

# Managing the circulation of banknotes

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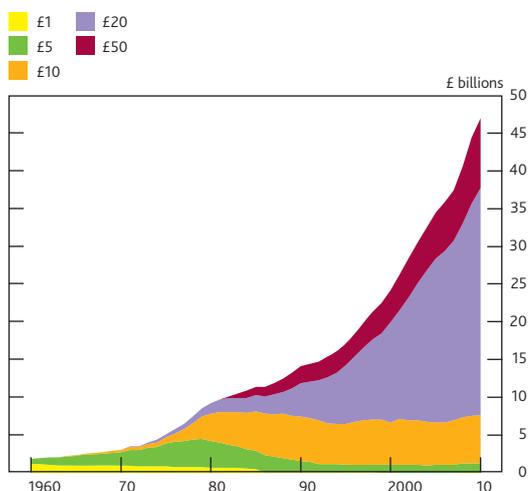
Issuing banknotes is one of the Bank of England's best known and most recognisable functions. To maintain confidence in the physical currency, genuine notes must be available to meet public demand. This article explains how the note circulation is managed to maintain this confidence. The Bank's role in this has changed considerably over the past 50 years with technological innovations and as the involvement of the commercial sector has grown. The Bank's response to future developments will continue to be consistent with its objective of ensuring the availability of genuine notes of good quality in a balanced mix of denominations.

## Introduction

The Bank of England has been issuing notes for over 300 years. Today, the note issue is one of the Bank's best known and most recognisable functions, and cash is the most frequently used means of payment by the public.<sup>(2)</sup>

The stock of Bank of England notes in circulation has risen almost continuously for the past 50 years (Chart 1). It now is around £50 billion, the largest proportion of which is the £20 denomination. Relative to nominal GDP, however, the value of notes in circulation has fallen, from almost 8% in the 1960s to around 3% today.

Chart 1 Stock of notes in circulation<sup>(a)</sup>



(a) Data provided for the value of £1, £5, £10, £20 and £50 notes annually at end-February (the end of the Bank's financial year).

People want to hold notes for two reasons: for making transactions and as a store of value. The size and composition

of notes in circulation can therefore be influenced by a number of factors. Among the most important are economic growth, inflation and the extent to which people use non cash payment means. These in turn depend on other more structural forces, such as technological innovations, demographics and personal preferences. The purpose of the Bank's note issue function is to meet the resulting public demand for notes.

This article explains how the Bank manages the circulation of its notes.<sup>(3)</sup> It first sets out the principles that engender confidence in notes and how the Bank seeks to achieve these through its role in note circulation and its interaction with commercial organisations involved in note distribution. It then highlights measures the Bank is taking to encourage a balanced mix of denominations to be provided to the public — particularly with respect to the £5 note. Finally, the article gives a flavour of some opportunities and challenges that may affect the management of the note issue in coming years.

## Objectives of the note issue

Bank of England notes are a form of 'central bank money', which the public holds without incurring credit risk. This is because the central bank is backed by the government. The public's confidence in the currency requires not only stability in the value of money — through low and stable inflation,

(1) The authors would like to thank George Baldwin, Alex Holmes, Hannah Street and Jordan Thursby for their help in producing this article.

(2) It is estimated that cash accounted for almost two thirds of UK consumer payments in 2009 (Payments Council (2010)).

(3) There are eight other issuers of currency in the United Kingdom: coin is issued by HM Treasury; and seven commercial banks are legally authorised to issue their own notes in Scotland and Northern Ireland. The Bank of England has statutory responsibility for regulating the issue of Scottish and Northern Ireland notes under Part 6 of the Banking Act 2009.

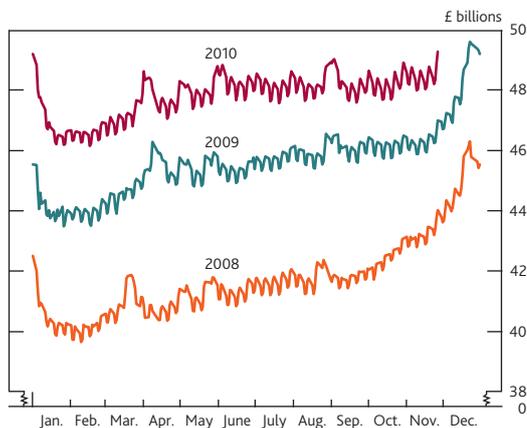
which is the focus of monetary policy — but also confidence that the physical notes in circulation are genuine and readily available. Cash users need to accept that a piece of paper that costs a few pence to produce is worth five, ten, twenty or fifty pounds.

