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# CONCEALED INTEREST INCOME OF HOUSEHOLDS IN THE NETHERLANDS; 1977, 1979 AND 1981

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Summary

The major problem in estimating the size of hidden income is that total income, reported plus unreported, is unknown. However, this is not the case with total interest income on giro, bank and savings accounts, (mortgage) bonds, savings certificates etcetera of households in the Netherlands. This makes it possible to estimate at least the order of magnitude of this part of hidden income. In this paper it will be shown that in 1977, 1979 and 1981 almost 50% of total interest received by households was concealed.

Contents

## 1. Introduction

In general for taxpayers there are three methods to reduce taxation: underreporting income, overreporting tax reliefs and taking advantage of loopholes in tax laws. Most of these activities are hidden. Nevertheless, many researchers have tried to quantify them and a vast variety of sometimes ingenious methods have been used. Yet, there is still no consensus on their magnitude.

The major problem in estimating the size of hidden income is that total income, reported plus unreported, is unknown. This, however, is not the case with total interest income on giro, bank and savings accounts, (mortgage) bonds, savingscertificates etcetera of households in the Netherlands. This fact makes it possible to estimate at least the order of magnitude of this part of hidden income.

The basic methodology underlying these estimates is a detailed analysis of the discrepancies between the National Accounts (NA) estimates of total interest income of households and the estimates in the Income Distribution Statistics (IDS). The estimates are based on different data sources: the first on data obtained from the giro, trade and savingsbanks, the Central Bank, the government, the stock exchange, institutional investors, pension funds, large companies etcetera. The IDS are mainly based on data derived from taxforms. Therefore the discrepancies between both sets of statistics can give an indication of the order of magnitude of concealed interest income.

A general belief arose that the total amount of evaded taxes due to concealed interest income was very large. To be certain of this, Parliament decided on a sample study in which the interest receipts reported in the tax returns of 3000 income tax payers, were compared with the corresponding information in the accounts of the giro and all trade and savingsbanks in the Netherlands. For this purpose a special law was passed in which matters of privacy were settled and the co-operation of the banks was enforced. The results of this micro discrepancy analysis became public and can be

compared with the results of the macro discrepancy analysis described in this paper. The results substantiate each other.

This paper is built up as follows. Section 2 gives a brief background of the Dutch National Accounts and the Dutch Income Distribution Statistics. The same section also includes a brief description of the Dutch income tax system as far as it is of interest with respect to the methodology of the macro discrepancy analysis. Sections 3 and 4 describe the adjustment made to the NA and IDS estimates. These adjustments were necessary because of differences in definitions and imperfections in both sets of statistics. In section 5, conclusions on concealed interest income are drawn. In section 6, the results of the above mentioned micro discrepancy analysis are summarized and compared with the conclusions in section 5. This paper concludes with section 7, a summary of the main results.

## 2. Some background information

In the Dutch income tax system, interest income is treated in a very special way. Whereas wages, salaries, social benefits etcetera are liable to a personal income tax, interest income is not. The latter is considered to belong to all members in a household. Therefore, the interest income of all members is counted together and must be added to the personal income of the main wage earner, that is the person with the highest income. There are few exceptions. The most important of these is that children of age and parents who live with their children are not considered to be members of the household. Their interest income is added to their own personal incomes.

In 1977 all interest income was subject to income tax. In 1979 and 1981 it was not. In 1979 there was an exemption for the first 200 guilders per household. In 1981 this exemption was 700 guilders, but applied to the balance of interest income and interest payments (e.g. on mortgages). Notwithstanding these exemptions, one was obliged to report total interest income, total interest payments and the resulting exemption separately. The reason for this obligation was the existence of an inverse relationship between the sum of all positive income elements and some tax deductions. For example, tax relief on charity gifts is higher for lower income groups. Consequently, for everybody who completed a tax return, any not reported interest income must be considered as concealed, even if it would not have influenced the assessment.

Not everybody has to complete a tax return, especially when wages, salaries or social security benefits do not exceed a specified maximum. In these cases the pay-as-you-earn tax (P.A.Y.E.) is considered to equal income tax. This applies to about 45% of all income tax payers. It does not apply to those

- who receive a tax form in spite of this. When the inland revenue thinks for some reason that the P.A.Y.E. does not equal the income tax it sends out a tax form which must be completed and returned.

- whose taxable income is 600 guilders higher than the income on which P.A.Y.E. was paid, because of e.g. a large amount of interest income. If the inland revenue does not send a tax form, one must ask for it oneself.

Besides these two exceptions, people who think that P.A.Y.E. exceeds their income tax are advised to ask for a tax form to obtain a refund. Obviously interest income of those people who are legally justified in not completing a tax return must not be considered as concealed.

Both the accounts of the income tax and those of the P.A.Y.E. are used as a data source for the IDS (CBS, 1982b, 1983b). The first accounts are more detailed than the latter. Among other things they contain information on interest income, in contrast to the P.A.Y.E. accounts which do not. The IDS do not include interest income of people who pay only P.A.Y.E.

