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Circulation velocity
and how you can
influence it

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What is circulation velocity?

When a banknote leaves the central bank, it enters circulation, moving around a network of commercial banks, retailers, people, machines and places before returning to the central bank. Circulation velocity (also known as the return frequency) is the number of times in a given period the average banknote will return from circulation to the central bank to be sorted. It's a critical factor to understand as it can dramatically impact the lifetime and quality of a banknote. It's calculated by dividing the volume of notes deposited over the period by the circulation volume at the end of the period. So a circulation velocity of one, means the note comes back once a year. Circulation velocity is distinct from the economics term 'velocity of circulation'.

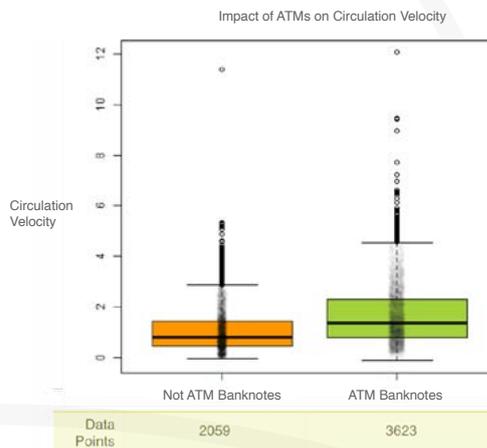
How central bank policies affect circulation velocity

A central bank's policies and processes can have a direct impact on circulation velocity. For instance cash cycles that are more centralised will have higher circulation velocities on average because the central bank is responsible for a greater proportion of the sorting. Cash cycles that are more decentralised will have a lower circulation velocity because the commercial sector are sorting and re-issuing banknotes, then only returning unfit banknotes to the central bank. In some instances banknotes only return to the central bank for destruction.



ATMs and circulation velocity

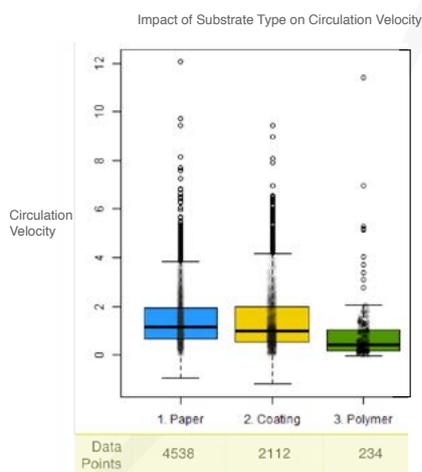
On aggregate within DLR Analytics™ users, ATM denominations have a higher circulation velocity than non-ATM notes, which means they return to the central bank more often. In the next example, the spread of circulation velocities in green suggests that not all the notes kept in ATMs are fully transactional. It may be easier for a central bank to get banknotes into circulation if they are distributed via an ATM machine.



When we compare circulation velocity vs note life curves for ATM notes and non-ATM notes we see that most non-ATM notes have a Circulation velocity of less than 2, while ATM notes have a much wider spread of circulation velocities.

Substrate and circulation velocity

How does the substrate affect a note's circulation velocity? The aggregated and anonymised DLR Analytics™ data so far tells us that polymer notes have a lower circulation velocity on average than paper or coated notes.



One explanation is that, where sorting is managed by commercial banks, polymer notes are being 'pre-sorted' as good by commercial banks because their fitness levels stay above the designated fitness standards for longer. This means that the polymer notes don't need to return to the central bank for sorting as often.

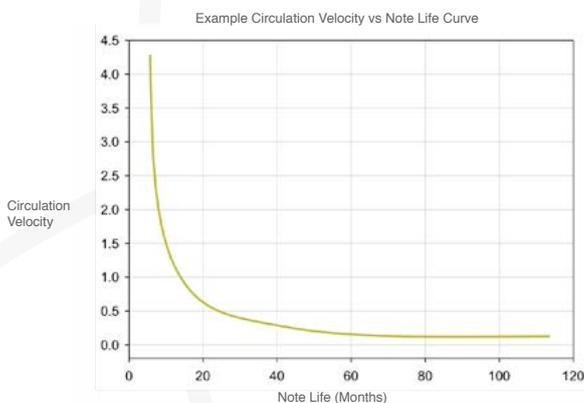
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Three ways to influence circulation velocity and note life

Low circulation velocity tends to mean extended note life beyond its useful life (because the banknotes don't necessarily get back to the central bank until after their condition is below the desirable fitness standard) and high circulation velocity can mean shorter note lives.



But there are things you can do, directly or indirectly, to influence circulation velocity and extend note life.

For instance:

How often you sort

If notes are coming back every three months and the average note life is three years, are you sorting too frequently? Would a sampling approach work for you and enable you to run your sorting machines less often? Could you use commercial banks to re-issue fit banknotes?

The way you sort

How you sort can influence the note life for particular denominations. Sorter calibration and sorter errors can mean you're sorting notes as unfit when they still have life left in them or allowing some unfit banknotes back into circulation. If you have a high circulation velocity then the importance of sorter calibration and performance is especially high.

Influencing your cash cycle

Since 2012 we've seen several instances of central banks directly impacting the circulation velocity by changing aspects of their cash cycle. In at least one instance, putting lower denomination banknotes into an ATM machine has helped encourage a higher circulation velocity. In several instances, increasing the number of banknotes in circulation has increased the circulation velocity – all of these instances typically involve banknotes where the number of banknotes in circulation has been relatively low compared to demand and the low number of banknotes has encouraged people and companies to hold onto the banknotes for use as change instead of depositing them and allowing them to return to the central bank for sorting. If you suspect that you need to change your circulation velocity in order to improve your banknote lifetime or circulation quality, please get in touch.

Conclusions

Circulation velocity is impacted by many things, including:

- Cash cycle dynamics
- Central bank policies
- The substrate used

We've touched on the benefits of optimising circulation velocity, and suggested some decisions that can be made to impact it.

For more information (or if you are a DLR Analytics™ user and would like the full report and supporting data) please email DLRAnalytics@delarue.com

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