DEFINITION OF MONEY SUPPLY

The current practice of excluding short-term Exchange Fund placements from the monetary aggregates has introduced minor statistical distortions. In order to address this issue, a slight revision will be made by including all Exchange Fund placements in money supply statistics. The revised data, as well as their relationship with macro-economic variables, are little affected by the change.

I. Introduction

The HKMA compiles several measures of monetary aggregates. Nevertheless, because of the peculiar treatment of the Exchange Fund's placements with the banking system, minor statistical distortions would arise under certain circumstances. This paper reviews the definition of money supply in Hong Kong, and sets out a proposal for revising it.

Section II reviews the current definition of money supply in Hong Kong, and shows how the treatment of Exchange Fund placements in the monetary data may give rise to statistical distortions. Section III discusses some conceptual considerations regarding the treatment of Government and Exchange Fund's deposit holdings in the money supply. Section IV examines the empirical considerations regarding changes in the money supply definition, and a revision is proposed in Section V.

II. Definition of Money Supply

In Hong Kong, several measures of money supply are compiled:

M1 = currency held by public + demand deposits

M2 = M1 + savings and time deposits with licensed banks + NCDs issued by licensed banks and held by the public

M3 = M2 + deposits with restricted licensed banks and deposit taking companies + NCDs issued by restricted licensed banks and deposit taking companies and held by the public

These aggregates can be further broken down into Hong Kong dollar and foreign currency components.

The types of liabilities included in the money supply are similar to those in other economies. There are, however, a number of differences (see **Annex I** for definitions of money measures in other economies). First, for a number of industrial economies, the monetary aggregates include a larger set of instruments, such as repos and money market funds. However, such instruments are considered inappropriate for inclusion in the money supply in Hong Kong as they lack liquidity. Secondly, in most other economies, the monetary aggregates are compiled on a resident-holding basis. In contrast, in gathering Hong Kong's money supply figures, we do not differentiate between holdings by resident and non-resident entities.[1]

The third difference relates to the treatment of Government and Exchange Fund placements with banks. Government's deposit holdings are included in the Hong Kong dollar broad money, whereas in most other economies they are

1 Nevertheless, in respect of Hong Kong dollar money supply, it is reasonable to assume that most holdings are held for domestic use, i.e. by entities with an economic interest in Hong Kong. As for the foreign currency component, its interpretation is complicated by the lack of information about the size of non-resident deposits in our banking sector.

excluded. Furthermore, Exchange Fund placements with a maturity of over one month are counted as customer deposits, and hence included in the money supply figures (see box below).

Broad monetary aggregates

Including:

Treasury deposits

Exchange Fund deposits with maturity above one month

Excluding:

Exchange Fund deposits with maturity of one month or below

Exchange Fund placements with a remaining maturity of one month or below have been excluded from the monetary aggregates since May 1979. This followed a decision to deduct such placements from banks' liquefiable assets in calculating their liquidity ratios. Against a background of rapid credit growth, the measure was introduced with the aim of preventing short-term Exchange Fund placements from contributing to banks' credit expansion. Nevertheless, the effect of the measure on credit growth appeared to be minimal: the liquidity requirement was a prudential, rather than a monetary tool; and most banks had a liquidity ratio considerably higher than the required minimum.

As the treatment of short-term Exchange Fund placements is different from that of longer-term Exchange Fund placements and Government deposits, small statistical distortions arise under two situations. First, it may result from fiscal transfers. There will be a decline in money supply when funds are transferred from the Treasury to the Exchange Fund, and placed in the money market at the short-end. Distortions also occur when longer-term Exchange Fund placements mature, and fall within the maturity bracket of one month and below.

III. Conceptual Considerations Regarding the Treatment of Treasury and Exchange Fund Placements

The distortions noted above can be removed by (a) including short-term Exchange Fund placements in the monetary aggregates, or (b) excluding all Exchange Fund and Government placements from the monetary aggregates. The fundamental issue is thus whether deposits placed by the Treasury and the Exchange Fund should be included in the money supply statistics. The paragraphs below examine this issue in detail.

Treasury Placements

The IMF Manual of Monetary and Financial Statistics (2000) provides commonly used guidelines for the treatment of government deposits. It does not offer a prescription for individual economy's definition of money. Nevertheless, it notes that "deposit holdings of the government are usually excluded from the monetary aggregates. It is argued, at least for some countries, that central government deposit holdings do not respond to macro-economic influences (i.e. changes in economic activity, interest rates, exchange rates, etc.) in the same way, or to the same degree as deposits of the money holding sectors".

