Economic and Social Council

Economic Commission for Europe

Conference of European Statisticians

Group of Experts on National Accounts

Tenth session
Geneva, 26–29 April 2010
Item 4 of the provisional agenda
Financial accounts and balance sheets

Theory and practice of holding gains and losses
Is the importance of revaluation reflected in the national accounts?

Note by the Czech Statistical Office

Summary

The recent financial crisis increaded the demand for statistics on financial instruments and their value changes i.e. the holding gains and losses resulting from holding assest and liabilities. The revaluation account is an integral part of the system of national accounts, but few countries compile it due to the difficulties to quantify the holding gains component. The present paper describes the experience of the Czech Statistical Office with measuring and recording of revaluation of financial instruments.

I.   Introduction

1.   One of the major aims of statisticians is to keep the difference between statistics and observed reality as small as possible, current financial crisis brings in this respect new challenges. With regard to the sources of the crisis originating from monetary sphere of the economy, greater attention will be (hopefully) given to the statistics of value changes, i.e. holding gains and losses resulting from the assets and liabilities held by economic agents. The reason is evident; importance of holding gains and losses can rise during some periods and significantly change the human behaviour, so holding gains and losses statistics can help us to explain changes in consumption and in the business cycle position. Thus, it is important to have a good reflection of the changes in the net wealth resulting from changes in the relative prices.

2.   This is the question of the revaluation account that is an integral part of the system of national accounts. In reality, the quantification of revaluation is one of the most difficult jobs in the process of compilation of the national accounts. The following paper deals with the issue of financial instruments revaluation. It is divided into three parts. The first part is focused on the theoretical reasoning of the position of revaluation account in the system of national accounts. The second part is addressed to practical problems with recording of revaluation. Some further issues or discussion points regarding business cycle analysis are mentioned in the last part of the paper.

II.   Theoretical background

3.   The present position of revaluation in the system of national accounts is the result of theoretical discussions on the concept of disposable income. The main purpose of the national accounts is to provide database for business cycle analysis that is concerned with consumption and savings behaviour of economic agents, this makes the definition of disposable income one of the most important concepts in the system. The definition of income is strongly connected with the concept of production and productive activity itself[1]. Disposable income "*reflects current transactions and explicitly excludes capital transfers, real holding gains and losses and the consequences of events such as natural disasters.*"[2] Disposable income is then allocated to consumption and savings and is considered to be the main source of financing of consumption[3].

4.   In reality, the amount of consumption and savings can result not only from regular and continuous activities; other processes generating sources available for consumption or savings can also be identified. In economic theory, one of the most important influences of "non-productive" process on consumption is called the "wealth effect". Economic agents experience gains or losses resulting from the changes in absolute and relative prices, and this takes the form of "revaluation of savings" from previous periods. Keynes[4] called these flows as "windfall gains and losses", he recommends excluding them from disposable income: "*Although the windfall loss (or gain) enters into his [agent] decisions, it does not enter into them on the same scale*"[as disposable income][5]. The same approach is followed

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[1]   „Income must be measured on the same basis as production." Canberra Group Final Report [2001]
[2]   Dtto.
[3]   Keynes [1936]
[4]   Keynes [1936]
[5]   dtto. Chapter 6 The Definition of Income, Saving and Investment

by the methodology of the system of national accounts, both in the present and revised manuals SNA and ESA respectively.

5.   Nevertheless, this topic is still under discussion. The Expert Group on Household Income Statistics (Canberra Group 2001), in discussing the disposable income of households, recommends (in accord with Keynes) excluding holding gains and losses from income due to a possible double counting and contradiction in the concept of production[6]. Other arguments put in favour of excluding of holding gains are the characteristics of high volatility, non-predictability and not sufficiently strong permanent component (Lequiller [2003]). Arguments for the inclusion of holding gains in income can be found in Eisner [1983].

6.   Generally speaking, the actual state of affairs (as a result of theoretical discussions) is that holding gains and losses are recorded in the revaluation account, separate from the non-financial accounts and disposable income. This approach is in line with the production borders definition, as Lequiller [2003] states: *"it is difficult to accept the idea that holding gains are the result of production."* Thus, revaluation is not taken as a source of consumption or savings and is shown separately in the national accounts in other changes accounts leading to changes in balance sheet and net worth.

