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THE GENERAL CONCEPT OF SURVEY ON CAPITAL STOCK

Supporting paper submitted by the Central Statistical Office of Hungary*

Introduction

1. The revaluation of the fixed capital stock and the calculation of the consumption of fixed capital is inevitable to calculate net macroeconomic indicators. Several types of methods are recommended by international standards (ESA, SNA) and the HCSO intends to apply a 'mixture' of these being mostly adaptable.

2. The Perpetual Inventory Method seems to be a possible solution for the major part of the economy, but for collecting reliable data on the opening stock, the use of the Direct Observation Method seems to be necessary.

3. A full scope survey is too expensive, so sample survey will be carried out. The Agricultural Census is an exception; it is a full scope survey.

4. It's an important aspect in the selection of the representative units that the grossing up procedure could be carried out at least on a two digit level.

* Prepared by Mr. Jozsef Imre, National Account Department.

5. The observed asset categories are the same as those included by the annual questionnaire of investment. The main categories are as follows:

- buildings and structures;
- machines and equipment;
- vehicles;
- plants and breeding animals.

6. The general concept of the survey on capital stock was worked out in 1999. The main principles are as follows:

- The asset categories exclude land and valuables.
- The required information will be produced by the owners.
- The estimation process of the fixed capital stock and the consumption of fixed capital for the government sector will be worked out separately by a PHARE project team.
- After finishing the pilot surveys on the industrial¹, construction and service branches a sample survey will be carried out.
- The estimation of the fixed capital stock for the agriculture will be based mainly on the Agricultural Census /2000/, but other supplementary data collections are planned to collect the missing information for the valuation.
- The valuation of the fixed capital stock in the financial sector will be based on the exsisting business accounting data source.
- The valuation of the dwelling stock is connected to the Population Census /2001/.

Estimation of the fixed capital stock for the industrial and construction enterprises

7. In 1998 the experts of the HCSO established a draft questionnaire for the data collection on the fixed capital stock. According to the plans a correctly revaluated stock will be obtained from a sample survey and this will be suitable for the PIM in the following years. During the preparation work, the experts of the HCSO visited some enterprises to ask for advice what the planned questionnaire should include. The book keepers of the enterprises suggested to use less detailed asset groups because of the the lack of the required information concerning their inventories. After the consultations a more simple questionnaire was established. The HCSO sent the new questionnaires to 20 enterprises and the experts were asked not only to fill in but to make their remarks about it, as well. The selected enterprises were representative in

¹ Industrial enterprises are classified into mining and quarrying, manufacturing, electricity, gas, steam and water supply. (C,D,E)

regional and activity aspects. The experts of HCSO visited the enterprises and gave assistance to fill in the questionnaires and discussed the possibilities how to adjust their accounting data to SNA requirements. Seventeen enterprises sent back the completed questionnaires. After processing the data it became clear that the experts of the enterprises were able to use the estimation methods and with some small corrections this form of the questionnaire would be a convenient one.

8. While the last few changes were made to finalize the questionnaire, 1000 industrial and 400 construction enterprises were selected for the sample survey to be applied. The main features of the sampling were the following: regional orientation; industries; the gross value of the tangible assets in the business account.

9. Because of lack of financial sources the work was postponed and it is expected to start in 2000. The questionnaire hopefully covers all the necessary data for the PIM model which will be used to estimate the fixed capital stock for every year. The main characteristics of the assets are:

- the current replacement value for the assets if these would be bought as new ones;
- the present age structure;
- the whole expected service life.

10. There are several ways for the determination of the replacement value from the accounting data of the enterprises:

- In the first case, if the gross historical value of the asset measured when put into operation is known, the old gross value can be converted to the current price level using the annual investment price indices.
- If the enterprise which makes the revaluation has no data on the gross historical value, then the revaluation can be done by using the market price of the same new asset, or the market price of a new asset which is the most similar to the original asset.
- When the two other methods are not usable then the estimated replacement value can be deduced from the gross accounting value /not the value measured when put into operation/, the vintage and the expected service life.

11. Besides the main categories of assets as buildings and structures, machinery and equipment, the category of vehicles can be found too, because this group has special characteristics which requires a separate treatment in the model. The basic assets used for long period are also separated from the other assets. The revaluation of assets used for shorter period will be done by the

HCSO from the gross historical value. The value of land is asked separately from the real assets and the square metre data are required, too.

12. For the compilation of the model it is necessary to have data on the expected service life and the age structure of the assets. The enterprises will provide the information on the gross historical value and the new values by vintages, and for the expected service life they will calculate an estimated average by the categories of assets.

13. The above mentioned basic data are suitable for the estimation of the initial stock of the fixed capital, and it could be updated with the annual data of the investment survey.

