Statistics Netherlands
Division Presentation and Integration
Department of National Accounts

P.O.Box 4000
2270 JM Voorburg
The Netherlands

A volume index for the output of the Dutch banking industry based on quantity indicators

Sake de Boer

A pilot study for the period 1987-1995

Keywords: *Banking sector, economic growth, FISIM, input method deflation, output method deflation, price indices, volume indices*

* John Ramaker highly contributed to this study; especially the choice of indicators and the choice of weights for FISIM were his. The sensitivity analysis of the results was carried out together with Gerrit Zijlmans. Wim van Sorge made the basic translation into English. Many other members of the staff of Statistics Netherlands have made valuable contributions to the study by providing data, suggestions for improvements or comments on content and text.

Project number: *PNR-EIN*

Date: *July 27, 1999*

Summary: *This study is the first in a series of attempts by Statistics Netherlands to find alternative indicators to deflate the production value of branches of the service industry in cases where deflation by standard methods is problematic.*
Banking has been singled out since on the one hand it has a large value added while on the other hand the specific character of a large share of its production value (FISIM) rules out the standard deflation procedure. Consequently, less conventional methods are necessary here.
The production value of banking activities consists of two components: commissions and fees (direct payments for services) and FISIM; the latter being the largest part by far. Lacking directly observable and measurable prices, it is impossible to compose price indices of output in the usual way and to deflate FISIM with them. The only way left to construct a direct, independent volume index of FISIM is to derive it from quantity indicators of output. In principle, deflation of commissions should be comparable with deflation of other business services. However, in the Dutch practice deflators are not available, at least for the time being. In the short run, the only possibility left for improvement beyond input methods is to use quantity indicators.

Contents Page

1. Introduction

1.1 General

A special research area within the framework of the revision of the Dutch National Accounts according to the European System of Accounts (ESA) 1995 is the deflation of the production value of service industries. This study is the first in a series of attempts by Statistics Netherlands to find alternative indicators to deflate the production value of branches of the service industry in cases where deflation by standard methods (deflators derived from observed prices) is problematic.
This study is a pilot study from which we hope to gain experience that can be used when tackling deflation problems with other industries in the service sector. Banking has been singled out since on the one hand it has a large value added while on the other hand the specific character of a large share of its production value (i.e. financial intermediation services indirectly measured (FISIM)) rules out the standard deflation procedure. Consequently, less conventional methods are necessary here.

The estimation method that has been used so far for the deflation of the production value in the banking sector is a variant of what is often called the 'input method'. Here the volume index of the production value is set equal to the volume index of total labour costs and intermediate consumption. The underlying idea is that there must exist a certain relation between the value of inputs and outputs, when seen in the course of time. A considerable disadvantage of this method is, however, that deflation of input and output is not calculated independently, and, for example, the changes in labour productivity which are calculated using these results are in fact implicitly included in advance.

(OECD, 1996) gives a survey of approximation methods that are used in member countries for the deflation of the production value of banking. There is a wide variation in methods that have in common that they seem to be rough estimates. We have the impression that with none of these methods the desired improvement will be achieved. So in this study we have worked out another approach. Yet, it should be noted that methods developed in other countries have been inspirational for us.

The purpose of this study is to find a sufficiently reliable alternative volume index for the production value and value added of the banking industry. According to the method of double deflation deflated value added results from deflated production value minus deflated intermediate consumption of goods and services. The deflation of intermediate consumption gives no particular problems. So the regular problem is the deflation of the production value.

The production value of banking activities consists of two components: commissions and fees (direct payments for services) and FISIM; the latter being the largest part by far. FISIM is built up from the payment by savers and borrowers for services rendered by banks for their intermediate role between parties. In the System of National Accounts (SNA) 1993 and in ESA 1995 the expression "Financial intermediation services indirectly measured" has been introduced for what in the past often has been called the "interest margin". Throughout the text we will use the acronym FISIM as a synonym for interest margin.

Specific for the financial intermediation by banks is that payment for their services takes place in a way that differs from other goods and services. In paying for these services there is no question of a price in the usual sense. Payment for services rendered to borrowers take place through a charge on paid interest, for services rendered to savers by retention on the payable interest.
Lacking directly observable and measurable prices, it is impossible to compose price indices of output in the usual way and to deflate FISIM with them. The only way left to construct a direct, independent volume index of FISIM is to derive it from quantity indicators of output.

The second component of the production value of banks is commissions, which are charged to clients for a variety of services. In principle, deflation of commissions should be comparable with deflation of other business services. However, in the Dutch practice deflators are not available, at least for the time

being. In the short run, the only possibility left for improvement beyond input methods is to use volume indicators.

The purpose of this study can now be summarised as follows:

- a search for volume indicators for each kind of service rendered by the banking industry;
- the selection of weights and so-called influence parameters for individual volume indicators, which reflect their contribution to the volume index of total production.

The next step is the calculation of the volume index of value added from production and intermediate consumption by applying the method of double deflation.

The study still has a highly experimental character and it is important that the methods have been subject to a thorough test over a number of years. Time series have been compiled for the period 1987 - 1995. However, efforts to find the best fitting indicators have not been successful so far for all components of the output. In such cases approximations have been applied. Nevertheless, we have the impression that the indicators give a fair picture of the actual developments.

1.2 Formulae

Several simple, general methods exist to derive a volume index from a set of volume indicators. In this paper two such methods are applied.

The first formula is the usual straightforward aggregate weighting of indicators leading to an index for the total.

Formula l

- 'straightforward aggregate weighting'*:*

$Ind\,Vol = \sum_{i=1}^{n} w(i)\ .\ Ind\ A(i)$, where

A(i) = a volume indicator which describes aspect i of a service,

w(i) = the weight of aspect i for the determination of volume changes, and

Sw(i) = 1

The second formula is used to indicate the influence of an indicator on the total index by means of an "influence parameter".

Formula II

- 'influence weighting':

$Ind\,Vol = \prod_{i=1}^{n} \{1 + f(i).[\,Ind\ A(i) - 1]\}$, where

A(i) = a volume indicator which describes aspect i of a service,
f(i) = a parameter reflecting the influence of *A(i)* on the volume index,
$0 \leq f(i) \leq 1$

An example is the calculation of a volume index for activities on saving accounts (see section 2.3.1). In this case two aspects are important: the *number* of saving accounts and the *average amount of money* per account.

In calculating the volume index, we have assumed that a change in the *number* of savings accounts will lead to a *proportional* change in the volume of this activity (influence factor *f(i)* = 1). However, we have assumed that a change in the *average monetary value* per account will lead to only a *limited* increase in the volume index of administration. Here the influence factor *f(i)* has been fixed at 0.1. So, a growth of the average values by 10% results in a growth of the volume of the activity by 1%.

1.3 Correction on credits, savings etc. for the consequences of inflation

Money plays two roles in the production process of the banking industry. On the one hand it is used, just like in other industries, for the payment for goods and services and production factors that are bought and sold. On the other hand money is also an object of production in the production process of banks, perhaps more or less comparable with goods in the manufacturing industries. But banks work with money instead of goods.
A logical consequence is the use of monetary values as indicators for estimating the volume index of parts of the production value in banking. So, series of monetary values are applied as quantity indicators. Examples are series of saving balances, mortgages and consumptive credits.

A particular problem with this type of indicators is inflation. Before series of monetary values can be used as indicators, they have to be corrected for changes in the value of money. In this study we have made corrections by applying an indicator for the general price level. The deflator for gross national final expenditure has been used as an indicator for the general price level.

By assuming this several potential complications are ignored. For example the fact that within the framework of the national accounts there are two points of view: that of the producer and that of the consumer of services. Inflation can be experienced differently by both parties. However, difference of point of view is a well known problem for the analyst e.g. when deflating goods where producer and consumer can take different views on the extent of a change of quality.