In terms of managing the note issue, there are two aspects to maintaining this confidence in the currency. First, there needs to be confidence in the physical integrity of notes: counterfeit notes are worthless. There are many ways through which the Bank seeks to achieve this, including: the periodic upgrading of designs with the latest security features; the procurement of good-quality notes; providing information to the public and retailers on how to check that notes are genuine; and co-operation with law enforcement authorities to combat counterfeiting activity. There is further information on the Bank’s note design and anti-counterfeiting strategy in the box on pages 304–05.

Second, there needs to be confidence in the availability of notes. To achieve this, the Bank facilitates a sufficient quantity of notes reaching the public, with an appropriate balance of denominations. It is the Bank’s policy to meet the public’s demand for notes: the choice between cash or other payment means is considered a matter for public preference. Achieving an appropriate balance in the availability of denominations is, however, an area in which the Bank is taking an increasingly active role. For example, the Bank is currently working with the commercial sector to improve the availability of £5 notes. This is discussed later in the article.

Recognising that the demand for notes follows clear, seasonal patterns (as seen in **Chart 2**) is central to making sufficient notes available. The peak for the public’s note demand is the Christmas period, with smaller peaks around Easter and other bank holidays. There is also an intraweek pattern, with the highest demand for notes coming ahead of weekends.

**Chart 2** Regular patterns in the stock of notes in circulation<sup>(a)</sup>



(a) Data provided on a daily basis for the combined value of £5, £10, £20 and £50 notes in circulation. Data for 2010 are to 26 November.

Despite this general predictability, the Bank needs to hold substantial contingency stocks of notes to meet unusual or unexpected peaks in demand. For example, in the run-up to the millennium, the Bank, along with the major financial institutions, held substantial additional stocks that could have been made available to the public, if required. This was in anticipation of the impact of two extended bank holiday weekends plus precautionary planning for breakdowns in, for example, communications or power that might interrupt the use of electronic payments or the normal operation of the note cycle. In the event, payment arrangements worked as planned and there proved to be ample cash available.

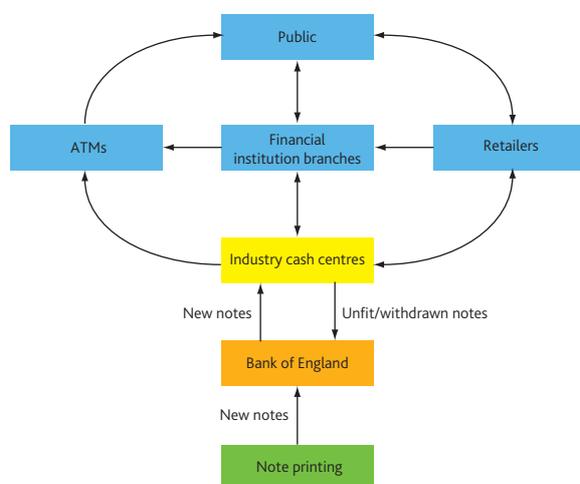
More recently, the demand for the higher-value denominations increased following the onset of the financial crisis in mid-2007. Increasing uncertainty about the state of the banking system led some people to prefer to hold notes (a direct claim on the central bank) rather than rely on access to commercial bank accounts. This further demonstrates the need for contingency stocks to support note availability, especially in times of stress.<sup>(1)</sup>

## The note cycle

### Overview

The life cycle of a typical note is illustrated in **Figure 1**. The first stage in a note’s life is its design and printing. The Bank procures new notes from a commercial printer, then supplies them to the wholesale cash industry — commercial institutions that handle large volumes of notes. There needs to be a regular flow of new notes into circulation, both to replace notes that have become unfit for further use and to facilitate the stock of notes in circulation growing in response to public demand.<sup>(2)</sup>

**Figure 1** Stylised life cycle of a note



(1) Data on the Bank’s stocks of new notes can be found at [www.bankofengland.co.uk/banknotes/about/stats.htm](http://www.bankofengland.co.uk/banknotes/about/stats.htm).  
 (2) In 2009/10, £14 billion of new notes entered circulation.

