Irving Fisher Committee on
Central Bank Statistics

BANK FOR INTERNATIONAL SETTLEMENTS

IFC - Central Bank of Armenia Workshop on *"External Sector Statistics"*

Dilijan, Armenia, 11-12 June 2018

Estimation of financial intermediation services indirectly measured in Armenia's external accounts[1]

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The accurate calculation of Financial intermediation services indirectly measured (FISIM) became a challenging issue during the last decade both for National accounts and the Balance of payments statistics. The estimation of FISIM export by the resident financial institutions of Armenia is regarded as an essential issue, which will both improve the external sector statistics coverage and contribute to the GDP calculation enhancement. The SNA 2008 revision as well as the BPM6 Manual clarified the measurements standards, as well as reviewed the sources and methods of relevant data collection. Despite details provided for both the reference rate selection, and the calculation methods applicable, there still remain a lot of issues with availability of the data required (mainly during FISIM import calculation), the treatment of credit organizations and international financial organizations, the use of appropriate reference rate based on analysis of financial environment in Armenia. Being a small highly dollarized economy makes Armenian interest rate formation subject not only to open market relations but also to other factors difficult to quantify. To address the issues different approaches were used and compared to derive the proper reference rate, with the discussion of strength and weaknesses of each method. As a result, the Central bank of Armenia calculated the export of FISIM to incorporate it into the Balance of payments data. At the same time, further steps are initiated, through introducing a new reporting form, to collect data necessary for calculations of FISIM import by non-financial organizations and ensure consistency with National accounts.

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Introduction

Nowadays it is very difficult to imagine a market economy without financial intermediation. Moreover, it can be argued that the effectiveness and level of development of any modern economy depends largely on the development level of financial intermediation. Recently, many economists have concluded that "finances have an impact". This expression means that the level of financial intermediation and level of financial services development are very important for the country's welfare and economic growth. For this reason, researchers are increasingly paying more attention to financial intermediation issues, involving the estimation of financial services, both explicitly and implicitly charged.

The accurate estimation of financial intermediation services indirectly measured (FISIM) became a challenging issue during the last decade both for National accounts and the Balance of payments statistics. The estimation of FISIM export and import by the resident sectors of Armenia is regarded as an important issue, which will both improve the external sector statistics coverage and contribute to the GDP calculation enhancement. The SNA 2008 revision as well as the BPM6 Manual clarified the measurements standards, as well as reviewed the sources and methods of relevant data collection.

Despite details provided in different manuals and research papers about the reference rate selection and the calculation methods applicable, there still remain a lot of questionable issues with data limitations (mainly during FISIM import calculation), the treatment of credit organizations and international financial organizations. The fact that Armenia is a small highly dollarized economy makes interest rate formation subject not only to market relations but also to other factors difficult to quantify. Thus the selection of appropriate reference rate, among other things, should be based on analysis of financial environment in Armenia.

The main objective of this working paper is to develop the internationally accepted approaches and localization of the methodology, taking into account the main features of the Armenian economy, the development of the FISIM estimation methodology for Armenia, as well as discovering the weak points of the calculations and proposing solutions for future development.

The Central bank of Armenia is responsible for external accounts statistics compilation, so this paper is focused solely on FISIM export and import estimation and provides methodological approach for measuring FISIM export and import in Armenia. For that, I used and compared different approaches to derive the proper reference rate, with the discussion of strength and weaknesses of each method. As a result, I calculated the export of FISIM to incorporate it into the Balance of payments data. A special importance was given to the analysis of available data sources, data limitations and existing problems with data series.

The final part of the paper discusses the steps initiated for FISIM import calculation. The data is still not complete and further development and improvement of the methodology is in progress.

Financial Intermediation Services and the Concept of Reference Rate

Financial Intermediation Services

The well-known theory of financial intermediation proposed by Garry and Shaw (1955) is one of the best examples of the role of the financial system. According to this theory, banks are mediators between economic units that have a surplus of financial resources and those needing them.

Banks collect the savings in the form of deposits and provide them to different borrowers whose own funds are insufficient to meet their needs. In the course of this process, banks are transforming the characteristics of financial assets primarily with regard to the amounts, timing and appropriate risks of these instruments. Thus, unlike the case of direct funding, banks exist as financial mediators and producers of financial services. While implementing the role of producers banks increase the value of financial capital, as they create the opportunity to use the funds more efficiently. This becomes possible by solving the issue of asymmetric information about available investment projects between lenders and borrowers. Possession of this information creates the need for financial services provision.

Considering financial intermediation services as a production activity implies that someone should consume these services. As with all other services, financial services can be used for intermediate consumption, final consumption or export. Financial organizations, in addition to intermediation services, also provide a variety of so-called support services for which they charge a separate fee. This part is called explicit charge. Production and consumption of such secondary services can be valued as in case of other services through paid commissions and fees. However, financial services cannot be fully evaluated in this way as the financial intermediaries also charge indirectly the lenders and receivers with the difference between interest received and interest rates paid on them. They pay lower interest rates to those entities who lend their money and charge higher interest rates from those who borrow from them. The major challenge facing statisticians in this area is the partitioning of the relevant interest flows to derive a service component. The purpose of this partitioning of interest is to make the service item explicit and attributable to the economic agent using the service, so categorizing the interest flows in order to reflect the service (FISIM) and property income (so called SNA rate) components separately.

According to existing methodology export of FISIM is the amount of indirectly measured financial services provided on the loan assets and deposit liabilities by resident financial institutions for which the counterparty is non-resident non-financial unit. At the same time, import of FISIM is the sum of indirectly measured financial services purchased by resident non-financial units on their loan liabilities and deposit assets from non-resident financial corporations. Indirect service charge is imputed in respect of all loans and deposits offered by a financial institution irrespective of the source of the funds and does not imputed in respect of securities by convention within the international measurement standards.

In line with SNA 2008 and BPM6 Manual only by certain financial intermediaries produce FISIM, that is deposit-taking corporations except the central bank and other financial intermediaries, except insurance corporations and pension funds. I should also stress that FISIM is estimated in respect of non-bank user institutional sectors only, and no interbank FISIM has to be calculated, as well as it is not is generated by central banks.

Reference Rate

The evaluation of financial intermediation services indirectly measured cannot be done directly, so an indirect method should be applied. The methodology proposes to use a so called "basic rate" or "reference rate" which is a risk free rate. A reference rate of interest is the rate at which both the lender and borrower would be happy to strike a deal. So, the services of financial intermediation are indirectly bought from financial institutions by lenders through receiving lower interest payments for deposited funds and by borrowers through paying higher interest for loans than in case the service was charged for directly. The difference between interest calculated at the reference rate and interest actually paid to depositors and charged from borrowers is a financial intermediation service charge indirectly measured (FISIM). Total FISIM is the sum of the implicit fees paid by the borrower and the lender.

From the discussion above, it is obvious that for FISIM calculations the selection of appropriate reference rate is essential. It should fully reflect the conditions of the financial market, the risk premium has to be eliminated and it should contain no intermediation service element. In the past decade a lot of academics and statistical institutions referred to the choice of reference rate, particularly focusing attention at the term premium eliminations, credit default risk and currency structure of balances.

For instance, a FISIM Task Force was set up in the European Union (EU) to consider and test a number of methods of reference rate calculation. As a result the methodology was approved, which specified the selection of two reference rates, to be used by countries to allocate FISIM on domestic loans and deposits (the internal reference rate) and on imports and exports (the external reference rate), without distinction by type and maturity of the instrument. Both rates would represent the average (interbank) interest rate, reflecting the domestic lending activity among financial intermediaries and the lending activities between resident and non-resident financial intermediaries respectively.

UK Office for National Statistics adopted the same approach and changed the methodology of internal reference rate calculation to using interbank loans average rates in 2014. As for external reference rate estimation, the interbank rate approach was denied by the UK statisticians for the reason of being unrealistically low, thus getting negative results for deposit FISIM of non-resident non-bank sectors. The reason was that being major financial centre led to using interbank lending and borrowing just for liquidity issues regulations, and did not truly reflect the pure cost of funding for banks.

