



Money, Banking, and Financial Institutions

Chapter 3 : Money Supply Process

Komla Avoumatsodo

January 14, 2025

Faculty of Business and Economics

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Learning Objectives

1. List and describe the "three players" that influence the money supply.
2. Classify the factors affecting the Bank of Canada's assets and liabilities.
3. Identify the factors that affect the monetary base, and discuss their effects on the Bank of Canada's balance sheet.
4. Explain and illustrate the deposit creation process through T-accounts.

Players in the Money Supply Process

Three Players in the Money Supply Process

- ▶ **The central bank** : the government agency that oversees the banking system and is responsible for the conduct of monetary policy.
- ▶ **Banks (depository institutions)** : The financial intermediaries that accept deposits from individuals and institutions and make loans
- ▶ **Depositors** : Individuals and institutions that hold deposits in banks

The Central Bank

Table 1: Simplified Central Bank Balance Sheet

	Assets	Liabilities
Government's Bank	Cash (foreign currency)	Currency in circulation
	Investments	Government deposits
Banks' Bank	Loans to banks	Bank deposits

- Cash (foreign currency) includes bonds issued by foreign governments.
- Investments consist of Treasury bills and government bonds issued by the Canadian government.
- Loans to banks are loans provided to Canadian banks.
- Currency in circulation are bank notes or coins in the hands of the public (Coins are issued by the **Royal Canadian Mint**).

Control of Monetary Base

- ▶ **Reserves** are all deposits of the LVTS¹-associated banks held at the Bank of Canada (and also their vault cash)
- ▶ **Monetary Base** is defined as the sum of the total reserves of commercial banks and currency in circulation : $MB = M_0 + R$
- ▶ The Bank of Canada controls the monetary base through **open market operations** and **advances to banks**.

¹LVTS : Large Value Transfer System

Open Market Operations

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- ▶ **What if depositors would like to keep an extra \$100M of their money in the form of currency?**
 - \$100M increase in M_0
 - Reserves in the banking system fall by \$100M
 - Yet, the action of the public has not affected the monetary base

Open Market Policies and Advances from the Bank of Canada: Summary

- ▶ Immediate effect of an open market purchase/sale or an advance to a bank is an increase/decrease in reserves in the banking system
- ▶ Ultimate effect on reserves depends on what banks do with these reserves.
- ▶ Next, we'll talk about the mechanisms of **Multiple Deposit Creation**

Multiple Deposit Creation

The Role of Banks in Money Creation: Intuition

- ▶ Through a loan or a bond purchase, the Bank of Canada **injects reserves** into the banking sector.
- ▶ Using these reserves, **banks can lend new funds** to their clients.
- ▶ These new loans constitute money, as they create **new deposits** in checking accounts.

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- ▶ These new loans are spent, and **the amounts are redeposited**.
- ▶ The banks that receive these deposits see their own **reserves increase**, and they too can start **lending**, thereby increasing the money in circulation.

- ▶ When they receive a deposit, banks keep a fraction in reserve to allow for withdrawals and lend out the rest.
 - We refer to a **fractional reserve** banking system
 - In some countries (not in Canada), there may be **minimum reserve requirements** imposed on banks.

Fractional Reserve Banking System

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 - We refer to a **fractional reserve** banking system
 - In some countries (not in Canada), there may be **minimum reserve requirements** imposed on banks.
- ▶ In the following example, let us assume that each bank keeps 10% of every new deposit as reserves and lends out the remaining 90%.

An Example of Money Creation

- ▷ The Central Bank purchases a \$1,000 bond from **Bank A**, increasing its reserves by \$1,000.
- ▷ Bank A loans \$1,000 to its **Mr. B**, who spends it. **Mrs. C** receives this money and deposits it at **Bank E**.
- ▷ Bank E loans \$900 to **Mrs. F**, who spends it. **Mr. G** receives this money and deposits it at **Bank H**.
- ▷ Bank H loans \$810 to **Mr. I**, who spends it. **Mrs. J** receives this money and deposits it at **Bank K**.

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- ▶ Money takes two forms: M_0 and D , each time a new loan is made, someone (B, F, or I in the example) sees their checking account increase.
- ▶ The total money created is therefore $\$1,000 + \$900 + \$810 = \$2,710$.

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Attention: *A loan creates additional money, without creating additional wealth.*

Money Creation: Summary

- ▶ **Money is created** when two things happen:
 - An inflow of funds into the banking system;
 - These funds are **lent** out.

- ▶ In conclusion, the Bank of Canada **only adds reserves**. From these reserves, the banking system contributes (involuntarily) to the creation of money.