The NA are completely different (CBS, 1983a). They are not based on one or two single sources, but are the result of a detailed comparison of a large number of data in an input-output framework. The data are obtained from many different sources and sets of statistics. Fiscal sources hardly play a role at all. As already mentioned in section 1, the sum of all interest flows is routinely calculated from data obtained from the giro, trade and savingsbanks, the Central Bank, the government, the stock exchange, institutional investors, pension funds, large companies etcetera. In addition, an independent estimate of the interest flows per sector is made, except for the household sector, which in the NA includes nonprofit organizations like trade unions, charities, sports clubs etcetera. The interest payments and receipts of this household sector are calculated as a residual.

As can be seen from the last two paragraphs, the IDS and NA cannot be compared without some adjustment. Firstly, the definition of a household differs. Secondly, the IDS contain interest flows between households, while the NA do not. On the other hand, the NA contain interest income of non tax payers and those tax payers who pay only P.A.Y.E., whereas the IDS do not. Further, the NA are transaction based and the IDS are cash based. Finally, the IDS distinguish between three different interest categories, as discussed below.

## 3. Adjustments to the National Accounts

As section 2 described, the interest income of households is deduced as the sum of all interest flows which cannot be assigned to other sectors. However, interest received on giro, bank and savingsaccounts and on all types of savingscertificates can also be directly deduced from other published statistics. These cover precisely two of the three interest categories distinguished in the IDS. Interest received on bonds can then be calculated as the difference between total interest receipts and the two direct estimates. This enables a more detailed discrepancy analysis.

The interest on giro, bank and savingsaccounts can be deduced from the Statistics of Savings (CBS, 1980, 1981a, 1982a, 1983c). The definition of households used in these statistics corresponds with the one used in the NA. The Statistics of Savings do not report interest payments, but they report the total end-of-year balances of savings of many different types of accounts and their corresponding interest rates. Together, these statistics provide enough information to estimate total interest received on these accounts. From end-of-year data, average interest rates and average balances were calculated for each type of account. Where no interest rates were given, information from similar accounts was used. Next, the available monthly data on giro accounts was used to adjust the average balances for seasonal fluctuations. Finally the averaged interest rates and seasonally adjusted average balances where multiplied to estimate the total interest due.

In 1978 the definition of savings used in the Statistics of Savings was changed slightly. From then on, deposits of less than 500,000 guilders were also counted as savings. It was possible to calculate the effects of this change in definition and to adjust the 1977 estimates accordingly. This new definition almost coincides with that of the IDS, except for the maximum of 500,000 guilders. This limitation, however, is not of great importance, because in most cases, deposits with a higher balance are of a business nature and are rightly excluded from the analysis. If they are not businesslike, they affect only the distribution of concealed interest income over the three categories. Concealed interest on giro, bank and

savingsaccounts are then slightly underestimated, while concealed interest on bonds are overestimated by the same amount.

The estimation of interest on all kinds of savingscertificates falls into two parts. The balances and interest rates of one type of savingscertificate can be found in the above mentioned Statistics of Savings. The interest due on these savings is calculated in the same manner as that on giro, bank and savingsaccounts. Further data on the balances of savingscertificates can be found in DNB (1983), but no data on interest rates is provided. It is known, however, that these rates are heavily related to the interest rates of longterm loans. As an approximation, the interest rates of public loans were used. Due to heavy fluctuations in this rate in the late 1970s, the total interest received in a given year on savingscertificates can be calculated only when the composition of year of issue and maturity dates is known. The following distribution of maturities was assumed: 2 years 10%, 3 years 10%, 4 years 20%, 5 years 20%, 20% 6 years, 7 years 10%, 8 years 5% and 9 years 5%. Using this distribution and starting from the first year for which data on savingscertificates were published, and assuming that this was their first year of issue, total interest due was calculated. Also several other distributions of maturities were simulated. They all gave approximately the same result. All savingscertificates were assumed to be possessed by households only.

As already mentioned, interest income on bonds is calculated as the difference between total interest income according to the NA and the above described independent estimates of the other two categories. An objection to this procedure is that all errors in the first estimates affect this last one. An alternative independent estimate is impossible because of lack of data. An attempt was made, however, to estimate the size of this third interest category independently. The data used were based on the bonds issued by national and local government, universal banks and other money creating institutions, assurance companies (DNB, 1983), the 'Bank Nederlandsche Gemeenten' (Dutch Municipality Bank) and the "Nederlandsche Waterschapsbank' (see e.g. BNG, 1982; NWB, 1982), religious communities, large limited companies or corporations listed at the share market and data on mortgage bonds (see e.g. CBS, 1979a, 1982c, 1982d, 1982e, 1983d). The

interest households received on these bonds was calculated to be at least 1700 million guilders in 1977, 2000 million guilders in 1979 and 2900 million guilders in 1981. Although these figures do not account for bonds issued by small limited companies or corporations listed on the stock exchange, unlisted companies, hospitals, savingsbanks, associations and institutions or foundations with businesslike goals, foreign bonds etcetera, they account for some 75% of the residually estimated total interest received on bonds. Therefore, these estimates are considered to be fairly reliable. The first column of table 1 presents the calculated distribution of total interest received by households.