7.   But this conclusion is not so clear, for example Hill [1998] notes that companies can use expected holding gains to cover a portion of their cost or other outlays. E.g. in the case of Czech Republic, the government plans to use the yield from the sale of shares of the company CEZ[7] for reform of the pension system. Another counter-argument is offered by Fixler and Moulton [2001], stressing the importance of expectations. Production is also based on the expectations of future prices, so it is critical to distinguish between pure holding gains and losses (that are not expected) from expected holding gains and losses (and production). Also Stauffer and Meier [2001] argue in similar way, that the calculation of production can understate the production and productivity if the companies increasingly rely on expected holding gains to finance provision of services. The rationale of separating of holding gains and production in business accounting is very interestingly discussed in Prakash and Sunder [1979]; the authors are inclined to not separate production activity and holding gains.

8.   A further insight into the holding gains and losses issue is brought by Lequiller [2003], where he discusses the contradiction of the influence of taxes and realized holding gains (tax base) on income. The author proposed to re-classify taxes on holding gains as capital taxes. This discussion is a rather technical one, motivated by the contradiction between recording of taxes and holding gains. Besides, there can be also significant influence of non-realized holding gains on consumption (especially in connection with financial innovations as "cash out"[8]). So, it is important to consider not only realized but also non-realized holding gains and losses.

9.   As mentioned above, revaluation is not recorded in the non-financial accounts. The present position of revaluation in national accounts is clearly displayed by basic stock-flow equation:

opening *stock + transactions + other changes in volume + <u>revaluation</u> = closing stock*

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[6] „Holding of assets can affect the disposable income by primary incomes emerging from these assets, i.e. interests, rents or dividends." P. 29 of Final Report.

[7] CEZ is producer of electricity owned especially by government that has a dominant position on the market. Value of this share has risen very strongly in the last years as can be seen in table 1. Thus, this very expensive reform can be financed by holding gains reached by government.

[8] This can enable agents to transform rise in value of any asset to liability or increase in liability.

10. To prove impact of revaluation on economic activity as discussed above, we will start with this basic stock-flow equation.

$$OS + T + OC + R = CS,$$

11. When we add opening stock (OS), transactions (T), other changes (OC) and revaluation (R) on the left side, this sum is equal to the closing stock (CS). Next, we assume that capital transfers, non-produced non-financial assets formation and other changes are equal to zero. Thus, we can substitute transactions by the difference between savings (S) and investment (GCF).

$$OS + (S – GCF) + OC + R = CS$$

12. Now, we make a further step, where savings (S) can be substituted by the expression (DD – FCE), where DD is disposable income and FCE final consumption expenditure. Thus:

$$OS + (DD – FCE – GCF) + R = CS$$

13. We can rearrange this formula in the following way:

$$DD + R = FCE + GCF + CBS,$$

14. CBS means the change in balance sheet (BC-BO). So, we have two sources on left side – disposable income and revaluation, which can be used for final consumption, investments or for some other change in balance sheet (e.g. investment into financial asset). In this last formula, a clear link of revaluation to economic activity can be identified. In other words, revaluation (realized and unrealized[9]) can be transformed to consumption or investment (into non-financial or financial assets).

15. The relation between revaluation and non-financial balancing items is still under discussion, as is the case of reinvested earnings. The reinvested earnings discussion can be good example of the difficulty in drawing a borderline between income that is a part of disposable income and between revaluations that is not a part of disposable income. The other perspective of this problem is the dichotomy resulting from taxation (already mentioned). It is evident that the concept of income may not be completed and clear. It is worth mentioning that the analytical potential of statistics on revaluation is further extended by the neutral and real holding gains and losses accounts, comparing the rise in the value of assets or liabilities with general price level movements.

III. Compilation of the revaluation account(s)

16. Changing prices and prices structures are a common feature of all capitalistic economies with more or less freely determined prices. Thus, the source of values recorded on the revaluation accounts are the changes in prices of economic assets and liabilities in line with the definition of asset boundary. Generally speaking, revaluation originates from the reactions of economic agents and institutions to changing economic conditions. E.g. in the face of an inflation threat, the central bank can hike interest rates affecting the market prices of bonds, raising profits usually increasing the (market) prices of (quoted) shares, fluctuations in the exchange rate affects prices of foreign currency denominated instruments, etc. The result of these influences can be positive or negative revaluations. In the case of a positive revaluation, there is a rise in the value of assets or liabilities; on the contrary, negative revaluation arises from the drop in the value of assets or liabilities.

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[9] For revaluation accounts, it is not important whether revaluation is realised or unrealised.