2. FISIM

2.1 Weights and indicators of the volume index of FISIM

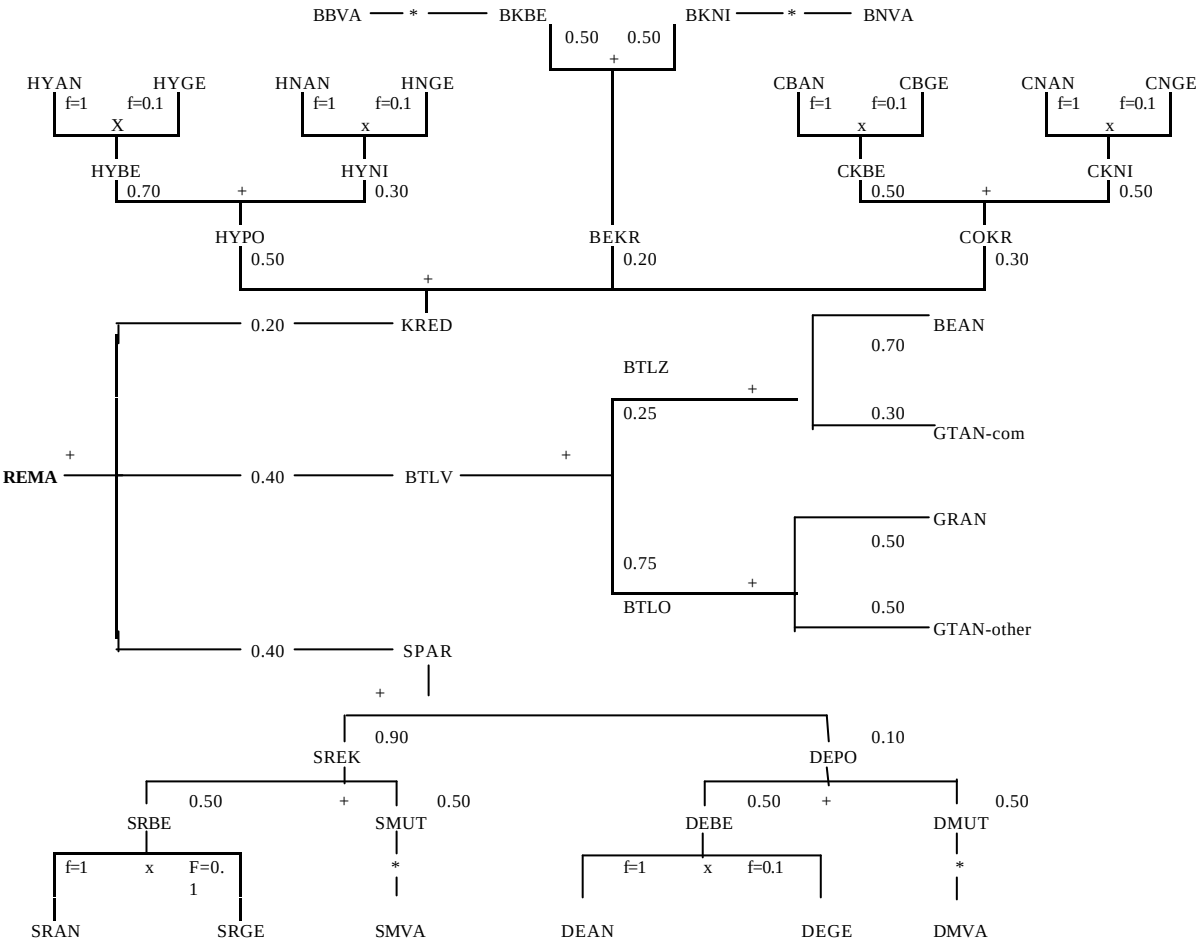
In general the rule is that, for deflating within the framework of national accounts, values of the preceding year are used as weights (starting with the Laspeyres volume index). However, for FISIM only its total value is available, except for an experimental partition among savers and borrowers for a number of years *(see: Ramaker and Van de Ven, 1996).* Thus, weights of indicators for the components of FISIM can not be based on the production value of the previous year and must therefore be obtained in a different way.
A 'second best' solution might be the aggregate weighting of volume indices for partial activities through their cost components. For that purpose intermediate consumption and labour costs in the banking sector should first be distributed over commissions and FISIM and then over those activities, that contribute to FISIM. This information cannot be drawn from Statistics Netherlands data, but must be obtained from the banking industry itself. For the time being, the weighting factors applied in this study are based on 'expert guesses' of the production value per partial activity, made by sector specialists. For the whole period of test calculations the same weights have been used.
The choice of the weights has been submitted to a sensitivity analysis. It has been examined which influence marginal fluctuations in certain weights have on the calculated volume index of FISIM (see section 2.4).

The weighting scheme for FISIM consists of a number of layers or strata. The first stratum is made up of indicators related to the main sources of FISIM: savings, credits and money transfers on bank accounts. The volume indices of each of these main activities in their turn have been constructed from a number of series. The latter have been build from sub-series. In this way a hierarchy of series arises, at which the deepest layer consists of indicators that are based on statistical observations. They are the

basis for all other indices. In fact, this approach means a step by step breakdown of activities in partial activities, until a level is reached over which statistical data is available.

The structure of the weights and influence parameters for the volume index of FISIM is represented in figure 1. The meaning of the variables in figure 1 is given in figure 2. Figure 3 shows the weights of the separate indicators and aggregates in the volume index of FISIM. Figure 3 is calculated from figure 1. Figure 4 distinguishes between activities with a more “continuous” character, that are summarised under “administration” and activities related to “movements” like turnover on savings accounts, acquisition of new credits and money transfers on current accounts.

Figure 1 – Scheme of weights and influence parameters volume index FISIM



+ =addition
x =multiplication
* =derived from

Figure 2 - List of indicators for the volume index of FISIM

Indicator	Description
REMA	Total FISIM
KRED	Total credit granting
HYPO	Mortgages
HYBE	Administration of running mortgages
HYAN*	Number of running mortgages
HYGE*	Average monetary value of running mortgages
HYNI	Acquisition of new mortgages
HNAN*	Number of new mortgages
HNGE*	Average monetary value of new mortgages
COKR	Consumer credit
CKBE	Administration of running consumer credits
CBAN*	Number of running consumer credits
CKNI	Acquisition of new credits
CNAN*	Number of new credits
CNGE*	Average monetary value of new credits
BEKR	Credits granted to enterprises
BKBE	Administration of credits granted to enterprises
BBVA*	Monetary value of credit granted to private enterprises
BKNI	New credits granted to enterprises
BNVA*	Total monetary value of new credit granted to private enterprises
SPAR	Total savings
SREK	Savings accounts
SRBE	Administration of savings accounts
SRAN*	Number of savings accounts
SRGE*	Average monetary value of savings accounts
SMUT	Payments and withdrawals of saving accounts
SMVA*	Turnover on savings accounts
DEPO	Deposits
DEBE	Administration of deposits
DEAN*	Number of deposits
DEGE*	Average monetary value of deposits
DMUT	Payments and withdrawals of deposits
DMVA*	Turnover on deposits
BLTV	Total money transfers on current bank accounts
BTLZ	Commercial money transfers
BEAN*	Number of enterprises in the Netherlands
GTAN-com*	Number of commercial money transfers

Series marked by an asterisk * are based on statistical observation; the other series are aggregates

Indicator	Description
BTLO	Other money transfers
GRAN*	Number of private persons with income
GTAN-other*	Number of money transfers (excl. commercial money transfers)

Series marked by an asterisk * are based on statistical observation; the other series are aggregates

