

A Uniform Currency in a Cashless Economy

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Abstract

A number of questions can arise when considering the implications of a cashless society. This note considers whether cash is necessary for a uniform currency.

Bank topics: Bank notes; Digital currencies and fintech; Financial services; Payment clearing and settlement systems

JEL codes: E, E4, E41, E42, E5

Résumé

Le passage à une société sans argent comptant peut soulever de nombreuses questions. On analyse ici la nécessité des espèces pour assurer l'uniformité de la monnaie.

Sujets : Billets de banque; Monnaies numériques et technologies financières; Services financiers; Systèmes de compensation et de règlement des paiements

Codes JEL : E, E4, E41, E42, E5

1. Introduction

Recent work by Engert, Fung and Hendry (2018) examines the implications of a cashless society, covering a range of issues relevant to a central bank, including seigniorage, monetary policy, payments and financial stability. An additional question that might be raised in the context of a cashless society concerns maintaining a “uniform currency.” In a uniform currency, various media of exchange circulate, but they trade at a fixed one-to-one exchange rate. For example, in the 1800s, when each commercial bank issued its own dollar-denominated notes, a uniform currency meant that the banks could exchange their notes with each other one for one, at their face values. (This is also known as par-value exchange.) As a result, the bank notes could be used interchangeably for payments, without being subject to discounting or other frictions.

Private bank notes have long been supplanted by the cash issued exclusively by the central bank. But another form of commercial bank money—deposits—now accounts for the vast majority of the money used in the economy. (We use “bank” loosely here to refer to deposit-taking institutions generally.) For example, transferable deposits are well over [90 percent](#) of the narrow money supply measure M1+ (cash plus personal and non-personal chequable deposits). And bank deposit-money, regardless of the bank that issues it, is universally accepted at face value in Canada. For instance, Scotiabank deposit-money is treated the same as Bank of Montreal deposit-money, and the deposits of these banks (or any other) can be used interchangeably as money. In other words, the deposit-monies of different banks have a fixed one-to-one exchange rate and comprise a uniform currency.

Is cash necessary for a uniform currency? Consider the following transaction: a person could exchange a bank deposit for cash at face value and then deposit that cash at face value in another bank, thereby forcing a deposit transfer at face value via cash.¹ In this way, cash could be used to establish a fixed one-to-one exchange rate between different bank deposit-monies. In the absence of cash, obviously, it would not be possible to conduct this kind of transaction. So, without cash, would our uniform currency break down? In this note, we consider whether a uniform Canadian currency would continue in a cashless economy.

The next section provides some historical background, briefly recounting the experience of establishing a uniform Canadian currency in the 19th century. As will be seen, the institutional environment was very different than it is today. Section 3 then explains how a uniform currency is maintained in a contemporary setting and shows that cash is not important to achieve this outcome. As a result, a uniform currency would be maintained in Canada even if a cashless economy were to develop. Section 4 considers a related question: do electronic

¹ Deposits are typically redeemable at face value, and banks can swap cash deposits for reserves at face value with the central bank.

payment methods, which are subject to various fees, undermine a uniform currency? Section 5 provides concluding remarks.

2. Achieving a uniform currency in the past

In some periods of North American history, privately issued bank notes were used as a medium of exchange and the means of payment.² For example, in Canada in the 19th century, each commercial bank issued its own notes, denominated in dollars, that circulated as currency. Before 1890, these privately issued bank notes often were not exchanged with each other one for one at their face values (Fung, Hendry and Weber 2017). Instead, commercial bank notes were frequently discounted in exchange for the notes of other banks and when used in transactions for goods and services. The discounts varied by the bank of issue, by the geographical location of note use or redemption, and over time. This was widely seen as a source of considerable inefficiency that would be remedied by moving toward a uniform currency. Accordingly, a series of government interventions, introduced mainly through successive revisions to the *Bank Act*, established a uniform currency by removing the frictions that led to bank note discounting.