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- ▶ To know the answer, one must measure the **money multiplier**.

The Money Multiplier

The Money Multiplier

- ▶ Link the money supply M_1 to the monetary base MB and let m be the money multiplier.
- ▶ The relationship is described by the following equation: $m = \frac{M_1}{MB}$.
 - This ratio tells us how much money is created from an additional \$1 of reserves.
 - In Canada, it was 9.94 in 2017.

Deriving the Money Multiplier

► By definition, $m = \frac{M_1}{MB} = \frac{M_0 + D}{M_0 + R}$

► Dividing both the numerator and the denominator by D , we find :

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► The money multiplier depends on two ratios.

1. The ratio that measures the proportion of currency to deposits M_0/D

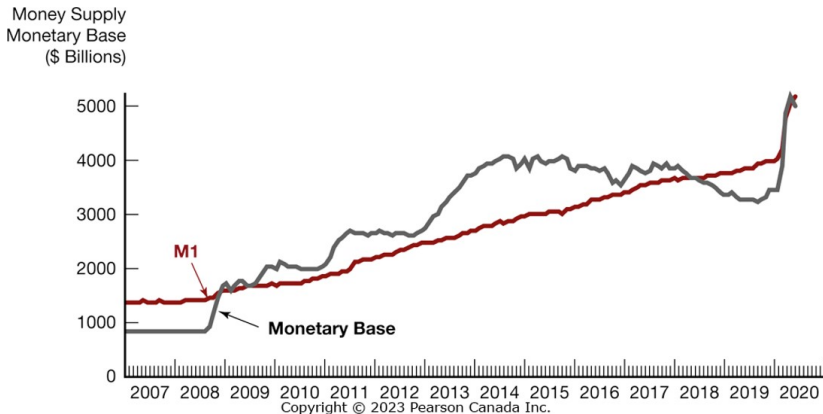
- It is influenced by **households**, who decide **what proportion of their money to hold in cash** (currency) and what proportion to leave in the bank.

2. The ratio that measures the proportion of reserves to deposits R/D

- It is influenced by the deposits received and by **the banks**, which decide **how much to lend** and how much to keep in reserves.

Quantitative Easing and the Money Supply, 2007-2020

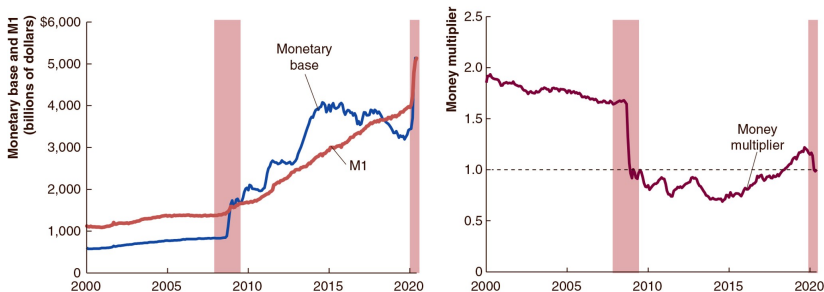
Figure 1: M_1 and the Monetary Base in the United States, 2007-2020



- ▶ In percentage terms the money supply rose by substantially less than the monetary base during the two quantitative easing episodes, the global financial crisis and the coronavirus pandemic.

Quantitative Easing and the Money Supply, 2007-2020

Figure 2: Reactions of the Money Multiplier and Money Supply to Changes in the Monetary Base in the United States, 2007-2020

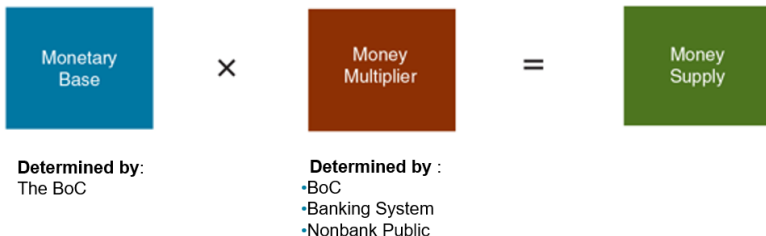


► Household and banking system responses to Central Bank monetary policy **vary** across crises and **evolve** over time.

Key Takeaways

Key Takeaways : Money Creation

- ▶ How can the Bank of Canada initiate the money creation process?
- ▶ How is this process completed through the actions of banks and households?
- ▶ The money multiplier depends on two key factors:
 - households' decisions about how much cash to hold and how much to leave in the bank.
 - banks' decisions about how much to lend and keep in reserves.



- ▶ Understanding these ratios helps explain how additional reserves can lead to an increase in the money supply.