The distinction between deposits from government and other sectors is crucial in a regime where money supply statistics serve as a guidepost for monetary policy, as central banks wish to ascertain the impact of policy changes on private holdings of monetary instruments. In most cases, such actions have limited leverage on government deposits, which are often influenced by the government's cash management policy, such as debt management and tax collection. Therefore, there are merits for excluding government deposits from monetary aggregates that serve as an intermediate target or an indicator of the stance of policy.

Under a fixed exchange rate regime, while there is no independent monetary policy, money supply data can still be useful as an indicator of changes in economic activity such as output growth and inflation. However, in this case, there is less of a need to distinguish between private and public sector holdings of monetary instruments. An increase in government deposits, for example, raises banks' loanable funds just like a rise in deposits by the private non-bank sector. Of course, such an increase in government deposits may not lead to credit expansion and boost economic activity. Given credit demand, interest rates would ease, resulting in outflows by the other sectors. In short, the money supply is determined endogenously by fund flows under fixed exchange rates. Exclusion of government deposits could reduce information content of a monetary aggregate about economic activity.

It is thus not surprising that while most economies exclude the government's deposit holdings from the broad money, currency board economies including Estonia and, previously, Argentina include such holdings in their definitions of monetary aggregates.

Exchange Fund Placements

In respect of the Exchange Fund's placements with commercial banks, the role of the Fund is a key issue. Normally, central banks are considered as a "money issuer", similar to commercial banks (which have a role in credit and money creation). The monetary instruments held by "money issuers" are not counted in the money supply statistics. For this reason, for example, interbank deposits and cash in vault are normally not covered by the monetary aggregates.

The Exchange Fund's placements, however, largely originate from the Fund's role as a manager of fiscal surplus, and do not constitute currency board activity. The Currency Board discipline guards against discretionary money creation. In fact, the nature of these placements is similar to Treasury placements with banks, and not so different from other bank customers.

In sum, conceptually there is a case to include placements of both the Exchange Fund and the Treasury in the monetary aggregates, given the Currency Board arrangements. The remaining issue is whether an inclusion of short-term Exchange Fund placements would lead to significant changes in the monetary aggregates and their relationship with other macro-economic variables such as output and price. We have informally consulted IMF economists, and they emphasised the importance of a stable relationship between money and macro-economic variables in determining the components of a monetary aggregate. This will be explored in the next section.

IV. Empirical Considerations

To provide some empirical evidence, we consider three versions of HK$M3, as depicted in the following table.

HK$M3	Exchange Fund placements		Treasury placements
	One month or below	Over one month	
Existing definition	Excluded	Included	Included
Variant A	Included	Included	Included
Variant B	Excluded	Excluded	Excluded

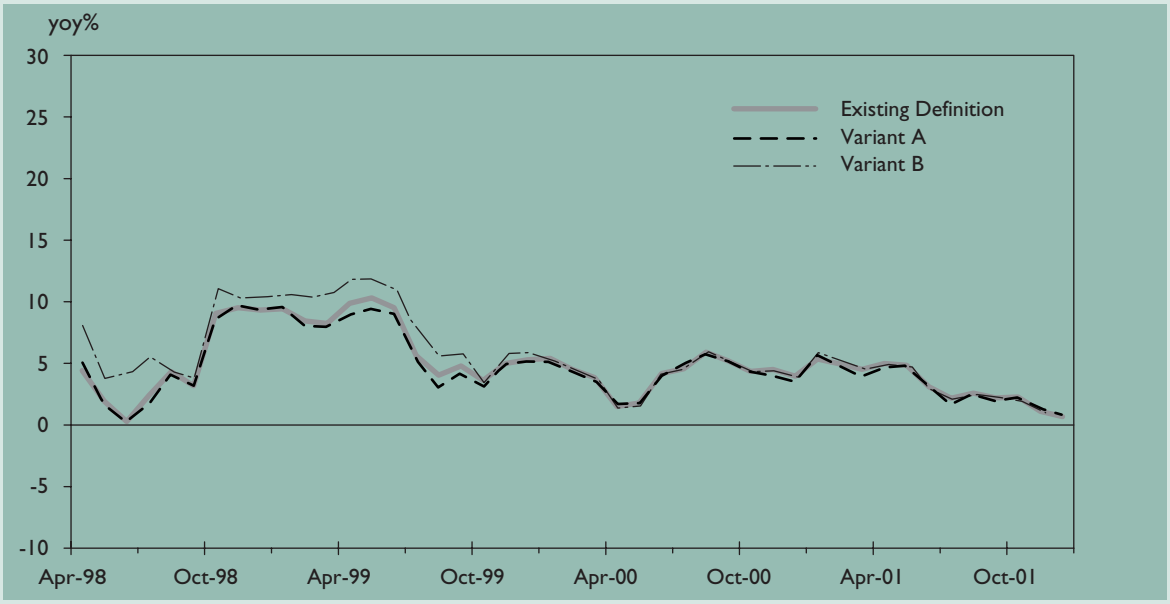
Statistics indicate that short-term Hong Kong dollar Exchange Fund placements account for only about 0.2% of the total Hong Kong dollar deposit base of the banking sector (at end-December 2001). In fact, total Hong Kong dollar placements of the Government and the Exchange Fund are only about 0.3% of the deposit base. Therefore, the inclusion or the exclusion of these placements does not make much difference to the monetary aggregates, as shown by Charts 1 and 2.

