

DEVELOPING A GDP-PROXY

The monetary policy developed in the white paper proposes the application of GDP-linked accounts. That makes it necessary to have a daily estimate of the GDP. We sketched a procedure with the GDP estimate based on the year sum (sum over the last year) of all real transactions. This year sum can be monitored easily. The official estimates of the GDP are used to normalize this transaction sum to the GDP. An alternative procedure is to develop a GDP-proxy that can be monitored directly. That possibility is explored here.

To realize a GDP-proxy that is easy to monitor, we use a definition of the GDP that deviates significantly from what is generally used¹. It is important that the transactions which contribute to the GDP can be monitored easily. The choices made here are also somewhat arbitrary. There are more options. Most important is that it shows that it can be done in a reasonable way. .

A major element in the GDP is the *production of consumer goods and services*. The value added is determined by the total of (final) sales transactions under subtraction of the import. Transactions regarding steps in the chain are a form of investment for the buyer and removes the investment of the supplier. The difference, the added value is the contribution to the GDP. The final step is the consumption. That removes the investment that is built up, but the total consumption value is now added to the GDP. We are going to label only the consumption transactions, the transactions regarding the sales to consumers, mainly the sales of final products. This way of monitoring the GDP is easier than by labeling all transactions in the chain

The supply of *non-life insurance* can be treated as the supply of goods and services. The premium is the service, the reimbursed damage is a form of cost, an input. *Health care* can be modelled accordingly. Buyers are households, insurance companies and the (central) government. The same for *education*. Contributions of the central government are interpreted as consumption. *Local governments* are also interpreted as service organizations, comparable to healthcare and education. A contribution of the central government is a form of consumption.

Next to consumer goods and services, there are *investment goods*. The added value can be derived from the total sum of sales transactions to the users. These transactions are going to be labeled. Just as in case of consumer goods and services, the import has to be subtracted. The precise definition of investment goods is yet open. Most straightforward is to stick to the usual criterion: consumption period longer than a year. To keep the labeling easy, we assume that

¹ Compare European System of Accounts, ESA 2010, Eurostat

whether a good is an investment good is independent of the buyer. So, if it is an investment good for a corporation, it is also an investment good for a household. The main form of household investment remains of course residence building.

The remaining actors are *financial corporations* (life insurance companies, banks, etc.) and *central government*. Both are modelled as not contributing to the GDP. Comparable to households. The financing costs are redirected through financial corporations to wages and profits and to other expenses (consumption and investment). For these other expenses, financial corporations are modelled as consumers. For the financing costs of corporations this way of modelling financials has no influence on the GDP-proxy, since we are going to label only the consumption transactions. But the financing costs of households are now treated as simple income transfers, instead of as a contribution to the GDP. The reason is that we want to restrict the GDP-proxy as much as possible to real goods and services, and it is not easy to distinguish the payment of interest and of profit on financial products from the payment of the process service.

The *central government* is modeled in the same way as financials. Taxes are redistributed through the central government, to be spent on infrastructure, social security, education, healthcare, local governments and the government organization itself. So, the wages paid by government or financials are not included in the GDP-proxy. Normally these wages, also the wages of the government, are interpreted as contributing to the GDP. We don't do that. That keeps the GDP-proxy closer to the market. We treat the whole central government as a consumer. Instead of that, government services that are partly paid for by users, could be modelled as service organizations, just as the local government organizations. The precise distinction of what is local and what is central government is something to elaborate further.

To monitor this GDP-proxy, we introduce the following labels:

- i. A label for all household accounts (including household serving institutions).
- ii. A label for all salary payments, private withdrawals from privately owned companies, dividend and interest payed directly to households², social security payments, etc.
- iii. A label for expenses of all financial corporations.
- iv. A label for all accounts that are used to pay investment goods.
- v. A label for expenses of the central government.
- vi. A label for transactions with respect to import and export of real goods and services.

To facilitate the labeling it may be necessary to have special accounts for certain types of transactions (e.g. ii. and iv.).

² If all such transactions go via financial corporations, it is not necessary to include them here.

