions should take a new viewpoint. Today’s improved fraud department should be structured around human analysis, whereby the staff reviews more alerts and decides which are worthy of further investigation or action. This procedure is the key to taking advantage of a higher false-positive rate and the power of human analysis.

Because the power of false positives is so closely tied to staffing, managing false positives naturally leads to managing workload. At peak times, when staffing and fraud are high, financial institutions can confidently increase their false positives to open their detection rates. Conversely, during slow periods with less staff, a more conservative false-positive rate will ensure that staff members can handle the workload and only work the most important alerts.

ACI has developed a loss reduction calculator where you can experiment with various loss reduction strategies as discussed in this flyer. The calculator is available at <http://www.aciworldwide.com/prmcalculator>.

This paper was produced by ACI Worldwide’s risk solutions team. This highly expert team consists of fraud consultants with years of hands-on experience in the fraud industry, from all over the world. More than 30 financial institutions have received guidance and support from the team through a variety of programs, such as fraud analytics, fraud prevention countermeasure strategy and departmental process engineering. To find out more about how ACI’s risk solutions can help you fight financial crime, please contact the team at [riskolutions@aciworldwide.com](mailto:riskolutions@aciworldwide.com).

Financial institutions should view false-positive rates as a flexible tool, not a performance metric. Only by taking the focus away from one specific metric and stepping back can institutions view the whole system, understand the system and make improvements.

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