Organisation de Coopération et de Développement Économiques
Organisation for Economic Co-operation and Development

25-Sep-2008

English - Or. English

STATISTICS DIRECTORATE
COMMITTEE ON STATISTICS

Working Party on National Accounts

AN ENHANCED METHODOLOGY OF COMPILING FINANCIAL INTERMEDIATION SERVICES INDIRECTLY MEASURED (FISIM)

To be held on 14-16 October 2008
Tour Europe, Paris la Défense
Beginning at 9:00 a.m. on the first day

The complete document is only available in PDF format

This document has been prepared by Reimund Mink, ECB and will be presented under item 7 of the draft agenda

For further information please contact:
Reimund Mink
E-mail: reimund.mink@ecb.int

JT03251258

AN ENHANCED METHODOLOGY OF COMPILING FINANCIAL INTERMEDIATION SERVICES INDIRECTLY MEASURED (FISIM)

FOR CONSIDERATION AND AGREEMENT BY THE COMMITTEE ON MONETARY, FINANCIAL AND BALANCE OF PAYMENTS STATISTICS

Luxembourg, 3 and 4 July 2008

Executive Summary

This paper argues that the starting point of measuring other monetary financial institutions' (oMFIs') output should be a distinction between the part of interest rates which is a payment for financial services and the part which represents the cost of using funds, which can take the form of taking a loan or issuing a debt security. The latter includes a remuneration for the credit default risk and for the term premium (i.e. a higher price must be paid if consumption is foregone for a longer period). Under this proposed framework, FISIM is estimated by comparing interest rates on loans and deposits, charged and received essentially by oMFIs, to the yield on debt securities with similar default risk and maturity characteristics. Excluding the compensation for such risk-bearing from the output notably prevents changes in output that are unrelated to changes in input and technology, e.g. that higher risk premiums on all financial instruments (including bonds) during periods of financial distress lead to higher FISIM on loans.

For example, the recent increase in interest rate spreads in the credit markets, in the wake of the financial turmoil, has led to higher estimates of financial intermediation services indirectly measured (FISIM) and, thereby, to an increased GDP. This may be seen as counterintuitive and difficult to explain to users. Conceptually, the main issue to be reconsidered relates to the treatment of the credit default risk and the term premium (i.e. spreads in interest rates due to different credit risk profiles and maturities) as part of interest receivable on loans or payable on deposits. This may necessitate the choice of multiple reference rates depending on the currency of denomination, type of loans and deposits, and counterpart sectors. If not adequately considered in the FISIM estimates, these factors may lead to distortions of the FISIM computations and to implausible results; in many instances negative FISIM arise from these shortcomings. In practice, any method should be easy to implement at the national level.

In the paper, two scenarios are discussed; one in which only the term premium is excluded from the FISIM calculation and another one in which both the term premium and the default risk are excluded from the FISIM calculation. Results are presented for the period January 2003 to December 2007 and limiting, for the time being, the scope to oMFIs that is, excluding other financial intermediaries except insurance corporations and pension funds.

The new methodology is based on existing, high frequency, harmonised and very timely data for EU-countries and therefore it can already now be implemented at both national and European level. In addition, the new methodology substantially increases the comparability of the FISIM calculations across EU-countries.

The paper has been transmitted to the ESCB's Working Group on Monetary and Financial Statistics for comments and has also been discussed by the Eurostat Working Group on National Accounts on 20 May 2008. It was also presented to the ESCB's Statistics Committee on 12 June 2008 which agreed that the current FISIM methodology yields rather unsatisfactory results and that the revised 1995 ESA should contain an improved methodology, if feasible; even more so, since the new draft 2008 SNA appears to be in line with the AEG recommendation that 'the reference rate used in the compilation of FISIM should be a rate that has no service element in it and which reflects the risk and maturity structure of the financial assets and liabilities to which FISIM applies'.

With regard to the new methodology as proposed in the note, the members of the STC generally favoured the exclusion of the term premium from the FISIM calculation and proposed some further reflections on the exclusion of the default risk premium. The Committee pointed out that the creation of a task force under the umbrella of the CMFB could be an appropriate format for designing a more accurate FISIM estimation methodology for incorporation into the forthcoming revised 1995 ESA. The Committee also agreed that the task force should first work on the general concepts, also broadly checking their feasibility (including in terms of data availability) and, thereafter, on any practical implementation.It was also

recommended that the new methodology should enable a comparability of the FISIM calculations across EU countries and worldwide.

The views of the CMFB are sought on:

- ***the rather unsatisfactory results of the current FISIM-methodology;***
- ***the necessity to apply an appropriate methodology in the revised 1995 ESA, which may be implemented in 2014;***
- ***the methodology described in this paper and its feasibility at both national and European level (using e.g. harmonised MFI interest rate statistics);***
- ***the establishment of a task force under the umbrella of the CMFB, in order to clarify the conceptual issues and the feasibility of a more accurate FISIM methodology along the lines described in this paper, with the aim to propose an improved draft methodology for incorporation in the revised ESA 95, in time for its implementation in 2014.***

1. Introduction

Following the adoption of the European system of national and regional accounts (*1995 ESA*) and the benchmark revision in 2005, all EU countries have implemented the common methodology to compile imputed bank output, or financial intermediation services indirectly measured (FISIM). The *1995 ESA* recommends compiling FISIM for *other monetary financial institutions* (*oMFIs, subsector S.122*) and for *other financial intermediaries, except insurance corporations and pension funds* (*OFIs, subsector S.123*)[1] as the product of the outstanding amounts on deposits and loans times the difference between the corresponding market interest rates and the so-called reference rate. The latter is defined as the ratio between interest flows and outstanding amounts on positions among financial intermediaries (oMFIs and OFIs together). The choice of the reference interest rate is especially disputable. While the *1995 ESA* distinguishes between an internal reference rate to be used for transactions among residents and an external reference rate to be used for the business between residents and the rest of the world (with the possibility of compiling different external reference rates according to currencies of denomination and counterpart areas) no different reference rates are recommended for different types of loans or deposits, and for different maturities. Furthermore, the choice of the reference rate refers to a risk free rate which implies that remuneration for the credit default risk and the term premium is treated as a productive service and thus becomes part of financial services.[2] This is inconsistent with the treatment of interest on debt securities, which does not add to GDP in any way.

Economic theory also suggests that loan and deposit interest rates should be compared to the yield on debt securities with similar risk and term characteristics[3]. Apart from theoretical reasons for a modified approach, there are also practical concerns about the current method. Including the compensation for risk-bearing with the production of financial services can lead to changes in output that are unrelated to changes in input and technology. In particular, during periods of financial distress like at present this leads to an undesirable volatility in output estimates, while a steepening of the yield curve increases the imputed service margin without any change of the service provided by the oMFI. The proposed methodology distinguishes between two scenarios: one in which the reference rate only takes into account the maturity structure of loans and deposits, and another one in which the default risk premium is also taken into account.

This paper is organised as follows. Section two describes the treatment of FISIM in international statistical standards like the *2008 SNA* and the *1995 ESA*, while section three deals with the enhanced methodology on FISIM. The estimates resulting from the new methodology are presented in section four for the euro area[4] as a whole and compared to FISIM derived according to the current European methodology; the

---

This paper was prepared by Antonio Colangelo and Reimund Mink (DG-S, ECB), in co-operation with Robert Inklaar (University of Groningen). The work has benefited from useful comments and suggestions by Henning Ahnert, Wim Haine, Jean-Marc Israël, Tjeerd Jellema, Steven Keuning, Antonio Matas Mir, Ruth Magono and Brigitta Sulyok.

1 The results presented in this paper are limited to oMFIs' output as a fully consistent and detailed set of statistics on OFIs is not yet available for all EU countries. This will be remedied under the new data collection framework for OFI statistics.

2 This paper concentrates on estimates of output at *current prices* only; see Section 4.1 for further details.

3 For instance, see Wang *et al* (2004) and references therein.

4 All estimates in the paper refer to the moving composition of the euro area, i.e. data prior to January 2007 do not include Slovenia.

impact on national calculations is also analysed with particular reference to various financial asset categories and subcategories.[5]

Two annexes are included: Annex 1 reviews the empirical set-up of the new proposed approach and Annex 2 presents the detailed FISIM results under the new methodological framework (broken down by sector and by type of loans and deposits) for the euro area as a whole and, as an example, for Germany, and compares them with results obtained by simulating the current method.

2. FISIM as recommended in international statistical standards

FISIM are the services that oMFIs and OFIs provide to their customers but which are not directly invoiced. For depositors, these services generally include the management of the accounts, the provision of accounts statements and fund transfers between accounts. Instead of directly invoicing the services, the financial institutions reduce the interest paid to depositors. This interest is lower than what customers could have obtained by lending their money directly to borrowers. For borrowers, these services include the monitoring of their creditworthiness, financial advice, the smoothing over time of repayments and the recording of the repayments for accounting purposes.

In the *1968 SNA* FISIM were compiled as the difference between interest receivable and interest payable. This compilation method was modified in the *1993 SNA* by defining FISIM as "the property income receivable by financial intermediaries minus their total interest payable, excluding the value of any property income receivable from the investment of their own funds."

2.1 The compilation of FISIM as recommended in the *1995 ESA*

Paragraph 3.63.J of the *1995 ESA* outlines the principles underlying the FISIM compilation. It states that in general financial intermediation services cover two parts: (a) financial intermediation services directly charged by financial intermediaries to their clients and measured as the sum of fees and commissions charged; and (b) FISIM.

Financial intermediaries charge for FISIM by paying lower rates of interest than would otherwise be the case to those who lend them money and by requiring higher rates of interest to those who borrow from them; by contrast, there is no intermediation service for debt securities.

The *1995 ESA* identifies oMFIs and OFIs (subsectors S122 and S123) as FISIM-producing sectors. Their output equals the difference between the actual rates of interest payable and receivable on loans and deposits vis-à-vis other sectors (including the rest of the world) and a "reference" rate of interest. For those to whom the intermediaries lend funds, both resident and non-resident, it is measured by the difference between the interest charged on loans and the amount that would have been paid if a reference rate had been used. For those from whom the intermediaries borrow funds, both resident and non-resident, it is measured by the difference between the interest they would have received if a reference rate had been used and the interest they actually have received. The *1995 ESA* also determines that the central bank must not be included in the calculation of FISIM: its output is measured as the sum of costs.

In turn, the reference rate is defined as the average interest rate at which FISIM-producing sectors lend money to each other.[6] The *1995 ESA* implicitly distinguishes between an internal reference rate, to be used

---

5 The FISIM estimates presented in this paper according to the methodology laid down in the Council Regulation (EC) No 2223/93 of 25 June 1996 on the European System of National and Regional Accounts in the Community (1995 ESA), amended by Council Regulations (EC) 448/98 and 1889/2002, are not based on national official statistics but have been derived by the ECB simulating this methodology. In particular, whereas national results are only presented for euro area countries, the methodological framework proposed in the paper can be applied to all EU countries.