There are countries which further developed this methodology, for example, estimating separate reference rates for each type of instrument (loans and deposits), or distinguishing between short and long-term operations. There are also options tested for estimating the reference rate as a weighted average of relevant EURIBOR and swap rates. The use of government bond yield as a risk free reference rate approximation was also proposed in international methodology.

Further in this paper, I will show three options for external reference rate estimation and the final combined version. The diversification by currency of stock denomination was performed. The research of data for Armenia showed that it is not rational to separate data by maturity of stocks, as this almost did not influence the value of reference rate. At the same time, in one of the options tested, I attempted to account for country risk premium.

The main features of Armenian economy influencing reference rate

The level of financial market development in Armenia, and factors influencing country risk indicators and the mechanism of interest rate formation in the financial system all influence the formation of the reference rate. In its turn, the choice of appropriate reference rate will lead to accurate estimation of FISIM export and import data.

One of the important features of Armenia's economy is the high rate of dollarization. Since early 90s until the mid-2000s, the main currency for savings, for real estate market transactions and the payment currency for durable goods was US dollar. Since the adoption of law on "Foreign exchange regulation and control" in 2004 the comparative ratio of foreign exchange started to decrease, but still, on average from 2010 to 2017 the share of foreign currency denominated liabilities of financial system was 68%. It means that in the process of FISIM export and import calculations the role of foreign currency is quite significant and it justifies the estimation of reference rates by different currencies in this research.

The next characteristic of financial relationships between commercial banks and their clients is the potential influence by direct investors to the formation of the banking rate. I should mention that there is

historically big share of direct investment in banking system of Armenia with average rate of commercial banks with direct investment for 2017 of 60%, which potentially may influence the borrowing/lending rate formation mechanism between affiliated institutions because of strong economic links. Thus, the deposit or loan from a related party can contain non-market elements, which will change the overall picture of the interest rates in economy.

Analyses of available data sources

The main constraint in performing calculations is always the accessibility of trustful and comprehensive data. The data should be both quite detailed and should cover the specific needs of calculation methodology. The other problem is the length of data series, which is obvious issue for developing economies whose statistical system is still developing and new reporting sources are still being introduced and used.

Using different data sources can give on the one hand a more comprehensive picture of the economic reality making available the analyses from different points of view, but on the other hand, the attempts to compare data available from different sources can make your life more difficult.

The main data sources, which were combined in FISIM export and import estimations for Armenia, were the following:

1. Balance sheets of financial institutions

The balance sheets contain detailed information by Chart of accounts confirmed by the Central bank of Armenia for the use of financial institutions. The balance sheets also contain the breakdown by national currency and convertible foreign currencies used in the economy, which are US dollar, EURO and Russian ruble. All the accounts are broken down by residency. The balance sheets are collected from all the financial instructions and long data series are available.

2. Raw data from commercial banks

Starting from 2016 new kind of database was created in the Central bank of Armenia. It is also an administrative data source and is structured on the same principle as the balance sheets of the commercial banks based on the same Chart of accounts. The aim was to collect the most granulate data from the commercial banks to be able to generate the consolidated set of information which is needed by different users. As a result, the reporting financial institutions provided a comprehensive database, which gives the opportunity to group the data based on different attributes. The database contains detailed information on the counterparty sector, maturity, the terms of financial instruments, the future repayments schedule, stocks at the end of the reporting period, etc. The shortcoming of these data series are the unavailability of historical data before 2016.

3. Reporting form of financial institutions on the average lending/borrowing interest rates.

The data from this reporting form is broken down by currencies, maturity of loans/deposits and by type of counterparty sector. This reporting form collects information only about the new contracts arranged during the reporting period. The weighted average interest rates are compiled and published as lending/borrowing rates by the Central bank of Armenia. In published data, the breakdown available is of Armenian dram and foreign currencies. The further analyses of interest rates data by each foreign currency is not valid, because frequently new contracts and transactions denominated in a particular currency are missing in the observed period.

4. Reporting form of financial institutions on their external assets and liabilities

The statistics department has been using this administrative resource starting from 1999 as the main data source for Balance of payments and International investment position compilation for financial sector. Since then it has been modified to meet the current developments in the external statistics methodology and adapted to the needs of external accounts compilers. The reporting form contains consolidated data broken down by the financial instruments, currencies of denomination and maturity. It also contains information about the interest rates accrued for each group of financial instruments.

5. Revenue/expenditure statements of financial institutions

This administrative data source contains breakdown of revenue and expenditure accrued for the reporting period by the counterparty sector and the financial instrument. Unfortunately, the currency breakdown is not available in this reporting form.

6. Report on loan liabilities of financial institutions

Alongside with the external assets and liabilities report from the financial institutions the reporting form contains detailed data on the loans liabilities from non-resident parties. This information is provided on the loan-by-loan basis and besides the stocks and flows values, gives the details of interest rate, maturity, the country and sector of the creditor, as well as the relationship with the creditor. This gives the opportunity to compare the data on external loans and the average interest rate charged from the resident banks from different sources and make necessary adjustments.

7. Reporting form for private non-bank sector liabilities

The new reporting form was introduced by the Statistical Committee in cooperation with the Central bank of Armenia at the beginning of 2018. The aim was to collect extensive data on the liabilities of private enterprises on loan-by-loan basis. The reporting form contains information on the future payments schedule of the liabilities, the interest rates, loan terms and conditions. This data set will allow in future estimating the import of financial intermediation services by the private enterprises. I refer to this issue in more details in the chapter dedicated to Estimation of Import of FISIM.

8. BIS locational banking statistics

Bank of International settlements publishes locational statistical data on the deposit and loan liabilities of reporting countries. This data also can be used in the process of Import estimation of FISIM.

The First option for reference rate selection

I have already mentioned above that fundamental and most questionable variable in FISIM calculation is the reference rate. The selection of appropriate reference rate will influence the results of the calculations so it has to be chosen in connection with the overall economic and financial conditions in the country. The next important point in respect of reference rate selection is the availability and limitations of relevant datasets, which can definitely become a problem in small economies with short "statistical history". That is the reason that many comparable data sources were tested and the most trustful and comprehensive information was derived from the available data.

The first option, which I tested in this paper, refers to the methodology, which is extensively used by the European Union member countries. In the European Union (EU), a FISIM Task Force was set up to discuss and test a number of methods, and agreed on a methodology, which resulted into Council Regulation (EC)

No. 448/98 (the FISIM Regulation). It is based on the assumption that interbank transactions have low-risk attached and thus reflect the basis rate at which the financial agents would be happy to strike a deal.

For calculations in this case I used so called raw database of commercial banks, which include detailed information broken down by balance sheet accounts. The data was filtered by counterparty sector, which made possible the segregation of interbank transactions. Only the assets and liabilities, which reported stocks at the respective end of period, took part in calculations. After that, I calculated the weighted average interest rate for interbank positions broken down by main currencies. The rates for all outstanding amounts were used to provide the relevance of the estimated reference rates for the entire portfolio, as opposed to using only "new business" rates.

The dataset gave the opportunity to have a clear allocation of liabilities by instruments, so only deposits and loans were filtered, as well as leasing transactions. By the convention within the international measurement standards FISIM is not imputed in respect of securities, so securities data was also taken out from the interbank stocks.