A key provision focused on reducing a friction due to the geographical distances between banks, which made note clearing and settlement costly in the 19th century. The *Bank Act* revision of 1890 required all commercial banks to establish note redemption offices in each major commercial centre in the country. In 1896, the government also provided for secure and efficient interbank note redemption and settlement by creating special large-denomination notes (called “Bank Legals”) that *only* banks could use to settle their interbank claims. And a series of *Bank Act* revisions in the late 19th century minimized the risks associated with holding the notes of failed banks by creating double-liability for bank shareholders (1871), a first lien for noteholders (1880) and a bank-financed note redemption fund (1890). As a result of these measures, banks and the non-bank public became indifferent to the notes issued by various commercial banks and treated them equivalently in trade. In other words, after the 1890 *Bank Act* revisions, a uniform currency emerged in Canada.³

3. A uniform currency today: Is cash required?

Nowadays, of course, private bank notes do not exist, and the Bank of Canada has long been the exclusive issuer of bank notes, i.e., cash.⁴ But instead of notes issued by commercial banks

² The medium of exchange is the asset transferred in exchange for goods, while the means of payment is the mechanism used to make the transfer. This is discussed further in Section 4.

³ Government-issued currency for public circulation (Dominion notes) was introduced shortly after Confederation (1867), but “the introduction of Dominion notes did not contribute to the uniformity of the Canadian currency” (Fung, Hendry and Weber 2017, 26). A comprehensive discussion of the Canadian experience is provided by Fung, Hendry and Weber (2017) and Johnson (1910). The related US experience is discussed in Weber (2014 and 2015).

⁴ Private bank note issuance was phased out after the creation of the Bank of Canada in 1935, and private bank notes ceased to circulate in Canada on January 1, 1950 (Fung, Hendry and Weber 2017).

as media of exchange, these days commercial bank deposit-money dominates money and trade. In other words, there are still multiple media of exchange in a modern economy: the electronic deposits issued by various commercial banks and the physical cash issued by the central bank. And the deposit-money of every bank exchanges one for one with the deposit-money of every other bank. In other words, deposit-money is part of a uniform currency.

As Weber (2015) points out, when there are multiple media of exchange, like privately issued deposits of different banks, some type of mechanism is generally required for them to be a uniform currency, such as a monetary authority willing to exchange the different media at a fixed rate at no cost to the holder. In that case, the public can be confident that any deposit-money they receive will be credited at face value by their own bank because it is certain to be credited at face value by the monetary authority in the interbank clearing and settlement process. As a result, the deposit-money of any bank can circulate and be universally accepted at face value, without discount.⁵

In this regard, the core payment system is the critical factor that assures one-to-one face-value transfers of bank deposit-money and therefore a uniform currency. This mechanism is summarized in the following points:

- Canada's core payment system is the Large Value Transfer System (LVTS), and *all* non-cash payments in the economy ultimately settle through this system. This means that the vast majority of economic transactions in the economy (virtually all by value) settle via the LVTS.
- The LVTS is a collateralized, deferred net settlement system, with a Bank of Canada settlement guarantee for extreme tail risks, including the simultaneous closure of several major banks. Given the rigorous risk controls of the LVTS and assured settlement provisions, the LVTS provides for *certainty of settlement*.⁶
- When financial institutions send payment messages over the LVTS, corresponding equivalent transfers of risk-free central bank reserves from the accounts of paying banks (in a net debit position) to the accounts of receiving banks (in a net credit position) are certain to occur in the Bank of Canada's ledger at the end of the day.
- Put differently, the central bank (and, by extension, the federal government) guarantees redemption of commercial bank deposit-money at face value for central bank reserves. This means that the Bank of Canada guarantees a fixed one-to-one exchange rate between different bank deposit-monies and so establishes a uniform Canadian currency. Further, given certainty of settlement in reserves on the books of the Bank of Canada, when a payment message is sent over the LVTS by a bank on behalf of a customer, the

⁵ See also Committee on Payment and Settlement Systems (2003).

⁶ For more on the LVTS, see this Bank of Canada (2016) [backgrounder](#) and Arjani and McVanel (2006). Daniel, Engert and Maclean (2005) discuss the Bank's role in guaranteeing settlement under extreme conditions. (An adequate real-time gross settlement, or RTGS, design would lead to the same conclusions.)

face value of that payment can also be credited immediately (in real time) to the recipient's bank account.