Figure 3. Weights of indicators for volume-index FISIM in % of the total

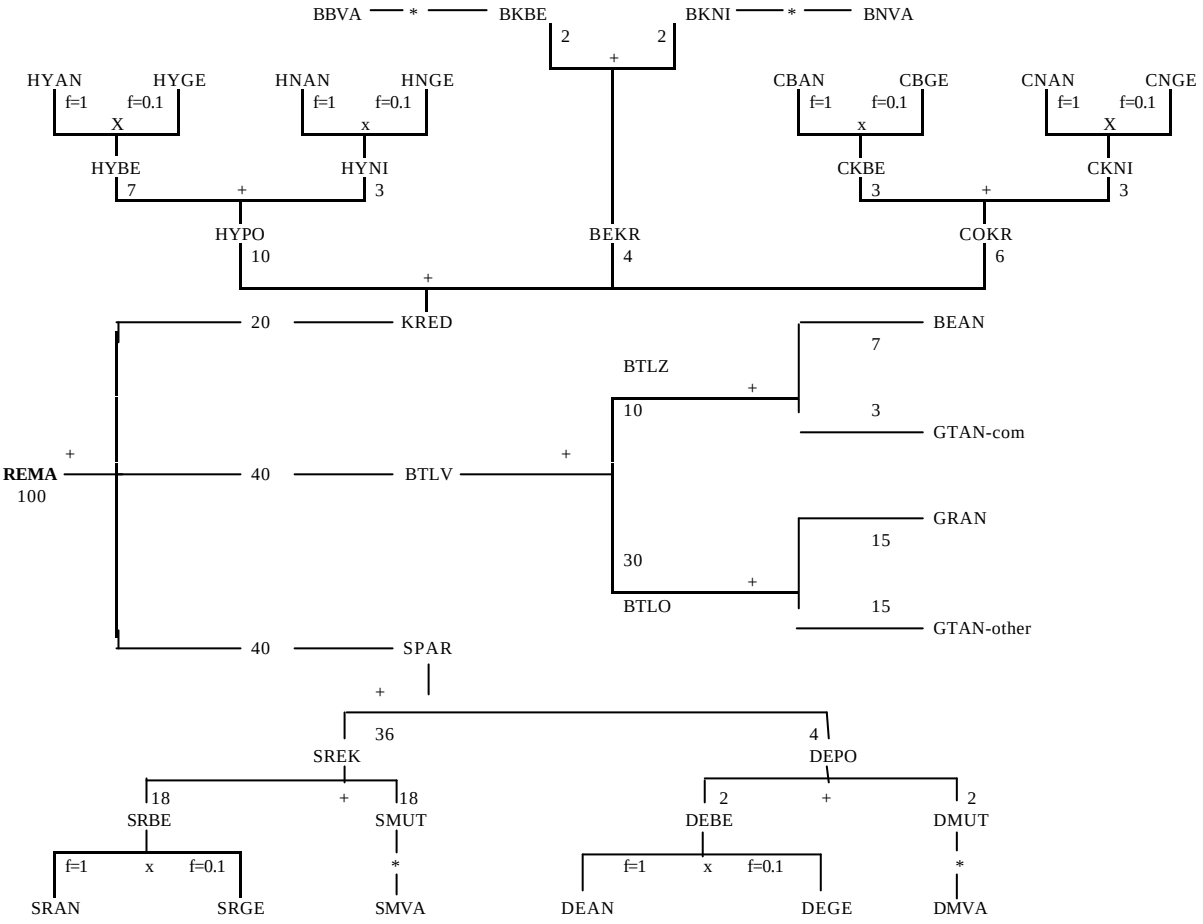


Figure 4. Weights classified according to "administration' and "movements" (%)

Indicator	weight	'administr' activities	'movement' activities
Mortgages			
-HYBE	7	7	
-HYNI	3		3
-total	*10*		
Consumer credit			
-CKBE	3	3	
-CKNI	3		3
-total	*6*		
Business credit			
-BKBE	2	2	
-BKNI	2	2	
-total	*4*		
Savings			
-SRBE	18	18	
-SMUT	18		18
-DEBE	2	2	
-DMUT	2		2
-total	*40*		
Commercial pay-transfers			
-BEAN	7	7	
-GTAN-com.	3		3
-total	*10*		
Other pay-transfers			
-GRAN	15	15	
-GTAN-other	15		15
-total	*30*		
Total	100	54	46

2.2 Results volume index FISIM 1987-1995

Table 1 gives a summary of the estimated volume indices of FISIM and the corresponding deflators. The build-up of the volume index from series of basic indicators is presented in table 2. In paragraph 2.3 below the separate steps of the calculation will be discussed.
The series of FISIM in current prices used here deviates from the series which was used by Statistics Netherlands until recently. E.g. after the ESA revision the interest margin of the Central Bank (DNB) will no longer be part of FISIM and for that reason has been left out here.

Table 1 - Breakdown of FISIM in volume and price (last year=100)

	FISIM (billion Hfl.)	Value index	Volume index	Deflator
1987	15.033			
1988	15.770	104.9	102.3	102.5
1989	15.711	99.6	103.9	95.9
1990	16.055	102.2	102.7	99.5
1991	17.256	107.5	102.4	105.0
1992	18.414	106.7	104.2	102.4
1993	19.664	106.8	106.1	100.7
1994	20.670	105.1	102.4	102.6
1995	21.567	104.3	99.8	104.5
Average		104.6	103.0	101.6

Table 1 shows that the volume index of FISIM has increased by 26% over the period 1987 – 1995. The average annual growth rate has been estimated at 3.0% while the average price index was 1.6%. For comparison: in the same period the average growth rate of GDP was 2.7% and the average price increase was 1.9%.
Table 2 shows that the decrease of growth rates in 1994/95 is caused by a sharp decrease of the activities on saving accounts and deposits.

2.3 Calculation system of the volume index of FISIM

The volume index of FISIM (Ind REMA) is calculated from the volume indices for the three main sources of FISIM: savings (Ind SPAR), credit granting (Ind KRED) and money transfers on current accounts with banks (Ind BTLV). Weighted aggregation is made, applying formula 1 from paragraph 1.2:

Ind REMA = 0.40 Ind SPAR + 0.20 Ind KRED + 0.40 Ind BTLV

If we may assume that enterprises are usually in the red on their current accounts while private persons are in general in the black, the rate between savings and credits within the weight of Ind BTLV is, according to figure 1, [0.30, 0.10]. So, within Ind REMA the rate between savings and credits (in a broader sense) is [0.40 + 0.30, 0.20 + 0.10] = [0.70, 0.30].
The expert guesses of this weights have been based on experimental calculations within the framework of the distribution of FISIM over the users of bank services (see *Ramaker and Van de Ven, 1996*). Estimates for 1991, 1992 and 1993 indicate that by far the largest part of FISIM must be considered as indirectly paid by holders of saving accounts.

Table 2 **Calculation of volume index of FISIM**

w/i	*parameter*	*data*	*level 2*	*level 3*	*level 4*	*result*	*1988*	*1989*	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*
i	1,00	HYAN					103,2	103,4	103,2	102,7	103,9	105,7	105,9	105,9
i	0,10	HYGE					102,7	102,8	102,7	100,5	98,7	100,4	101,4	101,9
w	0,70		HYBE				103,5	103,7	103,5	102,8	103,8	105,7	106,0	106,1
i	1,00	HNAN					102,3	97,7	89,0	101,9	110,8	135,9	125,8	92,3
i	0,10	HNGE					105,6	114,5	114,0	85,0	92,6	97,5	98,3	103,4
w	0,30		HYNI				102,9	99,1	90,2	100,4	110,0	135,6	125,6	92,6
w	0,50			HYPO			103,3	102,3	99,5	102,0	105,6	114,7	111,9	102,1
w	0,27	dummy					100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
w	0,73	BBVA					108,0	108,9	107,0	105,3	108,2	105,0	98,7	100,4
w	0,50		BKBE				105,8	106,5	105,1	103,9	106,0	103,7	99,1	100,3
w	0,27	dummy					100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
w	0,73	BNVA					104,7	128,2	85,8	117,7	125,4	58,1	80,7	136,4
w	0,50		BKNI				103,4	120,6	89,6	112,9	118,5	69,4	85,9	126,6
w	0,20			BEKR			104,6	113,5	97,4	108,4	112,3	86,5	92,5	113,4
i	1,00	CBAN					104,2	101,6	101,8	102,9	103,4	103,1	101,0	98,8
i	0,10	CBGE					101,8	103,2	102,7	102,3	103,4	100,6	100,0	104,2
w	0,50		CKBE				104,4	101,9	102,1	103,1	103,8	103,2	101,0	99,2
i	1,00	CNAN					104,1	97,9	105,7	100,3	104,7	102,5	101,1	94,0
i	0,10	CNGE					100,6	106,9	99,7	107,6	101,1	96,7	99,4	110,0
w	0,50		CKNI				104,2	98,6	105,7	101,1	104,8	102,2	101,0	94,9
w	0,30			COKR			104,3	100,3	103,9	102,1	104,3	102,7	101,0	97,1
w	0,20				KRED		103,9	103,9	100,4	103,3	106,6	105,4	104,8	102,8
w	0,27	dummy					100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
w	0,73	SMVA					107,5	100,3	98,2	95,9	109,5	127,1	105,2	81,8
w	0,50		SMUT				105,5	100,2	98,7	97,0	106,9	119,8	103,8	86,7
i	1,00	SRAN					98,2	99,4	99,2	99,2	99,1	98,0	98,8	100,4
i	0,10	SRGE					105,6	101,7	96,9	98,1	101,8	114,7	113,4	107,9
w	0,50		SRBE				98,7	99,6	98,9	99,0	99,3	99,4	100,1	101,2
w	0,90			SREK			102,1	99,9	98,8	98,0	103,1	109,6	102,0	94,0
i	1,00	DEAN					87,4	115,1	154,6	133,2	100,0	69,7	54,1	65,8
i	0,10	DEGE					102,3	100,3	97,5	95,0	105,6	109,7	110,9	106,6
w	0,50		DEBE				87,6	115,1	154,2	132,5	100,6	70,4	54,7	66,2
w	0,27	dummy					100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
w	0,73	DMVA					97,8	128,0	136,7	113,1	127,9	102,3	79,1	62,9
w	0,50		DMUT				98,4	120,4	126,8	109,6	120,4	101,7	84,7	72,9
w	0,10			DEPO			93,0	117,8	140,5	121,0	110,5	86,0	69,7	69,6
w	0,40				SPAR		101,2	101,7	103,0	100,3	103,8	107,3	98,7	91,5
w	0,70	BEAN					102,0	103,2	104,2	103,7	102,0	102,8	101,4	101,2
w	0,30	GTAN-zak					103,3	110,9	105,2	104,4	105,6	104,4	106,8	106,7
w	0,25		BTLZ				102,4	105,5	104,5	103,9	103,1	103,3	103,0	102,9
w	0,50	GRAN					101,8	101,4	101,7	102,5	101,8	102,6	99,5	101,0
w	0,50	GTAN-over.					103,3	110,9	105,2	105,4	105,3	109,1	111,2	114,8
w	0,75		BTLO				102,6	106,2	103,5	104,0	103,6	105,9	105,4	107,9
w	0,40				BTLV		102,5	106,0	103,7	103,9	103,4	105,2	104,8	106,6
						REMA	102,3	103,9	102,7	102,4	104,2	106,1	102,4	99,8