6 The current period demonstrates how problematic this method is as the interbank lending rate clearly exceeds a "risk-free" rate.

for transactions among residents, and an external reference rate, to be used for the business between residents and the rest of the world, with the possibility of compiling different external reference rates according to currencies of denomination and counterpart areas.

The ECB has implemented this methodology to provide estimates on sectoral FISIM allocation, mainly as part of the MFI "building block" for the euro area accounts produced in co-operation with Eurostat.

2.2 Some background on FISIM compilation as recommended in the updated *2008 SNA*

The current *1995 ESA* methodology on FISIM has been reflected in the updated *2008 SNA* (the new SNA paragraphs 6.160 to 6.166 describe the basic principle of FISIM). In particular, this refers to the concept of a "reference" rate of interest (paragraph 6.160) and its specification as a risk-free rate of interest such as that prevailing for inter-bank borrowing and lending. The current draft text also says that different reference rates may be needed for each currency in which loans and deposits are denominated, especially when a non-resident financial institution is involved (paragraph 6.163).

However, these principles (also partly described in the draft *2008 SNA*, Chapter 17) considerably deviate from the recommendations of the Advisory Expert Group on National Accounts (AEG) formulated in two meetings: First, the draft *2008 SNA* states that "*the reference rate to be used in the calculation of SNA interest is a rate between bank interest rates on deposits and loans* (paragraph 6.163)" and "*it is assumed that the inter-bank rate at which banks borrow and lend to one another is usually such as to meet the criteria for a reference rate, that is, it is a risk-free rate. (In some cases it may be appropriate to use the inter-bank rate as the reference rate.)*" (paragraph 17.237). The AEG, however, has not made a proposal to use the inter-bank rate as the reference rate. Moreover, the AEG agreed that multiple reference rates may need to be used. Furthermore, the AEG agreed that a single reference rate could be used but, when relevant, a country could also choose to use multiple rates.

Second, the draft *2008 SNA* states, in paragraph 6.123 that "*different reference rates may be needed for each currency in which loans and deposits are denominated, especially when a non-resident financial institution is involved.*" The AEG, however, never agreed to limit the use of different reference rates to multiple currencies (see also first point).

Third, it is explicitly mentioned in the draft *2008 SNA* that "*the reference rate should represent a risk-free rate of interest such as that prevailing for inter-bank borrowing and lending"* (paragraph 6.123). Looking at the outcome of the discussion in January/February 2006 the AEG agreed that "*the reference rate used in the compilation of FISIM should be a rate that has no service element in it and which reflects the risk and maturity structure of the financial assets and liabilities to which FISIM applies*."

The AEG text is less restrictive than what is currently included in the draft *2008 SNA* and is not "*too prescriptive about a single reference rate.*" As mentioned above, the AEG also concluded to refer to "*an appropriate reference rate*" instead of recommending a rather narrow concept as currently done. Such a rather flexible text might be included in the final *2008 SNA* and also be taken into the revised *ESA*.

2.3 Shortcomings of the current FISIM method

There are various shortcomings of the FISIM method as proposed in the *2008 SNA* and also in the *1995 ESA*.[7] Essentially, this method does not appropriately capture the differences between various types of

[8] Keuning (2008) describes that the current method is particularly flawed if banks practice the so-called "originate and distribute" model, whereby lending risks are transferred to end investors through securitisation or other credit risk transfer methods. Essentially, the pure costs of using financial assets ('funding costs'), be it through a loan or through issuing a security, should not be seen as financial intermediation output. On the other hand, the risk assessment is clearly a productive activity that should be incorporated in FISIM.

loans and deposits: for instance, whereas the inter-bank business is mainly short term with a low default risk premium, deposits and loans from/to other sectors may have completely different maturity structures with sometimes high default risks. In summary, within the current methodological framework compensation for the term premium and the default risk is treated as a productive service. In many instances negative FISIM estimates, both at the sectoral level and in the rest-of-the-world account, are a clear consequence of this distortion.[8]

3. The enhanced methodology

3.1 Conceptual framework

FISIM cannot be estimated without a description of the financial services that customers buy (see Wang *et al* (2004)). For a depositor's overnight account, banks provide ready access to the funds and provide payment services in the form of electronic money transfers or checks; on other types of deposits, the transaction services are usually fewer, and the interest received by the customer concomitantly higher. Bank services to borrowers mostly consist of screening creditworthiness and monitoring the loan performance during the duration of the contract.

Regarding the bank charges for these services, the argument for the depositor is most straightforward. Given that all European countries have a system of deposit insurance, the alternative to keeping money on a deposit account is buying a (ideally) risk-free debt security, like a government bond. By holding money in a deposit account, the depositor foregoes the interest on another risk-free investment. The value of the services received is equal to the interest foregone.[9]

In an equation, this becomes:

$$(1) \qquad Y_D = \left(r^F + r^T - r^D\right)S_D = m^D S_D,$$

where Y_D is the value of output associated with deposit type D, r^D is the interest rate paid on that type of deposit (which could be zero), r^F is the short-term risk-free rate, r^T is the term premium, S_D is the account balance and m^D represents the corresponding interest margin applied by the bank.

The logic is similar for loans, except that loans are generally risky. As assets in financial markets require a rate of return that exceeds the risk-free rate, so should bank loans. A firm has the choice between borrowing from a bank and issuing bonds in the financial markets. The bank's interest rate should be at least as high as the expected return on the bond and, in addition, the bank will charge for the services provided. In other words, to estimate the value of services provided to a borrower, the interest rate on the loan should be compared to the yield on a market security with the same risk characteristics:

$$(2) \qquad Y_L = \left(r^L - r^M\right)S_L = \left(r^L - r^P - r^T - r^F\right)S_L = m^L S_L,$$

where Y_L is the value of output associated with loan type L, r^L is the interest rate charged on that type of loan and r^M is the yield on the corresponding market security, which is the sum of the risk-free rate r^F, the term premium r^T and the default risk premium r^P, S_L is the amount of the loan and m^L represents the corresponding interest margin applied by the bank.

To illustrate the differences with the current approach, two factors are of relevance. Currently, a weighted average of inter-bank interest rates is used as the single reference rate for all deposits and loans. The inter-bank market covers loans up to one year, i.e. loans with short maturities that are (fairly) default risk-free.

---

8 The issue of negative FISIM on imports and exports is discussed by S. Fonte Santa (2007) proposing different (weighted) reference rates according to the term structure and the currency denomination for oMFI loans and deposits in Portugal.

9 This is the user cost of money; see Barnett (1978).

On the other hand, loans and deposits can be for (much) longer maturities, so the term premium is one factor to take into account. The default risk premium on loans is the other main factor.[10]

3.2 Empirical set-up[11]

The methodology developed in this paper to estimate FISIM generated by oMFIs (S.122) on positions vis-à-vis households and non-profit institutions serving households (S.14/S.15) and non-financial corporations (S.11) is mainly based on the use of MFI interest rate (MIR) statistics. These statistics provide (on a monthly basis and for periods as from 2003) a harmonised and comprehensive coverage of the interest rates applied by euro area oMFIs to euro area households and non-financial corporations on euro denominated loans and deposits. The data are available both at national and euro area level, with various breakdowns, and distinguish between the interest rates on new business, i.e. newly negotiated interest rates during the period, and rates on outstanding amounts.[12] While the presently used approach implicitly relies on MIR rates on outstanding amounts, the methodology developed in this paper uses statistics on new business. Annex 1 presents the arguments supporting this choice, although some further reflections may be useful.

As described above, another feature of the current approach is the use of the inter-bank rate as the reference rate to evaluate interest margins. The first proposed improvement (in the case of households and non-financial corporations) is to take into account the maturity structure of loans and deposits based on general government bond yield curves. Appendix Table A1 describes in detail which rate was applied to each category of loans and deposits for households and non-financial corporations under this approach[13].

Second, bank loan rates are not only higher because of longer maturities but also because of a higher default risk. Data on the yield on bonds, specifically indices of non-financial corporate bonds and of asset-backed and mortgage-backed asset bonds can be used to take this into account. Appendix Table A2 reviews the reference rates applied to each type of loans and deposits for households and non-financial corporations under this approach[14].

---

[10] A similar methodology was presented by DESTATIS at the Task Force on FISIM meeting on 16 April 2007. The DESTATIS approach is also based on the derivation of interest margins on loans and deposits discounting risk components, but in a more simplified way. For further information, see the paper "A proposal for an improved FISIM - calculation".

[11] Although the paper is manly focused on the derivation of FISIM estimates for the euro area as a whole, the empirical set-up of the methodology equally applies at the national level.

[12] The requirements for MIR statistics are laid down in Regulation ECB/2001/18. Almost all non-participating EU countries are already compiling MIR statistics complying with the standards required by the MIR Regulation; in particular these countries compile interest rate statistics for resident sectors, and separately for positions denominated in euro and in the national currency. Whereas the complete set of national MIR statistics is not published by the ECB for EU countries, they are available in full at NCBs.
For further information, see http://www.ecb.europa.eu/stats/money/interest/interest/html/index.en.html.

[13] An alternative method that may be considered is to use the interest swap yield curve, instead of the government bond yield curve; the latter may still contain sovereign risk and liquidity premium elements. In addition, this alternative may lead to further enhanced FISIM results for the financial turmoil period, in which the divergence between swap rates and government bond yields has increased.

[14] Default risk management can be viewed as an insurance contract where the lender, acting as a guarantor, charges a premium (default risk premium) to the borrower in exchange of the risk of his potential default; this premium can thus be viewed as the expected loss of the loan. See also the section on loan guarantees in chapter 17 of the 2008 SNA. Drawing a parallel with the methodology in use to derive the output of non-life insurance corporations, or specifically, of credit insurance institutions may be of some interest in this context. In this case, output is derived as the difference between the collected premiums minus the payments or the calls under the guarantees. This would then argue in favour of the default risk correction, under the recognition that for insurance corporations the correction is done ex-post (discount of 'realised' defaults) while in the context of FISIM compilation it would be performed ex-ante (discount of 'expected' defaults). Another way of indirectly performing the correction would be to use data on loan provisions which may be collected for financial stability purposes by national authorities; in practice, this approach may not be feasible due to a lack of harmonisation across EU-countries.

For the other resident sectors it has been assumed that their interest margins are the same as for non-financial corporations.[15] For the rest of the world (both at national and at euro area level), 'resident' margins are used, averaged on the basis of the sectoral composition of cross-border balances of loans and deposits. In view of the lack of reliable and detailed sectoral data on interest rates and flows for the positions with other resident sectors and with the rest of the world, the proposed method has conceptual advantages and is more appealing since it focuses on the services provided, rather than on an estimate for the service margins. In the current framework, these margins are derived as a residual based on two sets of statistics which are neither complete nor consistent.

Annex 1 describes in more detail the choice of the interest rates and the reference rates under the new methodology. The methodology relies on no more than ten bond indices in addition to MIR statistics (which, as noted before, are already available for almost all EU countries) and standard inter-bank rates reflecting national markets, and is therefore straightforward to implement.