- To smooth the operation of the system (and to provide a fulcrum for monetary policy), the Bank of Canada also stands ready to provide collateralized, interest-bearing overnight loans to banks in a net debit position. The Bank also accepts interest-bearing overnight deposits from banks in a net credit position. (For more on this, see Engert, Gravelle and Howard 2008.)

This mechanism at the core of the financial system ensures that all bank deposit-money is exchanged **one to one** at face value in the daily clearing and settlement process, and therefore ensures a uniform currency. This outcome is buttressed by deposit insurance (since 1967) and open-bank resolution methods, such as [bail-in](#), which applies to the [six major Canadian banks](#) and the [Desjardins Group](#). (This means that these institutions would remain open and provide banking services even while being resolved.)

As a result, banks and the non-bank public are indifferent to the various bank-deposit media of exchange. Cash does not play a role in this mechanism and is immaterial to the establishment of a uniform currency. Therefore, a cashless economy would not lead to the breakdown of a uniform Canadian currency made up of commercial bank-deposit money. Note, however, that another form of central bank money—reserves—plays a critical role in this process and is essential for a uniform currency.⁷

4. Do electronic payment methods undermine a uniform currency?

Earlier, we noted a distinction between the medium of exchange—the asset transferred in exchange for goods or services—and the method of payment, which is the mechanism used to transfer the medium of exchange. Put differently, the medium of exchange indicates “what” is paid, and the method of payment concerns “how” that asset is conveyed to the recipient, such as a debit or credit card (Zang 2007). Bank notes or cash, whether issued by commercial banks or by the central bank, are simultaneously a medium of exchange and a method of payment. And with cash as the method of payment, transfers between buyers and sellers are “zero-sum.” That is, the amount of money transferred by a payer (such as a customer) in a cash transaction is always equal to the amount received by the payee (a merchant, for example).

But this characteristic—a zero-sum transfer—does not generally hold for electronic payments. That is, with electronic payments, a customer often pays a different amount of money than

⁷ While cash is not necessary for a uniform currency, it provides other benefits as a method of payment and store of value, notably, immediate settlement finality and complete privacy (anonymity) in use. Engert, Fung and Hendry (2018) discuss possible concerns that could arise in a cashless economy.

the merchant receives. Does this mean that electronic payment methods contradict or undermine a uniform currency?

A feature of the contemporary payments landscape is a variety of electronic methods of payment, such as debit card transfers, credit card transactions and Interac e-Transfer.⁸ These electronic methods of payment are network-based and make it possible to manage access to the network and cross-subsidize between network participants (Chiu and Wong 2015). As a result, these arrangements can have a range of fee structures. These fees include, for example, interchange and acquirer fees, which merchants pay to participate in the payment network; in turn, these fees can be reflected in merchants' prices. Other types of payment methods, such as Interac e-Transfer or large-value wire payments, can also be subject to a transaction cost paid to transfer bank deposit-money.

As a result of such fees, electronic methods of payment generate "non-zero-sum" transfers, where payers pay different net amounts than payees receive in a transaction—in contrast to the zero-sum transfer of cash transactions.⁹ But all the deposit-money received through these methods is still credited by recipients' banks at face value, given the mechanism described in the preceding section. Therefore, the public remains indifferent to the various bank deposit-monies (media of exchange) that underpin exchange in the economy, regardless of the method of payment. In other words, the non-zero-sum nature of electronic methods of payment is not inconsistent with a uniform currency.

5. Concluding remarks

Since the Bank of Canada guarantees the exchange of bank deposit-money at a fixed one-to-one rate in the daily interbank settlement process, we have a uniform Canadian currency. Deposit-money of different banks is universally accepted at face value, and the general public is indifferent to these various media of exchange. Cash plays no role in the interbank settlement process that is critical to this outcome, and so a uniform Canadian currency would continue in a cashless economy.

⁸ For more on the methods of payment used in Canada, see Henry, Huynh and Welte (2018) and Huynh (2019).

⁹ Chiu and Wong (2015) analyze digital payment networks in the context of electronic money. They show that non-zero-sum transfers are efficient outcomes in those arrangements (in terms of resource allocation and economic welfare).

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