## Note design and anti-counterfeiting

There have been significant advances in the sophistication of the Bank's notes over the past 50 years, in terms of both design and anti-counterfeiting measures. This box examines each of these in turn, looking first at the evolution of note design, illustrated by changes in the £5 denomination.

### Fifty years of note design

In 1960, the famous 'white fiver' was still in circulation, albeit nearing the end of its life. These notes were more than twice the size of current £5 notes, and had printing on one side of the note only (Figure A). Rather than any picture, it was the monochrome black writing that was the focus on these notes, together with a watermark visible when held up to the light.<sup>(1)</sup> The style of this £5 note had changed very little since a version of this design was first issued in 1793.

Figure A White £5 note<sup>(a)</sup>



(a) First issued 1793, last issued 1957, ceased to be legal tender 1961.

In the 1960s, notes became predominantly pictorial with subtle colour combinations and detailed artwork — including the Queen's portrait, which first appeared on the £1 note in 1960. Notes also became smaller, facilitating their use in regular transactions. The design shown in Figure B is from a note series that was introduced from 1970. They were designed by Harry Eccleston, the Bank's first full-time note designer, who sadly died earlier this year.

The detailed artwork was deliberately difficult to reproduce and as such — in the days before digital reproduction technology — was a key anti-counterfeiting property of the note. The series was the first to use a picture of a historic character on one side — for example, the Duke of Wellington on the £5 note — which has been a feature of all subsequent Bank of England note designs.

Current note designs continue to consist of detailed artwork with subtle shading, but with an advanced array of more technical security features also incorporated within the design.

Figure B £5 note featuring the first Duke of Wellington<sup>(a)</sup>



(a) First issued 1971, last issued 1990, ceased to be legal tender 1991.

Several new security features were incorporated in the current £5 note design (Figure C). The image on the foil patch hologram changes on tilting, between a picture of Britannia and the number '5'. More subtly, there is microlettering in the pattern under the Queen's portrait — using a magnifying glass

Figure C Current £5 note featuring Elizabeth Fry<sup>(a)</sup>



(a) First issued 2002. Current series, legal tender.

reveals that the lines comprise 'FIVE' and '5' in minute lettering. Other security features within the design can only be detected with specialist equipment. For example, on the front of the note, the number 5 appears in the bottom-left area when viewed under ultraviolet light.

The design of notes with integral security features has a central role in combating counterfeiting. It is, nevertheless, only one of a number of aspects of the Bank's work in this area.

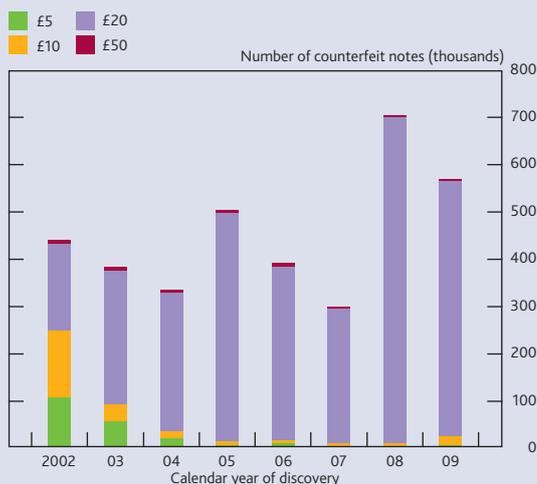
### The Bank's anti-counterfeiting strategy

Counterfeiting is an ever-present threat faced by all note issuers: there will probably never be a note that criminals cannot attempt to counterfeit. However, through a combination of approaches, the Bank works to maintain confidence in the integrity of the currency and minimise the impact of any counterfeiting.

The overall incidence of counterfeiting is small. During 2009, some 566,000 counterfeit Bank of England notes were taken out of circulation. This compared with around 2.5 billion genuine notes in circulation.

The most commonly counterfeited note is the £20 denomination (**Chart A**). This largely reflects that the number of £20 notes in circulation far exceeds any other denomination — it represents nearly 60% of all notes — and that the £20 note is the highest-value denomination commonly used in everyday transactions.

**Chart A** Number of counterfeit notes removed from circulation



The majority of counterfeits emanate from a handful of criminal groups. Some counterfeits are seized by police operations before they ever enter circulation. Of those that do enter circulation, the majority are soon identified in the Note Circulation Scheme sorting process and sent to the Bank for analysis.<sup>(2)</sup>

The Bank works to combat counterfeiting in a number of ways.