Table 1. Interest receipts of households according to the National Accounts 1977, 1979, 1981.

| | According to the NA | Adjustments | According to the NA after adjustment |
|---|---|---|---|
| | | × 1000 million guilders | |
| Interest on giro, bank and savingsaccounts, and between households | | | |
| 1977 | 4.2 | +0.2 | 4.4 |
| 1979 | 6.1 | +0.2 | 6.3 |
| 1981 | 8.8 | +0.2 | 9.0 |
| Interest on bonds | | | |
| 1977 | 2.3 | -0.1 | 2.2 |
| 1979 | 2.7 | -0.1 | 2.6 |
| 1981 | 3.8 | -0.2 | 3.6 |
| Interest on all types of savingscertificate | | | |
| 1977 | 0.6 | -0.3 | 0.3 |
| 1979 | 1.1 | -0.4 | 0.7 |
| 1981 | 1.5 | -0.4 | 1.1 |
| Total interest | | | |
| 1977 | 7.1 | -0.2 | 6.9 |
| 1979 | 9.9 | -0.3 | 9.6 |
| 1981 | 14.1 | -0.4 | 13.7 |

The definition of the household sector in the NA is more comprehensive than that in the IDS. The first includes some nonprofit organizations whereas the latter does not. For this disparity an adjustment is made. These adjustments were calculated from data retrieved from a large variety of sources, such as annual reports. Total interest received by the non-

natural persons in the NA household sector was estimated at about 100 million guilders in 1977 and the same in 1979. In 1981 it was just over 200 million guilders. The distribution of these amounts over the three interest categories is deduced from data of national associations of e.g. sports and dancing, nonprofit broadcasting organizations, employers' organizations, employees' organizations and religious communities (see e.g. CBS 1979b, 1981b, 1982d). These corrections are probably underestimates, because of interest on bonds, received by relief funds and strike funds of trade unions. No data could be found on these. The NA estimate of total interest income of households, however, is most probably also underestimated for the same reason and by approximately the same amount. Therefore this underestimation does not affect the estimate of concealed interest income.

The NA includes only interest flows between sectors. Ergo the interest flows within sectors are excluded. However, the latter are subject to income tax and they are therefore included in the IDS. There, they are titled 'overige vorderingen' (other claims), which in this paper are put together with the interest income on giro, bank and savingsaccounts. Separate data on these claims are not available, but can be partly deduced from total interest payments of households. A comparison of these payments according to the IDS and NA shows that the former exceeds the latter. It is assumed that this difference is due to interest payments within the household sector. Most probably, the mutual interest payments are much higher, because the IDS do not account for payments not reported. Consequently, the estimates of concealed interest in this paper are somewhat conservative. In 1977 the difference between NA and IDS estimates was 300 million guilders, in 1979 it was 100 million guilders and in 1981 it was almost zero. As this decline is not very likely, the estimates for 1977 were also used for the other two years. As this component constitutes only a very minor part of total interest income, this discrepancy will not alter our main findings.

Interest on savingscertificates is normally paid at the end of the contract period. At that moment it is subject to income tax and not in the years before. Therefore in the IS this interest is registered on cash basis. In the NA, however, it is registered on acrual basis. The difference

between the two can be calculated. In 1977 the difference was about minus 300 million guilders, in 1979 it was almost minus 400 million guilders and in 1981 again minus 300 million guilders. For bonds it amounted to minus 100 million guilders per year. For giro, bank and savingsaccounts it was almost zero each year.

For selfemployed persons, it is often difficult to keep private and business interest receipts separated. Errors are easily made. It is assumed that these errors are not very important and have not influenced the IDS systematically. Consequently, no adjustment for this is considered necessary. Table 1 shows the NA data on interest receipts of households and the sum of the necessary adjustments.

## 4. Adjustments on the Income Distribution Statistics

The IDS includes only the interest receipts of those people who returned a tax form. It does not cover the receipts of those who pay only P.A.Y.E. As argued in section 2, not all this interest is concealed. Only if a person has so much extra income that taxable income is 600 guilders more than the income subjected to P.A.Y.E., it must be considered as concealed, if not declared. Interest minus exemption falls within this extra income. In 1977 there was no exemption on interest income at all, in 1979 this exemption was 200 guilders on interest receipts and in 1981 it was a maximum of 700 guilders on the balance of interest receipts and payments. Thus if interest income was the only extra income, no interest was paid and there were no other deductions, P.A.Y.E. payers who did not complete a tax return but did receive more than 600 guilders interest in 1977, 800 guilders interest in 1979 or more than 1300 guilders interest in 1981 were tax evaders.