4. New FISIM estimates and comparison with current method

4.1 FISIM results for the euro area

With a complete set of interest margins (see Section 4.3 below for a detailed discussion) the implications for FISIM (imputed bank output) can be shown. Imputed bank output is calculated as:

$$Y_i = m^i S_i \tag{3}$$

where Y_i is the output associated with financial asset i (loan or deposit), m^i is the interest margin and S_i is the outstanding amount of the corresponding financial asset or liability on the oMFI balance sheet.[16] As discussed above, margins are calculated using interest rates on new business for each maturity band in the case of deposits and for each band of initial interest rate fixation periods in the case of loans, and then averaged according to the shares of new business volumes, but these are then applied to outstanding amounts. As discussed above, margins estimated for non-financial corporations are also applied to loans and deposits of insurance corporations and pension funds and general government. For an estimate of exported financial services, a weighted average of the relevant margins is used, where the weights are given by the share in intra euro area cross-border positions.

The top panel of Table 1 shows three estimates of FISIM by sector: (i) as required in the current FISIM regulation, (ii) when the term premium is removed from the interest margins and (iii) when the default risk premium for loans is additionally removed. The bottom panel shows the weighted average interest margin for each sector, based on the underlying margins for deposits and loans. Note that the differences between the FISIM under the current regulation and the two alternatives are due not only to different reference

---

[15] Loans and deposits of non-financial corporations and households are the main part of bank business in the euro area representing about 80 percent of total outstanding amounts of loans and deposits positions involving non financial counterparties. Loans and deposits of other domestic sectors, i.e. the government (S.13), insurance corporations and pension funds (ICPF, S.125), represent another 11 percent, while loans and deposits from the rest of the world make up the remaining 9 percent. Little is known about these loans and deposits except their overall size; especially data on corresponding interest rates is not available.

[16] A critical point has been recently raised that only on-balance sheet activities of oMFIs are taken into account. Once a bank loan is securitised, the bank is assumed to be no longer providing services to the borrower. Calculations of the Federal Reserve Bank of New York have shown that treating off-balance sheet lending originated by banks in the same manner as on-balance sheet loans would boost bank output by more than 10% for the US. This should be taken into account to avoid implausible growth rates: the subprime crisis has resulted in a substantive enlargement of bank balance sheets as the sponsors of many structured vehicles have returned back to bank financing. This shift will have, ceteris paribus, the effect of artificially boosting financial sector output. See e.g. Ashcraft and Steindel (2008). No detailed simulations have been carried out in the case of the euro area, but a very preliminary assessment has led to the conclusion that the impact would be much lower in this case.

rates, but also due to the use of interest rates on new business as compared to interest rates on outstanding amounts under the current regulation.

Table 1, Imputed bank output (FISIM) and interest margins in the euro area by sector, current regulation and modified approaches (average 2003Q1-2007Q4)

	Current regulation	Adjusted for term premium	Adjusted for term and default risk premium
FISIM (€bln)			
Total	225.1	170.3	128.5
Non-financial corporations	70.9	45.0	26.0
Households	144.3	99.9	86.0
Insurance companies & pension funds	-2.3	3.0	2.6
Government	12.3	10.6	6.0
Exports	-0.2	11.7	7.9
Interest margin (%)			
Total	1.4	1.0	0.8
Non-financial corporations	1.6	1.0	0.6
Households	1.7	1.2	1.0
Insurance companies & pension funds	-0.4	0.4	0.4
Government	1.1	0.9	0.5
Exports	0.0	0.8	0.5

Notes: FISIM is calculated as the interest margin of each type of loan and deposit times the outstanding balance. The interest margins in the bottom panel are weighted averages of loan and deposit margins. Current regulation FISIM uses interest rates on outstanding amounts and reference rates which mainly represent weighted averages of inter-bank interest rates. The two alternatives use interest rates on new business. When adjusting for the term premium, the government bond yield with the most closely matching maturity is used as reference rate. When also adjusting for the default risk premium, yields on corporate bonds and mortgage- and asset-backed securities are used. See Appendix Tables A1 and A2 for details.

Overall, the differences are substantial. Both alternatives show lower a FISIM than the current regulation: the average FISIM is €170.3bln after adjusting for the term premium and €128.5bln after adjusting for the default risk premium as well. These adjustments yield figures that are 24 and 43 percent lower, respectively, than the data on FISIM under the current regulation. While the current regulation implies an estimated average interest margin of 1.4 percent, this margin falls to 1.0 and 0.8 percent under the two options described above. The impact differs across sectors, with the largest drop in the margin for non-financial corporations and a more moderate adjustment for the household sector. Table 3 below illustrates why the impact of the two alternatives is larger for non-financial corporations than for households. For nearly all types of loans and deposits, the margins paid by non-financial corporations are lower than for households, even when a short-term interest rate is used. Any downward adjustment will therefore represent a relatively larger part of the margin. For a more complete overview on sectoral FISIM results and time series, see Annex 2[17].

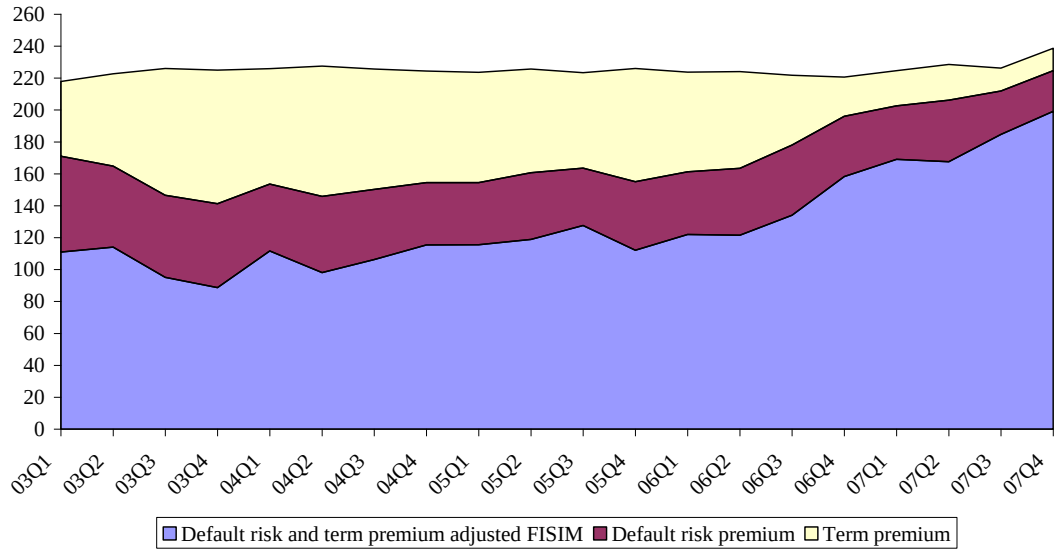
Non-financial corporations and households dominate total FISIM. While the results obtained for these sectors are derived under all frameworks on the basis of reliable sets of statistics, the proposed alternatives have the advantage of yielding a much more plausible outcome for FISIM paid by insurance corporations

[17] In particular, Annex 2 presents detailed results for the new methodology in its two variants, denoted with the suffix .NEW in the case of a full adjustment (both default risk and term premium) and the suffix .NEW.MC in the case of only a term premium adjustment.

and pension funds, general government and the rest of the world. As a result, there are no instances of negative FISIM for any of the sectors under either of the two alternative approaches, while the estimates of FISIM under the current regulation may show frequently and over longer periods produce negative results.

Figure 1 provides a summary overview on euro area FISIM. The bottom area shows FISIM calculated using interest margins from which both the term premium and default risk have been eliminated. The two bottom areas together correspond to FISIM estimated by discounting the term premium only, so that the middle area can be interpreted as the default risk premium adjustment. Finally, the three areas together correspond to the current statistical practice of measuring FISIM, and therefore the top area shows the bias resulting from the inclusion of the term premium.[18]

Figure 1, Euro area imputed bank output (FISIM) and the value of the risk premia (billions of euros), 2003:1-2007:12



The impact of removing the remuneration for credit default risk and term premium from bank output is substantial. A first important remark regards the sizable impact of the term premium correction over the period from 2003 Q3 to 2006 Q2 which was characterised by a steep yield curve; conversely, this adjustment drops in the course of 2007 because of a flattening yield curve. In addition, the default risk premium correction also appears to decrease in the last two quarters of 2007. This phenomenon is related to the peculiarity of the financial turmoil observed last year, which led to an increase of the general financial market risks while the borrowers' credit default risk have remained broadly unchanged.[19]

---

[18] Assessing the impact on GDP (at current prices) of the new methodology is not straightforward as FISIM affects both intermediate and final consumption and requires their bridging with the different types of loans recorded in the context of MFI balance sheet statistics. Services provided to corporations (as non-FISIM producers) are intermediate consumption, and do not affect GDP. However, services provided to households (as well as to general government and to non-residents) are final consumption and add to GDP. An important exception, though, is lending to households for housing purposes, which is an intermediate consumption input into the production of these services. Preliminary simplified estimates show that for the period January 2003 to December 2007 the contribution of FISIM to GDP on average would respectively represent about 77% of the current contribution in case of default risk and term premium adjustment, and about 87% of the current contribution in case of adjustment for the term premium only.

[19] In other words, while market interest rates on loans increased reflecting the sharp increase in inter-bank rates with a maturity between one month and one year, the government bond yields did not completely mirror this change. This may however differ if the interest swap yield curve is used instead (cf. footnote 14).

Risk-adjusted FISIM is slightly more volatile than current FISIM, but this mainly reflects the evolution of the outstanding amounts on loans and deposits which have shown sharp growth rates over the period under analysis. In turn, all interest margins are less volatile than under the current framework (see Annex 2 for further details); the reason is that most of the volatility of the current margins originates from the volatility of the term premium and the default risk premium components, while by removing these common drivers of the interest margins, idiosyncratic movements make up a more substantial part.

This paper does not yet discuss the effect of the proposed FISIM method on FISIM volume change measures. According to Regulation EC 448/98 FISIM volume change measures are calculated as the product of deflated FISIM at current prices and the ratio between the reference period interest margin and the current period interest margin. The same method, possibly somewhat enhanced, can still be applied on the basis of the improvements to FISIM at current prices described in this paper. Alternatively, Commission Decision 2002/990/EC provides the possibility to use direct output indicators (e.g. the number of accounts) in order to estimate volume changes.[20]

4.2 Impact on national calculations

The proposal for a refined FISIM computation methodology can equally be applied at the national level. The new methodological framework would in fact contribute to more harmonisation of national estimates on FISIM. This would improve the cross-country comparability of the results, including estimates for industry productivity and GDP. In addition, the proposed methodology would enable to treat cross-border imports and exports within the euro area (and EU) which should net out at the euro area (and EU) level. The simulation of the current framework shows that the current design of the external reference rate does not at all guarantee this balancing, while the refined methodology would lead to much more consistent results.