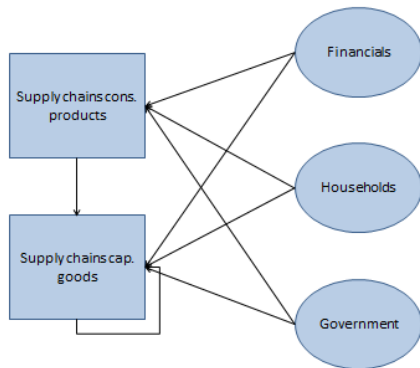


Figure 1: GDP expenses

These labels can be used to keep track of the expenses that form the GDP(-proxy). See also Figure 1:

- a) Consumption and investment of households (and household serving institutions). We need all transactions regarding (real) goods and services. That means that transactions with respect to salary etc. have to be excluded. Transactions with financial corporations have to be excluded as well. Such transactions imply the transfer of household income to financial service providers and then to corporations or other households, or the withdrawal of revenues from previously transferred income.

All remaining transactions together form the total of household expenditure for consumption and investment (residences). This includes payments for healthcare, education and local government services (or local taxes). Reimbursements to households (e.g. insurance) can be included and are subtracted in that way from the total of household expenditure. Payments between households have no influence on this total. Export is added, import subtracted.

The expenses are aggregated per day³. The total sum of these expenses over the past year, on day t is called $H(t)$. The labeling of the household accounts may not be expected to be perfect. There are free-lancers who use their business account for household expenses. Direct loans to corporations are wrongly counted as expenses⁴.

And the labeling of salary accounts and of financial service providers is probably also not flawless. Let $\gamma(t) \cdot H(t)$ be the real expenses for (real) goods and services. The factor $\gamma(t)$ is supposed to be stable. It is sufficient to re-estimate it only once every year or so.

³ This leads to a GDP-proxy that is updated daily. If necessary it is possible to use a finer time grid.

⁴ It is possible to prevent this. But that necessitates another label and the effect is relatively small.

- b) Consumption and investment of the central government. This includes all government expenses, except the salary payments and income transfers (also via local governments). The expenses for healthcare and education are included. The total of these expenses over the past year, on day t , is called $G(t)$. Given the role of the government one may expect that this variable measures rather precisely what it should measure.
- c) Consumption and investment of financial corporations. The total of these (labeled) expenses, on day t , is called $F(t)$. Let $\varphi(t) \cdot F(t)$ be the real expenses. The factor $\varphi(t)$ is supposed to be stable.
- d) Expenses for investment goods by corporations (with healthcare organizations, education institutes and local governments included). Here the label for accounts for the payment of capital goods can be used. The total of these expenses during the past year, at day t , is called $I(t)$. It may be expected that corporations collaborate in supporting this label, but perfection is not realizable. Let $\delta(t) \cdot I(t)$ be the real expenses. The factor $\delta(t)$ is supposed to be stable.

The total expenditure is equal to $Y(t) = \gamma(t) \cdot H(t) + G(t) + \varphi(t) \cdot F(t) + \delta(t) \cdot I(t)$. This variable can be used to link the accounts with. In case of a new estimate of $\gamma(t)$ and/or $\delta(t)$ one has to take care of continuity of the estimated total expenditure. Suppose at day t new estimates of $\gamma(t)$ en $\delta(t)$ are determined, $\gamma'(t)$ en $\delta'(t)$. Then a factor μ has to be determined such that $\mu \cdot \gamma'(t) \cdot H(t) + \mu \cdot \varphi'(t) \cdot F(t) + \mu \cdot \delta'(t) \cdot I(t) = \gamma(t) \cdot H(t) + \varphi(t) \cdot F(t) + \delta(t) \cdot I(t)$. Thereafter we continue with $\mu \cdot \gamma'(t)$, $\mu \cdot \varphi'(t)$ and $\mu \cdot \delta'(t)$ as correction factors⁵.

⁵ There is another discontinuity that requires attention. That is the existence of leap-years. It is important to stick to year totals because of the seasonality of expenses. Normally, to determine a new year total, one new day is added and the oldest day is skipped. On February 29 the new day is added, but the old day is not skipped. Instead of that all day totals are multiplied with a factor 365/366.