For tax payers who paid only P.A.Y.E., no data are available, except their number. Therefore, to estimate the size of correctly nonreported interest receipts some assumptions were necessary. Firstly, interest is the only extra income. No interest was paid, nor were other tax deductions allowed. Secondly, for each income bracket (32 in total) per socio-economic category (5 in total), the average realized exemption on interest income of people who paid P.A.Y.E. but did not complete a tax return equals that of those people who did complete one. Thirdly, the same assumption holds for the interest income distribution. The method used to estimate the correctly nonreported interest income is described in the Appendix. The results can be found in table 2.

A second but minor adjustment should be made for households who did neither completed a tax return, nor paid P.A.Y.E., e.g. students without earned income. Lack of data makes this impossible. This adustment, however, would not be very large and would hardly influence the conclusions on concealed interest income. Further, no full account is taken of income from properties of under-aged children whose parents or guardians are using those properties. This income must be reported as 'overig inkomen' (other income), and consists of e.g. income from real estate, dividends etcetera

and for a minor part of interest income too. As the total 'overig inkomen' in the IDS is less than 100 million guilders, the interest included is negligible.

Table 2. Reported interest receipts of households according to the Income Distribution Statistics 1977, 1979, 1981.

| | According to the IDS | Adjustments | According to the IDS after adjustment |
|---|---|---|---|
| | | x 1000 million guilders | |
| Interest on giro, bank and savingsaccounts, and between households | | | |
| 1977 | 2.7 | +0.2 | 2.9 |
| 1979 | 3.9 | +0.2 | 4.1 |
| 1981 | 5.8 | +0.4 | 6.2 |
| Interest on bonds | | | |
| 1977 | 0.7 | +0.0 | 0.7 |
| 1979 | 0.7 | +0.0 | 0.7 |
| 1981 | 0.8 | +0.1 | 0.9 |
| Interest on all types of savingscertificate | | | |
| 1977 | 0.0 | +0.0 | 0.0 |
| 1979 | 0.1 | +0.1 | 0.2 |
| 1981 | 0.2 | +0.0 | 0.2 |
| Total interest | | | |
| 1977 | 3.4 | +0.2 | 3.6 |
| 1979 | 4.7 | +0.3 | 5.0 |
| 1981 | 6.8 | +0.5 | 7.3 |

## 5. Concealed interest income of households

Table 3 shows the estimates of interest income after adjustment according to the NA and the IDS. The difference between them is so large that statistical reasons alone cannot explain it all. It is more realistic to assume that the discrepancies are caused by fraud, resulting in a systematic downward bias in the IDS estimates. Consequently, the discrepancies between the adjusted NA an IDS estimates can be considered as indicators of the order of magnitude of concealed interest income of households.

Table 3. Discrepancy between the receipts of households according to the adjusted National Accounts and the Income Distribution Statistics 1977, 1979, 1981.

| | According to the NA after adjustment | According to the IDS after adjustment | Discrepancy between adjusted NA and IDS | Discrepancy between adjusted NA and IDS as % of adj. NA[1] |
|---|---|---|---|---|
| | × 1000 million guilders | | | |
| Interest on giro, bank and savings accounts, and between households | | | | |
| 1977 | 4.4 | 2.9 | 1.5 | 34 |
| 1979 | 6.3 | 4.1 | 2.2 | 35 |
| 1981 | 9.0 | 6.2 | 2.8 | 31 |
| Interest on bonds | | | | |
| 1977 | 2.2 | 0.7 | 1.5 | 68 |
| 1979 | 2.6 | 0.7 | 1.9 | 72 |
| 1981 | 3.6 | 0.9 | 2.7 | 76 |
| Interest on all types of savingscertificate | | | | |
| 1977 | 0.3 | 0.0 | 0.3 | 91 |
| 1979 | 0.7 | 0.2 | 0.5 | 80 |
| 1981 | 1.2 | 0.2 | 1.0 | 84 |
| Total interest | | | | |
| 1977 | 6.9 | 3.6 | 3.3 | 47 |
| 1979 | 9.6 | 5.0 | 4.6 | 48 |
| 1981 | 13.8 | 7.3 | 6.5 | 47 |

1) Calculated from unrounded results

All three years under consideration show roughly the same percentage of concealed interest. This also applies to each interest category: 30-35% for giro, bank and savingsaccounts, around 70% for bonds and over 80% for savingscertificates. There is a downward tendency for savingsaccounts and an upward tendency for bonds. These tendencies, however, do not justify conclusions, as they may well be insignificant and fall within the confidence intervals.

Although the amount of concealed interest did not grow in relation to total interest receipts, it doubled in absolute terms from about 3300 million guilders in 1977 to 6500 million guilders in 1981, and in magnitude is possibly more significant than hidden extra earnings (Van Eck and Kazemier, 1988 and 1989). In relation to national income it grew from 1.2% of GNP in 1977 to 1.9% of GNP in 1981.