Table 2 shows simulations for euro area countries, comparing risk-adjusted FISIM with the current FISIM for both the total and the individual loans and deposits.[21] This shows a considerable variation in the size of the risk adjustment across countries. As expected, most countries show a lower bank output under the proposed alternatives than under the current approach. This may not be the case for Ireland and Luxemburg, the two biggest export countries of financial services in the euro area. The upward revision is related to the failure of the current FISIM methodology to correctly evaluate FISIM exports, which, according to the simulation carried out in this paper, show (big) negative values for the current approach and more sound estimates for the new methodology.

As the change in method involves both different interest rates and different reference rates, some of the specific country results show a different pattern, but some commonalities stand out. First of all, the decrease in FISIM is fairly comparable across countries with in particular the combined term premium and default risk adjustment leading to lower FISIM across nearly all countries and most instruments. In the largest countries, France, Germany and Italy, FISIM is 25 to 35 percent below the figures of current FISIM after the term premium adjustment and 40 to 55 percent below the figures of current FISIM after both the term premium and the default risk adjustment. As expected, the effects are most pronounced for loans, as both adjustments apply there: adjusted FISIM on loans in France is only 20 percent of current FISIM.

---

[20] For further details on the methodology for FISIM *volume change measures*, see Eurostat's Handbook on price and volume measures in national accounts, (2001), and also Basu and Wang (2006) and Inklaar and Wang (2007).

[21] National results for Slovenia are not yet presented as its MIR statistics were not yet available for the whole period under analysis.

Table 2, Estimates of risk-adjusted FISIM (imputed bank output) as a share of output based on current methods (average over 2003:1 to 2007:12, %)

	Total FISIM	Total domestic loans	Domestic loans to NFCs	Domestic housing loans	Domestic consumer credit	Other loans to domestic households	Total domestic deposits	Domestic business deposits	Domestic household deposits
Term premium adjustment									
Austria	0.85	0.61	0.51	0.64	0.83	0.49	1.48	1.31	1.56
Belgium	0.76	0.57	0.49	0.49	1.27	0.44	0.72	0.69	0.73
Finland	0.80	0.61	0.66	0.58	0.55	0.56	1.07	1.13	1.06
France	0.66	0.44	0.42	0.27	0.69	0.33	1.33	1.01	1.70
Germany	0.72	0.51	0.49	0.44	0.89	0.35	3.66	1.26	1.12
Greece	0.73	0.66	0.63	0.66	0.69	0.45	0.77	0.72	0.77
Ireland	1.29	1.09	0.99	1.72	0.95	0.62	0.72	0.76	0.69
Italy	0.75	0.72	0.64	0.78	1.42	0.58	0.74	0.68	0.75
Luxembourg	2.70	0.67	0.64	0.62	1.02	0.60	1.37	2.18	1.20
Netherlands	0.70	0.76	0.64	0.73	1.68	0.31	0.39	0.35	0.39
Portugal	1.05	1.22	1.45	0.98	1.26	0.87	0.70	0.77	0.69
Spain	0.92	0.79	0.69	0.69	1.50	0.59	1.08	1.09	1.09
Euro area	0.76	0.59	0.57	0.49	0.99	0.42	1.04	0.95	0.96
Term premium and default risk adjustment									
Austria	0.57	0.31	0.11	0.40	0.71	0.36	1.48	1.31	1.56
Belgium	0.58	0.28	0.08	0.27	1.17	0.33	0.72	0.69	0.73
Finland	0.59	0.28	0.20	0.24	0.44	0.35	1.07	1.13	1.06
France	0.46	0.21	0.07	0.08	0.61	0.24	1.33	1.01	1.70
Germany	0.54	0.34	0.25	0.32	0.81	0.27	3.66	1.26	1.12
Greece	0.66	0.55	0.47	0.53	0.66	0.43	0.77	0.72	0.77
Ireland	1.02	0.76	0.68	1.01	0.85	0.52	0.72	0.76	0.69
Italy	0.60	0.49	0.30	0.58	1.35	0.51	0.74	0.68	0.75
Luxembourg	1.90	0.37	0.26	0.36	0.86	0.41	1.37	2.18	1.20
Netherlands	0.45	0.42	0.15	0.46	1.56	0.16	0.39	0.35	0.39
Portugal	0.91	1.00	1.13	0.73	1.20	0.82	0.70	0.77	0.69
Spain	0.74	0.54	0.31	0.47	1.40	0.50	1.08	1.09	1.09
Euro area	0.57	0.37	0.24	0.31	0.91	0.33	1.04	0.95	0.96

Notes: Imputed bank output is calculated as the interest margin times the stocks of outstanding loans and deposits

These estimates are also in line with those for the US described in Basu *et al* (2008). Over the same period, output adjusted for the term premium was only 83 percent of unadjusted output and after adjusting for the term premium and default risk, output came out at 59 percent of unadjusted output. Even though the basic data and some of the assumptions are quite different, the similarity in results is comforting. Annex 2 shows detailed country results for Germany, for loans and deposits, broken down by sector and type of loans and deposits.

4.3 Refined interest margins

This section presents the interest margins as estimated in the refined framework. In the case of loans, the interest margin calculated is the excess a borrower has to pay compared to the market rate to compensate the bank for the information services provided. For deposits, it is the opposite: how much less a depositor is willing to accept than the market rate in return for the transaction services the bank provides.

Table 3 gives the broadest set of results on interest margins by comparing the estimates on the different financial asset categories and subcategories for the euro area as a whole and for households and non-financial corporations, using monthly data from January 2003 to December 2007 (the entire span of the MIR data collection on interest rates). Three sets of interest margins are compared. The first set is calculated by simulating the current approach where implicit interest margins can be obtained by

comparing MIR rates on outstanding amounts to the internal reference rate. The second set takes into account that for longer-term financial assets a term premium is paid, estimated by the yield spread of long-term over short-term government bonds. For loans, a third set is estimated, where the default risk is also taken into account by using data on corporate bonds and asset- and mortgage-backed securities. Under the new proposed framework, MIR statistics on new business are used and for all instruments a weighted average margin is compiled across maturities in the case of deposits and across bands of initial interest rate fixation periods in the case of loans using the shares in new business volumes as weights. For each set of margins, three statistics are calculated, namely the average over the period, the standard deviation and the number of negative margins. For a more complete overview of the results see Annex 2.

In the case of loans, the effect of accounting for the term premium and default risk on the average margin is as expected: margins decrease. Note that when comparing columns I to II and III, the reference rates change to reflect the risk of the loans and the interest rates change from those on outstanding amounts to interest rates on new business. In general, the changes in methodology have the largest impact on loans, where margins decrease by up to 2.5 percentage points. This was expected as many loans, in particular loans for housing purposes, have fixed rates for longer periods of time and default risk is an important factor as well. A further point to note is that the standard deviation of the margins also decreases. This is partly related to lower average margins, but not entirely. Finally, despite the large reductions in average margins, the margins on loans remain positive in all months. The adjustments to the average margins are smaller for deposits than for loans. This is because most deposits are short-term while loans are more frequently for longer periods. The effect on the standard deviation is also less pronounced. On the deposit side, there are also a number of months where the interest margins are negative both for the current and the new approach, but under the latter margins for the most important categories of deposits, overnight and with agreed maturity, are much less prone to negative margins.[22]

There are both conceptual and practical reasons that may explain temporarily negative interest margins. First, banks may accept small or even negative margins if a borrower or depositor brings in income from deposits or fees for other services. Second, there may be an imperfect pass-through of changes in market interest rates to retail bank interest rates[23] (e.g. due to long-term business relationships banks may not raise their loan interest rates by as much or ration credit in return for more favourable margins in periods of lower market rates). [24]

---

[22] In particular, most negative margins under the new approach refer to deposits redeemable at notice by NFCs, which only account for about 3% of the total NFCs deposits.

[23] See e.g. Boot (2000), Berlin and Mester (1999) and De Bondt (2002) and De Graeve *et al* (2007).

[24] A more practical reason for some of the negative margins may be inevitable shortcomings in the available data, such as mismatches between deposit and bond maturities. For example, for deposits with an agreed maturity of more than two years five-year government bonds have been selected as the reference rate. However, in Germany deposits are on offer with much longer maturities so that a ten-year government bond might be a more representative security. In some countries bank loans to very creditworthy firms may also be more prevalent, making a corporate bond with a very high credit rating a better choice. Rather than as a shortcoming of the proposed methodology, this should be seen as the potential added-value of its implementation by national FISIM compilers, who are best placed to reflect country specificities, so that the results become much more reliable than in the present method.

Table 3, Euro area interest margins on loans using different reference rates (weighted averages, Jan 2003 - Dec 2007, %)

	Average			Standard deviation			Number of negatives		
	I	II	III	I	II	III	I	II	III
Loans									
Business loans	1.76	0.99	0.42	0.47	0.21	0.15	0	0	0
Household mortgages	2.02	0.98	0.62	0.83	0.28	0.25	0	0	0
Consumer credit	3.84	3.97	3.63	0.72	0.49	0.46	0	0	0
Other household loans	3.84	1.57	1.22	0.72	0.35	0.29	0	0	0
Business deposits									
Overnight	1.68	1.44		0.37	0.37		0	0	
With agreed maturity	-0.04	0.26		0.24	0.18		31	4	
Redeemable at notice	0.33	0.20		0.33	0.38		7	31	
Repurchase agreements	0.33	0.07		0.13	0.04		0	2	
Household deposits									
Overnight	2.05	1.81		0.57	0.57		0	0	
With agreed maturity	0.02	0.39		0.51	0.17		36	0	
Redeemable at notice	0.70	0.57		0.53	0.58		0	2	
Repurchase agreements	0.33	0.07		0.13	0.04		0	2	

Notes: Interest margins are calculated as the difference between the relevant interest rate minus a reference rate

Reference rates:

I (current approach): euro area internal reference rate

II (term premium correction): for loans with an initial fixed rate period of more than one year, the government bond yield for that rate fixation period is used

III (default risk and term premium correction): in addition to II, an adjustment is made for the higher risk of bank loans using bond index yield spreads

Interest rates:

I: interest rates on outstanding amounts

II and III: interest rates on new business

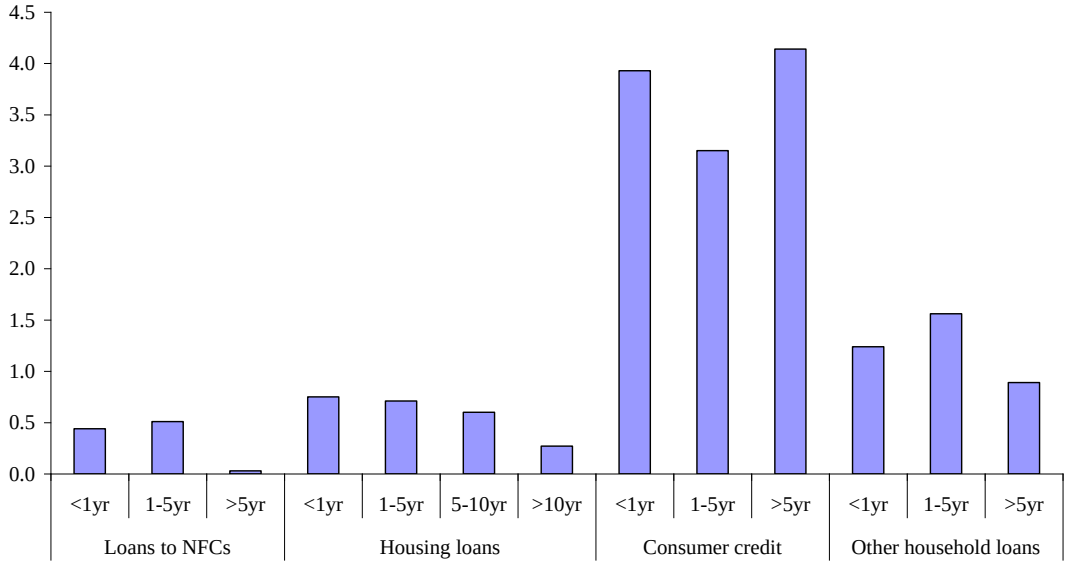
Interest margins shown are weighted averages of the margins derived for the different maturities and periods of initial interest rate fixation. The weights used reflect the outstanding amounts (case I) or the volumes of new business (cases II and III).

