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What's happening
to banknote
issuance patterns
around the world?

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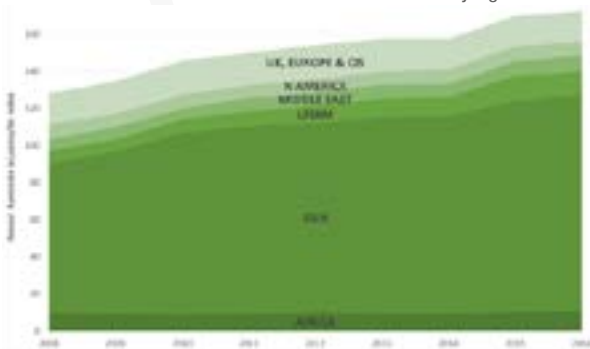
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What's happening to banknote issuance patterns around the world?

Banknotes aren't going away – [in fact the volume of notes in circulation around the world is increasing](#). However the future of the value of cash in circulation is only part of the story. For a central bank or issuing authority interested in forecasting banknote demand or better understanding their banknote lifetimes, there are additional dimensions to consider and one of these is banknote issuance patterns. In this paper we look at what is happening to banknote issuance patterns around the world and discuss the different types of behaviours seen, as well as any consequences of these behaviours.

This report is the public-facing insights report. There is a more in-depth report available to DLR Analytics™ users, exploring issuance pattern classifications, the impact of denomination value and ATMs. Users of DLR Analytics™ can request the full report and / or the supporting data by emailing nikki.strickland@delarue.com

Volumes of new banknotes issued into circulation by region.



Data from central banks and DLR Analytics™ data (covering 165 issuing authorities in total) reveals that around 170 billion new banknotes are put into circulation (“issued”) globally every year. That’s a compound annual growth rate (CAGR) of 3% over the past ten years, boosted by significant historical growth in countries like India and China.¹

But look more closely and regional differences emerge. While global CAGR growth in new banknote issuance is generally on the rise, the growth of individual regions (and countries within those regions) varies greatly. For example, between 2012 and 2016 there’s been growth in the rates of issuance in Africa, Asia, LATAM and the Middle East, but North America has seen no growth and overall the UK, European and the Commonwealth of Independent States (CIS) cluster have experienced a slight drop in the rate of

new note issuance. Overall in all regions the total cash in circulation continues to grow, so this points to other things going on. New issuance growth rates can be particularly volatile at a country level (which will impact the regional average) because of the impact of specific country events. Any 2012 issuance peak would make the 2012 to 2016 CAGR appear lower and any 2016 peak would make the 2012 to 2016 CAGR appear lower, irrespective of the underlying trends.

Issuance volumes versus Circulation volumes

One finding from our data is that issuance volume for most countries does not correlate with the volume of banknotes in circulation. This is not unexpected and is due to a number of factors:

- Note life variance – the lifespan of a banknote varies significantly depending on the banknote specification, the sorter performance, the fitness standards of the central bank, the circulation policy and the environment that the banknote experiences. With adequate circulation velocities and - with all other things being equal - the useful life of paper banknotes is less on average compared to more durable substrates such as polymer.
- Changes in clean note policies can raise or lower the quality of banknotes in circulation. This will impact the rate at which banknotes are issued to replace notes that have reached the end of their useful life, but will not impact the overall number of banknotes in circulation.
- New banknote denominations and new banknotes series designs – will often lead to entire denominations in circulation being replaced with the new denomination. Although a spike in circulation volume at this time is not uncommon the spike in the rate of issuance is often much more dramatic.
- Denominational drift – as the purchasing power of banknotes gradually change with time the rate at which need to be replaced by issuing new banknotes will also change.
- Issuance dates – random or reactive issuance of new banknotes will make the data unpredictable. Natural disasters and other shock events can be particularly disruptive to issuance rates.

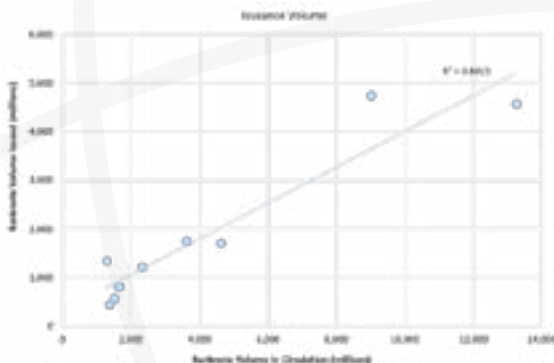
¹Although this growth in issuance is likely to have been disrupted recently in India and China, which will be seen when last year’s data is incorporated into the analysis.