## 6. Micro discrepancy analysis

In 1983 the Dutch Parliament instituted an enquiry in which the interest receipts, reported in the tax returns of a sample of 3000 income tax payers were compared with the corresponding information in the accounts of the giro and all trade and savingsbanks in the Netherlands. The enquiry details and matters of privacy were governed by the 'Wet Rentesteekproefonderzoek 1984/1985' (Law Interest Sample Research 1984/1985) of 1985 may 21st.

The sample consisted of 1369 units, i.e. a single person, a married couple without children or a family. Children of age were handled as a separate unit. The 1369 units correspond with almost 3000 persons. The Dutch Central Bank collected the 1981 data on interest received, as far as they could be found in the accounts of the giro or the banks. The Department of Finance collected the corresponding reported data on interest, as far as tax returns had been completed. Both data files were put in the same order, made anonymous and sent to the Central Bureau of Statistics for further analysis. The details and results of this micro discrepancy analysis were reported in TWEEDE KAMER (1986).

A comparison of the results of the micro analysis with those of the macro analysis shows remarkable similarities. In the micro analysis, the adjusted but still underestimated interest receipts on giro, bank and savingsaccounts were 8100 million guilders in 1981. In the macro approach these were estimated at 8500 million guilders (NA estimate minus other claims ('overige vorderingen')). The difference is less than 5%. Further, the interest reported in the micro approach is circa 5700 million guilders, whereas in the macro approach interest reported was 5500 million guilders (IDS estimate minus 'overige vorderingen'), also a difference of less then 5%. Finally, the correctly nonreported interest of tax payers who paid only P.A.Y.E. is approximately the same. These striking similarities, arrived at by completely different methods from completely different data sources, strengthens the confidence in the results of both analyses.

## 7. Conclusions

In 1977, 1979 and 1981 around half of total interest receipts of households in the Netherlands was illicitly concealed from the tax authorities. Because of the rapid growth of total interest, the concealed interest income grew from 3000-3500 million guilders in 1977 to 6000-7000 million guilders in 1981. Also, for the three interest categories distinguished, the percentages of interest concealed were approximately the same in each year considered. In descending order: 80-90% on all types of savingscertificates, 65-80% on bonds and 30-35% on giro, bank and savingsaccounts. The results of this last category are confirmed by those of a micro discrepancy analysis.

Appendix

For 1979 there were IDS data available on the average interest income and average interest exemption per socio-economic category per income bracket. This made it possible to estimate a two parameter interest income distribution function per category per bracket. The most flexible specification often used for income distribution purposes is the Gamma distribution. An alternative is the Pareto distribution function but it is not defined for incomes of less than a certain pre-defined level. A second alternative is the Lognormal distribution but this can never be strictly decreasing (KLOEK and VAN DIJK, 1978). Therefore, the Gamma distribution was chosen. Its general form is

$$f(x) = \lambda^r x^{r-1} e^{-\lambda x}/\Gamma(r) \qquad \lambda, r, x > 0$$

For values of $r>1$, this function first increases to its maximum and then decreases uniformly. If $r\leq 1$ this function is strictly decreasing. For each socio-economic category i and each income bracket j the average interest income is $\bar{x}_{ij}$, the average interest exemption is $\overline{xv}_{ij}$ and the number of people who paid only P.A.Y.E. is $LB_{ij}$. The maximum exemption $xv_{max}$ in 1979 was 200 guilders. Using the Gamma distribution and the known averages the values of $\lambda_{ij}$ and $r_{ij}$ can be calculated.

$$\bar{x}_{ij} = \int_0^\infty x f_{ij}(x)dx = r_{ij}/\lambda_{ij}$$

and

$$\overline{xv}_{ij} = \int_0^{xv_{max}} x f_{ij}(x)dx + xv_{max} \int_{xv_{max}}^\infty f_{ij}(x)dx$$

The first equation gives the ratio between $r_{ij}$ and $\lambda_{ij}$. Using the second equation, the absolute value of both parameters can be calculated. The results of the calculations can be found in Table A. For some income brackets, the number of observations was rather small. Therefore some brackets were taken together. The results of the categories "self employed"

and "managing directors" were omitted, as they hardly contribute to the total adjustment. The number of self employed or managing directors who pay only P.A.Y.E. is very small.

Table A. Estimates of the parameters $\lambda$ and r of the Gamma distribution to describe the 1979 interest income distribution, per socio-economic category and income bracket

| Income bracket (× 1000 guilders) | Employees and unemployed | | Retirement pensioners and disablement pensioners | | Dependent persons | |
|---|---|---|---|---|---|---|
| | $\lambda$ | r | $\lambda$ | r | $\lambda$ | r |
| | ×0.001 | ×0.01 | ×0.001 | ×0.01 | ×0.001 | ×0.01 |
| less than 8 | 0.5 | 54.8 | 0.6 | 55.7 | 0.6 | 55.3 |
| from 8 to 16 | 4.1 | 58.9 | 1.2 | 56.9 | 1.0 | 55.2 |
| from 16 to 24 | 2.2 | 57.5 | 0.5 | 56.1 | 0.9 | 55.0 |
| from 24 to 32 | 1.6 | 57.2 | 0.3 | 55.2 | 0.4 | 54.1 |
| more than 32 | 1.7 | 57.2 | 0.2 | 55.3 | 0.2 | 54.2 |