The results of reference rate calculations for four major currencies are presented in the table below:

Table 1: Reference rate by Option 1

	2016				2017			
	USD	EUR	RUB	AMD	USD	EUR	RUB	AMD
Q1	6.2%	0.8%	4.5%	4.4%	6.4%	1.5%	1.7%	9.5%
Q2	6.5%	1.2%	1.4%	0.5%	6.0%	1.1%	1.9%	5.9%
Q3	5.8%	1.5%	5.8%	0.0%	5.7%	1.2%	0.9%	4.9%
Q4	6.5%	1.8%	1.1%	9.3%	5.4%	1.5%	1.3%	6.3%

The results show that reference rates for Armenian dram are quite volatile. It is due to limited transactions and stocks of interbank positions with non-resident banks denominated in Armenian dram. Thus, reference rates on Armenian drams are not representative as are based on from just few contracts. At the same time the value of FISIM generating transactions in Armenian dram are quite big in their value and represent approximately 42% on assets side and 16% on liabilities side of Armenian commercial banks. In further estimations a different method for Armenian dram reference rate was chosen.

We can notice the same high volatility in respect of Russian ruble rate, but this is not significant in respect of its impact on FISIM final export calculations, as the stocks, which take part in FISIM generation denominated in rubles, represent less than 1% of total assets and liabilities of domestic commercial banks in respect of non-resident non-financial corporations.

there are concerns in professional literature that interbank borrowing/lending rate can give a distorted picture of interest rates as it may not exactly reflect the risk and maturity structure of the deposits and loans, since the rate reflects just short-term lending and borrowing used to overcome short time liquidity issues. This statement can be true with regard to countries, which have big financial centres, but it is not the case for a small country like Armenia. For instance, in Armenia interbank borrowing with non-resident financial institutions is mainly long-term comprising in average 80% of non-resident interbank liabilities.

There are stocks of corresponding accounts of International organizations in Armenian commercial banks. It is still not quite clear whether to classify them as financial institutions and refer to their relationships with commercial banks as interbank transactions. In this case, these stocks will influence the formation of reference rates. The other option is to categorize them as non-bank to banks transactions; in that case, the

stocks should be included in FISIM generating transactions. In the framework of this working paper, I decided to classify them as non-FIs and thus I excluded these stocks were while estimating the reference rate.

The most significant shortcoming of using the raw database in Option 1, is the absence of the same dataset for previous years, because it is a new reporting format, which is collected starting from 2016. For historical data it was not possible to filter the transactions based on the counterparty sector and the rate of each transaction simultaneously.

The Second option for reference rate selection

The second option, which I checked in the process of external reference rates selection exercise were the weighted average interest rates from new deposits and loans provided of Armenian commercial banks in course of business. In this case, the interest rates from newly signed contracts are used to calculate the reference rates broken down by currencies. These are the official lending and borrowing rates, which are published by the statistics of the Central bank of Armenia on monthly basis and are used by external users as valuation of banking rates fluctuations. The breakdown by the counterparty sector and currency of contract denomination is available.

In the same way as in the previous method, these calculations are based on the nominal interest rates fixed in the contracts and not on the accrued interest to stocks ratio. The main disadvantage of this method is the possible limited number or even absence of transactions during the reporting period. This makes impossible the reference rate estimations for particular currencies, for example there might be periods when there is no new loan provided or amount deposited from non-resident client denominated in Russian ruble. For that reason, the foreign currency rates were grouped and a weighted average rate was taken in respect of all foreign currencies. For clarity, it should be mentioned that the vast majority of these transactions are denominated in US dollar.

As a result, the following reference rates were estimated for Armenian dram and foreign currency.

Table 2: Reference rate by Option 2

	2016		2017	
	Foreign currency	AMD	Foreign currency	AMD
Q1	7.2%	15.4%	6.2%	14.2%
Q2	6.8%	15.0%	5.8%	13.2%
Q3	6.7%	15.0%	5.5%	11.8%
Q4	6.4%	14.1%	5.2%	10.9%

In contrast to the first Option results, the reference rate calculated in respect of Armenian dram is quite high in this table. Spreading these results to relationships with non-residents will not explain the true business rates established in the economy. This is also proved by looking through some biggest transactions, which are bargained between Armenian commercial banks and non-resident clients, which have lower rates fixed. Further in the paper we will see that the Government bond yields better reflect the true situation with AMD rate in financial market. Relative to foreign currency estimates it we can acknowledge that they go in line with USD rates calculated in Option 1.

The Third option for reference rate selection

One of the options suggested by the international methodology and manuals for external reference rate selection is the use of official rates established in international financial markets, such as LIBOR and EURIBOR. In my case, I used LIBOR for USD, EURIBOR for EURO and Weighted Average Actual Rates in rubles for RUB. At the same time, in course of using international rates for a developing country like Armenia country risk factors should also be accounted for, as by definition the reference rate should contain no risk element. As an approximation of country risk assessment, I took the difference between Government bond (GB) yields of respective countries and Armenian Government bond. The assumption made was that the higher the difference between Armenian GB yield and, for example, the Fed Reserve's bond yield the higher is country risk for Armenia, so the higher should be the USD reference rate. To calculate the reference rate for each currency I used USA Fed Reserve's bond yields for US dollar, Germany GB's for Euro and Russian Federation GB for Russian ruble.

Based on this approach the 3rd option of external reference rate valuation was implemented and I got the following results for reference rates:

Table 3: Reference rate by Option 3

	2016				2017			
	USD	EUR	RUB	AMD	USD	EUR	RUB	AMD
Q1	6.1%	6.7%	6.4%	11.9%	4.1%	4.2%	4.0%	7.7%
Q2	5.8%	6.3%	5.9%	10.9%	4.0%	4.1%	4.5%	6.9%
Q3	5.2%	5.5%	8.8%	9.0%	4.1%	4.5%	4.5%	6.6%
Q4	4.9%	5.4%	7.5%	7.9%	4.3%	4.8%	5.5%	6.3%

As the main problem with using this method can be mentioned that the reference rate formation in small highly dollarized country like Armenia with strong links with direct investors is influenced by a lot of factors which are difficult to incorporate only to country risk concept measured by GB yields. For example, historically big share of Direct investment in banking system of Armenia (average rate of commercial banks with Direct investments for 2017 was 60%) which influences the borrowing/lending rate formation mechanism between affiliated institutions because of strong economic links and in this case it cannot be accounted for by using the estimation of country risk. Anyway, as we can see from the table, except for lower rates calculated for 2016 the remaining results for USD reference rates do not significantly differ and are somewhere around 5%- 6%. We should take into account that more than half of foreign assets and more than 70% of foreign liabilities of Armenian commercial banks are denominated in USD. Thus this is the main variable that will influence the final FISIM calculations.

Final decision- Combined Method

After putting together all the available data sources and evaluating the results, taking into account the abovementioned pros and cons of using different options, the final decision on the methodology of reference rate calculations was made. The choice is also based on data limitations and the economic logic and reasonability of the different results derived. The reference rates for foreign currencies were taken from First method that is the rates derived from interbank weighted average factual rates. At the same time, taking

into account the limited data for AMD denominated transactions in interbank market, it was decided to use the rate of government bonds in respect of Armenian dram.