17.   These price changes are not always the same for both counterparties (as in the case of bonds not held to maturity or quoted shares that are imputed in the accounts). But, due to the balanced character of the national accounts, the changes in value are the same for both creditor and debtor in the national accounts. Thus for statisticians, this does make their job easier; the quantification of revaluation can be based only on the assets´ or liabilities´ side. In the case of the Czech Republic, emphasis is put on the asset-side. This stems from the fact that the revaluation of assets can be, in many cases, obtained directly from business accounting. And, on the other hand, the debtors do not revalue the liabilities in their accounting systems, for example in the case of tradable shares or bonds (not held to maturity).

18.   We will briefly describe the method of quantification of revaluation in the Czech national accounts. This is based on few data sources:

        (a)   **statistical survey** - respondents are asked in the special section of the questionnaires to separate transaction, revaluation and other changes (as mentioned above, this is the case of financial assets). This direct data on revaluation are preferred to the information on revaluation from the income statement because of accounting practices. Concretely, e.g. on the yields on shares or returns account can be charged to both transactions and revaluation of this instrument, so it is impossible for national accountants to separate them. These direct data sources are available in the case of non-financial companies (total assets or financial assets more than 200 million CZK), public institutions (more than 1000 inhabitants), large non-profit institutions (more than 20 employees), insurance companies and pension funds. This restriction of respondents is made due to statistical burden considerations.

        (b)   **administrative data** sources – these data sources can be divided into sub-groups:

        (i)   banking statistics – banking institutions have special importance in the economy, in the financial sector and also in the process of calculation of revaluation. For banks, we used balance sheets of banks divided by currencies, i.e. loans (AF.4) provided in domestic and foreign currencies, deposits (AF.2) accepted in domestic and foreign currencies, etc[10]. Thus, in case of banks, the revaluation is calculated (modelled) **for** both assets and liabilities. The reason is that this information is taken as a more reliable (especially for AF.2, AF.4), these calculations also compensate the lack data on assets for some counterparties of banks, especially households. In other cases, revaluation is derived on the base of stocks or information in the profit and loss account or it is estimated during **the process of balancing.**

        (ii)   separate data for financial instruments - revaluation is directly estimated in the case of gold and SDR (AF.1), quoted and unquoted shares (AF.511+AF.512) or mutual fund shares (AF.52), because the information on the transactions is at disposal.

19.   The most difficult and uncertain process is the calculation of revaluation for securities other than shares (AF.3), especially derivatives (AF.33) that are also affected by changes in interest rates. The reason is the usual one – lack of data. In this case, we apply the combination of possible approaches – models from stocks and residual values of revaluation of securities other than shares. Generally, when there are no direct data sources on revaluation, the preferred approach is to base the calculation on stocks of assets recorded in the balance sheets. The options are either residual value or modelled, based on the

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[10] For revaluation calcution is than used formula recommended in the IMF manual.

formula already mentioned. The results of calculation of revaluation are shown in the following table:

Table 1

Revaluation account, Czech Republic (mil. of CZK)

	2000	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*
Non-financial assets	**387 036**	**325 504**	**116 314**	**182 247**	**385 996**	**315 033**	**460 735**	**586 020**	**367 891**
Financial assets	**-96 704**	**-48 457**	**-99 826**	**-31 590**	**59 080**	**239 141**	**-32 146**	**8 553**	**-274 820**
SDR and gold	0	0	0	0	-447	1 299	162	758	521
Currency and deposits	-237	-1 499	-9 876	-2 700	-9 292	-4 436	-59 570	-55 118	11 685
Securities other than shares	16 111	-13 368	-47 369	-44 900	-61 882	6 894	-67 676	-47 117	43 660
Loans	26 611	-5 623	-104 703	-15 140	-5 764	-2 259	-7 394	-11 363	15 003
Shares	-59 724	23 754	71 112	34 947	150 117	257 436	135 151	174 934	-324 882
Insurance technical reserves	0	0	0	0	0	0	0	0	0
Other receivables	-79 465	-51 721	-8 990	-3 797	-13 652	-19 793	-32 819	-53 541	-20 807
Liabilities	**-127 197**	**-25 892**	**10 065**	**3 757**	**107 456**	**195 046**	**31 130**	**88 865**	**-352 716**
Currency and deposits	318	-417	-6 707	-2 700	-13 487	-6 524	-49 487	-55 035	6 340
Securities other than shares	3 557	-376	-34 347	-20 329	-2 003	-2 052	2 218	-348	23 980
Loans	17 027	3 198	-9 970	-61	-5 764	-2 259	-7 394	-11 363	15 003
Shares	-70 434	23 424	70 079	30 644	142 362	224 738	115 858	157 966	-380 297
Insurance technical reserves	0	0	0	0	0	0	0	0	0
Other receivables	-77 665	-51 721	-8 990	-3 797	-13 652	-18 857	-30 065	-2 355	-17 742

