The Measurement of Monetary Aggregates According to the International Standard

Maayan Kellerman*

Abstract

Due to Israel joining the Organization for Economic Cooperation and Development (OECD), the Information and Statistics Department adjusted the definitions and the calculation of the monetary aggregates in Israel to the international definitions set by the International Monetary Fund (IMF). The main aggregate for measuring the money stock—the "broad money" aggregate—includes the most liquid instruments, such as cash and demand deposits, but also other less liquid instruments, such as short-term bills (known as makam). The main difference between the broadest monetary aggregate calculated until now in Israel—M3—and the broad money aggregate derives from the development in the last few decades of new instruments and issuers, which were not taken into consideration in the previous definition, such as money market funds (MMFs). Since the transition to an inflation targeting regime in monetary policy management in Israel and in many other countries, the monetary aggregates no longer serve a central role in determining monetary policy. Nevertheless, policy makers examine many indicators when assessing the policy required to attain the inflation target, among them the development of the monetary aggregates, as an additional source of information on the state of the economy.

* Information and Statistics Department, Bank of Israel

1. Introduction

Israel's ascension to the OECD[1] obliged it to meet international standards required by the Organization in various fields, including statistics. Within this framework, the Bank of Israel's Information and Statistics Department is working on, among other things, meeting international standards in the area of financial and monetary statistics. Adherence to international definitions in this field allows decision makers and analysts in Israel and globally to make international comparisons on the basis of uniform data. The importance of this factor increases as Israel becomes more closely integrated into the global economy.

One of the main areas of responsibility of central banks is the management of monetary policy in the economy as a tool for maintaining price stability. Money is a key element in the transmission mechanism between monetary policy and economic activity and inflation. Consequently, understanding the concept of money and the factors affecting it is important for central banks and economists. However, since the transition to an inflation targeting regime in the management of monetary policy in Israel and in many countries, monetary aggregates no longer serve a central role in determining monetary policy. In an inflation targeting regime the main tool is setting interest rates and not direct control over the money stock. Policy makers examine many indicators in order to assess the policy required to achieve the inflation target, specifically inflation expectations, which greatly affect the way prices are determined and the future inflationary process. However, decision makers and economists still also examine the development of the monetary aggregates as an additional source of information on the state of the economy and in order to monitor changes in the source and use of money in the economy.

Since the last financial crisis, monetary policy worldwide has been accommodative and this is expressed, in Israel as well, in interest rates that are low and, in some countries, even negative, and by quantitative easing—in other words, the injection of liquidity by the central bank.[2] In such an environment, it is particularly interesting to examine the effect of low and even negative interest rates in some countries on the behavior of the various monetary aggregates.

The Information and Statistics Department recently adjusted the data on Israel's monetary aggregates to the international standard, and the new data are already being reported to international organizations and displayed on the Bank's website.[3] This paper describes the definitions and the way the monetary aggregates are measured in Israel based on IMF guidelines adopted by the OECD as an obligatory standard for member countries, and demonstrates them with the help of data presented on the monetary aggregates in Israel and by comparing them with data from OECD countries.

[1] Currently, 34 developed countries are members of the OECD.

[2] For more on the subject of quantitative easing (QE) and other monetary tools, see "Unconventional monetary policy—goals and means" in the Monetary Policy Report for the second half of 2013.

[3] http://www.boi.org.il/en/DataAndStatistics/Pages/MainPage.aspx?Level=3&Sid=23&SubjectType=2

2. The Broad Money Aggregate

Money is described as an instrument that meets three criteria:
1. Serves as a unit of account: goods and services are measured in terms of money;
2. Store of value;
3. Accepted as a means of exchange for goods and services.

The International Monetary Fund established a uniform definition of monetary aggregates for all the countries, and the same definition is also obligatory for OECD countries.[4] The main aggregate for measuring the money stock, as determined by the International Monetary Fund, is called "broad money" and includes the most liquid monetary components, but also other instruments used for savings purposes and for carrying out transactions. According to IMF guidelines, the methodology is implemented based on a detailed balance sheet (an MFS report) of assets and liabilities of the central bank, the commercial banks, and other financial corporations.

Each aggregate of the money stock has three dimensions: the instruments or the financial assets, the sectors issuing financial instruments and the holding sectors.