There are also no notable differences in terms of the predictive or corroborative properties for real GDP and prices. Nevertheless, a slightly higher correlation of Hong Kong dollar broad money and its lags with nominal GDP is found when all the Exchange Fund and Treasury

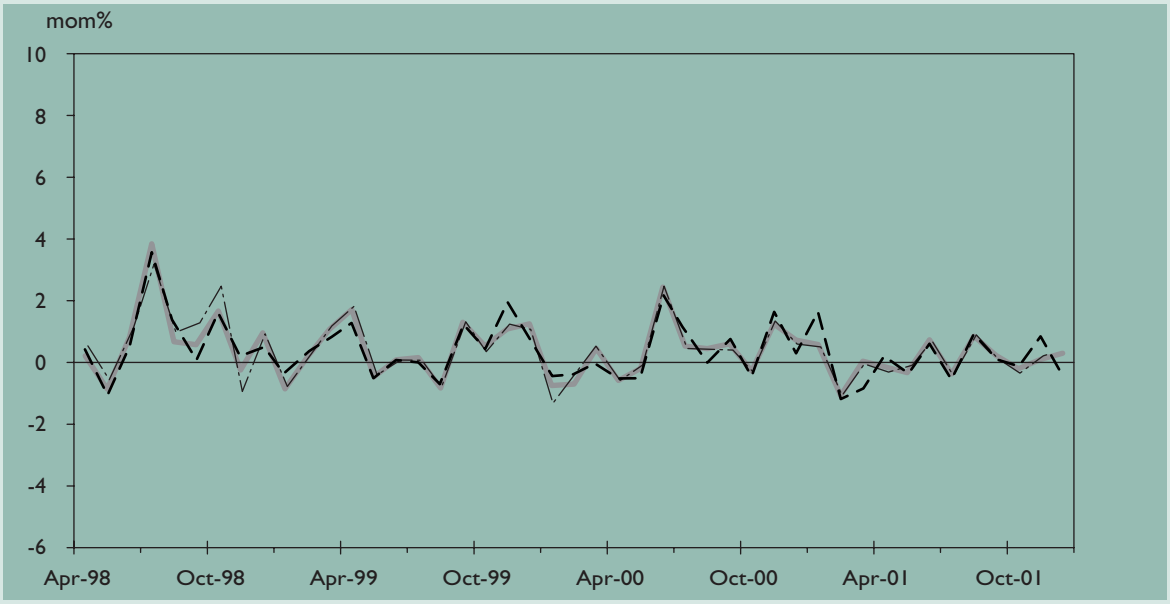
Chart 1

Hong Kong Dollar M3

A. Year-on-year changes



B. Month-on-month changes

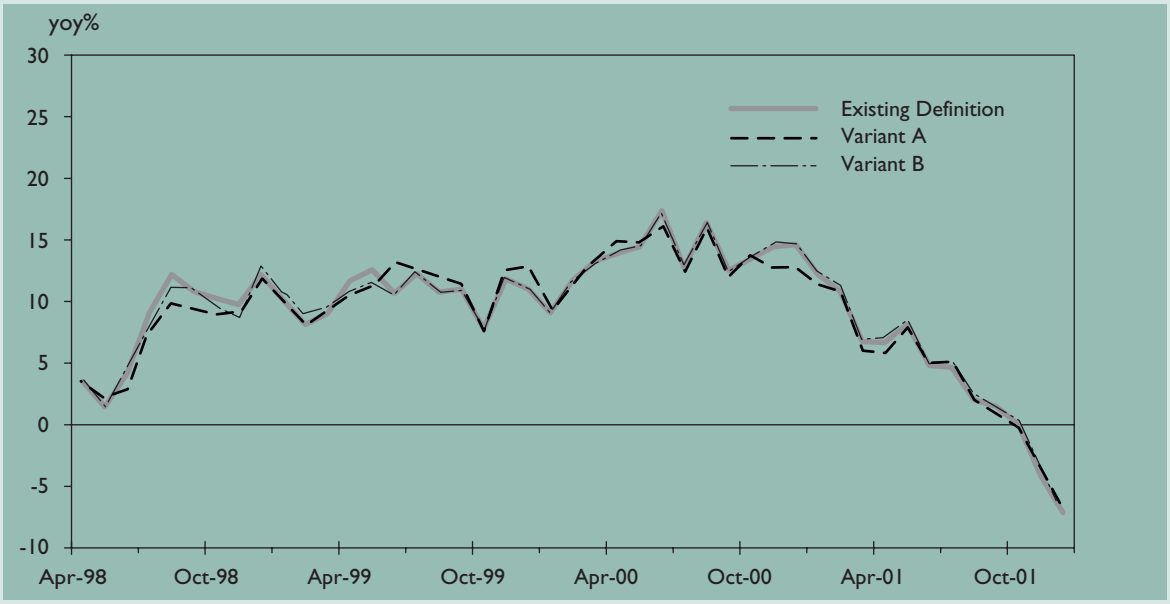


placements are included in the monetary aggregate (Table 1 and Chart 3). Our empirical work shows that the estimated money demand functions also improve slightly upon including all placements of the Exchange Fund and the government.[2]