- **The physical notes.** The Bank issues high-quality notes, produced to consistent standards. The notes are deliberately made to be difficult to copy. They have intricate, complex designs, features such as raised print and are printed on unique paper incorporating the latest security features. The Bank employs a team of scientists who analyse new developments that can further improve the security of notes.
- **Working with machine manufacturers.** The Bank works closely with the cash industry to help ensure that note-handling equipment can identify and reject counterfeits. It has recently introduced arrangements for manufacturers of machines that accept, count or sort notes to test the machines' ability to identify known counterfeits. The results are published on the Bank's website and regularly updated.<sup>(3)</sup>
- **Working with law enforcement agencies.** The Bank supports investigations and prosecutions of counterfeiters in a number of ways. Information on counterfeit numbers and types are collected by the Bank and reported to the police. Specialist Bank staff can provide forensic expertise for analysis of counterfeits and act as expert witnesses in court cases.
- **Education and training.** The Bank provides a range of materials to help cash users — including the public and staff at retailers and at financial institutions — check that notes are genuine.<sup>(4)</sup> It also has a training programme for those involved in law enforcement.

Through these approaches, the Bank seeks to minimise the number of counterfeits and ensure that any counterfeits are quickly detected and withdrawn from circulation.

(1) Watermarks have been a security feature of the Bank's notes since 1697, assuming a variety of patterns and pictures for different designs of notes.  
 (2) Advice on how to check notes and what members of the public should do if they believe they have been given a counterfeit note can be found at [www.bankofengland.co.uk/banknotes/index.htm](http://www.bankofengland.co.uk/banknotes/index.htm).  
 (3) Information on the Bank's framework for the testing of automatic banknote handling machines can be found at [www.bankofengland.co.uk/banknotes/retailers/framework.htm](http://www.bankofengland.co.uk/banknotes/retailers/framework.htm).  
 (4) These include leaflets, posters, information on the Bank's website, a film guide and a computer-based training guide. Information can be found at [www.bankofengland.co.uk/banknotes/educational.htm](http://www.bankofengland.co.uk/banknotes/educational.htm).

The wholesale cash industry then puts the notes into public circulation — that is, to circulate around the blue sections of **Figure 1**. Notes reach the public predominantly through ATMs and, once in circulation, can then be used in transactions. Some notes — especially lower denominations — will be used by retailers as change items in further transactions with members of the public. Other notes will be surplus to retailers' requirements and they are likely to deposit them at a financial institution.<sup>(1)</sup>

In turn, financial institutions in receipt of such deposits will send surplus notes to industry cash centres at regular intervals. An institution in receipt of surplus cash has an incentive to pass on the physical cash, converting it into value in its bank account, thereby also relieving itself of the physical storage requirement and security risk.

While in the industry cash centres, the notes are checked by passing them through sorting machines. If authenticated as genuine and of sufficient quality, they will be recirculated to the public. Some 93% of notes acquired by the public are used notes that are being recirculated; the remainder are new notes entering circulation for the first time.

Notes are likely to pass between the public, retailers, financial institutions and cash centres a number of times during their life. For example, a typical £20 note will circulate for four to five years — being sorted and recirculated around 25 times — before its quality has degraded to the extent that it is no longer fit for circulation. At that point — or if a note design is being withdrawn — cash centres will return it to the Bank for destruction.<sup>(2)</sup>

The Bank's role in the note cycle has changed over the past 50 years, particularly in relation to the involvement of the commercial sector. The next section examines the main changes that have occurred.

### Development of roles in the note cycle

The Bank's involvement in preparing used notes for recirculation to the public has evolved gradually. Throughout the 1960s, the counting, authentication and quality checks were performed by hand by Bank staff. The Bank began to automate these processes from the late 1970s with the introduction of note sorting machines. This period also saw widespread adoption of mechanised sorting by financial institutions, particularly reflecting their increased demand for notes sorted to a sufficient standard for use in ATMs. For some years the Bank helped meet this demand by supplying sorted notes to some financial institutions on a commercial basis.

By the mid-1990s, commercial sorting capacity had expanded such that financial institutions had become self-sufficient in preparing notes for recirculation. The Bank judged it was more efficient for sorting to be performed by the commercial sector

and gradually withdrew from this activity, closing four of its regional branches at which note sorting was performed. Since the late 1990s, sorting has taken place wholly within the commercial sector.