2.1 The financial assets considered as money

Money, expressed as various types of financial assets, is held as means of exchange. Therefore, when defining the broad money aggregate an assessment is needed of the liquidity of the various financial assets. The term liquidity relates to the extent to which the asset can be sold on short notice and at a price equal to or very close to the market price. The most liquid financial assets are cash and demand deposits—they can be used immediately and at their full nominal value to purchase goods, services and assets. Other, less liquid, assets are also included in the definition of the broad money aggregate. It was therefore decided by the International Monetary Fund to include in broad money all the other low risk financial assets with original terms of maturity up to two years.[5] The instruments included in broad money according to the IMF[6] are:

- Cash;
- Demand deposits;
- Non-demand deposits with an original maturity period of up to two years;
- Bonds issued with an original maturity period of up to two years;

[4] International Monetary Fund (2000), Monetary and Financial Statistical Manual.
Burgess S. and Janssen N. (2007), 'Proposals to modify the measurement of broad money in the United Kingdom: a user consultation', Bank of England.

[5] It is reasonable to suppose that short instruments in terms of the period remaining until repayment are a more accurate indicator that these instruments will be used for exchange purposes. But according to the IMF, the original period of maturity (the repayment period at the date of issue) should be referred to because of the need to create a fixed criterion for international comparisons and the difficulty various countries have reporting according to the remaining period.

[6] Each country is entitled to make adjustments according to the structure and limitations of the data, with IMF permission.

- Repo transactions for a period of up to two years.[7]

It is important to note that included in the definition of broad money are those instruments in both domestic and foreign currency and for all indexation types. It is also important to stress that in a world in which financial systems are constantly changing, it is necessary to monitor instruments that need to be included in the broad money aggregate. For example, the use of electronic means instead of money will require a reappraisal of the definition of aggregates.

2.2 Issuers of money instruments

Issuers of money instruments are financial institutions issuing instruments used by their holders as a means of exchange (money issuers). There are two methods for defining the issuing sector: on a legal basis or on a functional basis. The first, which is employed for example in the UK, includes institutions that have been authorized by the law to accept deposits, for the most part the central bank and the commercial banks. In the second method, which is employed in the eurozone, in the US and in Israel, also taken into account are financial intermediaries, which are not the central bank or the commercial banks, such as money market funds, entitled to issue an instrument which is effectively a substitute for money, but officially cannot accept deposits.

The sectors and institutions issuing financial instruments in Israel included in broad money according to the functional method are:

- The central bank;
- The commercial banks – including branches of foreign banks in the country;
- The government;
- The money market funds;
- The Postal Bank.

2.3 The money holding sectors—the public

The money holders are all the sectors in the economy (Israeli residents), apart from the money issuers and nonresidents:

- Households;
- Nonfinancial companies;
- Financial corporations not included in the issuing sector (for example, institutional investors);
- Local municipalities.

According to IMF directives, the reason that nonresidents are not included in the money-holding sector is based on the assumption that most nonresident deposits in the local market are used as a

[7] A repo transaction is one in which party A purchases from Party B a security and undertakes to sell it back on a date known in advance at a price determined in advance on the day the contract is signed.

means of exchange outside the Israeli economy, whereas the broad money aggregate is intended to reflect the money used for local market activities.

3. Measuring the Broad Monetary Aggregate in Israel

Following is a breakdown of the broad money aggregate components, with the part included in the aggregate being only holdings by the holding sectors (the public):

- Cash – Calculated as the money (banknotes and coins) issued in circulation by the Bank of Israel less cash held by the banks[8];
- The public's NIS demand deposits;
- Deposits in NIS and foreign currency for up to a year[9] according to the original maturity period, including demand deposits in foreign currency.
- Money market funds (MMFs) – Mutual funds that invest their assets in short-term fixed income channels, such as short-term central bank bills (makam). Funds deposited in money market funds are liquid and low risk since they can be redeemed on any trading day and are therefore included in the broad money definition. There are countries such as the United States where it is possible to write a check against deposits in these funds. The money funds in Israel were set up at the beginning of 2008 and there are currently (as at the end of 2015) 36 such funds.
- Makam and government bonds originally issued for a period of up to two years—included in this item are makam which are non-interest bearing bills with a maturity period of up to a year, issued by the Bank of Israel, as well as government bonds issued with an original maturity period of up to two years.
- Deposits in the Postal Bank—The Postal Bank Ltd. was incorporated in Israel and began operating on March 1, 2006 as a subsidiary of the Israel Postal Company Ltd. and operates pursuant to the Postal Law. The Postal Bank's main services are collection for various beneficiaries; management of clearing accounts; domestic and international money transfers; foreign currency conversion and the issuance of debit cards; clearing services and various auxiliary services to holders of clearing accounts in the bank. As part of these services the public makes deposits in the Postal Bank. It is important to note that the Postal Bank is not considered a commercial bank since it does not give credit and is not subject to the Banking Law, and is therefore also not subject to supervision by the Bank of Israel.

