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#### REFERENCE RATES AND FISIM ALLOCATION

Supporting paper submitted by the Central Bureau of Statistics of Israel\*

#### Introduction

1. The objective of this note is to present first results on the allocation of financial intermediation services indirectly measured (FISIM) to resident sectors, by applying the different internal reference rates that have been proposed. This experimental calculation on the allocation of FISIM is made in order to examine the range resulting from the use of different reference rates. The rates are obtained by taking selected financial assets and corresponding interest flows of financial intermediaries that generate FISIM. For conceptual reasons the selected reference rates should exclude the value of financial services indirectly charged and be, consequently, "pure " interest rates (internal/external, short/long term, etc.). There is no consensus on the rates to be adopted. Therefore, it is important to measure the sensitivity of the results when using the optional rates proposed, to evaluate the availability of the required data and to take them into account as additional elements when reaching final decisions. The exercise has been useful also in making a detailed analysis of our problems in relation to data availability in the field of financial statistics.

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2. This note contains four sections. The first shows the main findings; the second mentions briefly a conceptual issue that is important for Israel; the third discusses data problems and the last draws some conclusions.

## **MAIN FINDINGS**

### Results

3. Table 1 shows the results obtained in this experimental calculation for the national accounts base year 1995. Six different reference rates have been calculated and their values vary between 5.2 and 6 percent. (The 6.5 percent computed under method 3, is the value of a long-term rate that is applied together with a short-term rate in this option).

4. The value of FISIM provided to resident sectors varies between NIS 7.4 and 8.2 million, representing 2.8 and 3.1 percent of GDP respectively. FISIM are allocated, internally, to final and intermediate consumption. Households consume between 21 and 29 percent, approximately 10 to 13 percent is allocated to general government and reflected in its final consumption expenditure and the residual (60 to 66 percent) are services allocated to intermediate consumption of corporations, unincorporated enterprises and NPISH.

5. The allocation of FISIM to final consumption increases GDP between 1.05 and 1.21 percent.

6. Resident borrowers receive between 40 and 55 percent of the allocated services with the rest allocated to resident depositors.

TABLE 1: ALLOCATION OF FISIM TO RESIDENT SECTORS AND MAIN RELATED INDICATORS 1995

Methods	1	2	3	4a	4b	4c
	Percentages					
Internal Reference Rate	5.19	5.94	6.46	5.9	5.54	5.92
			long term			
FISIM to resident sectors /GDP	3.09	2.96	2.81	2.97	3.03	2.98
Change in GDP due to allocation (1)	1.05	1.19	1.1	1.19	1.12	1.21
FISIM impact on:						
Intermediate consumption (2)	66.1	59.7	60.9	59.8	63	59.5
of which: owners of dwellings	10.0	6.0	3.3	6.2	8.1	6.1
Final consumption expenditure	33.9	40.3	39.1	40.2	37	40.5
General government	12.8	12.3	10.1	12.3	12.5	12.2
Households	21.1	28	29.1	27.9	24.5	28.3
Total	133.9	140.3	139.1	140.2	137	140.5
FISIM originating in:						
Loans to resident sectors	55.2	39.8	45	40.4	48	40
Deposits from resident sectors	44.8	60.2	55	59.6	52	60
Total	100.0	100.0	100.0	100.0	100.0	100.0
Million NIS						
FISIM for domestic uses (1)	8150	7804	7417	7851	8003	7865
FISIM impact on:						
Intermediate Consumption (2)	5384	4662	4515	4694	5039	4678
of which: owners of dwellings	813	471	248	487	650	479
Final consumption expenditure	2766	3142	2902	3157	2964	3187
General government	1043	959	747	963	1003	960
Households	1723	2183	2155	2194	1961	2227
FISIM originating in:						
Loans to resident sectors	4500	3108	3336	3173	3845	3143
Deposits from resident sectors	3651	4695	4081	4678	4159	4721

(1) Imports and exports of FISIM were not taken into account.

(2) Including corporations unincorporated enterprises and NPISH. FISIM allocated to general government is shown directly as final consumption

## Explanation of the results

7. As is known, a reference rate is not supposed to contain services. Being a "pure" interest rate, the difference between the effective rate charged to borrowers and the reference rate measures the value of FISIM provided by financial intermediaries per monetary unit of loan. Regarding depositors, the difference between the reference rate and the effective rate payable to them measures the financial service generated per monetary unit of deposit.