There was a further change of roles in 2003, when the Bank's printing of notes was outsourced to the commercial sector. The role is currently performed by De La Rue, a company specialising in high-security printing.<sup>(3)</sup>

These changes mean that the Bank's direct, operational involvement in the note cycle — the issue of new notes and destruction of unfit and withdrawn notes — now comes only at the beginning and end of a note's life. To perform these roles, the Bank retains two cash centres (in Essex and Leeds) to store its stock of new notes and to process and destroy notes no longer fit for recirculation.<sup>(4)</sup> The Bank also maintains a direct interest in the functions performed by the commercial sector and, through its contractual arrangements, ensures that there is an appropriate framework in place to manage these arrangements.

### Development of the Bank's contractual schemes

The Bank's relationship with the cash industry has changed over time. These developments have been influenced in part by the expanding role of the commercial sector but also by the Bank seeking increased efficiency and improved risk management.

A significant development came in 1982 when the Bank introduced the Notes Held to Order (NHTO) scheme to address the risks and costs associated with excessive volumes of notes being transported to and from the Bank. Before the 1980s, financial institutions would physically return large volumes of surplus notes to the Bank (including its regional branches) for storage, then collect them when required to fulfil public demand. This was because the alternative — of holding the surplus notes themselves — would mean that a financial institution would incur the cost of funding a non interest bearing asset on its balance sheet. Over time, the volumes being transported each day grew in size and the associated risks and costs rose commensurately.

The principal feature of the NHTO scheme was that it allowed scheme members (the major financial institutions handling

(1) Large retailers may have arrangements to send their cash directly to industry cash centres.

(2) In 2009/10, the Bank destroyed notes worth £13 billion. The most recent withdrawal of a note series was of the £20 note bearing the portrait of Sir Edward Elgar. From 2007, this was gradually replaced with a new design featuring Adam Smith, which incorporates stronger anti-counterfeiting measures. The Elgar £20 was formally withdrawn on 30 June 2010; however, the Bank will always exchange its old series notes for current series notes (see [www.bankofengland.co.uk/banknotes/about/exchanges.htm](http://www.bankofengland.co.uk/banknotes/about/exchanges.htm)).

(3) In 2009/10, the Bank procured 1,369 million new notes from De La Rue, at a cost of £38 million.

(4) The Bank also stores new notes in the vaults of its head office at Threadneedle Street, London.

large quantities of notes) to be paid the face value for selling surplus notes to the Bank, but without physically returning those notes to the Bank. They could hold these notes — with no balance sheet funding cost — securely in their own cash centres until demanded by the public. This removed the financial incentive for physical movements of notes to and from the Bank. As a result, the NHTO scheme substantially reduced the transport costs and associated risks of commercial note distribution.

By 2001, note sorting was established as an activity wholly in the commercial sector and the NHTO scheme was replaced by the Note Circulation Scheme (NCS). The NCS incentivised greater efficiency in members' processes and improved the risk management of the overall scheme. Importantly, it retained as a central principle the mechanism for relieving members of the funding cost of holding notes that are being sorted, or held as surplus to current demand.

The NCS — described in more detail in the next section — remains in operation today, subject to periodic reassessment by the Bank to ensure the framework remains suited to achieving the Bank's objectives for the note circulation.

## The Note Circulation Scheme

The NCS framework allows the commercial sector to perform key functions in the middle of the note life cycle. That is, NCS members perform the activities to manage the circulation of notes after the Bank has issued new notes and until the notes are returned to the Bank for destruction. They facilitate notes entering and leaving circulation and sort, distribute and store notes without the direct operational involvement of the Bank.<sup>(1)</sup> There are few other countries in which the commercial sector plays such a large role in the note cycle, but more are now moving in this direction.