It should be emphasised that we would prefer weighting with information from the accounting system of banks on the shares of these three activities in the total turnover or in the total costs, but unfortunately we lack that information. In fact, we are still negotiating with representatives of the Dutch banking sector, including the Dutch central bank, to get the necessary information.

2.3.1 Savings

The volume index for savings is calculated from two sub-series: savings accounts (Ind SREK) and deposits (Ind DEPO). For weighting formula 1 has been applied:

Ind SPAR = 0.90 Ind SREK + 0.10 Ind DEPO

All the weights in section 2.3.1 are based on expert guesses by the sector specialists.

2.3.1.1 Savings accounts

Here we have two relevant activities: the administration of savings balances and the processing of payments and withdrawals. For both activities a volume index has been derived. Here again, aggregation takes place by applying formula 1:

Ind SREK = 0.50 Ind SRBE + 0.50 Ind SMUT

a. Administration of savings accounts (Ind SRBE)

Data are available for the number of the saving accounts per ultimo December. From that series we have calculated the average numbers per annum and - as a next step - the year by year changes.
A series of the total monetary value of savings balances at ultimo December is also available. From this series the average value per annum has been calculated.
Next, from the series of values and the series of numbers a new series of the average value per account has been calculated. From that a series of year by year changes has been calculated. Then, the latter was corrected for inflation, by means of the price indices of national final expenditures.

In calculating Ind SRBE, we have assumed that a change in the *number* of savings accounts (Ind SRAN) will lead to a proportional change in the volume of administration (influence factor = 1). However, we have assumed that a change in the average value per account (Ind SRGE) will lead to only a limited increase in the volume index of administration. The influence factor of Ind SRGE has been fixed at 0.1.

Formula II from paragraph 1.2 has been applied in weighting together both series:

$$Ind\ SRBE = \{1+ 1.0\ [\ Ind\ SRAN - 1]\} * \{1 + 0.1\ [\ Ind\ SRGE - 1]\ \} =$$

$$= Ind\ SRAN * \{1 + 0.1\ [\ Ind\ SRGE\ - 1]\ \}$$

b. Payments to and withdrawals from savings accounts (Ind SMUT)

Data are available of the turnover (the sum of payments and withdrawals) in savings accounts per annum. However, we would prefer a series of the *number* of payments and withdrawals (Ind SMAN) and a series of their averages (Ind SMGE). Unfortunately, these data are not available.
So, under constraint, we start with year by year indices of the series of the deflated turnovers (Ind SMVA). Next, making some assumptions, from Ind SMVA a series of volume indexes of payments and withdrawals has been derived. See below.
Basically, we assume that the (unknown) index of the number of payments and withdrawals and the (unknown) index of the average turnover both move into the same direction. This means that the change in the numbers (Ind SMAN) is a component of the change in the turnover:

$$[Ind\ SMAN - 1] = F * [\ Ind\ SMVA - 1],\ where$$

$$(0 \leq F \leq 1)$$

From this formula it follows that:

$$Ind\ SMAN = F * Ind\ SMVA + (1 - F)$$

The required Ind SMUT is the result of the index of the numbers (Ind SMAN) and the index of the average turnover (Ind SMGE). If formula II is applied like elsewhere and we set, f(1) = 1.0 and f(2) = 0.1, we obtain:

*Ind SMUT = Ind SMAN * {1 + 0.1 [Ind SMGE -1]} =*

*= Ind SMAN * {0.9 + 0.1 Ind SMGE}*

Since *Ind SMGE = Ind SMVA / Ind SMAN* holds, it follows that

Ind SMUT = 0.9 Ind SMAN + 0.1 Ind SMVA

Substituting Ind SMAN yields:

*Ind SMUT = 0.9 * {F * Ind SMVA + (1 - F)} + 0.1 Ind SMVA =*

*= (0.9 F + 0.1) * Ind SMVA + 0.9 (1-F)*

We assume that F = 0.7. The formula then becomes:

*Ind SMUT = 0.73 * Ind SMVA + 0.27*

2.3.1.2 Deposits

Here too we have two relevant activities, the administration of deposit accounts and payments and withdrawals. For both a volume index has been derived: Ind DEBE and Ind SMUT. Again we apply formula I for its aggregate:

Ind DEPO = 0.50 Ind DEBE + 0.50 Ind DMUT

a. Administration of deposit balances (Ind DEBE)

Data are available for the number of deposit accounts per ultimo December. From that series we have calculated the average numbers per annum and - as a next step - the year by year changes.
A series of the total monetary value of deposits at ultimo December is also available. From this series the average value per annum has been calculated.
Next, from the series of values and the series of numbers a new series of the average value per account has been calculated. From that a series of year by year changes has been calculated. Then, the latter was corrected for inflation, by means of the price indices of national final expenditures.

In calculating Ind DEBE, we have assumed that a change in the *number* of deposits (Ind DEAN) will lead to a proportional change in the volume of administration (influence factor = 1).
However, we have assumed that a change in the average value per deposit (Ind DEGE) will lead to only a limited increase in the volume index of administration. The influence factor of Ind DEGE has been fixed at 0.1.

Formula II from paragraph 1.2 has been applied in weighting together both series:

*Ind DEBE = {1 + 1.0 [Ind DEAN - 1]} * {1 + 0.1 [Ind DEGE - 1] }*

*Ind DEAN * { 1 + 0.1 [Ind DEGE - 1]}*

b. Payments and withdrawals of deposits (Ind DMUT)

A series on deposit turnovers (payments plus withdrawals) is at our disposal. However, we need a series on the number of payments and withdrawals (Ind DMAN) and a series for their averages (Ind DMGE). Unfortunately such data are not available.
So, under constraint, we take as point of departure the year to year indices of the series of (deflated) turnovers (Ind DMVA). We apply the same formula as we did for the savings accounts:

Ind DMUT = 0.73 Ind DMVA + 0.27

2.3.2 Granting of credits

The volume index for the granting of credits is calculated from the volume indexes of three activities: mortgages (Ind HYPO), consumer credits (Ind COKR) and business credits to enterprises (Ind BEKR). Applying formula I the aggregation of the three series yields:

Ind KRED = 0.50 Ind HYPO + 0.30 Ind COKR + 0.20 Ind BEKR

All weights in section 2.3.2 are based on expert guesses by the sector specialists.

2.3.2.1 Mortgages

Here we distinguish between two relevant activities: administration of running contracts and the acquisition of new contracts. For both a volume index has been derived: Ind HYBE and Ind HYNI respectively. Applying formula I their aggregation yields:

Ind HYPO = 0.70 Ind HYBE + 0.30 Ind HYNI

a. Administration of running contracts (Ind HYBE)

Time series of the numbers of running contracts per ultimo December are available. From this figures numbers per calendar year and year to year indexes have been calculated (Ind HYAN).
There is also available a time series of the monetary value of current contracts per ultimo December. From this series of values per calendar year and of year to year indices have been calculated.
From values and numbers average values per mortgage have been calculated and year to year indexes. The latter have been corrected for inflation. The result is Ind HYGE.

In calculating Ind HYBE, we have assumed that a change in the *number* of mortgages (Ind HYAN) will lead to a proportional change in the volume of administration (influence factor = 1).
However, we have assumed that a change in the average value per mortgage (Ind HYGE) will lead to only a limited increase in the volume index of administration. The influence factor of Ind HYGE has been fixed at 0.1.