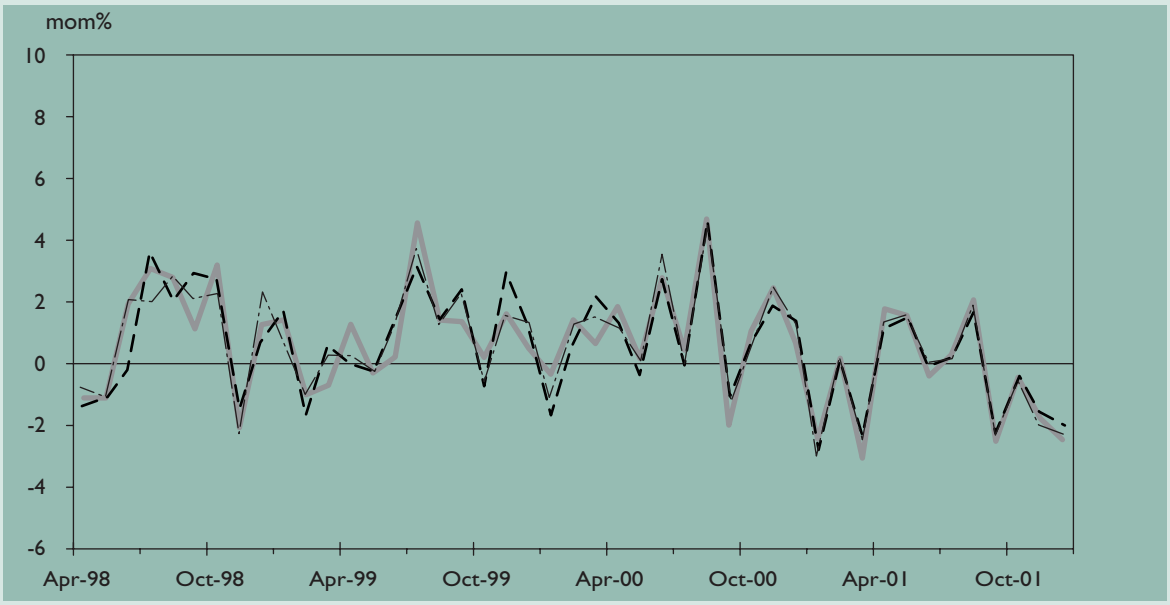
Chart 2

Foreign Currency M3

A. Year-on-year changes



B. Month-on-month changes

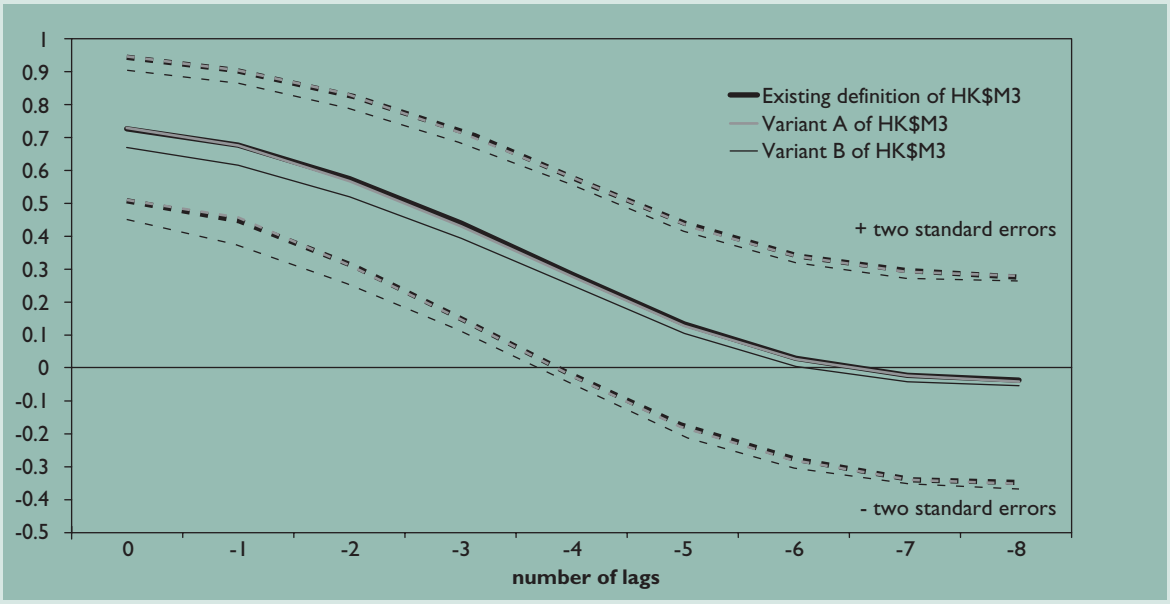


2 Specifically, we employed an error-correction model to examine the empirical relationship between various definitions of HK$ M3 and a number of macroeconomic and financial variables such as income, price and interest rate. We also performed a Granger causality test to examine the predictive properties of HK$ broad money on nominal GDP, real GDP and consumer prices. The estimates were very close across various definitions of money supply. The detailed results are available upon request.