The manner in which these activities are performed by the commercial sector is critical to the Bank's ability to achieve its objectives for the note issue. Consequently, the Bank maintains a close interest in the operations of these commercial institutions and influences their behaviour through both the rules of the NCS and frequent bilateral contact.<sup>(2)</sup>

### Requirements of NCS membership

The NCS is a contractual framework: its members undertake to perform activities in accordance with the Bank's NCS rules. Membership of the NCS is open to institutions engaged in wholesale note processing: for example, financial institutions, specialist note processors, cash in transit companies or security companies. Potential members must fulfil a number of operational, financial and security-related criteria. There are currently five NCS members, which between them operate 28 NCS cash centres in England and Wales.<sup>(3)</sup>

A condition of NCS membership is compliance with clear requirements set by the Bank. These cover the physical security for the custody of notes owned by the Bank, the overall control environment, the conditions of custody and reporting procedures. Regular audits are conducted by the Bank to check the security and contents of members' cash centres.

Security standards are regularly reassessed and upgraded to mitigate new threats. An important upgrade occurred in the wake of the robbery of the Securitas NCS cash centre in Tonbridge, Kent in February 2006. Some £53 million was stolen, the largest ever cash robbery in the United Kingdom: reimbursement was, however, received immediately from Securitas for the notes belonging to the Bank, so there was no loss to the public sector. Following this incident, the physical security of note storage and the accompanying monitoring arrangements were immediately reviewed and more stringent requirements for NCS members were put in place.

All of these requirements are intended to protect the Bank — and therefore the public sector — from the financial and reputational risk of operating the NCS.

The following sections describe the key roles performed by NCS members, which are undertaken within their cash centres — the yellow box in **Figure 1**.

### Sorting

When used notes pass through an NCS cash centre, they will be checked by a sorting machine. In aggregate, NCS members sort some £200 billion of notes each year.

This process of machine sorting is a cornerstone of the NCS: financial institutions and other ATM operators have a strong reputational incentive to ensure that counterfeit notes are not recirculated to their customers. This in turn means the vast majority of notes acquired by the public will have been machine-authenticated as genuine.

Notes that are unsuitable for recirculation — whether because they are poor quality, or from a note series that is being withdrawn — are returned to the Bank for destruction. Any counterfeit notes identified are sent to the Bank for analysis, as explained in the box on pages 304–05. All NCS members are required to operate sorting machines that reliably detect counterfeit notes and the Bank regularly checks the performance of these machines.

(1) Typically, financial institutions requiring and/or receiving large amounts of notes have a contractual relationship with an NCS member and pay a fee for its services.

(2) Additionally, the Bank liaises with the cash industry at all levels of seniority through a range of fora, often organised in conjunction with the Payments Council, see [www.paymentscouncil.org.uk/payments\\_council\\_working\\_groups/-/page/783/](http://www.paymentscouncil.org.uk/payments_council_working_groups/-/page/783/).

(3) At 1 December 2010, the NCS members were: Bank of Scotland plc, G4S Cash Centres (UK) Ltd, Post Office Ltd, Royal Bank of Scotland plc and Vaultex UK Ltd (a joint venture between Barclays Bank and HSBC Bank).

## The note issue and the Bank's balance sheet

Notes that have been acquired from the Bank for their face value are termed 'in circulation'. These can be in a wide variety of locations of different accessibility — ranging from being in ATMs or bank branches awaiting dispense, to being in the hands of the public or in retailers' tills — illustrated by the blue area in **Figure 1** on page 303.

In accounting terms, only those notes that are 'in circulation' are a liability on the Bank's balance sheet. At that point, the Bank has received value from the commercial sector for the notes, at their face value. The Bank of England's balance sheet currently has around £50 billion of notes in circulation.

The NCS is designed to encourage efficient commercial processes. This is achieved by limiting the period over which the Bank buys notes that are being sorted by members.

### Surplus notes: storage and redistribution

The seasonal variation in the demand for notes means there is a significant stock of used notes that is surplus to the economy's requirements in between peak periods. For example, the stock of notes in circulation typically rises by around £4 billion ahead of the Christmas period. After Christmas, there is a significant reduction in this stock as public demand declines, which in turn results in surplus notes being sent to NCS members. Surplus used notes are stored in the vaults of the NCS members' cash centres but are purchased by the Bank so that NCS members do not incur any funding costs while storing them.

This arrangement has other benefits. It helps ensure a geographically dispersed stock of used notes, which supports efficient note distribution and gives widespread contingency supplies in case of any problems with the normal operation of the note cycle. It also means the Bank does not have to provide storage space for these surplus used notes.

