

Divisia Monetary Aggregates

The purpose of Divisia monetary aggregates is to weight the component assets of monetary aggregates according to the transactions services they provide. These weights are a function of the interest rate on the asset, such that assets with a higher interest rate are assumed to provide fewer transaction services.

Calculations are based on Törnquist-Theil discrete time approximation to the Divisia quantity index:

$$\Delta \log D_t = \sum_{i=1}^n \tilde{s}_{it} (\ln M_{i,t} - \log M_{i,t-1})$$

where: D_t is Divisia quantity index at time t , and M_{it} is the real balance of i -th monetary asset during period t .

$\tilde{s}_{it} = \frac{(s_{it} + s_{i,t-1})}{2}$ is the average of the current (s_{it}) and lagged ($s_{i,t-1}$) share of asset i in the expenditure on monetary services,

$$s_{it} = \frac{(R_t - r_{it})M_{it}}{\sum_{i=1}^n (R_t - r_{it})M_{it}}$$

where: R_t is return on the benchmark asset,

r_{it} is return on monetary asset i .

According to the Divisia index theory, the benchmark asset should be a capital-certain and completely illiquid asset. In this case, the difference between its return and the return on a component asset measures the liquidity services of that asset. However, it is difficult to find such an asset. Therefore, the National Bank of Poland is calculating the benchmark rate using an envelope approach, such that the highest rate among the component assets of M3 at each point in time serves as the benchmark rate.

Change in the Divisia index is based on the changes in logarithms of its components. Hence, the growth rate of the Divisia index is equal to infinity when a new asset is introduced. In such cases the ideal Fisher index was used¹.

National Bank of Poland publishes a set of Divisia indexes:

- Div1, Div2, Div3 - monthly Divisia monetary index of M1, M2 and M3.
- Div1_MA, Div2_MA, Div3_MA - monthly Divisia monetary index of M1, M2 and M3, where r_{it} was calculated using six-term moving averages of the return on monetary asset i ,
- Div1_KURS, Div2_KURS, Div3_KURS - monthly Divisia monetary index of M1, M2 and M3, where exchange rates were used to calculate return on foreign currency deposits.
- Div1_Q, Div2_Q, Div3_Q - quarterly Divisia monetary index of M1, M2 and M3

Starting from dissemination of end-March 2010 data, the National Bank of Poland introduced changes in its Website statistical presentation of MFIs' Assets and liabilities. The data in new structure are available from March 2002. As less informational items with minor economic value were excluded, the methodology of compiling Divisia indexes has been changed.

From March 2002 the number of monetary categories M_{it} is lower than before as some categories were joined. The details are presented in the table below:

Former categories	New categories
Overnight deposits Other overnight liabilities	Overnight deposits and other liabilities
Deposits with agreed maturity – up to 1 month, – over 1 month up to 3 months, – over 3 months up to 6 months, – over 6 months up to 1 year, – over 1 year up to 2 years Other liabilities with agreed maturity up to 2 years Deposits redeemable at notice up to 3 months	Deposits and other liabilities with agreed maturity up to 2 years and deposits redeemable at notice up to 3 months

Due to those changes Divisia time series were revised from March 2002.

¹ E. Gaiotti, *Measuring Money with a Divisia index: an Application to Italy*.