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There are a few instances of strong correlation between the number of banknotes issued and the number of notes in circulation. In Venezuela, for instance, correlation between the public data for issuance volumes and circulation volumes is 89 %. That's because of extremely high demand for new notes, indicating that existing notes (that would have otherwise been replaced) were left in circulation. Correlation is also possible for cash cycles where the circulation volume is growing uniformly, where issuance rates are regular and uniform and where no changes are happening in circulation.

An example of issuance volumes correlated with circulation volumes.

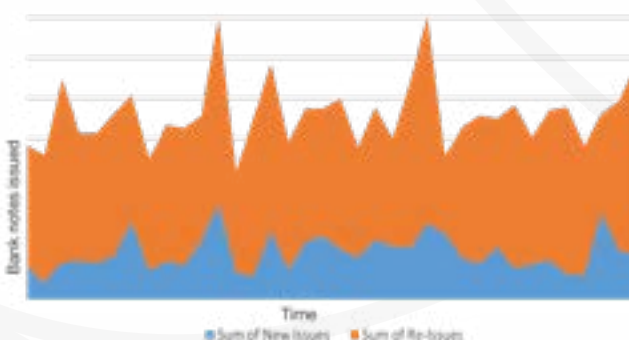


All of these factors therefore become important to consider when forecasting future banknote demand. Previous analysis in De La Rue has indicated that 70 to 90% of the banknotes ordered are needed to replace banknotes that have worn out in circulation, so the replacement of worn out notes in circulation is an incredibly important factor in any banknote forecast.

Types of issuance patterns

DLR Analytics™ data from around the world reveals three types of banknote issuance pattern: regular, event-driven and sporadic. By plotting note issuance over the course of several years, it's possible to build a detailed picture of how those patterns occur.

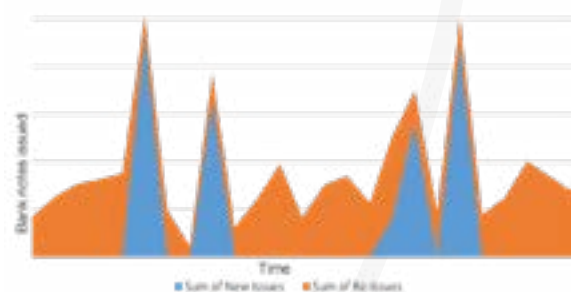
An example of a regular issuance pattern over time



Regular issuance is characterised by predictable monthly activity. There are some minor fluctuations and seasonal demand around the end of the year and some summer months. Peaks in demand can be easily predicted. This type of issuance pattern tends to lead to stable note life values calculated and a simpler forecasting process (assuming events don't change).

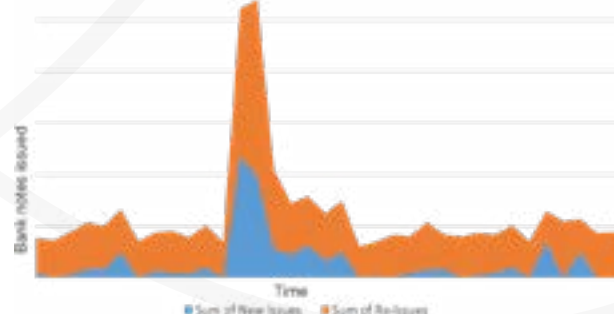
Event-driven issuance, on the other hand, is characterised by the issuance of new notes for special calendar events such as Eid in the Middle East, or Chinese New Year, when demand is particularly high. Often, the country will then rely on re-issued banknotes to meet demand for the rest of the year. For these patterns the policy around banknote issuance and banknote destruction can have a significant impact on the lifetime of the banknote. Some forecasting approaches are better than others at taking into account events that don't always repeat in the same month of the year.

An example of event driven issuance over time



Sporadic issuance, as its name suggests, is less tied to scheduled activity or events, making it harder to understand what drives demand and to predict when demand will occur. This is slightly more common in countries with smaller volumes of cash in circulation, but not always seen in those countries (and not exclusive to countries with smaller volumes of cash in circulation). Discussions and debate during forecasting exercises can be particularly useful if banknote issuance is more sporadic because the forecasting models are likely to be fitting to data that is also slightly more sporadic.

An example of sporadic issuance over time



¹ <http://www.bcv.org.ve/c2/indicadores.asp> [Accessed February 2018]

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Conclusions

- Banknote issuance is increasing globally.
- Issuance patterns vary significantly from country to country and issuance growth rates can be volatile from year to year (significantly more so than circulation value growth rates).
- With notable exceptions there's no clear correlation between issuance volumes and circulation volumes.
- DLR Analytics™ has revealed three broad types of issuance pattern: regular, event-driven and sporadic. Understanding the issuance pattern type you have can help with forecasting and understanding banknote lifetime.

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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