Source: czso.cz

20.   In table 1 you can see significantly positive revaluations of non-financial assets and quite volatile course of revaluations of shares, that is partly caused by methodological changes (in 2004) and partly resulting from the high volatility of the market in last two years. On the other side, there is rise in the value of securities other than shares as an effect of falling interest rates. On the whole, revaluation of financial assets is rather negative; the rise in the net worth is usually caused by rise in non-financial assets prices. It´s worth mentioning that revaluation during this period is strongly affected by permanent appreciation of domestic currency (CZK).

21.   In the following table (2), we review the situation of households, i.e. gains and losses on assets and liabilities held by this exceptionally important institutional sector. Households systematically accumulate gains from their non-financial assets. On the contrary, the revaluation of financial assets is negative during the whole period under question. The revaluation of liabilities is not significant; this is the result of the dominant role of loans being recorded in nominal value and the insignificant amount of households' loans in foreign currency. The same holds true for other payables.

Table 2
Revaluation accounts of Czech households (mil. of CZK)

Changes in assets		*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*
AN	Non-financial assets	82 555	73 563	46 969	62 412	90 111	77 511	107 051	139 887	129 027
AF	Financial assets	-4 528	-1 609	-1 570	-4 739	-5 009	-590	-3 768	-4 161	-44 994
AF.2	Currency and deposits	0	0	-92	0	0	0	-2 829	-8 059	4 471
AF.3	Securities other than shares	-767	-628	-1 451	-123	-168	-130	-74	107	230
AF.5	Shares	-3 735	-191	-1 530	-3 813	-1 664	1 447	1 532	6 148	-49 695
AF.7	Other receivable	-26	-790	1 503	-803	-3 177	-1 907	-2 397	-2 357	0
Changes in liabilities and net worth										
AF	Financial liabilities	0	0	0	0	-1 725	-873	-750	-1 189	6 413
AF.4	Loans	0	0	0	0	-878	95	-1 374	0	6 413
AF.7	Other payables	0	0	0	0	-847	-968	624	-1 189	0
B.10.3	Change in the net worth due to revaluation	78 027	71 954	45 399	57 673	86 827	77 794	104 033	136 915	77 620

Source: czso.cz

22.	We will only briefly touch the case of AF.7 for which there is serious problem with the lack of data for both stocks and revaluation. In 2008, we made a revision in the approach to quantify the stock; firstly, the estimation of AF.7 of households is based on the direct data sources (statistical survey, administrative sources - arrears on taxes, back interest, etc.). The second step is to compare this result with our assumption that the behaviour of Czech households is not fundamentally different from the behaviour of households in the other European countries, i.e. the share of other payables in total liabilities amounts circa to 10 percents, the share of other receivable should be circa 2-3 percent of total assets of households´ sector.

23.	These accepted assumptions caused a very significant change in the level of AF.7, but net worth of households was influenced by much less; the same holds true for revaluation of AF.7. It is also worth mentioning, that in the case of AF.71, the position of the economy in the business cycle is also taken into account. Quantification of AF.7 for households makes the picture of financial position complete, even if these items are not a part of total indebtedness of households´ sector.

## A.	Real holding gains and losses

24.	From 2008, CZSO calculates and publishes neutral and real holding gains and losses accounts. The calculation is described by the manual ESA95, this is based on the implicit deflator of final uses. The of only one price deflator is necessary because of the balancing character of the accounts. But, this almost surely contradicts with the observed reality in most of cases, because price movements are usually assessed differently by both parties. It would be more appropriate to deflate price movements by different indexes according to the economic essence of the sectors (production, consumption, etc.). This technical aspect potentially restricts the adequacy of the reflection of reality provided by the national accounts.

25.	The logic of real holding gains or losses treatment is to display the impact of price level changes on the value of assets and liabilities. Thus, the real rise in value of assets is lowered (in comparison to nominal rise) by inflation (showed as the implicit deflator of final use); and, on the contrary, the real rise in liabilities is in comparison to the nominal rise reduced by the price level rise. The results of the calculation can be seen in the following table.