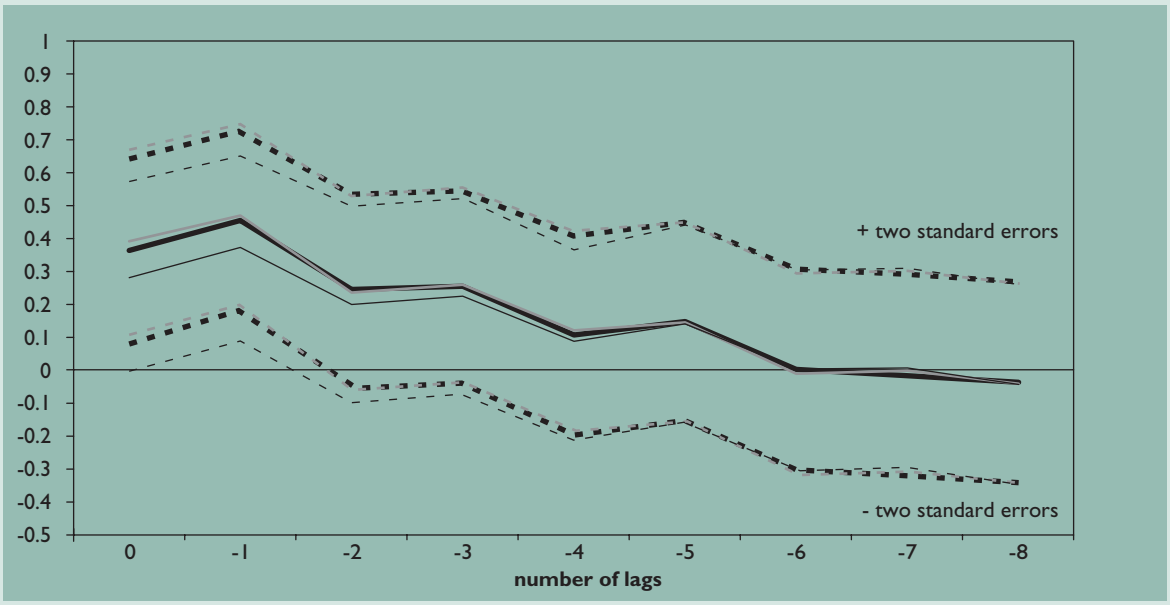
Chart 3

Cross Correlation between Nominal GDP and lags of HK$M3

A. in terms of year-to-year percentage change



B. in terms of quarter-to-quarter percentage change



Notes: *1) The standard errors of correlation coefficient (s_r) is calculated based on the following:*

$$s_r = \sqrt{\frac{(1 - r)^2}{N - 2}}$$

where r is the correlation coefficient and N is the number of observations.

2) The above diagrams show the correlation for the three versions of money supply ± 2 standard errors. Should the standard-error band contains zero in any period, the null hypothesis of zero correlation could not be rejected.

3) Further statistical tests suggest that the correlation coefficients on the three versions of money supply in each lag are not significantly different from one another.

Table 1

Correlation between HK$M3 and nominal GDP (Q1/1990-Q2/2001)

	Definition of HK$M3		
	Existing definition, i.e. excluding 1-month EF placements	**Variant A, i.e. including all EF and Treasury placements**	**Variant B, i.e. excluding Treasury and EF placements**
Correlation in terms of:			
yoy%	0.73	0.74	0.68
qoq%	0.36	0.39	0.28

V. Conclusion

Based on the above analysis, the preferred approach to eliminate the slight distortions in the current definition of money supply would be to include the short-term Exchange Fund placements in the monetary aggregates. The HKMA will release money supply figures based on the revised definition starting from July 2002. Past data will also be adjusted to facilitate comparison.

- Prepared by Priscilla Chiu and Kitty Lai of the Research Department

REFERENCE

International Monetary Fund, *Monetary and Financial Statistics Manual*, Washington: International Monetary Fund, 2000.

Definitions of Monetary Aggregates in Various Economies