These storage arrangements also facilitate the redistribution of surplus notes between NCS members. Some NCS members may service financial institutions that typically have surplus notes — in that the deposits they receive from customers, such as retailers, exceed the notes they send out, for example to fill ATMs. But other NCS members may service financial institutions that typically have a deficit of notes. These surpluses and deficits can be matched through the redistribution of notes between NCS cash centres. This helps reduce the stock of used notes in NCS cash centres, which in turn reduces the cost to the public sector of printing additional notes.

The Bank purchases low-risk assets to match this liability on its balance sheet, typically sterling money market instruments or government bonds. The income from these assets, after deducting the Bank's costs of managing the note issue, is paid to HM Treasury, as the Bank's shareholder. This net profit of the note issue is known as 'seigniorage' and can be a significant source of revenue for the government.

Most stocks of notes held by NCS members are not in circulation. They are neither a liability of the Bank, nor an asset of the commercial sector, as the Bank has paid the face value to the NCS member. Typically, around £10 billion of notes are held in the NCS, although this is subject to considerable seasonal variation.

The box above explains the accounting treatment of notes on the Bank's balance sheet and how this interacts with their movement in and out of NCS members' cash centres.

## The importance of denominational mix

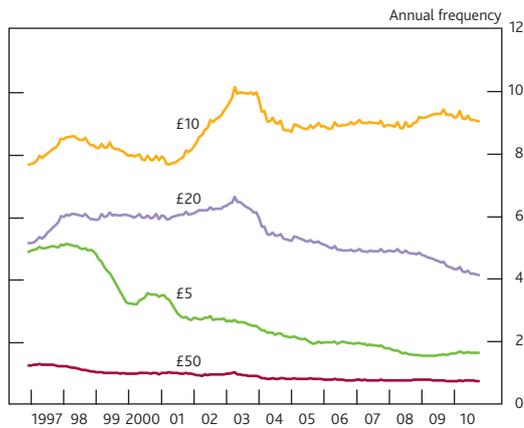
The Bank does not place any restrictions on the overall value of notes in circulation: it aims to meet public demand. However, it recently has adopted an active policy in influencing the denominational mix of notes available to the public. Primarily, this has been to address the suboptimal circulation of £5 notes. In recent years, the availability of good-quality £5 notes to the public has declined — a decline that the Bank believes must be addressed for notes to continue to fulfil an efficient transactional role.<sup>(1)</sup>

Higher-value denominations are more likely to serve as a store of value and so people will tend to hold them for longer. In contrast, lower-value denominations are used almost exclusively for consumer transactions and so should be more likely to pass through NCS cash centres for sorting. In general, therefore, higher-value denominations (such as the £50 note) might be expected to be sorted less frequently than lower-value denominations.

In practice, this relationship holds true for all denominations except £5 notes (**Chart 3**). A £5 note typically now passes through an NCS cash centre for sorting less than twice a year, far less frequently than a £10 or £20 note. Moreover, there has been a trend decline in the frequency with which £5 notes are sorted. A consequence of this has been a deterioration in the quality of £5 notes in circulation.

(1) The Governor drew attention to this problem in his Mansion House speech of 2007 (King (2007)). Recent developments are explained in Cleland (2010).

**Chart 3** Frequency with which notes pass through an NCS cash centre<sup>(a)</sup>

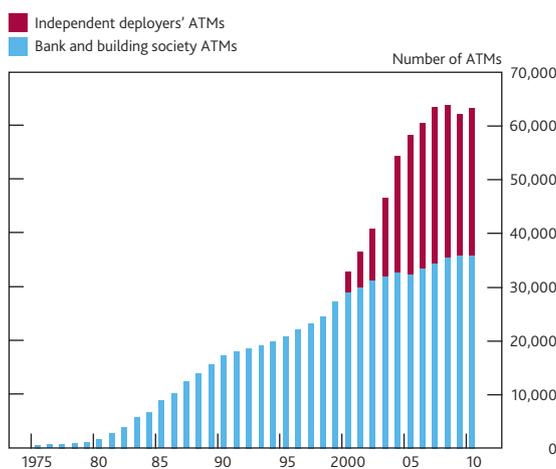


Sources: Bank of England and Payments Council.

(a) The average number of times a note passes through an NCS cash centre each year. Calculated as a twelve-month moving average of annualised monthly outflows from NCS cash centres divided by notes in circulation of that denomination.