Table 4: Reference rate by combined Final method

	2016				2017			
	USD	EUR	RUB	AMD	USD	EUR	RUB	AMD
Q1	6.2%	0.8%	4.5%	11.9%	6.4%	1.5%	1.7%	7.7%
Q2	6.5%	1.2%	1.4%	10.9%	6.0%	1.1%	1.9%	6.9%
Q3	5.8%	1.5%	5.8%	9.0%	5.7%	1.2%	0.9%	6.6%
Q4	6.5%	1.8%	1.1%	7.9%	5.4%	1.5%	1.3%	6.3%

In the following table you can see the results of FISIM export calculations separately for loans provided by resident commercial banks to non-resident non-bank sector and for deposits taken from non-resident non-bank sector by the Armenian commercial banks for 2016 and 2017.
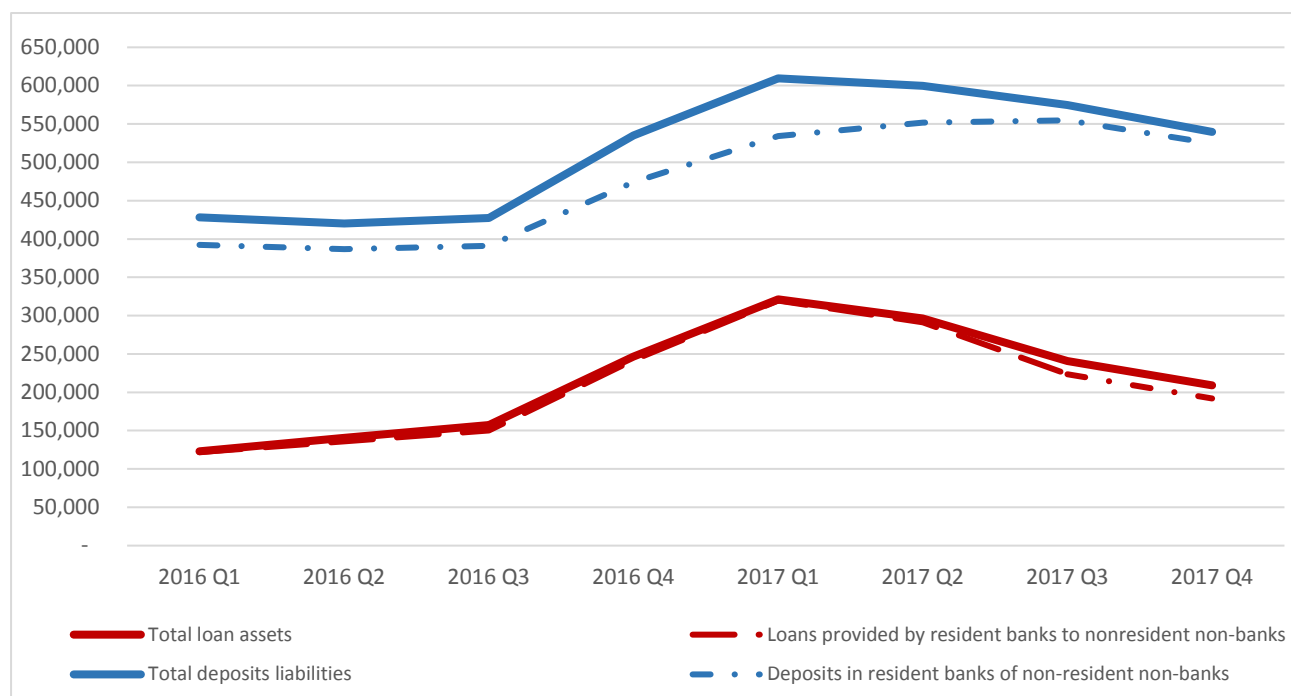
Table 5. Results of FISIM export for each Option, mln USD

	Option 1			Option 2			Option 3			Option 4 Final		
	On Loans	On deposits	Total	On Loans	On deposits	Total	On Loans	On deposits	Total	On Loans	On deposits	Total
2016 Q1	2.1	(0.0)	**2.1**	(0.9)	6.7	**5.7**	0.3	4.0	**4.3**	0.3	2.2	**2.5**
2016 Q2	3.3	(0.7)	**2.6**	(1.1)	6.3	**5.2**	0.5	3.4	**3.9**	0.3	2.6	**3.0**
2016 Q3	4.6	(1.8)	**2.8**	(0.9)	6.0	**5.1**	1.8	1.6	**3.3**	1.6	1.2	**2.8**
2016 Q4	6.0	2.5	**8.4**	3.0	6.1	**9.1**	7.6	0.4	**8.0**	6.8	1.9	**8.6**
2016	*15.9*	*(0.0)*	*15.9*	*0.1*	*25.1*	*25.2*	*10.2*	*9.3*	*19.5*	*8.9*	*7.9*	*16.9*
2017 Q1	5.8	2.5	**8.3**	1.9	6.3	**8.2**	8.9	(1.9)	**7.1**	7.3	1.5	**8.8**
2017 Q2	10.5	(0.7)	**9.8**	5.0	5.7	**10.7**	11.0	(2.2)	**8.8**	9.8	(0.1)	**9.7**
2017 Q3	8.7	(2.1)	**6.7**	5.2	3.9	**9.0**	8.7	(2.3)	**6.4**	7.9	(1.0)	**6.9**
2017 Q4	2.9	1.9	**4.8**	1.1	5.6	**6.7**	3.3	1.3	**4.6**	2.9	1.9	**4.8**
2017	*28.0*	*1.5*	*29.6*	*13.1*	*21.5*	*34.6*	*31.8*	*(5.0)*	*26.8*	*27.9*	*2.3*	*30.2*

The table shows that while in Option1 and Option3 there were some negative FISIM results on deposits part, in the final version they are offset due to combining RRs by currencies from different options. The other point, which comes to attention, is the increase of FISIM export in 2017 as compared to 2016. The reason is the dynamic increase of loan assets starting from the end of 2016, denominated both in US dollars and in Armenian drams. I should mention that the vast majority of these loans were provided to non-resident non-bank sector, which led to increase in FISIM export. This can be observed by the difference of the lines in the

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graph. The solid lines show the total external loan/deposit assets of the commercial banks and the doted lines show the part where the counterparty is non-resident nonbank private sector.

Graph 1. Commercial banks external assets/ liabilities stocks for 2016-2017, mln USD

Legend:
— Total loan assets
– • – Loans provided by resident banks to nonresident non-banks
— Total deposits liabilities
– • – Deposits in resident banks of non-resident non-banks

Accounting for FISIM in Balance of payments

After the incorporation of the results to the Balance of payments, the interest received in the primary account decreases, at the same time the export of financial services will increase by the same amount. In the terms of the overall balance on the current account, it will have no effect, but if the users will need to analyse the Goods and services account then the difference will be visible. Hereafter in the next table the results are shown from the viewpoint of the balance of payments accounts.

Table 6. Results of FISIM export evaluation for 2015[1]-2017, mln USD

	2015					2016					2017				
	Q1	Q2	Q3	Q4	**Total**	Q1	Q2	Q3	Q4	**Total**	Q1	Q2	Q3	Q4	**Total**
credit	4.0	4.9	5.1	3.9	**17.9**	2.5	3.0	2.8	8.6	**16.9**	8.8	9.7	6.9	4.8	**17.9**

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[1] Calculations for 2015 were made using Option 2 for reference rates, because of data shortage. I will refer to this issue in detail under the Future steps and conclusions title.

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Table 7. Balance of payments interests and financial services data before FISIM for 2015-2017, mln USD

	2015					2016					2017				
	Q1	Q2	Q3	Q4	**Total**	Q1	Q2	Q3	Q4	**Total**	Q1	Q2	Q3	Q4	**Total**
Interests accrued by FIs	(27.5)	(25.4)	(26.4)	(26.3)	**(105.6)**	(26.4)	(23.9)	(23.2)	(10.4)	**(84.0)**	(13.1)	6.1	4.4	9.6	**7.0**
credit	5.6	5.8	6.1	7.6	**25.1**	7.5	9.1	9.9	26.5	**53.0**	36.2	49.7	47.5	47.1	**180.5**
debit	33.1	31.2	32.4	34.0	**130.7**	33.9	33.1	33.2	36.8	**137.0**	49.2	43.6	43.1	37.5	**173.5**
Financial services by FIs	(2.2)	(1.5)	(1.3)	(2.1)	**(7.1)**	(2.6)	(3.6)	(1.6)	(3.6)	**(11.5)**	(1.1)	(2.1)	(1.5)	(4.3)	**(9.0)**
credit	1.5	1.4	1.3	1.9	**6.1**	1.3	1.5	1.5	1.8	**6.1**	1.4	1.8	2.3	0.6	**6.1**
debit	3.7	2.9	2.6	4.0	**13.2**	4.0	5.1	3.2	5.5	**17.6**	2.5	3.9	3.8	4.9	**15.1**