	Hong Kong	Argentina	Estonia	ECB	Japan	Singapore	UK	US
M1	Currency + Demand deposits	Currency + Current account deposits in pesos	Currency + Demand deposits	Currency + Overnight deposits	Currency + Demand deposits	Currency + Demand deposits	N.A. [No satisfactory measure of narrow money because many interest-bearing deposits are also transactions money.]	Currency + Travellers' cheques + Demand deposits + NOW and similar interest-bearing demand deposits
M2	M2 = M1 + Savings and time deposits with licensed banks + NCDs issued by licensed banks	N.A.	M2 = M1 + Time and Savings deposits + foreign currency deposits	M2 = M1 + Deposits with an agreed maturity of up to two years and redeemable at notice of up to three months	M2+CDs = M1 + Savings and time deposits of banks + CDs of banks	M2 = M1 + Savings and fixed deposits with banks + S$ NCDs	N.A.	M2 = M1 + Savings and money market deposits accounts + Small time deposits + Retail type money market mutual fund balances + Overnight repos + Overnight Eurodollars
M3	M3 = M2 + Deposits with restricted licensed banks (RLBs) and deposit-taking companies (DTCs) + NCDs issued by RLBs and DTCs	M3 = Currency + Total deposits (in both local and foreign currency)	N.A.	M3 = M2 + Repos + Specific marketable liabilities of monetary financial institutions	M3+CDs = M2+CDs + Deposits and CDs of non-bank financial institutions	M3 = M2 + Deposits with finance companies	M4 = All sterling deposit liabilities of monetary financial institutions (i.e. banks and building societies)	M3 = M2 + Large time deposits + Wholesale type money market mutual fund balances + Term repos + Term Euro dollars
Government Deposits	Included	Included	Included	Excluded	Excluded	Excluded	Excluded	Excluded

Sources: Websites of the respective central banks/monetary authorities.