Bonds issued by the banks and repo transactions of the central bank and the banks with the public with a maturity period of up to two years—These instruments were not taken into account since

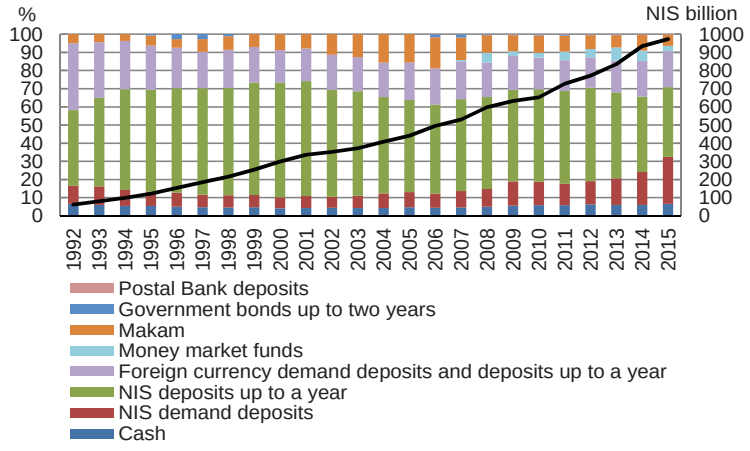
[8] It is possible that cash held by foreign residents is also included in this item, although the assumption is that it would be a small amount.

[9] Although the international definition is deposits with an original maturity period of up to two years, because of data limitations only deposits for up to a year are included.

they are not reported in the financial statements of the central bank and the banks in the format required for broad money aggregate measurement purposes. In any event, an analysis of the banks' financial statements shows that the amount is a negligible percentage of the total broad money aggregate (less than one percent in 2014) and therefore its non-inclusion does not substantially change the measurement of broad money.

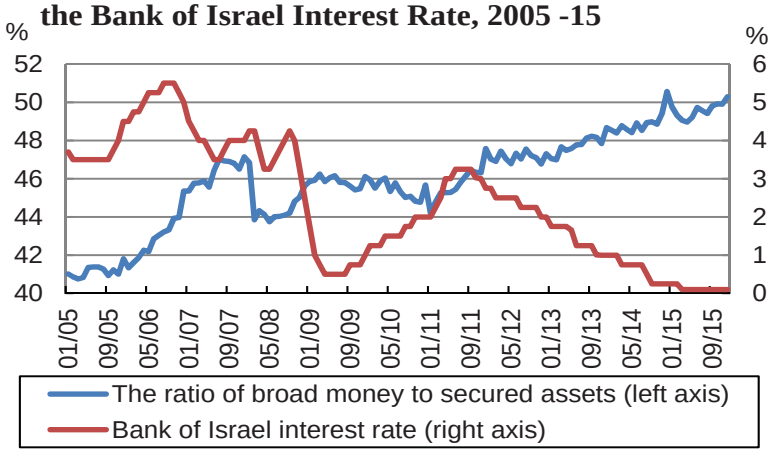
As an example of the methodology and its significance, the following two diagrams show data on the broad money aggregate in Israel: Figure 1 shows total broad money and the distribution of its components, and Figure 2 shows the ratio of broad money to the secured assets held by the public and Bank of Israel interest rate.

Figure 1
Broad Money and the Distribution of its Components, 1992-2015



SOURCE: Bank of Israel.

Figure 2
The Ratio of Broad Money to Secured Assets*, and the Bank of Israel Interest Rate, 2005 -15



*Secured assets – government bonds, makam, deposits and cash.
SOURCE: Bank of Israel.