*Ind HYBE = { 1 + 1.0 [Ind HYAN -1] } * { 1 + 0.1 [Ind HYGE - 1] }*
*= Ind HYAN * { 1 + 0.1 [Ind HYGE - 1] }*

b. The acquisition of new contracts (HYNI)

Time series of the number and the monetary value of new contracts per year are available. In calculating Ind HYNI, we have assumed that a change in the *number* of new contracts (Ind HNAN) will lead to a proportional change in the volume of administration (influence factor = 1).

However, we have assumed that a change in the average value per new contract (Ind HNGE) will lead to only a limited increase in the volume index. The influence factor of Ind HNGE has been fixed at 0.1.

*Ind HYNI = Ind HNAN * { 1 + 0.1 [Ind HNGE - 1] }*

2.3.2.2 Consumer credit

There are two relevant activities: the administration of running credits and the acquisition of new credits. For both we have derived a volume index: Ind CKBE and Ind CKNI. According to formula 1 their weighted aggregate shows up as:

Ind COKR = 0.50 Ind CKBE + 0.50 Ind CKNI

a. Administration of running credits (Ind CKBE)

Time series are available for the number and for the monetary value of the running credits, both at ultimo December. Unfortunately the series contain a break around 1991, caused by a change in definitions. This break has been repaired provisionally.
From the series of numbers figures per calendar year have been derived and also year to year changes (Ind CBAN).
Also from the series of values calendar year values and year to year indexes have been derived. From the combination of values and numbers a series of year to year indexes of the value per credit has been calculated. After correction for inflation Ind CBGE results.
In calculating Ind CKBE, we have assumed that a change in the *number* of credits (Ind CBAN) will lead to a proportional change in the volume of administration (influence factor = 1).
However, we have assumed that a change in the average value per mortgage (Ind CBGE) will lead to only a limited increase in the volume index of administration. The influence factor of Ind CBGE has been fixed at 0.1.

*Ind CKBE = Ind CBAN * { 1 + 0.1 [Ind CBGE - 1] }*

b. The acquisition of new credits (Ind CKNI)

Here we need a series for the number of new credits (Ind CNAN) and a series for the average monetary value per new credit (Ind CNGE). Unfortunately, these data are not available. However, there is available a time series of the total value of new credits granted in a calendar year and of the value of the annual repayments. Besides, there are available time series of the value of current credits at the beginning and at the end of the year, and of the number of current credits at the beginning and at the end of the year.

Combining all these data we have derived approximations of Ind CNAN and Ind CNGE. At first we have calculated the total number of fully repaid credits per annum. Crucial for this calculation is the assumption that the credit terms show no great dispersion at the moment of granting and that the composition of credits by kind and the related credits terms only gradually will change.
The number of full repayments has been calculated as the product of the number of credits at the beginning of the year and the reciprocal of the average credit term at that moment. Next the series of the number of new credits can be calculated (Ind CNAN). Once this is known, Ind CNGE can be derived from the series for the total value of new credit.

Weighted aggregation of both series, applying formula II yields:

Ind CKNI = Ind CNAN / { 1 + 0.1 [Ind CNGE - 1] }

Above calculations have been carried out for the total of all kinds of consumer credits. However, there is much more detailed basic material available, which makes a subdivision of the calculations by kind of credit possible.

2.3.2.2 Business credit

This concerns credit granting to enterprises, excluding short term credits which are granted when pay-accounts of enterprises are in the red. The volume index has been calculated from the volume indexes of two activities: the administration of running credits (Ind BKBE) and the acquisition of new credits (Ind BKNI).

Formula I is applied for the aggregation:

Ind BEKR = 0.50 BKBE + 0.50 Ind BKNI

a. The administration of business credit (Ind BKBE)

Ideally, to find Ind BKBE we would need both the number of credits as well as the average value per credit. Unfortunately, the series for the number of credits is not available.
However, data are available for the total value of credits granted to enterprises per annum. They can be derived from the series of claims by banks on private enterprises per ultimo December that are published in the Quarterly Bulletin of the Central Bank DNB. From this series the averages per annum are calculated and from them, after a correction for inflation, the year to year indexes (Ind BKVA). For the relation between Ind BKBE and Ind BKVA the same assumptions have been made and the same formula has been applied as when we determined the volume index of the changes in savings accounts (see section 2.3.1.1):

Ind BKBE = 0.73 Ind BKVA + 0.27

b. Granting of new business credit (Ind BKNI)

The indicators for newly granted credits too have been derived from the above mentioned Quarterly Bulletin. After a correction for inflation the value of newly granted credits has been estimated as the sum of the annual increase of the total credit position per ultimo December and the annual repayments. Here we have assumed that repayments will amount to 10% of the credit position at the beginning of the year. As the next step the annual changes have been calculated (Ind BNVA).

We assume the same relation between Ind BKNI and Ind BNVA as we did between Ind BKBE and Ind BKVA:

Ind BKNI = 0.73 Ind BNVA + 0.27

2.3.3 Money transfers on current accounts

The volume index of the activity money transfers on current accounts with banks has been derived from a volume index for commercial money transfers (Ind BTLZ) and a volume index for other money transfers (Ind BTLO):

Ind BTLV = 0.25 Ind BTLZ + 0.75 Ind BTLO

At first sight the weight for commercial money transfers (0.25) seems rather low in the formula. Actually, the same holds for their weight in the calculation of the volume index for the total FISIM (see survey 3 and 4). However, we have taken into account that the revenues of banks from

commercial money transfers do not only originate from FISIM but for the larger part from commissions.

a. Commercial money transfers (Ind BTLZ)

This volume index is derived from indices for two activities. The first one is the general administration of current accounts. A good indicator would have been the number of commercial current accounts. Lacking this data, we have taken instead as an approximation the series of the total number of enterprises in the Netherlands (Ind BEAN).

The second activity is the execution of the money transfers by banks. The annual report of Interpay (the clearing organisation of Dutch banks) provides time series of the annual number of money transfers. Here we use the year to year index of their series of commercial money transfers (Ind GTAN-com).
An inadequacy of this series is the missing of data for transactions by the Postbank. Supplementary data are necessary. A further improvement might be weighting the payment categories with the costs per transaction. However, this kind of information is not available at the moment.

We apply formula I for the aggregation of the two series:

$$Ind\ BTLZ = 0.70\ Ind\ BEAN + 0.30\ Ind\ GTAN\text{ - }com$$

b. Other money transfers (Ind BTLO)

In a comparable way, Ind BTLO is derived from indices for two activities. The first one is the general administration of current accounts of private consumers. A good indicator would have been the number of current accounts. Lacking this data, we have taken instead as an approximation the series of the "number of individual persons with income" in the Netherlands (Ind GRAN). Since in Holland most salaries, disbursements and social security benefits are paid through banks nearly everybody who has an income, will also have a bank account.

The second activity is the execution of the money transfers by banks. Here we use the year to year index of the series of money transfers from the annual report of Interpay, exclusive commercial money transfers. (Ind GTAN-other).

We apply formula I for the aggregation of the two series:

$$Ind\ BTLO = 0.50\ Ind\ GRAN + 0.50\ Ind\ GTAN\text{ - }o$$

2.4 Sensitivity of Ind REMA for variations in the weights of separate activities

For the time being, the weights applied in this study for the separate activities contributing to FISIM are (except for an experimental partition among savers and borrowers for a number of years) based on 'expert guesses'. And not, as usual, on the production values in the preceding year. For that reason we have carried out a sensitivity analysis.
We examined which influence marginal changes of the weights of separate activities would have on the calculated volume index of FISIM (see for a more comprehensive discussion: *De Boer and Zijlmans, 1997).*

The results of twelve variations of the weights have been calculated. Variants 1, 11 and 12 are variations on the three main weights: for granting of credits, savings and money transfers on current

accounts; variants 2-7 concern other weights and variants 8,9 and 10 concern the influence factors f (2) and F.

Figure 5. Variations on the weights for Index REMA

Variant 1 Heavier weights for total money transfers on current accounts
Variant 2 Other weights for mortgages, consumer credit and business credit within credit granting
Variant 3 Other weights for administration and acquisition within mortgages
Variant 4 Other weights for administration and acquisition within business credit
Variant 5 Other weights for savings accounts and deposits within savings
Variant 6 Other weights for administration and turnover within savings accounts
Variant 7 Other weights for business and other within money transfers
Variant 8 Higher influence for changes in average monetary values of mortgages etc.
Variant 9 Heavier value for F

Variant 10 Unlimited influence for changes in average monetary values of mortgages etc
Variant 11 Heavier weights for total credit granting
Variant 12 Heavier weights for total savings

Variants 1 through 9 are, in principle, complementary. So, the resulting differences with the basic variant in paragraph 2.2 may be aggregated. These differences are summarised in table 3. In judging the aggregated difference we should take into account that, in case the weighting scheme contains errors, corrections of different kind (higher or lower weights for a separate activity) could be needed. So, even though the variants have been chosen with prudence, the aggregation of variants 1 through 9 represents a rather extreme conjunction of errors in the weights.