Table 8. Balance of payments revised data after the incorporation of FISIM export estimations for 2015-2017, mln USD

	2015					2016					2017				
	Q1	Q2	Q3	Q4	**Total**	Q1	Q2	Q3	Q4	**Total**	Q1	Q2	Q3	Q4	**Total**
Interests accrued by FIs	(31.5)	(30.3)	(31.5)	(30.2)	**(123.5)**	(28.9)	(26.9)	(26.0)	(19.0)	**(100.8)**	(21.8)	(3.7)	(2.5)	4.8	**(23.2)**
credit	1.6	0.9	0.9	3.8	**7.2**	5.0	6.2	7.1	17.8	**36.1**	27.4	39.9	40.6	42.3	**150.3**
debit	33.1	31.2	32.4	34.0	**130.7**	33.9	33.1	33.2	36.8	**137.0**	49.2	43.6	43.1	37.5	**173.5**
Financial services by FIs	1.8	3.5	3.8	1.8	**10.8**	(0.2)	(0.6)	1.2	5.0	**5.4**	7.7	7.7	5.4	0.5	**21.2**
credit	5.5	6.3	6.5	5.8	**24.0**	3.8	4.4	4.4	10.5	**23.0**	10.2	11.6	9.2	5.4	**36.3**
debit	3.7	2.8	2.6	4.0	**13.2**	4.0	5.1	3.2	5.5	**17.6**	2.5	3.9	3.8	4.9	**15.1**

As the table shows the export of the financial services increased as a result of FISIM export for approximately 4 times in 2015-2016 and for 6 times in 2017. At the same time, the credit of interest account for commercial banks decreases for nearly 17% for 2017, 30% for 2016 and more than 3 times for 2015.

Estimation of FISIM import

The import of financial intermediation services indirectly measured represents the import of services by nonbanking sector of Armenia from the non-resident financial institutions. Thus, it is generated in process of depositing amounts abroad and receiving loans by resident nonbank sector from non-resident financial institutions.

Estimation of Financial intermediation services indirectly measured in Armenia's external accounts

As for calculating FISIM import data for Armenia there are still more problems than reference rate estimation. The issue is that until the beginning of 2018 there was no information for distinction of international liabilities of nonbank sector by counterparty sectors. As we know, FISIM is generated only in the cases when the loan is received from financial institution. Thus, the breakdown by the counterparty sectors of the private sector loans are required to perform the calculations.

Starting from the 1ˢᵗ quarter of 2018 a new reporting form was introduced in close collaboration with the Statistical committee. In the new form the private companies report on the details of the loans acquired on a loan-by-loan basis. The information on the non-resident partner's sector is filled in. The reporting company also gives information on the interest rate of the contract, which will give the opportunity to calculate the factual accrued interest and estimate the difference with the reference rate on a loan by loan basis. Moreover, the currencies of denomination of the loans are also available. As regarding the deposits side, the aggregated information on the deposited funds and interests accrued by nonbanks is also available from the corresponding reporting form.

In international methodology there are recommendations to use the counterparty country's reference rate in estimation of import for financial intermediation services. At the same time, it is not always practically possible to get the necessary information from other countries.

The other option is to use the same rates as for export calculations. In this case there is no need to make extra calculations, but using the export reference rates might not fully reflect the economic relationships between resident nonbank sector and non-resident financial institutions.

The other option, which I will test when I start to calculate import of FISIM, is based on using the reference rate of Option 2 described above, which is the combination of international financial markets rates (LIBOR/EURIBOR) and the estimation of country risk factor based on GB rates difference among countries. In my opinion, this method better reflects the grounds for choosing the rate for signing a contract by non-resident financial institutions with Armenian private sector.

Unfortunately, there is still some misreporting by private companies due to the new format and structure of information collected. After the mistakes will be corrected, the import calculation of FISIM will be initiated and incorporated to the balance of payments statistics.

The calculation of import of FISIM should also include the transactions by the Government and the Central bank based on loans received and deposited funds in non-resident financial sector. This information is readily available in details from the Ministry of finance and the Central bank. The only issue which still needs to be clarifies is the treatment of International organizations, which are one of the main creditors in public sector. Considering these organizations as non-financial institutions will generate corresponding import of FISIM by Government and Central bank. This issue still needs further clarification and study.

Future steps and conclusions

As the outline of future steps in calculation and incorporation of FISIM export/import to balance of payments, I should first mention the need to calculate the historical data. The current chosen reference rate method cannot be applied to years before 2016 because the detailed raw data is not available for years before 2016, as mentioned in data sources list. Thus, the estimates for 2015 in the table above were actually made based on weighted average interest rate of loans and deposits, that is, based on Option 2. As for stocks denominated in AMD, there is no problem with the data used in the Final option, so the reference rate was chosen based on Government bond yields. The same approach will be used for previous years' data.

As a future improvement, the FISIM calculation should also include information on credit organizations. They mostly perform the same financial functions as commercial banks, but the overall circulation of financial funds is much lower than in banks (the stocks of deposits from non-bank nonresidents is approximately 4% of banks' stocks). At present raw database is not yet collected from them.

As future development of the methodology more emphasis should be made to country risk valuation of small economy like Armenia. The best result would be the maximum elimination of risk factor from risk free reference rate estimations. It concerns both the default risk, as well as foreign currency risk.

After the data and estimations for import will be available, a further discussion will be performed with the Statistical committee whether the rates for domestic FISIM should differ from rates of export and import of intermediation services. All after all the main idea of FISIM export and import calculation is not only including the results to the balance of payments statistics, but also deriving a consistent estimation of financial services indirectly measured for the whole economy and incorporating the data to GDP. This should be done by close cooperation with the Statistical committee. Thus, the next step would be to harmonize the methods of calculations and in future use one single estimation for FISIM export and import by the both agencies, by clarifying whether it should be under the responsibility of statistical agency or the Central bank.

Estimation of Financial intermediation services indirectly measured in Armenia's external accounts

References

Antonio Colangelo (2012), *"Measuring FISIM in the euro area under various choices of reference rate(s)"*, European Central Bank

Bruce Omundsen (2011), *"Measuring the Contribution of Financial Intermediation to Gross Domestic Product (GDP)"*, New Zealand

Joanna Czajka (2016), *"Financial intermediation services indirectly measured (FISIM) in the balance of payments"*, bilateral meeting of Central bank of Armenia and national bank of Poland specialists, National bank of Poland, Warsaw, Poland

Karen Grovell and Daniel Wisniewski (2014), *"Changes to the UK National Accounts: Financial Intermediation Services Indirectly Measured (FISIM)"*, Office for National Statistics, United Kingdom

Jean-Brieux DELBOS Bruno MAILLOT (November 2017), *"Estimating the Financial Intermediation Services Indirectly Measured (FISIM) in the National Accounts and the Balance of Payments"*, IBFI Seminar on Balance of Payments and other external statistics, Paris, France.

Statistics Department International Monetary Fund (October 25–27, 2010), *"The Measurement of FISIM and Effects on the Statistics"*, Twenty-Third Meeting of the IMF Committee on Balance of Payments Statistics Washington, D.C.

International Monetary Fund (2009), *"Balance of Payments and International Investment Position Manual", Sixth Edition (BPM6)*, Washington, D.C.

Commission of the European Communities, International Monetary Fund, Organization for Economic Cooperation and Development, United Nations, World Bank (2008), *"System of National Accounts 2008"*

Estimation of financial intermediation services indirectly measured in Armenia's external accounts[1]

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[1]   This presentation was prepared for the meeting. The views expressed are those of the authors and do not necessarily reflect the views of the BIS, the IFC or the central banks and other institutions represented at the meeting.