Following are a number of points that should be made regarding the development of the broad money aggregate and its components:

- From 1992 until 2015, there was an almost continual increase in all components of the broad money aggregate;
- The most dominant instrument is NIS deposits for up to a year, which make up 38 percent of the total aggregate in 2015;
- In the last few years, the public's total demand deposits in the banks have increased at a brisk rate, and at the end of 2015 they were 26 percent of the total broad aggregate, compared with 10 percent in 1992, while the weight of cash held by the public remained stable at around 6 percent;
- Foreign currency checking deposits and other deposits in foreign currencies for up to a year also increased during the measurement period, although the total weight of the broad aggregate dropped from 37 percent at the end of 1992 to 20 percent at the end of 2015.
- The public's holdings of makam comprise 6 percent of the total broad aggregate as at the end of 2015;
- The money market funds, which began operating in Israel at the beginning of 2008, contributed about 3 percent at the end of 2015, compared with 6 percent at the end of 2014;
- The share of the aggregate of deposits in the Postal Bank and government bonds for up to two years is low (less than 0.5 percent as at the end of 2015);
- The ratio of broad money to secured assets, including—beyond broad money—government bonds and longer term deposits, has increased in the last few years along with a reduction in Bank of Israel interest rates. The significance is that the public is inclined to hold more liquid assets and for a shorter time, since there is less profit from waiving the holding of these assets.

The data sources are Bank of Israel accounting, the balance sheets of the financial banks reporting to the Bank of Israel—data on the public's deposits in the banks, the monthly reports published by the money market funds according to the directives of the Securities Authority, the annual financial statements of the Postal Bank, and Bank of Israel calculations.

4. Other Monetary Aggregates in Israel and Their Comparison with the Broad Money Aggregate

In 1980, the US Federal Reserve established definitions for the measurement of the money stock. Consequently, the following monetary aggregates were defined in Israel.
M1 = Cash held by the public and NIS demand deposits of Israeli and foreign residents, excluding interest-bearing checking accounts;
M2 = M1 with the addition of interest-bearing checking accounts and unindexed deposits for up to a year (pahak and pazak);
M3 = M2 with the addition of CPI-indexed deposits, foreign-currency denominated and indexed deposits for up to a year.

In monitoring the development of the money stock, the Bank of Israel uses the monetary aggregates data in the different definitions—the broad money aggregate and its components with the addition of M1 and M2 as explained above.

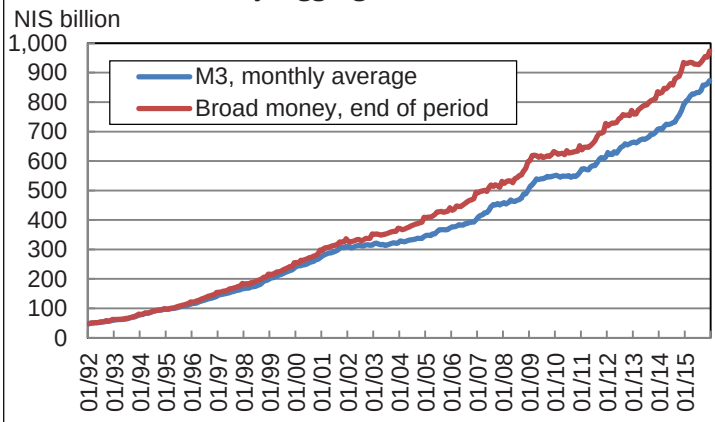
The M1 and M2 definitions in Israel are different from the international definitions –

- According to an IMF recommendation for the definition of the narrow monetary aggregate (M1), it should include cash held by the public with the addition of the public's NIS demand deposits in the banks. However, the M1 that the Bank of Israel presents and calculates includes only non-interest-bearing checking deposits since it is the narrowest aggregate and includes components without interest and indexation, and for historic reasons, these deposits are included in the components of M2.
- Included in M1 and M2 are nonresidents' deposits on the assumption that in a small economy like Israel's, nonresidents will use their deposits in the economy itself and not outside it.
- Moreover, the Bank of Israel calculates M1 and M2 on an average of the days in a month compared with the end of month data required in the calculation according to the IMF definitions, and that is because of volatility during months. The average provides a better description of the use of the monetary aggregate according to activities in that month and other conditions. In a datum that relates to only a single day, there is great volatility, especially at the end of the year, which does not reflect the basic economic factors that determine the demand for money.