The calculated values of $\lambda$ and r show a satisfying regularity. Both decrease when total income increases. The obtained interest income distribution is used to calculate the adjustments for correctly nonreported interest income. This adjustment equals

$$\sum_{i,j} LB_{ij} \int_{0}^{600+xv_{max}} xf_{ij}(x)dx \quad \text{guilders}$$

The 1979 interest income distribution functions can also be used to calculate the 1981 adjustment. At least one of the parameters $\lambda$ and r, however, must be changed because the average interest income $\bar{x}_{ij}$ differs in 1981 and ergo the ratio $r_{ij}/\lambda_{ij}$. The shape of the distribution depends mostly on the value of r, because this determines whether the function is strictly decreasing ($r \leq 1$), or has a peak ($r > 1$). Therefore, in order to preserve the shape of the distribution, r was kept constant and only the parameter $\lambda$ was varied.

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NA/01 **Flexibility in the system of National Accounts**, Van Eck, R., C.N. Gorter and H.K. van Tuinen (1983).
This paper sets out some of the main ideas of what gradually developed into the Dutch view on the fourth revision of the SNA. In particular it focuses on the validity and even desirability of the inclusion of a number of carefully chosen alternative definitions in the "Blue Book", and the organization of a flexible system starting from a core that is easier to understand than the 1968 SNA.

NA/02 **The unobserved economy and the National Accounts in the Netherlands, a sensitivity analysis**, Broesterhuizen, G.A.A.M. (1983).
This paper studies the influence of fraud on macro-economic statistics, especially GDP. The term "fraud" is used as meaning unreporting or underreporting income (e.g. to the tax authorities). The conclusion of the analysis of growth figures is that a bias in the growth of GDP of more than 0.5% is very unlikely.

NA/03 **Secondary activities and the National Accounts: Aspects of the Dutch measurement practice and its effects on the unofficial economy**, Van Eck, R. (1985).
In the process of estimating national product and other variables in the National Accounts a number of methods is used to obtain initial estimates for each economic activity. These methods are described and for each method various possibilities for distortion are considered.

NA/04 **Comparability of input-output tables in time**, Al, P.G. and G.A.A.M. Broesterhuizen (1985).
It is argued that the comparability in time of statistics, and input-output tables in particular, can be filled in in various ways. The way in which it is filled depends on the structure and object of the statistics concerned. In this respect it is important to differentiate between coordinated input-output tables, in which groups of units (industries) are divided into rows and columns, and analytical input-output tables, in which the rows and columns refer to homogeneous activities.

NA/05 **The use of chain indices for deflating the National Accounts**, Al, P.G., B.M. Balk, S. de Boer and G.P. den Bakker (1985).
This paper is devoted to the problem of deflating National Accounts and input-output tables. This problem is approached from the theoretical as well as from the practical side. Although the theoretical argument favors the use of chained Vartia-I indices, the current practice of compilating National Accounts restricts to using chained Paasche and Laspeyres indices. Various possible objections to the use of chained indices are discussed and rejected.

NA/06 **Revision of the system of National Accounts: the case for flexibility**, Van Bochove, C.A. and H.K. van Tuinen (1985).
It is argued that the structure of the SNA should be made more flexible. This can be achieved by means of a system of a general purpose core supplemented with special modules. This core is a fully fledged, detailed system of National Accounts with a greater institutional content than the present SNA and a more elaborate description of the economy at the meso-level. The modules are more analytic and reflect special purposes and specific theoretical views. It is argued that future revisions will concentrate on the modules and that the core is more durable than systems like present SNA.

NA/07 **Integration of input-output tables and sector accounts; a possible solution**, Van den Bos, C. (1985).
The establishment-enterprise problem is tackled by taking the institutional sectors to which the establishments belong into account during the construction of input-output tables. The extra burden on the construction of input-output tables resulting from this approach is examined for the Dutch situation. An adapted sectoring of institutional units is proposed for the construction of input-output tables.

NA/08 **A note on Dutch National Accounting data 1900-1984**, Van Bochove, C.A. (1985).
This note provides a brief survey of Dutch national accounting data for 1900-1984, concentrating on national income. It indicates where these data can be found and what the major discontinuities are. The note concludes that estimates of the level of national income may contain inaccuracies; that its growth rate is measured accurately for the period since 1948; and that the real income growth rate series for 1900-1984 may contain a systematic bias.

NA/09 **The structure of the next SNA: review of the basic options**, Van Bochove, C.A. and A.M. Bloem (1985).
There are two basic issues with respect to the structure of the next version the UN System of National Accounts. The first is its 'size ': reviewing this issue, it can be concluded that the next SNA must be 'large ' in the sense of containing an integrated meso-economic statistical system. It is essential that the next SNA contains an institutional system without the imputations and attributions that pollute present SNA. This can be achieved by distinguishing, in the central system of the next SNA, a core (the institutional system), a standard module for non-market production and a standard module describing attributed income and consumption of the household sector.