8. The value of FISIM provided to resident borrowers by resident financial intermediaries during a given period is equal to  $L (r_l - r_r)$ . The FISIM provided to resident depositors is  $D (r_r - r_d)$ . The value of FISIM provided to resident units is, consequently, equal to:

$$\text{FISIM} = L (r_l - r_r) + D (r_r - r_d).$$

Where

$L$  = loans to residents by resident FIs,

$D$  = deposits of residents,

$r_r$  = reference interest rate,

$r_l$  = interest rate receivable on loans, and

$r_d$  = interest rate payable by FIs on deposits.

9. Given the value of loans, deposits and corresponding interest rates, and an internal reference rate that is lower than  $r_l$  but higher than  $r_d$ : The lower the reference rate, the more services will be provided to borrowers and the less to depositors. The impact on GDP will be higher if more FISIM are allocated to final uses. If depositors are mainly households as final consumers, and borrowers are mainly non-financial corporations and unincorporated enterprises, the lower the reference rate, the more FISIM will be allocated to intermediate consumption and the less to households final consumption, generating a lower impact on GDP. The contrary will happen when the reference rate is higher.

10. FISIM allocated to general government and NPISH will be registered as intermediate consumption, and because they increase the costs of non-market producers but not their sales, they will result in a higher value of their final consumption expenditure and, consequently, in a higher GDP.

**SOME CONCEPTUAL ISSUES**

## Real and nominal interest

11. Due to the high rates of inflation suffered by the Israeli economy for long periods of time and especially in the first half of the 1980's (with CPI reaching an annual average rate of increase of 381% in 1984), a large number of financial instruments became index-linked. Real interest, instead of nominal, were introduced in the national accounts, in order to separate from the nominal interest flows what corresponded to a repayment of the principal and not a property income payment. The rate of inflation has notably decreased since then, reaching single digit levels since 1997. (The annual average increase in the CPI was 5.5 % in 1998 and 5.2 in 1999. Previously, from the beginning of the 1960's, single digit rates were observed only in year's 1966 to 1968). Nevertheless, the national accounts continue to include real interest flows because they are the conceptually correct concept of interest to apply.

12. As a consequence of the use of real interest, global FISIM is being estimated in the national accounts on the basis of real interest flows, and the same happens in this experimental allocation of FISIM.

## Treatment of the Central Bank

13. The Central Bank is treated in the Israel's national accounts as a non-market producer with its output measured through its production costs. The Central Bank's production account does not generate FISIM as part of its output. The stock positions and flows of interest between the Central Bank and resident financial intermediaries are not taken into account when estimating reference rates based on inter-monetary financial institutions' loans and deposits positions and corresponding interest flows.

**REFERENCE RATES, REQUIRED DATA AND MAIN PROBLEMS**

## Main data sources

14. The two most important sources of data were the Bank of Israel and the CBS's National Accounts Division. The first provided data on returns of the banking corporations to the Central Bank's Supervisor of Banks, and the second was the data contained in the institutional sectors' balance sheets. This last source covers for the moment only the national accounts' base year 1995. For this reason, the experimental allocation of FISIM in this paper covers only 1995.

Available data and main problems

Data on assets, liabilities and implicit interest rates

15. An important advantage for the allocation of FISIM is the availability for the banking corporations of annual average data on loans, deposits and other financial stocks, as well as their corresponding real interest flows and the resulting implicit real rates of interest. The Bank of Israel demands these data from banking corporations that are classified in sub-sector S.122. Annual flows of effective interest must be compared to annual average data on assets and liabilities. The banking corporations directly provide average annual data.

16. The data are classified by indexation base, covering: unindexed instruments in local currency, instruments in local currency indexed to CPI, instruments indexed to the dollar and instruments in foreign currency. This classification of financial stocks and corresponding real interest flows originate implicit real interest rates.

Sectoral classification of the data

17. The most important problem is the very partial institutional sector disaggregation applied, since it distinguishes separately: central government, central bank, other banking corporations and the rest of the world. All other sub-sectors and sectors are included together in what is called "the public".