Estimation of Financial Intermediation Services Indirectly Measured in Armenia's external accounts

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IFC-CBA Workshop on External Sector Statistics,

Armenia, Dilijan, 11-12 June 2018

Contents

➢ What is FISIM, how and when it occurs

➢ FISIM export and import valuation in External accounts

➢ Current state of financial intermediation services in Armenia

➢ Selection and evaluation of different data sources available

➢ Reference rate- pros and cons of each method

➢ Comparison of results using each option for RR

➢ Method picked up for Armenia- main results, incorporation of results in BOP

➢ Future steps, FISIM import calculations

Financial intermediation and FISIM generation mechanism

➢ Financial institutions are providing financial intermediation services for which the consumers are charged, either explicitly (fees and charges) or implicitly.

➢ The implicit part of charge is hidden in the spread between rates receivable and payable, as financial institutions pay lower interest rates to deposited funds and charge higher interest rates from funds lent out.

➢ Export- indirectly measured financial services provided on the loan assets and deposit liabilities from resident financial institutions for which counterparty is non- resident non-financial unit.

➢ Import- indirectly measured financial services purchased by resident non-financial units on their loan liabilities and deposit assets with nonresident financial corporations

➢ The part covered in interest paid and received should be reclassified in BOP from Primary income account to Financial services

Main changes in new manuals

Indirect service charge is imputed in respect of **all loans and deposits** offered by a financial institution irrespective of the source of the funds

According to SNA 2008 and BPM6 Manual Financial intermediation services indirectly measured are produced only by certain financial intermediaries:

- *Deposit-taking corporations except the central bank (S.122)*
- *Other financial intermediaries, except insurance corporations and pension funds (S.125)*

FISIM is calculated in respect of non-bank user institutional sectors only, so **no interbank** FISIM has to be calculated.

No FISIM is generated by **central banks**.

Formulas:

$$FISIM_L = (r_L - rr) * S_L$$

$$FISIM_D = (rr - r_D) * S_D$$

$$FISIM_{L+D} = (r_L - rr) * S_L + (rr - r_D) * S_D$$

Where:

S_L – stock of loan

S_D – stock of deposit

r_L – rate on loan

r_D – rate on deposit

rr - reference rate

Reference rate - the key variable:

✓ the risk premium has to be eliminated

✓ should contain no intermediation service element

✓ should reflect the risk and maturity structure of deposits and loans

✓ should reflect the currency structure when estimating FISIM external trade

Armenia's case:
main features of financial system

- Highly **dollarized** economy (average share of foreign currency liabilities of financial system from 2010-2017 was 68%)

- Historically big share of **Direct investment** in banking system of Armenia (average rate of commercial banks with DI for 2017 was 60%), which influences the borrowing/lending rate formation mechanism between affiliated institutions because of strong economic links

- Still actively developing financial market with **limited range** of financial instruments available

- **Short data** series for demanded breakdown of financial data, which sometimes makes it difficult to select appropriate data source for calculations
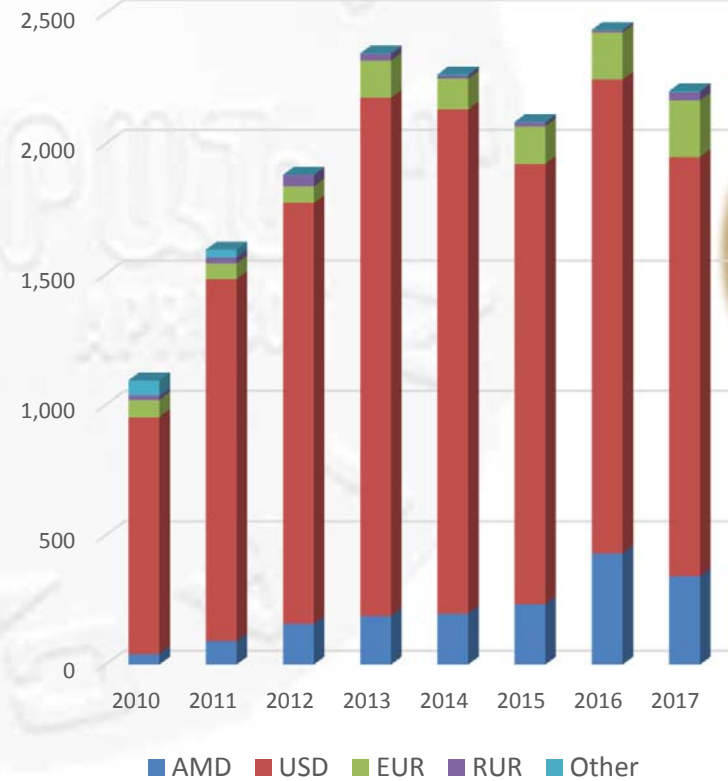
Dollarization of economy

Currency composition of FI's foreign **assets**- loans and deposits, mln USD
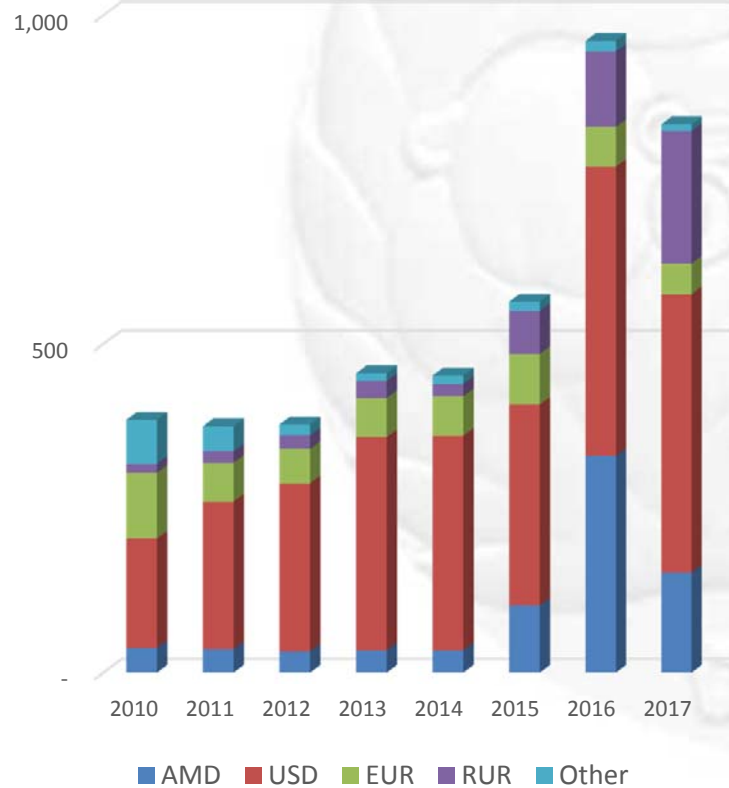
Currency composition of FI's foreign **liabilities**- loans and deposits, mln USD

Legend: AMD, USD, EUR, RUR, Other

Available data sources

➢ Balances of financial institutions

➢ Raw data from financial institutions with detailed breakdown (Soushi)

➢ Reporting form N18 for commercial banks and credit organizations on their external assets and liabilities

➢ Revenue/expenditure statements of financial institutions

➢ Report on loan liabilities of financial institutions on a loan by loan basis, containing information on the interest rate, maturity, currency of loan and information about counterparty sector

➢ New reporting form for Private sector liabilities for services import estimations

➢ BIS statistics for services import estimations

Different options for external reference rate selection: Option 1

Using the weighted average factual interest rates of loans and deposits between resident and nonresident financial institutions which report stocks at the end of period.

Pros:

❖ clear-cut allocation of instruments between residents and nonresidents

❖ information on the nonresident counterparty sector

❖ availability of currency breakdown of stocks

Cons:

❖ the detailed breakdown of data is available for only 2 years

❖ sometimes the counterparty sector is not clearly identified, which makes it difficult to derive the FI vs FI positions

❖ not clear whether the loans received from International organizations should be classified as interbank stocks thus included in reference rate calculations

Despite the opinion that interbank borrowing/lending may not exactly reflect the risk and maturity structure of the deposits and loans, since the rate only reflects short-term lending and borrowing, in Armenia interbank borrowing is mainly long-term (80% of nonresident interbank liabilities).