Agriculture

14. The revaluation process of fixed capital stock will be based on the data collected in the Agricultural Census. The full scope questionnaire which will be used in the Agricultural Census will contain questions about the number of buildings and machinery, as well as on their technical parameters. Later on from a sample survey more detailed information can be obtained for the technical and the age structures parameters, which would give the possibility to create more precise estimations on the replacement value. It seems that we need to use different methods to continue the fixed capital stock of the various asset categories through the following years.

15. The detailed survey of the agricultural **buildings** gives the opportunity to use proper construction prices to each category having specific technical characteristics. The square metre data for each type of buildings could be used with the construction costs. Having the new construction costs and information on the changes of the structure of the stock the valuation of buildings seems to be solved.

16. For the valuation of the stock of **machinery** which is surveyed in detail the value data from different sources /e.g. from catalogues, merchants of capital goods, experts/ can be used. The annual changes of the stock cannot be used from the regular statistical data collections, so the adoption of PIM is important to calculate the annual scrapping. 'Vehicles' is a separate asset category in the case of agricultural assets, too. (The difficulty comes partly from the fact that entrepreneurs can use their cars both for private and business purposes.)

17. According to the ESA95 definition **plant** means the vegetal culture which yields crops for several years. This category contains the fruit plants and vineyards. The up-to-date area figures and value data of these plants are available in the HCSO. Data on the territory of different plantation come from

other agricultural survey. The data on changes in stocks are collected annually. The plantation cost of each type of plants will be available directly from the questionnaire. The information mentioned above is enough to estimate the stock so the adoption of PIM is not necessary.

18. In the case of **breeding animals** the HCSO also have annual data collections on the stock and on the changes in stocks. The gross replacement value of the stock can be calculated by multiplying the number of animals with the unit prices.

Service industries

19. The estimation of the stock held by service branches will be based on data collected from the same questionnaire which is used for the industrial branches. The basic parts of the questionnaire will be the same, so the most important data for the model will be determined for the same asset structure.

20. The pilot survey is planned to contain 20-25 enterprises, but the participation rate is much lower than in the industrial enterprises. It would seem easier to estimate the stock of some industries because of the small number of enterprises, but because of the voluntary character of the survey the possible non-response cannot be solved in the case of enterprises which cannot be substituted /e. g. telecommunication/. In the case of some other industries for example external trade the sampling means the keen point.

21. The enterprises classified into transport industry are showing heterogeneous features. The sizes of the enterprises show salient divergency, the absence of some enterprises from the survey can lead to acceptable inaccuracy. The solution is to separate this group of enterprises and they should be treated separately. The sampling will be applied only for the other enterprises. The data collection for the selected special units will be carried out with assistance of their experts. The industrial questionnaire is convenient for the sample survey. More investigations are needed to decide what the best method would be for estimating the fixed capital stock of the 33 thousand entrepreneurs.

The valuation of fixed assets for the government sector

22. In Hungary we estimate the annual consumption of fixed capital for the assets of the government sector. The methodology which was and is applied is as follows:

23. Until 1991 was evaluated on a historical base, and because of the relatively low rate of inflation it did not cause any serious distortion. Data

were available at two digit level. 1991 was chosen as the base year for the constant price data series.

24. In 1992 several changes occurred in the process of the estimation. 1992 was the first year when the stock of fixed assets for the general government sector covered the military and police services. Data were available only for their stock at historical cost /except the military assets which can be used only for military purposes/. An estimation was made on the proportion of the replacement cost to historical cost for the rest of the stock of the general government sector.

25. The annual report of government institutions covers the following aggregates:

Opening stock of fixed assets
 + Purchased assets
 + Other increases
 - All decreases
 = Closing stock of fixed assets

Opening value of depreciation
 + Increases
 - Decreases
 = Closing value of depreciation

26. The process of revaluation from historical cost to replacement cost is the following:

The opening stock is revaluated with the price index of construction
 + the purchases are in current prices
 + other changes are revaluated using the replacement cost/historical cost proportion of the opening stock
 = closing stock in replacement cost.

Using the reported depreciation we calculate the CFC of the opening stock
 + annual depreciation for the assets purchased in the recent year and for the other changes of the stock and half of the amount is added to the CFC
 = depreciation in replacement cost.

27. Depreciation rate is calculated from the historical data, using the average of the previous years and then CFC has to be split up to branches based on the structure of the closing stocks of fixed assets at historical cost.

28. The two main problems in connection with our estimations are:

- the data of the benchmark year are incomplete;
- the level of aggregation is too high /assets/.

29. It seems that this method overestimates the CFC in the General Government sector. Between 1991-1998 the CFC calculated by this way was 24-29% of the Gross Value Added of the sector. The new project which is started by the HCSO hopefully will give a better estimation for the CFC. The first results will be available not before June of 2000. The estimations are based on two large administrative data sources.