See Appendix Tables A1 and A2 for further details.

When comparing margins on different instruments, a few observations stand out. First, the estimated margins for consumer credit are much higher compared with the other instruments, regardless of the approach taken. This could reflect higher data processing costs, but it might also show a different way of accounting for the higher risk associated with these loans. The frequent absence of collateral for such loans can be used to argue either way: the lack of collateral makes the loan riskier, but might also induce more screening and monitoring activities by banks.

Figure 2 shows how the average margin varies by band of initial fixation periods for the different types of loans for the euro area, calculated using reference rates that account for both the term premium and default risk. In general, margins are lower on loans with a longer period of initial rate fixation. This holds not only for the euro area as a whole but also for many countries. The main exception is consumer credit with a fixed interest rate for more than five years. The pattern is clearest for housing loans, where the margin on loans with a fixed period of less than a year is 0.80 percent while loans with a fixed period of more than ten years have a margin of only 0.26 percent.

Figure 2, Euro area interest margins on loans by period of initial rate fixation, average 2003:1-2007:12 (%)



One possible reason for this is that the screening of new borrowers is an important part of the services provided to borrowers. The associated costs are spread over the life of the loan. Alternatively, it could reflect higher administration costs for loans with variable interest rates. This is likely to be a factor as well for loans to NFCs: only 13 percent of new loans have a fixed rate for more than one year, but 69 percent of the outstanding loans have an (original) maturity of more than one year. This implies that most loans to non-financial corporations have (fairly) flexible rates and a long maturity.

A further observation is that the margins on loans granted to non-financial corporations are noticeably lower than on loans to households; only the margins on loans for house purchases come close. An explanation could be that the risk associated with NFCs loans is easier to gauge than that of loans to households. This would be the case if non-financial corporations tend to have standard financial reports compared to less standard or less detailed financial information provided by households. Non-financial corporations (in particular large ones) may also be better informed and have more bargaining power than households. Another possible reason is that loans to households are generally smaller so that banks provide more services per euro lend and need to charge a higher price to cover their fixed costs. Besides large NFCs loans are often collateralised.

Figure 3, Euro area interest margins on deposits by maturity, average 2003:1-2007:12 (%)

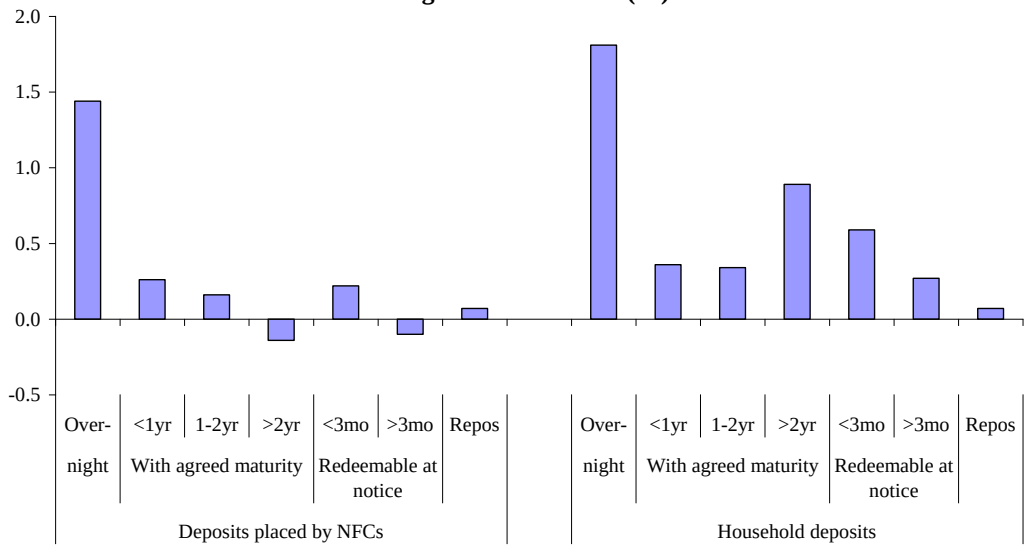


Figure 3 shows the average interest margin in the euro area for deposits. Margins for non-financial corporation deposits tend to be lower than for household deposits, which may have the same reasons as for loans. Furthermore, overnight deposits (current accounts) command the highest margins. This is consistent with the idea that banks charge a high interest margin on these deposits because they provide most transaction services to their customers on this type of accounts.

Appendix Table A1, Bank loan and deposit instruments and reference rates: Term premium adjustment

	Reference rate
Loans	
(breakdowns by periods of initial interest rate fixation)	
Non-financial corporations	
Up to 1 year	6-month EURIBOR
Over 1 year and up to 5 years	3Y government bond yield
Over 5 years	7Y government bond yield
Households	
For house purchases	
Up to 1 year	6-month EURIBOR
Over 1 year and up to 5 years	3Y government bond yield
Over 5 year and up to 10 years	7Y government bond yield
Over 10 years	10Y government bond yield
Consumer credit	
Up to 1 year	6-month EURIBOR
Over 1 year and up to 5 years	3Y government bond yield
Over 5 years	7Y government bond yield
Other purposes	
Up to 1 year	6-month EURIBOR
Over 1 year and up to 5 years	3Y government bond yield
Over 5 years	7Y government bond yield
Deposits	
(breakdowns by maturity; same treatment for households and non-financial corporations)	
Overnight deposits	EONIA
Deposits with agreed maturity	
Up to 1 year	6-month EURIBOR
Over 1 year and up to 2 years	2Y government bond yield
Over 2 years	5Y government bond yield
Deposits redeemable at notice	
Up to 3 months	1-month EURIBOR
Over 3 months	2Y government bond yield
Repurchase agreements	EONIA

Acronyms:
ML: Merrill Lynch
NFC: non-financial corporations
ABS/MBS: Asset-backed security/Mortgage-backed security
EURIBOR: Euro interbank offered rate
EONIA: Euro overnight index average

Appendix Table A2, Bank loan and deposit instruments and reference rates: default risk and term premium adjustment

	Reference rate
Loans	
(breakdowns by periods of initial interest rate fixation)	
Non-financial corporations	
Up to 1 year	ML NFC bond index, 1-5Y minus 3Y/1Y government bond spread
Over 1 year and up to 5 years	ML NFC bond index, 1-5Y
Over 5 years	ML NFC bond index, 5-10Y
Households	
For house purchases	
Up to 1 year	ML ABS/MBS index minus 5Y government bond yield plus 1Y government bond yield
Over 1 year and up to 5 years	ML ABS/MBS index minus 5Y government bond yield plus 3Y government bond yield
Over 5 year and up to 10 years	ML ABS/MBS index minus 5Y government bond yield plus 7Y government bond yield
Over 10 years	ML ABS/MBS index minus 5Y government bond yield plus 10Y government bond yield
Consumer credit	
Up to 1 year	ML ABS/MBS index minus 5Y government bond yield plus 1Y government bond yield
Over 1 year and up to 5 years	ML ABS/MBS index minus 5Y government bond yield plus 3Y government bond yield
Over 5 years	ML ABS/MBS index minus 5Y government bond yield plus 7Y government bond yield
Other purposes	
Up to 1 year	ML ABS/MBS index minus 5Y government bond yield plus 1Y government bond yield
Over 1 year and up to 5 years	ML ABS/MBS index minus 5Y government bond yield plus 3Y government bond yield
Over 5 years	ML ABS/MBS index minus 5Y government bond yield plus 7Y government bond yield
Deposits	
(breakdowns by maturity; same treatment for households and non-financial corporations)	
Overnight deposits	EONIA
Deposits with agreed maturity	
Up to 1 year	6-month EURIBOR
Over 1 year and up to 2 years	2Y government bond yield
Over 2 years	5Y government bond yield
Deposits redeemable at notice	
Up to 3 months	1-month EURIBOR
Over 3 months	2Y government bond yield
Repurchase agreements	EONIA

Acronyms:
ML: Merrill Lynch
NFC: non-financial corporations
ABS/MBS: Asset-backed security/Mortgage-backed security
EURIBOR: Euro interbank offered rate
EONIA: Euro overnight index average

Annex 1
The empirical set-up of the enhanced methodology in detail

The methodology developed in this paper to estimate bank output on positions vis-à-vis households and corporations is mainly based on the use of MFI interest rate (MIR) statistics. These statistics provide (on a monthly basis and for periods as from 2003) a harmonised and comprehensive coverage of the interest rates applied by euro area MFIs to euro area households and non-financial corporations on euro denominated loans and deposits. These statistics on bank interest rates, are available both at national and euro area level with a high level of breakdown by type of deposits and, in the case of loans to households, by purpose of the loan, i.e. consumer credit, loans for house purchases and other credit. In addition, the data distinguish between interest rates on new business, i.e. newly negotiated interest rates during the period, and rates on outstanding amounts; further breakdowns are available by period of initial interest rate fixation in the case of new business loans, and by maturity.

In the current approach, the reference rate mainly reflects the inter-bank rate. A first possible improvement of the estimates for households and non-financial corporations is to take into account the maturity of the loans based on government bond yield curves. Second, bank loan rates are not only higher because of longer maturities but also because of higher risk. Data on the yield on bonds, specifically indices of non-financial corporate bonds and of asset-backed and mortgage-backed asset bonds can be used to take this into account. These indices are compiled by Merrill Lynch, who provides information on the average yield of the bonds after adjusting for option-like features of these bonds. For the other sectors, as well as for cross border positions, some assumptions have been applied.