The problem stems from there being few channels through which £5 notes enter circulation. As ATMs have become more prevalent (**Chart 4**), they have become the dominant channel through which the public obtains cash.<sup>(1)</sup> The public now acquires almost three quarters of its cash from ATMs, compared with only one quarter in the early 1990s. Yet very few ATMs dispense £5 notes. As a result, the public’s ability to acquire £5 notes is impaired, despite opinion surveys showing there is demand for the denomination. Those £5 notes that are in circulation tend to be repeatedly used for transactions between the public and retailers without returning to cash centres for sorting and potential replacement.

**Chart 4** Number of ATMs in the United Kingdom<sup>(a)</sup>



Source: Payments Council.

(a) Data for 2010 are provided for end-September; all other data are on an end-year basis.

To address this problem, the Bank is working with NCS members, financial institutions, ATM owners and retailers. The Bank has concluded that the long-term solution is for more

£5 notes to be dispensed through ATMs, accompanied by a greater supply of £5 notes to retailers for use as change.

In 2009, the Bank worked with HSBC to facilitate a wider understanding of the business case for ATM dispense of £5 notes and similarly with Sainsbury’s on the case for ordering more £5 notes as change items. Both pilot studies proved positive, demonstrating benefits to ATM owners and retailers — as well as to the public — from the greater dispense and use of £5 notes. All the major ATM owners have since committed to increase significantly the value of £5 notes dispensed and several large retailers are also working to increase the number of £5 notes they give as change.

Together, these initiatives should result in the availability of significantly more £5 notes to the public. By 2012, an extra £2 billion of £5 notes should be entering circulation each year, which will double the current rate. The quality of these £5 notes should also improve, as the Bank is requiring NCS members to sort £5 notes to a higher-quality standard than before.<sup>(2)</sup>

Nevertheless, the extent to which these initiatives will improve the circulation of £5 notes cannot be precisely predicted at this stage, so the availability and quality of £5 notes will remain under close review by the Bank.

Additionally, the Bank will be implementing changes to the design of the NCS in 2011, in part so the funding relief available through the NCS better supports the Bank’s denominational mix policy. The proposed new design will rebalance the funding relief currently provided, to recognise the additional costs in preparing £5 notes for recirculation.

## Future developments

There are many developments that can present challenges to the Bank’s objectives for the note issue — be they innovations in cash-handling technology, changes in cash use and alternatives to cash, or alterations in the structure of the industry. Most such developments take a number of years to become established, but sudden shifts in the cash landscape cannot be ruled out.

One example is the possible impact of cash alternatives such as contactless payment cards or mobile payments. These have the potential to alter the public’s demand for cash but — as with ATMs — their impact may only become apparent over a number of years. Outcomes are subject to many variables, including the scale of roll out and the public’s adoption of the

(1) The way in which ATMs have changed and ‘modernised’ the use of cash is discussed in a recent speech (Bailey (2009)).

(2) See the News Release, ‘Fivers — back on track’, 27 October 2010, available at [www.bankofengland.co.uk/publications/news/2010/083.htm](http://www.bankofengland.co.uk/publications/news/2010/083.htm).

arrangements. The same observations apply to whether greater use of self-service tills in retail outlets might influence the overall demand for notes and its denominational mix.

Another development is the use of note sorting machines that are small enough to be feasibly deployed in a retailer's premises or a financial institution's branches — in contrast to the industrial-scale sorting machines used in NCS cash centres. The Bank is mindful that the potential convenience and efficiencies from using such machines could be accompanied by a risk to note integrity were they to have inadequate authentication capabilities that allowed counterfeits to re-enter circulation. Therefore, as explained in the box on pages 304–05, the Bank is working with machine manufacturers to facilitate high standards of authentication capabilities in these, and other, note-handling machines.

The range of institutions involved in the cash cycle — from manufacturers of cash-handling machines to financial

institutions to retailers — makes widespread co-operation in day-to-day business essential. This becomes even more important in times of stress during which there could be a sudden impact on cash arrangements. Business continuity planning exists for a range of scenarios, including to maintain the cash circulation system in the event of disruption due to a pandemic, the preparation of which involved industry groups, a range of commercial organisations and several public authorities, including the Bank.

There have been enormous changes in note circulation arrangements over the past 50 years. The Bank's response to future developments will be consistent with the maintenance of its objectives for the note issue. That is, the priority is to ensure that genuine notes, of good quality and in a balanced mix of denominations, are available to the public.

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