A comparison between M3 and the broad money aggregate

Since 1992, M3 and broad money have been increasing, with the difference between them growing over the years (Figure 3). The main difference between M3 and the broad money aggregate according to the International Monetary Fund and the OECD requirement is the result of the development of new instruments and issuers in the last few decades, such as the money market funds, which were not taken into account in the definition of the M3 aggregate. Consequently, the advantage of adopting the measurement in Israel according to the international standard is not only in allowing an international comparison but also in giving proper expression to the developments that have occurred in the last few years in new instruments that comprise part of the money and that were not taken into account in previous definitions.

Figure 3
The Broad Money Aggregate and M3, 1992-2015



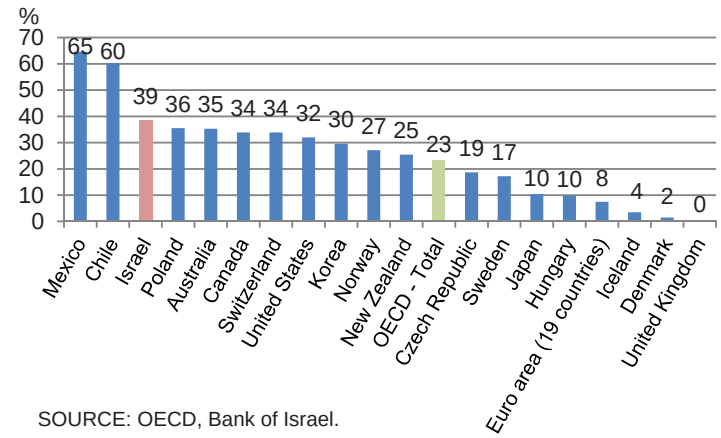
SOURCE: Bank of Israel.

5. International Comparison

In order to make a significant international comparison of the broad money aggregate, a comparison is shown below of the rates of change in broad money during a period for which we have data, and the relationship between broad money and GDP in selected OECD countries is shown as well.

It can be seen that from 2010 until 2014 (after the financial crisis that erupted in 2008), Israel's broad money aggregate increased by 40 percent, whereas the index of all the OECD countries combined increased by only 23% (Figure 4). This is against the background of three variables:

Figure 4
Rates of Change in the Broad Money Aggregate from 2010-14, Selected OECD Countries



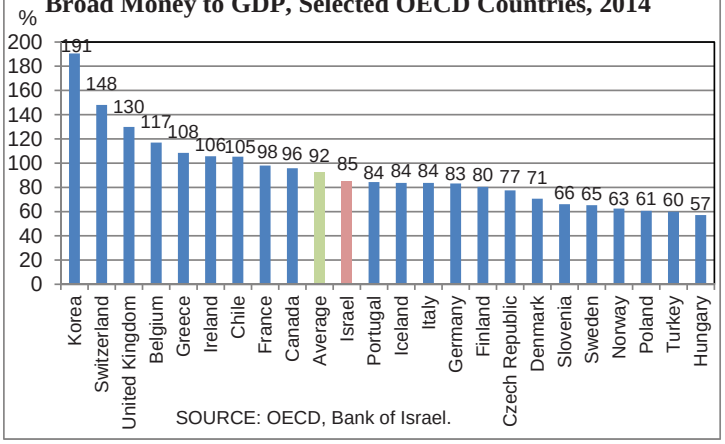
SOURCE: OECD, Bank of Israel.

1) Higher growth in Israel: An increase of approximately 4.6 percent in GDP in the period compared with an estimated 1.7 percent on average for the OECD countries.

2) Slightly lower inflation in Israel: Cumulative inflation of 7.4 percent in 2010–14, compared with 8.7 percent, on average, for OECD countries.

3) A lower average level of the central bank interest rate in Israel throughout the entire period: 1.8 percent compared with an average of 2.2 percent for most of the OECD countries.

Figure 5
Broad Money to GDP, Selected OECD Countries, 2014



SOURCE: OECD, Bank of Israel.

In a comparison between the ratio of the broad money aggregate to GDP for OECD countries for December 2014 data: At 85 percent, the ratio for Israel is close to the average of the selected OECD countries, which was 92 percent (Figure 5). It is important to note that the differences between countries are attributable to a large number of structural factors which require thorough analysis but are not included within the scope of this paper.