Therefore, the aggregate difference of 3.0%, cumulated over the period 1987 - 1995 (0.4% per annum) gives confidence in the stability of the results. Within table 3 variant 1 shows the largest dispersion. Especially the index for 1994 / 95 appears to be sensitive for shifts in the weights for money transfers and for savings. This sensitivity is caused by a strong increase in the volume of money transfers in combination with a strong decrease of activities related to savings. If variant 1 is left out, the aggregated difference turns out to be only 0.8% (0.1% per annum).

Further (see variant 5) for some years the volume index of savings (Ind SPAR) appears to be highly sensitive for even small changes in the weight of deposits and saving accounts. However, during the period 1987-1995 pluses and minuses counterbalance to 0.

Table 3 Differences with basic variant Ind REMA (t-1 = 100)

	1988	1989	1990	1991	1992
Var. 1. KRED, SPAR, BTLV = [0.17, 0.33, 0.50]	0.1	0.4	0.2	0.3	-0.1
Var. 2. HYPO, BEKR, COKR = [0.45, 0.30, 0.25]	0.0	0.2	-0.1	0.1	0.1
Var. 3. HYBE, HYNI = [0.60, 0.40]	0.0	0.0	-0.1	0.0	0.1
Var. 4. BKBE, BKNI = [0.60, 0.40]	0.0	-0.1	0.1	0.0	-0.1
Var. 5. SREK, DEPO = [0.95, 0.05]	0.2	-0.4	-0.8	-0.5	-0.1
Var. 6. SRBE, SMUT = [0.60, 0.40]	-0.2	0.0	0.0	0.1	-0.3
Var. 7. BTLZ, BTLO = [0.35, 0.65]	0.0	0.0	0.0	0.0	0.0
Var. 8. f(2) = 0.2	0.2	0.2	0.0	-0.1	0.1
Var. 9. F = 0.8	0.1	0.1	0.0	0.0	0.3
Total	0.3	0.4	-0.8	-0.1	0.0
Total (excl. Var. 1)	0.2	0.0	-1.0	-0.4	0.1
Basic variant	102.3	103.9	102.7	102.4	104.2

	1993	1994	1995	Total	Gem.
Var. 1. KRED, SPAR, BTLV = [0.17, 0.33, 0.50]	-0.2	0.4	**1.2**	2.2	0.3
Var. 2. HYPO, BEKR, COKR = [0.45, 0.30, .25]	-0.4	-0.3	0.3	0.0	0.0
Var. 3. HYBE, HYNI = [0.60, 0.40]	0.3	0.2	-0.1	0.2	0.0
Var. 4. BKBE, BKNI = [0.60, 0.40]	0.1	0.1	-0.1	0.0	0.0
Var. 5. SREK, DEPO = [0.95, 0.05]	0.5	0.6	0.5	0.0	0.0
Var. 6. SRBE, SMUT = [0.60, 0.40]	-0.7	-0.1	0.5	-0.8	-0.1
Var. 7. BTLZ, BTLO = [0.35, 0.65]	-0.1	-0.1	-0.2	-0.4	-0.1
Var. 8. f(2) = 0.2	0.4	0.3	0.1	1.2	0.2
Var. 9. F = 0.8	0.4	0.0	-0.3	0.6	0.1
Total	0.2	1.1	1.8	**3.0**	**0.4**
Total (excl. Var. 1)	0.4	0.7	0.6	**0.8**	**0.1**
Basic variant	106.1	102.4	99.8		

Table 4 shows the differences between the results of variants 10 - 12 and the basic variant.

By means of variant 10 we have investigated whether the restriction of the influence of the changes in average monetary value of mortgages, saving accounts etc. (f(2)) has any practical meaning. For this purpose we have set f(2) equal to 1. In that case changes in the average value would have a

proportional effect on the volume index. In fact, e.g., the volume index of mortgage activities would be equal to the index of the (deflated) monetary value of mortgages.

Table 4 Differences with results basic variant Ind REMA (t-1 = 100)

	1988	1989	1990	1991	1992
Var. 10 f(2) = 1.0	1.7	1.5	0.1	-0.5	1.0
Var. 11. KRED, SPAR, BTLV = [0.30, 0.35, .35]	0.2	0.0	-0.3	0.1	0.3
Var. 12. KRED, SPAR, BTLV = [0.17, 0.50, .33]	-0.2	-0.4	0.0	-0.3	-0.1

	1993	1994	1995	Total	Gem.
Var. 10 f(2) = 1.0	3.4	2.3	1.1	10.6	1.3
Var. 11. KRED, SPAR, BTLV = [0.30, 0.35, .35]	-0.1	0.3	0.4	0.9	0.1
Var. 12. KRED, SPAR, BTLV = [0.17, 0.50, .33]	0.2	-0.6	-1.4	-2.7	-0.3

Table 4 shows that omitting the above mentioned restriction of influence would lead to a much higher estimate of the volume growth rate of FISIM (on average per annum + 1.3%; for 1993 even: 3.4%). So, the restriction is very important. For it is clear that the volume of bank activities will far less than proportionally change with changes in the average value of saving accounts etc.
This is also interesting because according to (*OECD,1996*) a number of countries (e.g. Germany, UK, Canada, New Zealand) applies series of deflated values of credits and savings for the estimation of the volume index of the output of banks. It is unclear whether they restrict the influence of the average values.

The results of variant 12 are, as could be expected, a reflection of the results of variant 1. The results of variant 11 show that the accuracy of the weights for credit granting are of marginal importance for the results of Ind REMA.

We think that from the results of the sensitivity analysis it can be concluded that the volume index of FISIM is to a less extent sensitive for marginal changes in the weighting scheme. However, the results for 1995 and especially those for variant 1 and 12 show that the volume index of FISIM is especially sensitive to the weights in the equation:

Ind REMA = 0.40 Ind SPAR + 0.20 Ind KRED + 0.40 Ind BTLV

Statistics Netherlands is discussing this problem with representatives of the banking sector. We have reasons to expect that the banking sector can provide information from which better weights can be derived towards the end of 1999.

3. Commissions

In this study the estimates of the volume indices for commissions in banking have been based on five sub-series. At first the data on commissions are sub-divided into nine categories. Due to a change in definition, after the ESA-revision the greater part of commissions charged by investment funds will no

longer be seen as output from services. Therefore this category has been omitted. Because of their relatively small extent four other categories have been combined to one.
We have looked for suitable indicators for the deflation of the five remaining activities. Unfortunately, for commissions no direct price index figures are available. So, there has been a search for suitable quantity indicators. Below, it will appear that this was not always successful. Therefore in some cases approximating indicators had to be used.
As usual in the national accounts, commissions of the previous year have been applied as weights for the aggregation of the volume indexes of the five categories. For reasons of confidentiality, the weights cannot be published

Table 5 summarises the results per category and for the total of commissions.

Table 5 - Volume indicators for commissions in the banking sector (t-1 = 100)

	1988	1989	1990	1991	1992	1993	1994	1995
Total	102	109	90	104	103	112	108	108
Money transfers	103	111	105	105	106	108	110	113
Stock orders	98	106	97	107	117	142	109	118
Stock issues	96	118	55	134	80	139	116	92
Foreign currency traffic	103	107	95	114	107	96	98	106
Other	107	108	95	87	97	95	104	102

3.1 Commissions on money transfers on current accounts

A quantity indicator has been derived from the annual reports of Interpay BV Nederland (the same data have been used for the contribution of the activity money transfers on current accounts to FISIM). For 12 different categories of payments the number of transactions are published. We assume that the annual changes are representative for the changes of all payment transfers in the Netherlands. For the time being transactions have been aggregated without weighting.

3.2 Commission on stock orders

This concerns the purchases and sales of shares and bonds. The volume index of commissions has been calculated from the aggregation of a volume index for the trade in shares and a volume index for the trade in bonds on the Amsterdam Stock Exchange. These indexes are based on series for the value of the trade turnovers, which have been calculated roughly in “constant courses”. Perhaps a better alternative would have been quantity indices based on the number of traded stocks or the number of charges. Unfortunately, these data are not available at the moment. The volume indexes of the trade in shares and the trade in bonds have been aggregated applying equal weights.