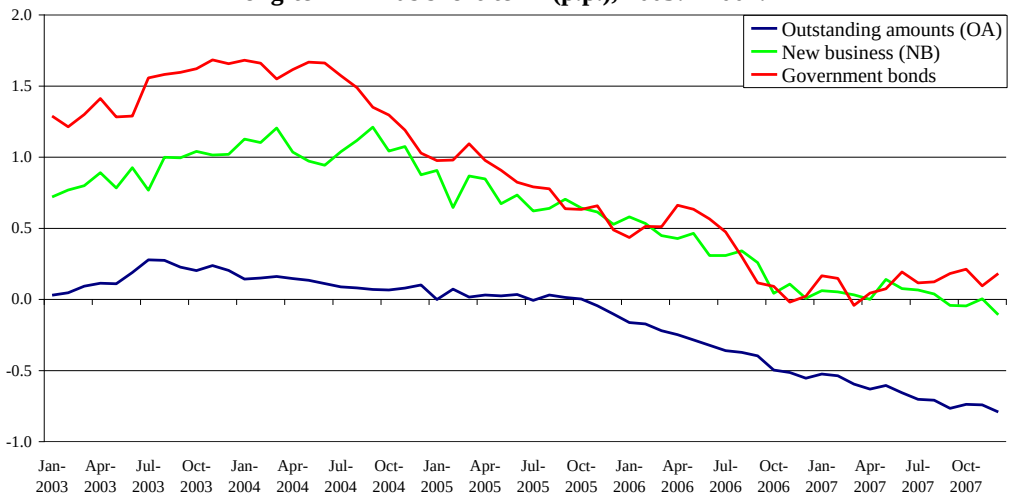
1. Interest rates for households and non-financial corporations

A first question is whether to use the 'new business' (NB) or 'outstanding amounts' (OA) interest rate as the basis for comparison. While the estimated margin should be relevant for the entire portfolio (i.e. outstanding amounts) of bank loans in that category, a drawback of this approach is that the correct reference rate is difficult to define as OA loan interest rates were agreed some years ago. Ideally, the reference rate should then be a weighted average of past bond yields, where the weights reflect the share of loans from each period in the past that are still on the banks' balance sheets.

There is also a problem related to the precise definitions of NB and OA interest rates for different maturities. NB rates are categorised according to the initial period of rate fixation while OA rates are categorised according to the original time to maturity of the loan. So if a loan has an original maturity of seven years, but rates are reset annually, it would be more appropriate to compare the interest rate on this loan to the yield on a bond with a time to maturity of one year rather than seven years.

Given these considerations, the new methodology will rely on the NB rates to calculate the interest margins. Figure 4 illustrates the impact of the problems discussed above in the case of loans to NFCs. The figure shows the yield spreads of long-term loans to non-financial corporations (more than five years) over short-term loans (less than one year). In comparison, a similar spread on government bonds is also shown (seven years minus one year yield). The spread for OA turns negative at the end of 2005, while the NB spread stays positive (or very close to zero), just like the government bond spread. The negative OA spread reflects favourable rates on loans that were agreed in earlier years.

Figure 4, Interest rate spread of government bonds and loans to NFCs: long-term minus short-term (p.p.), 2003:1-2007:12



Sources: ECB (MIR interest rates), Datastream (Government bonds)
Notes: All series for the euro area. MIR rates on loans to non-financial corporations: >5 years minus <1 year.
Government bonds: 7 year minus 1 year yield

2. Yields on corporate bonds and asset/mortgage backed securities

The proposed method requires data on the current market yield of different types of debt securities with a broad coverage of the euro area market. Therefore, bond indices are preferred over individual bonds. The bond indices compiled by Merrill Lynch (ML) satisfy these criteria.[25] In addition, data on the yield curve for government bonds of each of the euro area countries are used (source: Datastream).[26]

Loans to non-financial corporations and households

ML publishes a range of bond indices for non-financial corporations, but only the overall ML non-financial corporations bond index, which has an average rating between BBB and A, is available broken down by maturity band. Although there is no information available on the credit quality of bank loan portfolios, it may be assumed that most borrowers (by number, but not by volume) are not investment-grade. However, this may be less of an issue when considering the bank loan volumes. Besides, using the overall ML bond index is the most practical approach in view of the availability of maturity breakdowns.[27]

Figure 5 compares the interest rate of loans to non-financial corporations with the corresponding corporate bond and government bond yields.[28] As expected, the loan rate is higher than the corporate bond yield, which in turn is higher than the government bond yield. Overall, for loans to non-financial corporations,

---

[25] See www.mlindex.ml.com for these data as well as the bond index rules and definitions. ML does not produce country-specific bond indices as most national debt markets within the euro area do not have the characteristics for the derivation of reliable and meaningful bond indices.

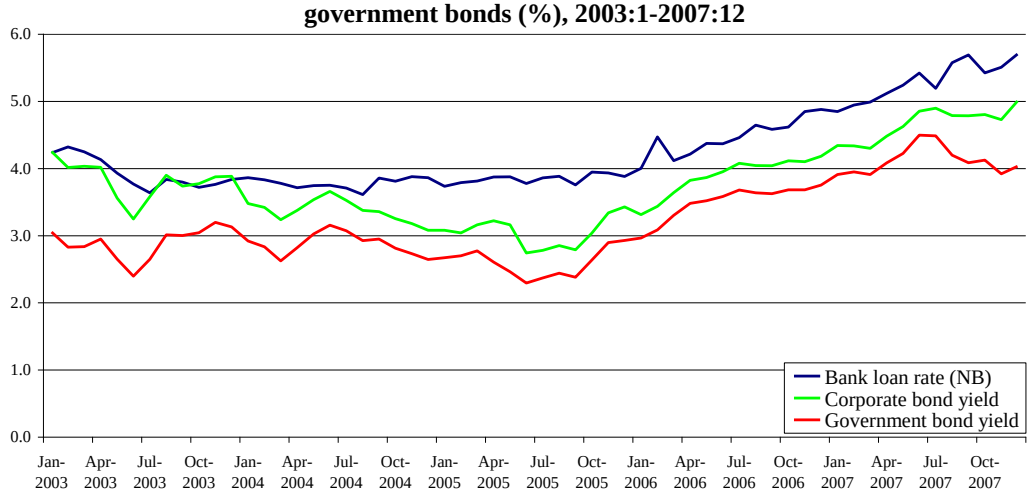
[26] When implementing the methodology at national level, other national data sources could be used in alternative to private financial data providers. In particular, for euro area countries a harmonised set of statistics on government bond yields may be derived in the context of the production of the euro area yield curve; for further information, see http://www.ecb.europa.eu/stats/money/yc/html/index.en.html.

[27] A sensitivity analysis has shown that the advantages related to the use of bond yield indices broken down by maturity largely overcome these shortcomings, at least at the euro area level.

[28] The interest rate for non-financial corporations refers to loans with an initial interest rate fixation period between one and five years and is the rate on new business. The corporate bond and government bond yields are defined to match this maturity band.

the ML bond index for the corresponding maturity band captures the main developments in the loan rate. It may be noted that since the summer of 2007, the spread of the corporate yield over the government bond yield has widened due to the financial market turmoil. Interest rates on bank loans to non-financial corporations have also risen though the risk-adjusted interest margins have been broadly stable.

Figure 5, Interest rate on loans to NFCs compared to corporate and government bonds (%), 2003:1-2007:12



Sources: ECB (MIR interest rates), Datastream (Government bonds), Merrill Lynch (Corporate bonds)
Notes: All series for the euro area. Bank loan rate refers to loans to non-financial corporations with a period of initial rate fixation between 1 and 5 years. Corporate bond yield is the yield on the Merrill-Lynch bond index for non-financial corporation bonds with a remaining maturity between 1 and 5 years. Government bond yield is the 3 year constant maturity bond yield

For loans to households, it is more challenging to compute interest-rate margins since households do not raise funds directly from financial markets. The most comparable security is securitised debt. Securitisation is a means for banks to fund further credits. To allow these loans to be sold in secondary markets, a group of similar loans is pooled and usually divided into tranches. The senior tranches commonly receive an AAA credit rating. The default risk on the most liquid MBS and asset-backed securities (ABS) is minimal and the main reason for the positive spread over risk-free government bonds is the prepayment risk.[29]

However, the ABS and MBS market in Europe is small compared to the corporate bond market. While the overall ML bond index for non-financial corporations covers around 700 corporate bonds, the ML index for ABS and MBS covers only some 30 bonds.[30] Thus, for Europe there is only one index that covers all maturities and credit ratings, with most securities AAA-rated.[31] Despite the small number of securities, the yield spread over government bonds is quite stable, highly correlated with the yield spread of AAA corporate bonds (0.60) and of almost the same size on average[32].[33]

---

[29] See e.g. Rothberg *et al* (1989).

[30] By comparison, similar indices for the US cover around 3000 corporate bonds and 1500 residential MBS or collateralised mortgage obligations (CMOs).

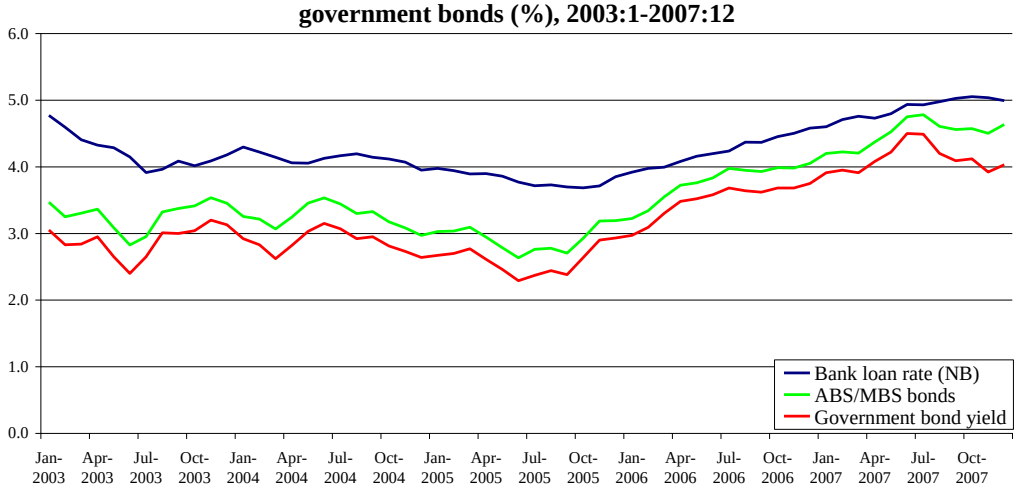
[31] Merrill Lynch only provides occasional snapshots of the composition of the index and these suggest limited differences between the components. Given the scarcity of information, this is a tentative finding.

[32] The average spread for AAA corporate bonds was 0.33 percentage points over the period 2003-2007 and for the MBS/ABS bonds it was 0.35 points.

[33] While sensitivity analysis has show the overall reliability of the approach described above, further research is being performed aimed at improving this framework. The development of new statistics on short-term European paper (STEP), which also cover asset-backed commercial paper, might offer some interesting prospects. For further information on STEP, see http://www.ecb.eu/stats/money/step/html/index.en.html).