18. Data on loans provided by mortgage banks are available, which allows the allocation of FISIM to owners occupied dwellings. Loans provided by sub-sector S.122 to other unincorporated enterprises (such as small family businesses) and their corresponding interest rates are not available. As a result, the total FISIM that should have been allocated to the household sector as owners of unincorporated enterprises is not shown. It affects the sectoral allocation of FISIM but not the level of GDP, since the FISIM allocated to households as owners of unincorporated enterprises are used as intermediate consumption.

Methods applied to estimate reference rates and data problems

19. The allocation of FISIM to users is based on the application of reference rates. It has been recommended to use two reference rates: an internal rate to allocate FISIM among resident sectors and an external rate to allocate FISIM as exported services. For the internal reference rate, six methods have been proposed. In each method, an implicit reference rate is obtained by dividing a flow of interest by the asset on which the interest originates. For each method we describe the required data, the main problems faced when these data are not available and the solution adopted in each case.

#### Method 1

20. The data needed to calculate the internal reference rate: interest receivable on the credits between other monetary financial institution (S.122) and other financial intermediaries, except insurance corporations and pension funds (S.123), and stocks of credits between these sub-sectors.

21. Mortgage banks (S.123) are strongly interrelated with banks included in S.122. The value of the stocks of credits between them is relatively low when compared with the ones between banks belonging to S.122. Therefore, the stocks and interest flows on credits between units included in S.122 were used to calculate the implicit rate.

#### Method 2

22. Data needed: The same as in method 1 plus interest on, and stocks of, securities other than shares issued by S.122 and S. 123.

23. The same problems mentioned in relation to stocks and interest on credits between these sub-sectors apply to securities other than shares and corresponding interest. The securities other than shares, issued by sub-sector S.122, and corresponding interest were used instead.

#### Method 3

24. Two internal reference rates are used: a short and a long term rate, to be applied in relation to short and long term credits and deposits, respectively. Since the inter-bank rate defined in method 1 is a short-term rate, it is applied to short term loans and deposits. The long-term rate adopted corresponds to the published rate for a similar type of securities similar to the ones issued by sub-sector S. 122.

25. The main problem was to classify deposits and loans by short/long maturity and, particularly, by sectors in order to allocate FISIM. This method provides the less reliable results.

#### Method 4a

26. Data needed: Interest on credits and deposits, and stocks of credits and deposits, from sub-sectors S.122 and S.123 in relation to all resident sectors, except the Bank of Israel.

27. The interest flows and stocks mentioned were used to calculate the internal reference rate but only data for sub-sector S.122 were taken into account for reasons already noted in relation to data on sub-sector S. 123.

#### Methods 4b and 4c

28. Data needed: In these methods the reference rates were estimated as weighted averages of the rates obtained in methods 1 and 4a, and 2 and 4a, respectively. The data required have been already noted above.

#### **Conclusions**

29. The most important conclusion is that a much wider sectoral classification of data on loans, deposits and interest flows is required. We are presently discussing with the Bank of Israel and the banking corporations ways of applying a more complete sectoral classification of financial assets, liabilities and interest flows originating from them.

30. The proposed reference rates have been applied only to 1995, and consequently, the effects through time of the application of different methods could not be analyzed. For 1995, no extreme variability has been found in the results obtained by the different methods. Before recommending reference rates on the basis of this experimental allocation of FISIM, it would be necessary to analyze what happens over time. This will permit us to analyze the impact of changes in the composition of loans and deposits by indexing base as a reaction to changes in the rates of inflation, exchange rate and interest rates.

31. On a conceptual basis, we would reject method 3. In principle, all the FISIM generated by S.122 and S. 123 should be allocated. One of the functions of financial intermediaries is to take different term deposits and provide loans with different time maturities to borrowers, according their demand. If different reference rates are applied to take into account the different maturity of deposits and loans, the estimated value of FISIM will be lower. Applying the short term reference rate to short term deposits and loans and the long term rate to long term deposits and loans, as recommended by method 3, eliminates the output from FISIM created by the transformation of short term deposits into long term loans. Since for the producer, the eliminated FISIM is part of his output it should be accounted for, even if the borrower is not concerned with the maturity characteristics of the deposits that finance his loan.

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