It should be clear that these indicators are very rough. A first improvement would be a break down into commissions on shares and commissions on bonds. Information on the number of traded stocks, the number of orders and on annual changes of commission rates would also be very helpful.

3.3 Commission on issues of stocks

At first, the volume index had been based on the aggregation of a volume index of issues of shares and a volume index of issues of bonds. Each of them was constructed from two sub-series, i.e. one for the number of issues and one for the average value per issue (applying formula II).
This approach appears to be problematic. The series of the volume index and the implicit deflators show some very erratic results. It is quite clear that the indicators used are too rough. Therefore, the deflator of gross national final expenditure has been applied as an approximation.

It is clear that this is also a rough approximation. For a first improvement a break down into commissions on share issues and commissions on issues of bonds is necessary. Information on the number of issued shares and bonds and on changes of commission rates would also be very helpful.

3.4 Commission on foreign currency transfers

This concerns the commissions paid by tourists etc. The volume index is approximated by the aggregation of at one hand the volume index of consumption abroad by Dutch residents and at the other hand the volume index of consumption in the Netherlands by non-residents.

3.5 Other commissions.

Other commissions are commissions from insurance intermediation, from travel intermediation, from financial intermediation and from letting of safe-deposits. They make up a relatively small part of bank output. Moreover, no indicators are available for a substantial part of this category. Therefore, the deflator of gross national final expenditure has been applied as an approximation.
Insurance intermediation and travel intermediation by banks are secondary activities. So, a suitable alternative would be to use the deflators applied by the insurance and travel industries.

3.6 Total commissions

The volume indices for the five categories of commissions have been aggregated applying as weights the value of the previous year. In table 6 the value of total commissions has been divided into volume and price.
The volume of commissions has increased by 40% over the period 1987-1995. This is more than the increase of the volume of FISIM: on average 4.3% against 3.0% per annum. On average, commissions and FISIM show the same price increases (1.6% per annum). During the same period the volume and price index of GDP increased 2.7% and 1.9% per annum respectively.

Table 6. Value, volume and price indexes of commissions of banks (t-1=100)

	1987	1988	1989	1990	1991	1992	1993	1994	1995	Average
Value	3146	3.204	3.806	3.722	3.956	4.258	4.710	5.047	5.022	
Value index		101.8	118.8	97.8	106.3	107.6	110.6	107.2	99.5	106.0
Volume index		101.5	109.5	90.3	104.4	102.6	112.0	107.8	107.9	104.3
Deflator		100.3	108.5	108.3	101.8	104.9	98.7	99.4	92.2	101.6

Table 6 illustrates how the series on volume changes for commissions is subject to large fluctuations. From table 5 it can be concluded that the same is true for the larger part of the underlying sub-series. Considering the character of the services, for which commission are charged fluctuations of the volume of these activities, especially those related to shares and bonds, could be expected. However, it is very important to search for better indicators.

4 Total output, value added and labour productivity

Annex I (tables A-H) presents the annual results of this study for the period 1987-1995. The volume indices of value added have been derived from total output minus intermediate consumption. Furthermore, indicators of the annual change of labour productivity have been calculated (here simply defined as the quotient of the volume index of value added and the annual change of the number of full time equivalent jobs).
The results of the new method (called "output method") have been compared with the results obtained by the current "input method".

Table 7 summarises the volume indexes of total output, intermediate consumption, value added, labour (number of full time equivalent jobs) and labour productivity.

Table 7 Volume indices total output, intermediate consumption, value added, labour and labour productivity; output method (t-1=100)

	Total output	Intermediate consumption	Value added	Labour	Labour productivity
1988	102.2	106.0	100.7	100.9	99.8
1989	104.8	104.2	105.1	101.8	103.2
1990	100.3	104.0	98.7	101.7	97.1
1991	102.8	103.5	102.4	100.8	101.6
1992	103.9	103.0	104.3	99.2	105.2
1993	107.2	107.1	107.1	99.2	108.1
1994	103.4	102.7	103.8	96.6	107.4
1995	101.4	103.8	100.3	97.3	103.1

In table 8 the volume indices of value added and the annual changes in the labour productivity according to the input method and the output method are compared.

Figure 6 shows the development of the volume of output and the cumulated changes of labour productivity between 1987 and 1995 according to the output and the input method.
According to the output method the increase of labour productivity during the period 1987 - 1995 was 28% (3,1% per annum). According to the input method the increase over the same period is 8% (1.0% per annum).

Figure 6

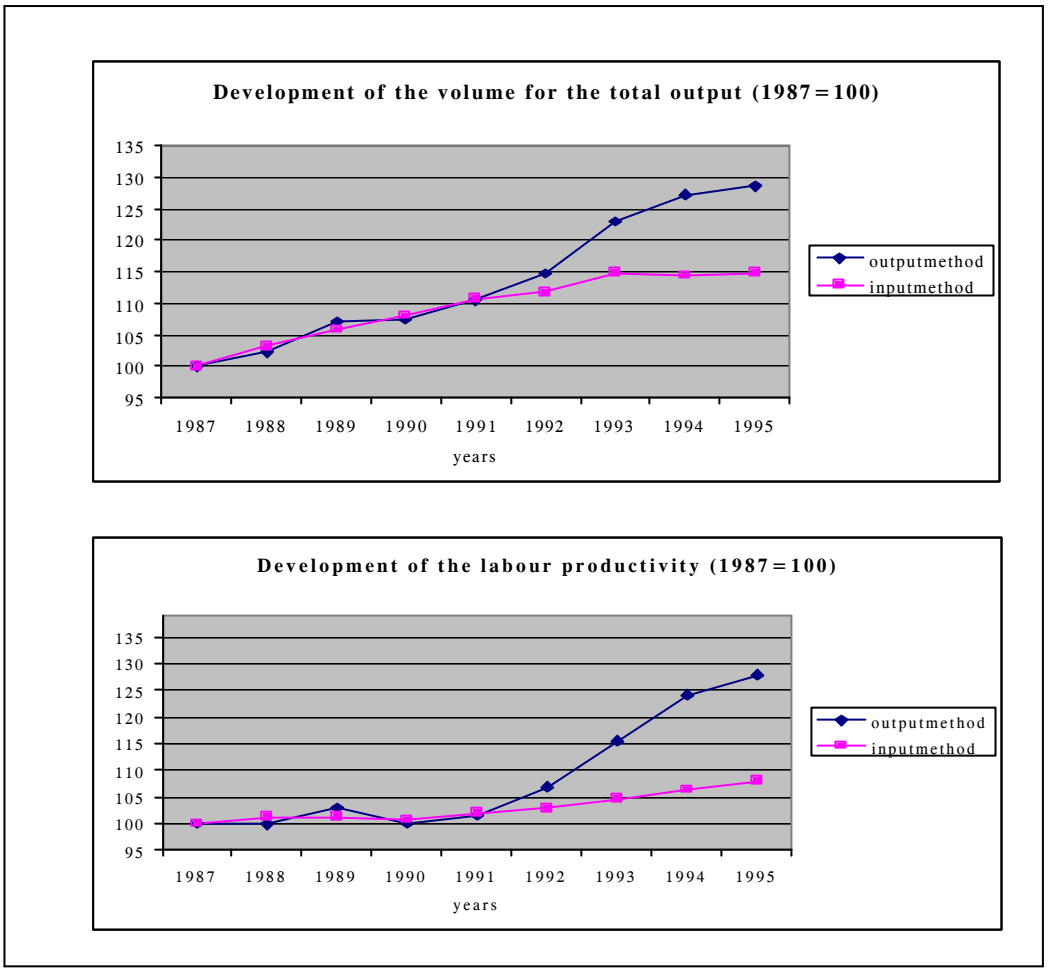


Table 8 and figure 6 show for the sub-period 1987-1991 counterbalancing plus and minus differences between the output and the input method.
However, from 1991 the results of both methods obviously diverge. For example, for 1991-1995 the annual change of labour productivity is estimated +5.9% vs +1.4%. This can be related to the fact that from 1991 on the number of full time equivalent jobs with banks decreases, while in contrast the output of banks increases substantially. By nature the results of the input method follow for most part the decline of the labour force.

The results for 1991-95 very obviously show the shortcomings of the input method. Since estimates of output and input in constant prices are not independent, the input method is not capable to give a reliable picture of an industry that is subject to strong transformations like the replacement of labour by computers, the introduction of money machines etc..