Table 3
Real holdings gains and losses, Czech Republic (mil. of CZK)

Classification	2000	2001	2002	2003	2004	2005	2006	2007	2008
Non-financial assets	10107	-34721	19388	69589	-80175	193092	209626	199408	-209986
Financial assets	-388791	-335710	-176571	-121310	-314539	140150	-241024	-327369	-794021
Liabilities	422492	318044	68514	90259	284894	-88061	193239	271066	912666

Source: czso.cz

26.   These time series show the development in particular parts of the residents´ balance sheet. The holding of non-financial assets earns positive gains for holders in most years. The opposite is true in the case of financial assets record real holding losses, except in 2005 that was the year of stock market rally. In the case of liabilities, there is also significant regularity – positive holding gains caused by rises in price level. So, we can conclude, that the dominant strategy in the ever rising price level environment is to be the holder of non-financial assets and a debtor.

IV.   Discussion issues

27.   Holding gains and losses can have an important role in business cycle analysis. For business cycle analysis, it is crucial to identify the changes in consumption (and savings) behaviour of economic agents. Thus, it is important to identify, if economic agents tend to consume more or they rather tend to save increasing part of their sources. These changes in the behaviour are the driving forces of business cycles. But the evaluation of consumption-savings behaviour on the basis of the macro-aggregate "savings" in the national accounts seems problematic. On which basis do the agents make the decision to consume or to save?

28.   If the definition of income is restricted (as was mentioned above), then the "use of disposable income account" compares the disposable income with total consumption financed not only by disposable income but also by other flows such as revaluations. Thus, changes in consumption cannot be explained only by changes in disposable income. As a result, it seems problematic to follow the concept of savings as non-consumed portion of disposable income, if the consumption is financed not only by the disposable income.

29.   Consider an agent earning income amounting to 100 and registering a holding gain 10[11]. Then total sources for consumption are 110. The agent decides to allocate 105 on consumption. What are the consequences? Savings (B.8g) would show negative value (-5), i.e. the consumption exceeds the disposable income. But it is not the correct reflection of reality. Total sources of funds of the agent are 110 and only 105 was spent on consumption ─ that is, the agents do not create negative savings (dis-savings), but the real propensity to consume is 4,5 per cent. The agent used its sources of funds exceeding disposable income to satisfy his needs.

30.   Consequently, the picture of human preferences is completely different. In the first case, agents prefer present time, i.e. to consume now than to save and consume more in the future. The natural interest rate is very (or prohibitively) high due to weak savings. In the second case, the economic agents save some part of their disposable sources, i.e. the preference of present time is weaker than in the first case. The increasing availability of savings squeezes the interest rate. Primarily, this can serve as a predictor of future

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[11] E.g. as result of stock market rally.

investment and productive activity and gives us the information on the position of the economy in the business cycle.

31.   The following chart shows alternative calculation of saving rate inspired by similar calculation in Lequiller [2003][12]. But in our chart, there are not only realized but also non-realized holding gains and losses <u>for assets</u>:

Chart 1
Saving rate and adjusted saving rate, Czech Republic
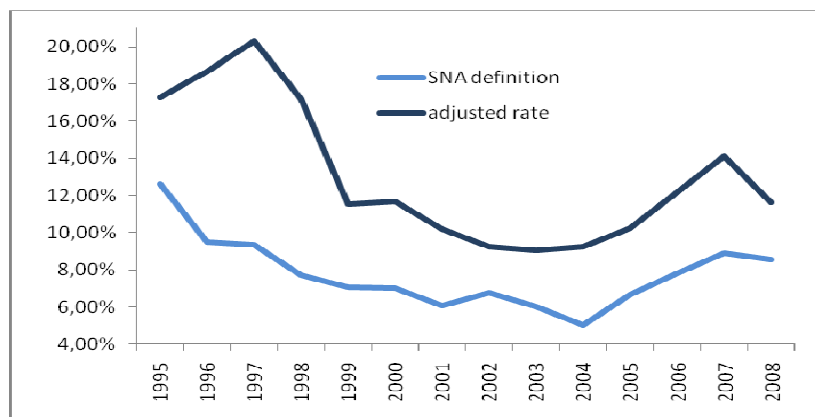
Source: czso.cz, own computation

V.   Conclusion

32.   Revaluations and the definition of disposable income are still at issue. In practice, there is big challenge for statisticians to improve the quantification of revaluation. On a theoretical level, the concept of disposable income and its possible extension by holding gains and losses can be discussed and reviewed. This discussion is essential, the importance of the holding gains and losses can rise during some periods, as we were witnessing in the last decade. In times of increasing importance of revaluations, the predictive power of some aggregates can be more or less restricted. Without regard to potential changes in the SNA, revaluation should be taken into account in the analysis of business cycles.

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