In each case where loans with specific maturities could not be directly linked with the corresponding bond indices, maturity spreads have been applied to obtain a maturity matching. For instance, there is no bond index covering corporate bonds with a remaining maturity of less than one year, so for loans with an initial fixed rate period of less than a year the spread of the corporate bond index over the three-year government bond index is added to the one-year government bond index. Similarly, the ML ABS/MBS index has duration of around five years, so the spread over the five-year government bond index for each maturity is applied for the maturity matching.

Figure 6, Interest rate on housing loans compared to ABS/MBS and government bonds (%), 2003:1-2007:12



Sources: ECB (MIR interest rates), Datastream (Government bonds), Merrill Lynch (ABS/MBS)
Notes: All series for the euro area. Bank loan rate refers to loans to households for house purchases with a period of initial rate fixation between 1 and 5 years. ABS/MBS bonds is the yield on the Merrill-Lynch bond index for asset-back and mortgage backed bonds, adjusted using government bond yields to a 3-year maturity. Government bond yield is the 3 year constant maturity bond yield

Figure 6 shows the interest rate on household loans for housing purposes compared to the ABS/MBS series and the corresponding government bond yield. The interest margin for this type of loans varies more than the corporate margins as the inertia of bank interest rates seems greater. On the other hand, the interest margin stays positive throughout the period. As in Figure 5, the latter half of 2007 was characterised by stable or rising bank interest rates and bond yields but declining government bond yields. So if the bond yield is used as a reference rate, this implies a rising risk premium and a stable interest margin; in line with the underlying causes of the credit crisis.

Deposits by non-financial corporations and households

Deposits can usually be considered risk-free investments for households and NFCs because of deposit insurance schemes. All countries in the euro area currently have some form of deposit insurance (see Gropp and Vesala, 2001). This basically eliminates default risk as a factor, but deposit holders benefit from any term premium on deposits with agreed maturities and deposits which are only redeemable with an advance notice. For those deposits, a comparison with longer-term (default) risk-free rates seems most appropriate. Some of the maturity and initial fixation period categories of loans and deposits are straightforward to match, such as approximating the one to five year band with a three-year government bond.[34] The open-ended categories, such as more than two years or more than five years require more

[34] The government bond yields are based on (notional) zero-coupon bonds, so the duration of these bonds is equal to its maturity. Most bank loans will have regular interest payments, so the duration of those loans will be smaller than their maturity. For most maturities, this distortion is likely to be small. Assuming annual interest payments of a 5 percent interest rate, the duration will be on average 0.1 year shorter than the maturity for the one to five year maturity bracket.

judgement. Overall though, the results are not very sensitive to the exact choices that are made in this regard.

Appendix Tables A1 and A2 describe in detail which rate was applied to each category of loans and deposits for households and non-financial corporations under the two approaches (term premium adjustment only, and default risk and term premium adjustment). The simplicity of implementing this framework even at the national level may be emphasised, as the whole methodology (even with the complexity as presented in this paper) relies on no more than ten bond indices in addition to MIR statistics (which are available for almost all EU countries) and standard inter-bank rates reflecting national markets.

3. The treatment of other sectors

Loans and deposits of non-financial corporations and households represent about 80 percent of the total outstanding amounts of loans and deposits positions involving non financial counterparties. Loans and deposits of other domestic sectors, i.e. the government, insurance corporations and pension funds (ICPF), represent another 11 percent while loans and deposits from the rest of the world make up the remaining 9 percent.[35] Little is known about these loans and deposits except their overall size; especially data on the corresponding interest rates are not available.

In the case of other resident sectors, this paper assumes that the interest margins are the same as for non-financial corporations. This differs from the approach under the current regulation, where the margin is calculated as a residual of the sectoral interest rates on loans and deposits after a comparison with the common reference rate.[36] Here a constant margin is assumed, which allows the reference rate to be different. The refined approach seems appropriate on various grounds. First, loans and deposits to non-financial corporations involve similar financial services as those to the government and ICPF. Secondly, in many countries banks' business with these sectors (mainly ICPFs) has a very long maturity and negative margins may result in the framework of the FISIM regulation. Finally, given the lack of data on interest rates and flows for these sectors, the current FISIM method involves a higher degree of estimation than the alternative proposed.

When deriving euro area estimates, for residents in the rest of the world it is assumed that they buy the same services as euro area residents. This may not be fully correct as, for example, screening costs might be higher for borrowers in other countries. Still, it seems more plausible than using, for example, foreign margins (if those were available). Therefore, a weighted average of euro area margins based on the sectoral composition of cross-border balances of loans and deposits within the euro area is used.

Applying this method to individual euro area countries would require using domestic margins for exports from one euro area country to another and foreign margins for imports from another euro area country. For imports from outside the euro area this is not feasible, so domestic margins will have to be used there as well. This approach to the import and export of FISIM also differs from current methods. Currently, the external reference rate should be compared to market interest rates on cross-border positions within the euro area and for the rest of the world.[37] In view of the lack of reliable and detailed sectoral data on interest

---

[35] These shares are based on the average balance sheet composition over the period 2003-2007. Loans and deposits of financial institutions are omitted as under the current FISIM regulation, a sector can be either a FISIM producer or user, not both.

[36] For the purpose of simulating FISIM results under the current methodology, interest rates on loans to the general government and insurance corporations and pension funds are estimated using financial market data, while the corresponding interest rates on deposits are assumed to be the same as for NFCs.

[37] In our simulation of the current FISIM official methodology, both the external reference rate and the cross-border interest rates are based on estimated interest flows which are respectively derived from inter-bank rates (EURIBOR, LIBOR) for the inter-bank component, from MIR rates for the intra euro area positions vis-à-vis non-banks, and from balance of payment statistics for the positions vis-à-vis extra euro area non-bank residents.

rates and margins for the positions with extra euro area residents, the proposed method has conceptual advantages and is more appealing since it focuses on the services provided, rather than making an estimate for the service margin as a residual based on two sets of statistics which are neither complete nor consistent..

References

Ashcraft, A.B. and C. Steindel (2008), "Measuring the impact of securitization on imputed bank output." Paper presented at the 2008 World Congress on National Accounts, Arlington (VA), USA.

Basu, S. and J. C. Wang (2006), "Technological Progress, 'Money' in the Utility Function, and the 'User Cost of Money.'" Paper presented at the 2006 NBER/CRIW Summer Institute workshop.

Basu, S., R. Inklaar and J. C. Wang (2008), "The Value of Risk: Measuring the Service Income of U.S. Commercial Banks" mimeo, Boston College, University of Groningen and Boston Fed.

Berlin, M. and L. Mester, "Deposits and Relationship Lending," Review of Financial Studies, 12 (Fall 1999), pp. 579-607.

Boot, A.W.A. (2000), "Relationship Banking: What Do We Know?" Journal of Financial Intermediation 9(1), pp. 7-25

Barnett, W.A. (1978), "The User Cost of Money" Economics Letters 1(2), pp. 145-49.

De Bondt, G. (2002), "Retail bank interest rate pass-through: New evidence at the euro area level" ECB Working Paper, no. 136.

De Graeve, F., O. De Jonghe and R. Vander Vennet (2007), "Competition, transmission and bank pricing policies: Evidence from Belgian loan and deposit markets" Journal of Banking and Finance, 31(1), pp. 259-278.

European Council, Council Regulation (EC) No 2223/96 of 25 June 1996 on the *European system of national and regional accounts in the Community" (ESA95)*, Brussels, 25 June 1996

European Central Bank (2003), Manual on MFI Interest Rate Statistics, ECB: Frankfurt, see http://www.ecb.europa.eu/pub/pdf/other/mfiintrestratestatisticsmanualen.pdf.

Fonte Santa, S. (2007), "Financial Intermediation Services Indirectly Measured (FISIM) – the problematic of imports and exports." Banco de Portugal, Supplement 1/2007 to the Statistical Bulletin, August 2007.

Keuning, S.J. (2008), "Measures of output and prices of financial services: general conceptual issues and a discussion of papers", IFC Bulletin No. 28 (forthcoming).

Gropp, R. and J. Vesala (2001), "Deposit insurance and moral hazard: does the counterfactual matter?" ECB Working Paper, no. 47.

Inklaar, R. and J.C. Wang (2007), "Not Your Grandfather's Bank Any More? Consistent Measurement of Non-Traditional Bank Output" mimeo, University of Groningen and Boston Fed.

Rotherberg, J.R, F.E. Nothaft and S.A. Gabriel (1989), "On the determinants of yield spreads between mortgage pass-through and Treasury securities" Journal of Real Estate Finance and Economics, 2(4), pp. 301-315.

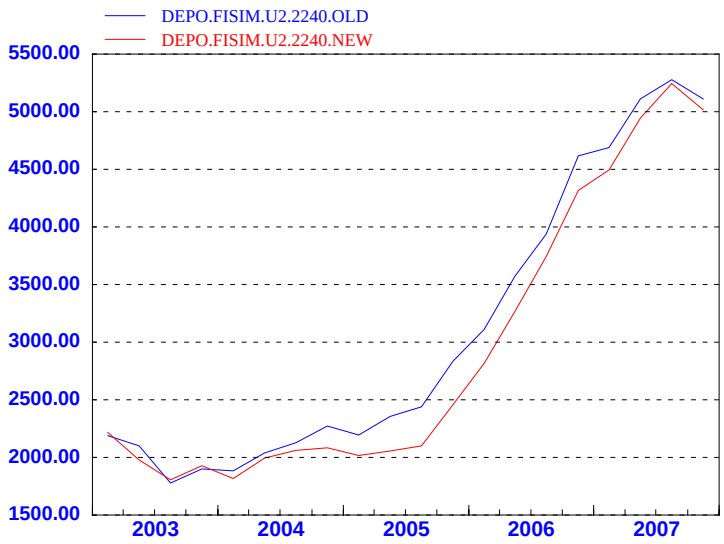
United Nations, Eurostat, International Monetary Fund, Organization for Economic Cooperation and Development and World Bank (1993), *System of National Accounts 1993*, Series F, No. 2, Rev. 4, United Nations, New York.

Wang, J. Christina, Susanto Basu and John Fernald (2004), "A General-Equilibrium Asset-Pricing Approach to the Measurement of Nominal and Real Bank Output" Federal Reserve Bank of Boston Working Papers, no. 04-7.