Table 8 Comparison of input method and output method (t-1=100)

	Volume index value added		Changes labour productivity		
	Input method	Output method	Input Method (2)	Output method (1)	Difference (2)-(1)
1988	102.1	100.7	101.2	99.8	-1.4
1989	101.8	105.1	100.0	103.2	+3.2
1990	101.3	98.7	99.6	97.1	-2.5
1991	102.0	102.4	101.2	101.6	+0.4
Average 87/91	101.8	101.7	100.5	100.4	-0.1
1992	100.0	104.3	100.8	105.2	+4.4
1993	100.9	107.3	101.7	108.1	+6.4
1994	98.2	103.8	101.7	107.4	+5.7
1995	98.9	100.3	101.6	103.1	+1.5
Average 91/95	99.5	103.9	101.4	105.9	+4.5

In 1995 the growth of the output of banks slows down by a sharp decline in the activities on savings accounts and deposits. As a consequence the pace of improvements in labour productivity also stalled. In the mean time results for 1995/96 and 1996/97 according to the output method are available. The estimated volume indexes of value added are 106.8 and 105.5 and the growth rates of labour productivity +2.7% and +1.6% respectively.

5 Further data requirements

In this paper the results have been presented of a pilot study. It has been shown that it is possible to calculate a volume index of the production value of banks based, for the greater part, on output quantity indicators. It also became clear that there is still a need for more and better-suited indicators and for weights for the three main activities contributing to FISIM based on information provided by the sector.
Below follow some points, which should be paid attention to if we want to improve the quality of the results.
However, this does not mean that the introduction of a new method should be postponed till all problems will have been solved. It is necessary to consider the qualities and the shortcomings of the presented output method as opposite to the efforts of improving the method currently in use.

FISIM

1. Annual information on the share of activities concerning savings, credit granting and payment transfers within FISIM.
2. Information for a better founding of the values of f(2) en F in the formulae.
3. Direct data on the number of new consumptive credits per annum.

4. Direct data on the number of payments and withdrawals on savings accounts per annum
5. Direct data on the number of payments and withdrawals on deposits per annum
6. Data on the number of commercial and private bank accounts
7. Data on the number of payment transfers on accounts by the Postbank
8. Data on rates per separate category of payment
9. Data on the number of running and newly granted commercial credits

Commissions

1. On payment transfers: see FISIM point 7 and 8
2. On stock orders
   -Breakdown of commissions on bonds and shares
   -Data on numbers of traded bonds and shares
   -Data on commission rates
   -Information on other activities (e.g. trade in options)
3. On share issues
   -Breakdown of commissions on issues of shares and bonds
   -Data on commission rates

Sources and references

Collings, Richard and George Sciades, *Measuring the Output of Banks*, Statistics Canada, 1993.

De Boer, Sake and Gerrit Zijlmans, *Gevoeligheid ramingen volume-index rentemarge voor wijzigingen in de wegingen (Sensitivity volume index FISIM for variations in the weights)* , 1997.

De Nederlandsche Bank, *Jaarverslag,* various numbers

OECD, *Services: measuring real annual value added*, 1996.

Ramaker, John and Peter van de Ven, *Allocating FISIM, Results of some alternative methods,* 1996

Stastistics Netherlands, *Financiële Maandstatistiek,* various numbers

Statistics Netherlands, *Sparen en lenen in Nederland*, 1996.

Annex I Total output, value added and productivity 1987-1995

Table A. Output, value added and productivity 1987/88 *)

	1987 current prices	volume index	1988 prices 1987	deflator	1988 current prices
FISIM	15033	102.3	15379	102.5	15770
Commissions	3146	101.5	3194	100.3	3204
Output (output method)	18179	102.2	18573	102.2	18974
Output (input method))	18179	103.2	18761	101.1	18974
Intermediate consumption	5094	106.0	5398	101.1	5456
Value added (output method)	13085	100.7	13175	102.6	13518
Value added (input method)	13085	102.1	13363	101.2	13518
Labour (full time equivalent jobs)	113	100.9			114
Labour productivity (output method)		99.8			
Labour productivity (input method)		101.2			

*) Output etc.: mln hfl; labour: 1000 full time equivalent jobs

Table B. Output, value added and productivity 1988/89

	1988 current prices	volume index	1989 prices 1988	deflator	1989 current prices
FISIM	15770	103.9	16385	95.9	15711
Commissions	3204	109.5	3507	108.5	3806
Output (output method)	18974	104.8	19892	98.1	19517
Output (input method))	18974	102.5	19448	100.4	19517
Intermediate consumption	5456	104.2	5687	102	5806
Value added (output method)	13518	105.1	14205	96.5	13711
Value added (input method)	13518	101.8	13761	99.6	13711
Labour (full time equivalent jobs)	114	101.8			116
Labour productivity (output method)		103.2			
Labour productivity (input method)		100.0			

Table C. Output, value added and productivity 1989/90

	1989 current prices	volume index	1990 prices 1989	deflator	1990 current prices
FISIM	15711	102.7	16135	99.5	16055
Commissions	3806	90.3	3438	108.3	3722
Output (output method)	19517	100.3	19573	101.0	19777
Output (input method))	19517	102.1	19927	99.2	19777
Intermediate consumption	5806	104.0	6038	102.2	6171
Value added (output method)	13711	98.7	13535	100.5	13606
Value added (input method)	13711	101.3	13889	98.0	13606
Labour (full time equivalent jobs)	116	101.7			118
Labour productivity (output method)		97.1			
Labour productivity (input method)		99.6			

Table D. Output, value added and productivity 1990/91

	1990 current prices	volume index	1991 prices 1990	deflator	1991 current prices
FISIM	16055	102.4	16440	105.0	17256
Commissions	3722	104.4	3886	101.8	3956
Output (output method)	19777	102.8	20326	104.4	21212
Output (input method))	19777	102.5	20271	104.6	21212
Intermediate consumption	6171	103.5	6388	103.0	6582
Value added (output method)	13606	102.4	13938	105.0	14630
Value added (input method)	13606	102.0	13883	105.4	14630
Labour (full time equivalent jobs)	118	100.8			119
Labour productivity (output method)		101.6			
Labour productivity (input method)		101.2			

Table E. Output, value added and productivity 1991/92

	1991 current prices	volume index	1992 prices 1991	deflator	1992 current prices
FISIM	17256	104.2	17981	102.4	18414
Commissions	3956	102.6	4060	104.9	4258
Output (output method)	21212	103.9	22041	102.9	22672
Output (input method))	21212	100.9	21403	105.9	22672
Intermediate consumption	6582	103.0	6779	102.8	6970
Value added (output method)	14630	104.3	15262	102.9	15702
Value added (input method)	14630	100.0	14624	107.4	15702
Labour (full time equivalent jobs)	119	99.2			118
Labour productivity (output method)		105.2			
Labour productivity (input method)		100.8			

Table F. Output, value added and productivity 1992/93

	1992 current prices	volume index	1993 prices 1992	deflator	1993 current prices
FISIM	18414	106.1	19537	100.7	19664
Commissions	4258	112.0	4771	98.7	4710
Output (output method)	22672	107.2	24308	100.3	24374
Output (input method))	22672	102.8	23307	104.6	24374
Intermediate consumption	6970	107.1	7464	102.6	7658
Value added (output method)	15702	107.3	16844	99.2	16716
Value added (input method)	15702	100.9	15843	105.5	16716
Labour (full time equivalent jobs)	118	99.2			117
Labour productivity (output method)		108.1			
Labour productivity (input method)		101.7			

Table G. Output, value added and productivity 1993/94

	1993 current prices	Volume index	1994 prices 1993	deflator	1994 current prices
FISIM	19664	102.4	20136	102.6	20670
Commissions	4710	107.8	5076	99.4	5047
Output (output method)	24374	103.4	25212	102.0	25717
Output (input method))	24374	99.6	24276	105.9	25717
Intermediate consumption	7658	102.7	7865	102.3	8030
Value added (output method)	16716	103.8	17347	102.0	17687
Value added (input method)	16716	98.2	16411	107.8	17687
Labour (full time equivalent jobs)	116	96.6			112
Labour productivity (output method)		107.4			
Labour productivity (input method)		101.7			

Table H. Output, value added and productivity 1994/95

	1994 current prices	Volume index	1995 prices 1994	deflator	1995 current prices
FISIM	20670	99.8	20629	104.5	21567
Commissions	5047	107.9	5447	92.2	5022
Output (output method)	25717	101.4	26076	102.0	26589
Output (input method))	25717	100.4	25820	103.0	26589
Intermediate consumption	8030	103.8	8332	101.8	8486
Value added (output method)	17687	100.3	17744	102.0	18103
Value added (input method)	17687	98.9	17488	103.5	18103
Labour (full time equivalent jobs)	112	97.3			109
Labour productivity (output method)		103.1			
Labour productivity (input method)		101.6			