Different options for external reference rate selection: Option 2

Using weighted average interest rates from new deposits and loans provided in commercial banks

Pros:

❖ Unlike in previous Option 1, the data is available for longer years

❖ Data can be broken down both by maturity and by sectors

Cons:

❖ The use of midpoint of the interest rates on loans and deposits assumes that the service element is equally shared between the borrower and depositor.

❖ The separation of international organizations accounts from other financial organizations is not available

❖ Only new transactions can be seen, so "today's" interest rate is applied to historical stocks

❖ Number of new transactions may be too small to calculate a valid interest rate, especially in by currency allocation. Thus, the deposit/lending rates are published in just AMD/Foreign currency breakdown.

Different options for external reference rate selection: Option 3

The selection of the reference rate for foreign currency denominated stocks is based on using LIBOR/EURIBOR rates combined with country risk valuation. As a country risk indicator the difference between Government Bond yields of countries is calculated.

Pros:

❖ Takes into consideration the risk component of the particular country

❖ A currency breakdown is available

❖ Long data series are available

Cons:

❖ The reference rate formation in small country with high dollarization levels and strong links with direct investors is influenced by a lot of factors which are difficult to incorporate only to country risk concept measured by GB yields.
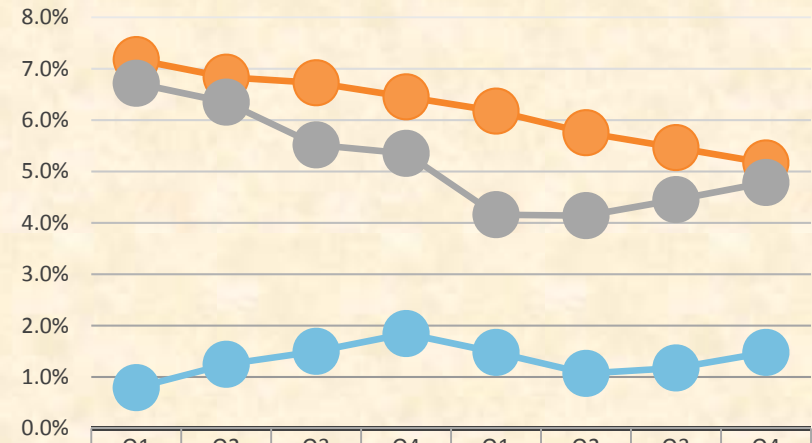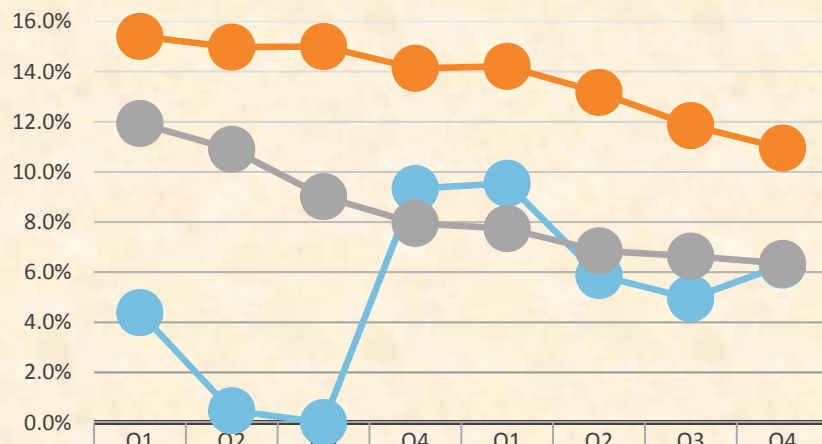
USD Reference rate
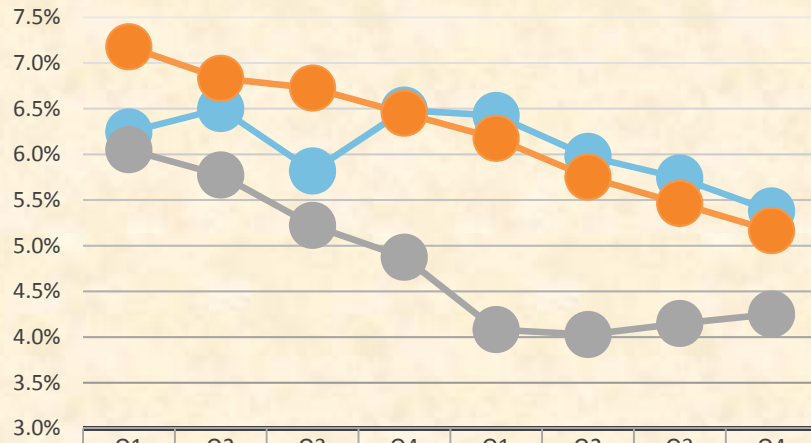
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
		2016				2017		
Option 1	6.2%	6.5%	5.8%	6.5%	6.4%	6.0%	5.7%	5.4%
Option 2	7.2%	6.8%	6.7%	6.4%	6.2%	5.8%	5.5%	5.2%
Option 3	6.1%	5.8%	5.2%	4.9%	4.1%	4.0%	4.1%	4.3%

EUR Reference rate

	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
		2016				2017		
Option 1	0.8%	1.2%	1.5%	1.8%	1.5%	1.1%	1.2%	1.5%
Option 2	7.2%	6.8%	6.7%	6.4%	6.2%	5.8%	5.5%	5.2%
Option 3	6.7%	6.3%	5.5%	5.4%	4.2%	4.1%	4.5%	4.8%

AMD Reference rate

	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
		2016				2017		
Option 1	4.4%	0.5%	0.0%	9.3%	9.5%	5.9%	4.9%	6.3%
Option 2	15.4%	15.0%	15.0%	14.1%	14.2%	13.2%	11.8%	10.9%
Option 3	11.9%	10.9%	9.0%	7.9%	7.7%	6.9%	6.6%	6.3%

RUB Reference rate
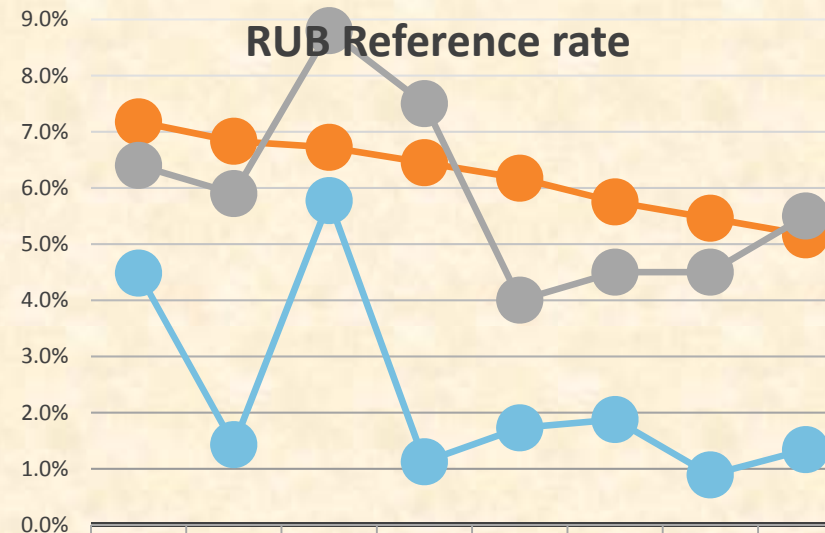
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
		2016				2017		
Option 1	4.5%	1.4%	5.8%	1.1%	1.7%	1.9%	0.9%	1.3%
Option 2	7.2%	6.8%	6.7%	6.4%	6.2%	5.8%	5.5%	5.2%
Option 3	6.4%	5.9%	8.8%	7.5%	4.0%	4.5%	4.5%	5.5%