NA/10 **Dual sectoring in National Accounts**, Al, P.G. (1985).
Following a conceptual explanation of dual sectoring, an outline is given of a statistical system with complete dual sectoring in which the linkages are also defined and worked out. It is shown that the SNA 1968 is incomplete and obscure with respect to the links between the two sub-processes.

NA/11 **Backward and forward linkages with an application to the Dutch agro-industrial complex**, Harthoorn, R. (1985).
Some industries induce production in other industries. An elegant method is developed for calculating forward and backward linkages avoiding double counting. For 1981 these methods have been applied to determine the influence of Dutch agriculture in the Dutch economy in terms of value added and labour force.

NA/12 **Production chains**, Harthoorn, R. (1986).
This paper introduces the notion of production cains as a measure of the hierarchy of industries in the production process. Production chains are sequences of transformation of products by successive industries. It is possible to calculate forward transformations as well as backward ones.

NA/13 **The simultaneous compilation of current price and deflated input-output tables**, De Boer, S. and G.A.A.M. Broesterhuizen (1986).
A few years ago the method of compiling input-output tables underwent in the Netherlands an essential revision. The most significant improvement is that during the entire statistical process, from the processsing and analysis of the basic data up to and including the phase of balancing the tables, data in current prices and deflated data are obtained simultaneously and in consistency with each other.

NA/14 **A proposal for the synoptic structure of the next SNA**, Al, P.G. and C.A. van Bochove (1986).

NA/15 **Features of the hidden economy in the Netherlands**, Van Eck, R. and B. Kazemier (1986).
This paper presents survey results on the size and structure of the hidden labour market in the Netherlands.

NA/16 **Uncovering hidden income distributions: the Dutch approach**, Van Bochove, C.A. (1987).

NA/17 **Main national accounting series 1900-1986**, Van Bochove, C.A. and T.A. Huitker (1987).
The main national accounting series for the Netherlands, 1900-1986, are provided, along with a brief explanation.

NA/18 **The Dutch economy, 1921-1939 and 1969-1985. A comparison based on revised macro-economic data for the interwar period**, Den Bakker, G.P., T.A. Huitker and C.A. van Bochove (1987).
A set of macro-economic time series for the Netherlands 1921-1939 is presented. The new series differ considerably from the data that had been published before. They are also more comprehensive, more detailed, and conceptually consistent with the modern National Accounts. The macro-economic developments that are shown by the new series are discussed. It turns out that the traditional economic-historical view of the Dutch economy has to be reversed.

NA/19 **Constant wealth national income: accounting for war damage with an application to the Netherlands, 1940-1945**, Van Bochove, C.A. and W. van Sorge (1987).

NA/20 **The micro-meso-macro linkage for business in an SNA-compatible system of economic statistics**, Van Bochove, C.A. (1987).

NA/21 **Micro-macro link for government**, Bloem, A.M. (1987).
This paper describes the way the link between the statistics on government finance and national accounts is provided for in the Dutch government finance statistics.

NA/22 **Some extensions of the static open Leontief model**, Harthoorn, R. (1987).
The results of input-output analysis are invariant for a transformation of the system of units. Such transformation can be used to derive the Leontief price model, for forecasting input-output tables and for the calculation of cumulative factor costs. Finally the series expansion of the Leontief inverse is used to describe how certain economic processes are spread out over time.

NA/23 **Compilation of household sector accounts in the Netherlands National Accounts**, Van der Laan, P. (1987).
This paper provides a concise description of the way in which household sector accounts are compiled within the Netherlands National Accounts. Special attention is paid to differences with the recommendations in the United Nations System of National Accounts (SNA).

NA/24 **On the adjustment of tables with Lagrange multipliers**, Harthoorn, R. and J. van Dalen (1987).
An efficient variant of the Lagrange method is given, which uses no more computer time and central memory then the widely used RAS method. Also some special cases are discussed: the adjustment of row sums and column sums, additional restraints, mutual connections between tables and three dimensional tables.

NA/25 **The methodology of the Dutch system of quarterly accounts**, Janssen, R.J.A. and S.B. Algera (1988).
In this paper a description is given of the Dutch system of quarterly national accounts. The backbone of the method is the compilation of a quarterly input-output table by integrating short-term economic statistics.

NA/26 **Imputations and re-routeings in the National Accounts**, Gorter, Cor N. (1988).
Starting out from a definition of 'actual' transactions an inventory of all imputations and re-routeings in the SNA is made. It is discussed which of those should be retained in the core of a flexible system of National Accounts. Conceptual and practical questions of presentation are brought up. Numerical examples are given.

NA/27 **Registration of trade in services and market valuation of imports and exports in the National Accounts**, Bos, Frits (1988).
The registration of external trade transactions in the main tables of the National Accounts should be based on invoice value; this is not only conceptually very attractive, but also suitable for data collection purposes.