30. The first source is the database of the Treasury Property Managing Institute. It contains all the fixed assets of central budgetary institutions individually, social security and extrabudgetary funds above a price threshold which is 5 million HUF. The data cover the following information on each asset: historic value; date of purchasing/establishment; range of data in physical terms.

31. The other data source is the register of the fixed assets of the local government. It contains data for the real estate of local government institutions individually but it doesn't have any data on machinery and equipment. The information contained is as above.

32. The basic idea of the estimation is the following:

- Calculations will be based on physical terms when it's appropriate. The experts will select the group of assets, the most relevant indicators, and the relevant price of the current year. They will decide the level of aggregation and the depreciation rate as well.
- When the use of physical terms is inadequate, the estimation will be based on the date of purchase/establishment of the asset and on the historic value. The experts will group these assets and choose the suitable price indices and depreciation rates.
- No data are available on two groups of assets in the new data sources:
 - assets of military institutions and secret services
 - machinery, equipment and intangible assets of local government.

33. Finding a method to estimate the missing data is also the task of the work-program within Phare project team.

Valuation of the dwelling stock

34. The dwelling structure consists of dwellings owned by local governments and of the privately owned ones. At the end of the 1980s the share of government owned dwellings was around 20% of the total. This share has now reduced to only

7% largely as the result of the privatisation process. The privatisation process is almost completed and no further changes are expected in the dwelling stock structure.

35. The stock of dwellings was revaluated for the last time in 1971. In the case of government owned buildings it was a direct revaluation to each individual dwelling, based on different technical parameters. In the case of owner occupied dwellings it was an indirect revaluation /using coefficients from the revaluation of government owned dwellings/. From that time these were the figures in both cases to be updated /working with the data of new constructions and the demolishing of the buildings, too/.

36. The main problem in the valuation of dwellings was the mixed price level. The standard stock wasn't extrapolated to the price level of the current year, these were accounted on the base year prices. The new constructions were added on current prices, so until the next base year the price levels were a mixture of current and base year prices, they were accounted on the same level only in the base year. Until the end of the 80's the low rate of inflation made this problem more a theoretical one, but with the increasing inflation this became a very important problem to be solved.

37. The stock of owner occupied dwellings are extrapolated now in each year to the current price level. Concerning to the government dwellings as the HNA doesn't follow the business book-keeping regulations any more, the stock of these dwellings is valued in replacement cost since 1991 too.

38. After having acceptable values on both types of stocks /they are on common price level/ for the extrapolation of data there are different possibilities:

- using the building construction price index /relating to the new constructions only/
- making detailed revaluation for the stock /financial source are needed for this solution./
- making revaluation applying a simple method.

39. The third mentioned method was chosen for the revaluation. It means that we used the sqm data of government dwellings, and the average market prices on sqm of the dwellings to revalue the whole stock. The annual average construction price per square metre was used for owner-occupied dwellings.

40. Until 1991 the rate of amortisation for government dwellings was used and it was 1%. There was no reason to apply another rate for private dwellings. One percent was applied for the whole dwelling stock.

41. During the revision it was realised that there are significant differences among various types of dwellings, and it gives a good reason to estimate separate rates for different types. The newly created rate was 1,5% which meant that the amortisation period reduced from 100 years to 67 years.

42. It is planned to change the estimation method using a special model which contains 28 types of dwellings with their characteristics. This model will be connected to the Population Census in 2001.

The improvement of the annual investment survey and the related price indices

43. We have more results in the development of our annual investment survey. This survey contains the annual investment data which we need to extrapolate the basic stock data of PIM. The categories of the questionnaire were rearranged and they are conform with the SNA standards. The first year for the new annual survey is 1999. 'Plants' and 'Breeding animals' are new individual categories /until 1999 plants were collected in the category of 'Other investments'/. The additional investment costs on construction and machines are added to the appropriate category /until 1999 these costs were covered by 'Other investments', too./

44. The annual investment data are available on four digit level, and by legal forms. The general and local government institutions are fully covered by the survey. Enterprises with more than 20 employees are also surveyed full scope. There is a sample survey for the enterprises with 5 to 20 employees. An expert estimation is needed for the smaller enterprises which are not covered by the survey.

45. The questionnaire contains data on assets put into operation and these data can be used to calculate the capital stock data onward.

The construction price index

46. It is compiled monthly, but there is an independent annual index too. It depends on the price changes of the materials used for construction, and the variations of the wages in the construction. The former and the current price indices are estimated averages for the whole economy and there is no more detailed data for official use. 2000 is the starting year of a quarterly sample survey to collect price data for the construction of the same types of structures.

Price index for domestic machines

47. The estimation of this category is available for the same aggregation level as for construction. So we don't have detailed data for the branches, but only for the machines as a total. The group of vehicles will be taken out from the category of machines in the investment survey, so we will produce an individual price index for vehicles.