The final decision, combination of different methods used, mln USD

mln USD	Option 1			Option 2			Option 3			Option 4 combined		
	On Loans provided	On deposits	Total	On Loans provided	On deposits	Total	On Loans provided	On deposits	Total	On Loans provided	On deposits	Total
2016 Q1	2.1	(0.0)	2.1	(0.9)	6.7	5.7	0.3	4.0	4.3	0.3	2.2	2.5
2016 Q2	3.3	(0.7)	2.6	(1.1)	6.3	5.2	0.5	3.4	3.9	0.3	2.6	3.0
2016 Q3	4.6	(1.8)	2.8	(0.9)	6.0	5.1	1.8	1.6	3.3	1.6	1.2	2.8
2016 Q4	6.0	2.5	8.4	3.0	6.1	9.1	7.6	0.4	8.0	6.8	1.9	8.6
2016	15.9	(0.0)	15.9	0.1	25.1	25.2	10.2	9.3	19.5	8.9	7.9	16.9
2017 Q1	5.8	2.5	8.3	1.9	6.3	8.2	8.9	(1.9)	7.1	7.3	1.5	8.8
2017 Q2	10.5	(0.7)	9.8	5.0	5.7	10.7	11.0	(2.2)	8.8	9.8	(0.1)	9.7
2017 Q3	8.7	(2.1)	6.7	5.2	3.9	9.0	8.7	(2.3)	6.4	7.9	(1.0)	6.9
2017 Q4	2.9	1.9	4.8	1.1	5.6	6.7	3.3	1.3	4.6	2.9	1.9	4.8
2017	28.0	1.5	29.6	13.1	21.5	34.6	31.8	(5.0)	26.8	27.9	2.3	30.2

Total FISIM by different options, mln USD
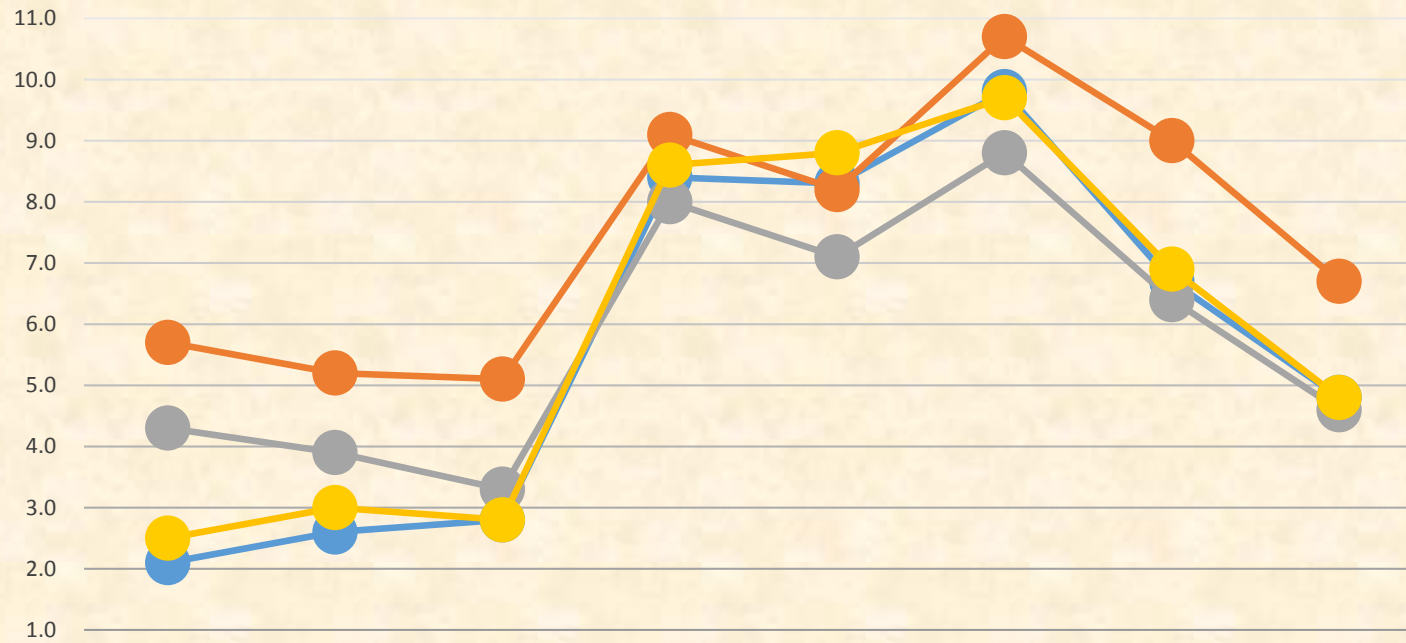
	2016 Q1	2016 Q2	2016 Q3	2016 Q4	2017 Q1	2017 Q2	2017 Q3	2017 Q4
Option 1	2.1	2.6	2.8	8.4	8.3	9.8	6.7	4.8
Option 2	5.7	5.2	5.1	9.1	8.2	10.7	9.0	6.7
Option 3	4.3	3.9	3.3	8.0	7.1	8.8	6.4	4.6
Option 4	2.5	3.0	2.8	8.6	8.8	9.7	6.9	4.8

FISIM Results

mln USD	2015					2016					2017				
	Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4	
credit	4.0	4.9	5.1	3.9	**17.9**	2.5	3.0	2.8	8.6	**16.9**	8.8	9.7	6.9	4.8	17.9

Data from BOP

mln USD	2015					2016					2017				
	Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4	
Interests	(27.5)	(25.4)	(26.4)	(26.3)	**(105.6)**	(26.4)	(23.9)	(23.2)	(10.4)	(84.0)	(13.1)	6.1	4.4	9.6	**7.0**
credit	5.6	5.8	6.1	7.6	**25.1**	7.5	9.1	9.9	26.5	53.0	36.2	49.7	47.5	47.1	**180.5**
Financial services by Fis	(2.2)	(1.5)	(1.3)	(2.1)	**(7.1)**	(2.6)	(3.6)	(1.6)	(3.6)	(11.5)	(1.1)	(2.1)	(1.5)	(4.3)	**(9.0)**
credit	1.5	1.4	1.3	1.9	**6.1**	1.3	1.5	1.5	1.8	6.1	1.4	1.8	2.3	0.6	**6.1**

Modified Data from BOP after FISIM incorporation

mln USD	2015					2016					2017				
	Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4	
Interests	(31.5)	(30.3)	(31.5)	(30.2)	**(123.5)**	(28.9)	(26.9)	(26.0)	(19.0)	**(100.8)**	(21.8)	(3.7)	(2.5)	4.8	**(23.2)**
credit	1.6	0.9	0.9	3.8	**7.2**	5.0	6.2	7.1	17.8	**36.1**	27.4	39.9	40.6	42.3	**150.3**
Financial services by Fis	1.8	3.5	3.8	1.8	**10.8**	(0.2)	(0.6)	1.2	5.0	**5.4**	7.7	7.7	5.4	0.5	**21.2**
credit	5.5	6.3	6.5	5.8	**24.0**	3.8	4.4	4.4	10.5	**23.0**	10.2	11.6	9.2	5.4	**36.3**

Efforts to estimate import of FISIM

Loans attracted/ funds deposited abroad

➢ **Private sector**

Available data- stocks, interest accrued during the period, maturity breakdown, BIS data on funds deposited in member countries' FIs

Not available data- breakdown by counterparty sector, currency breakdown

Future steps

Collecting data from a new reporting form on Private sector external liabilities containing detailed information on the creditor sector, interest rate, future payments schedule, etc.

Estimation of possible reference rates by currencies

➢ **Central bank and Government**

Future steps
Issues to clarify

➢ Estimation of **FISIM import**

➢ Cooperation with National statistical service for incorporation of FISIM export/import data in **GDP**

➢ Loans and deposits of **International organizations**

➢ Calculation and incorporation of FISIM export/import **historical data**

➢ Inclusion of **credit organizations** data in FISIM calculations

THANK YOU