NA/28 **The institutional sector classification**, Van den Bos, C. (1988).
A background paper on the conceptual side of the grouping of financing units. A limited number of criteria are formulated.

NA/29 **The concept of (transactor-)units in the National Accounts and in the basic system of economic statistics**, Bloem, Adriaan M. (1989).
Units in legal-administrative reality are often not suitable as statistical units in describing economic processes. Some transformation of legal-administrative units into economic statistical units is needed. This paper examines this transformation and furnishes definitions of economic statistical units. Proper definitions are especially important because of the forthcoming revision of the SNA.

NA/30 **Regional income concepts**, Bloem, Adriaan M. and Bas De Vet (1989).
In this paper, the conceptual and statistical problems involved in the regionalization of national accounting variables are discussed. Examples are the regionalization of Gross Domestic Product, Gross National Income, Disposable National Income and Total Income of the Population.

NA/31 **The use of tendency surveys in extrapolating National Accounts**, Ouddeken, Frank and Gerrit Zijlmans (1989).
This paper discusses the feasibility of the use of tendency survey data in the compilation of very timely Quarterly Accounts. Some preliminary estimates of relations between tendency survey data and regular Quarterly Accounts-indicators are also presented.

NA/32 **An economic core system and the socio-economic accounts module for the Netherlands**, Gorter, Cor N. and Paul van der Laan (1989).
A discussion of the core and various types of modules in an overall system of economy related statistics. Special attention is paid to the Dutch Socio-economic Accounts. Tables and figures for the Netherlands are added.

NA/33 **A systems view on concepts of income in the National Accounts**, Bos, Frits (1989).
In this paper, concepts of income are explicitly linked to the purposes of use and to actual circumstances. Main choices in defining income are presented in a general system. The National Accounts is a multi-purpose framework. It should therefore contain several concepts of income, e.g. differing with respect to the production boundary. Furthermore, concepts of national income do not necessarily constitute an aggregation of income at a micro-level.

NA/34 **How to treat borrowing and leasing in the next SNA**, Keuning, Steven J. (1990).
The use of services related to borrowing money, leasing capital goods, and renting land should not be considered as intermediate inputs into specific production processes. It is argued that the way of recording the use of financial services in the present SNA should remain largely intact.

NA/35 **A summary description of sources and methods used in compiling the final estimates of Dutch National Income 1986**, Gorter, Cor N. and others (1990).
Translation of the inventory report submitted to the GNP Management Committee of the European Communities.

NA/36 **The registration of processing in make and use tables and input-output tables**, Bloem, Adriaan M., Sake De Boer and Pieter Wind (1990, forthcoming).
The registration of processing is discussed primarily with regard to its effects on input-output-type tables and input-output quotes. Links between National Accounts and basic statistics, user demands and international guidelines are examined.

NA/37 **A proposal for a SAM which fits into the next System of National Accounts**, Keuning, Steven J. (1990).
This paper shows that all flow accounts which may become part of the next System of National Accounts can be embedded easily in a Social Accounting Matrix (SAM). In fact, for many purposes a SAM format may be preferred to the traditional T-accounts for the institutional sectors, since it allows for more flexibility in selecting relevant classifications and valuation principles.

NA/38 **Net versus gross National Income**, Bos, Frits (1990).
In practice, gross figures of Domestic Product, National Product and National Income are most often preferred to net figures. In this paper, this practice is challenged. Conceptual issues and the reliability of capital consumption estimates are discussed.

NA/39 **Concealed interest income of households in the Netherlands; 1977, 1979 and 1981**, Kazemier, Brugt (1990).
The major problem in estimating the size of hidden income is that total income, reported plus unreported, is unknown. However, this is not the case with total interest income of households in the Netherlands. This makes it possible to estimate at least the order of magnitude of this part of hidden income. In this paper it will be shown that in 1977, 1979 and 1981 almost 50% of total interest received by households was concealed.

NA/40 **Who came off worst: Structural change of Dutch value added and employment during the interwar period**, Den Bakker, Gert P. and Jan de Gijt (1990).
In this paper new data for the interwar period are presented. The distribution of value added over industries and a break-down of value added into components is given. Employment by industry is estimated as well. Moreover, structural changes during the interwar years and in the more recent past are juxtaposed.

NA/41 **The supply of hidden labour in the Netherlands: a model**, Brugt Kazemier and Rob van Eck (1990).
This paper presents a model of the supply of hidden labour in the Netherlands. Model simulations show that the supply of hidden labour is not very sensitive to cyclical fluctuations. A tax exempt of 1500 guilders for second jobs and a higher probability of detection, however, may substantially decrease the magnitude of the hidden labour market.

NA/42 **Benefits from productivity growth and the distribution of income**, Keuning, Steven J. (1990).
This paper contains a discussion on the measurement of multifactor productivity and sketches a framework for analyzing the relation between productivity changes and changes in the average factor remuneration rate by industry. Subsequently, the effects on the average wage rate by labour category and the household primary income distribution are studied.

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