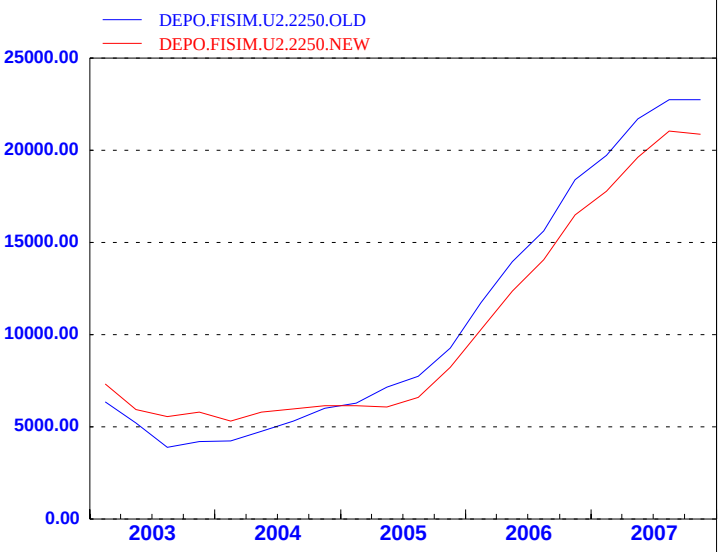
Bank output with domestic residents: regulation vs new approach

Estimated output on deposits for the euro area
(EUR million)

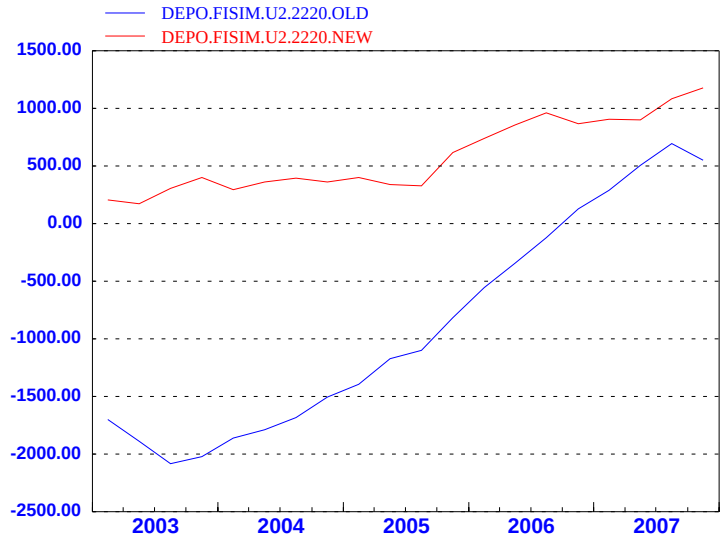
NFCs



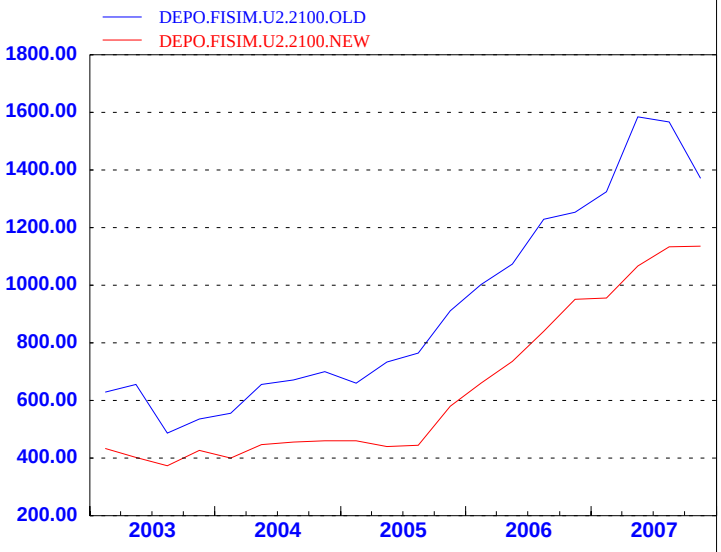
Households



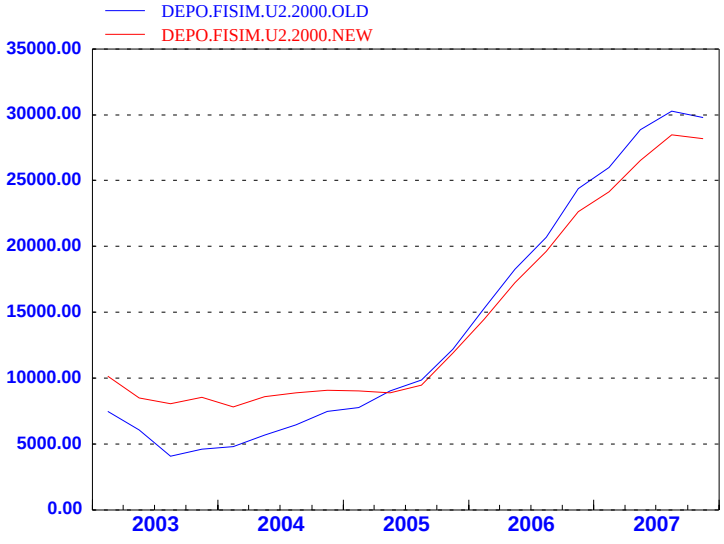
ICPFs



General Government



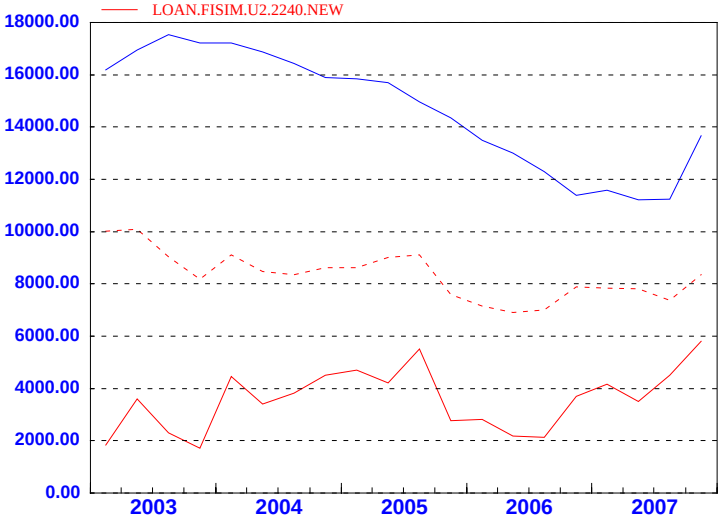
Total domestic economy



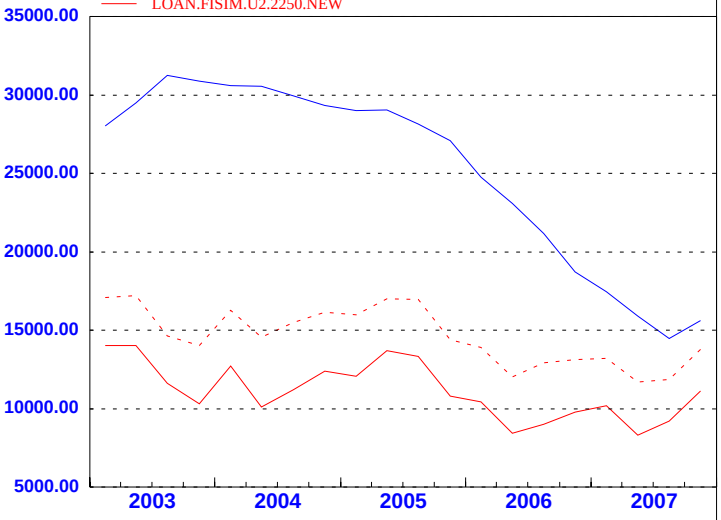
Bank output with domestic residents: regulation vs new approach

Estimated output on loans for the euro area
(EUR million)

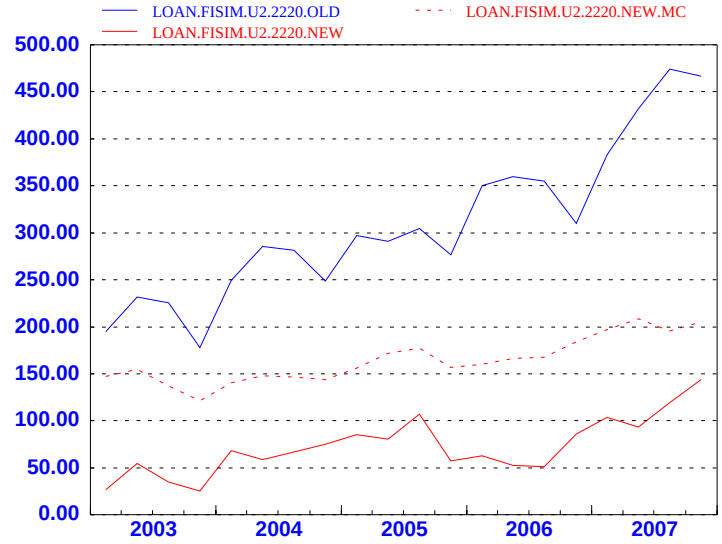
NFCs



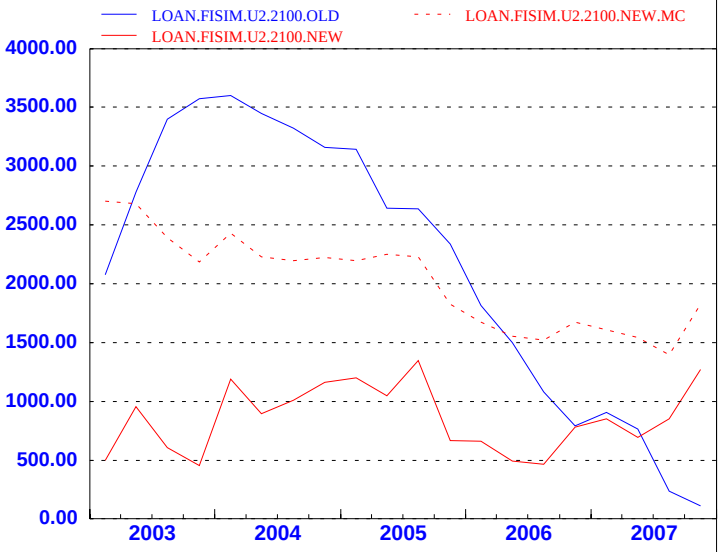
Households



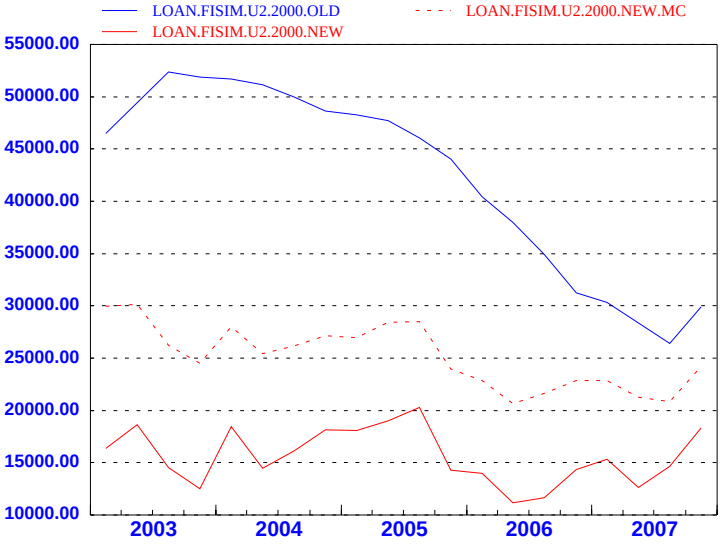
ICPFs



General Government



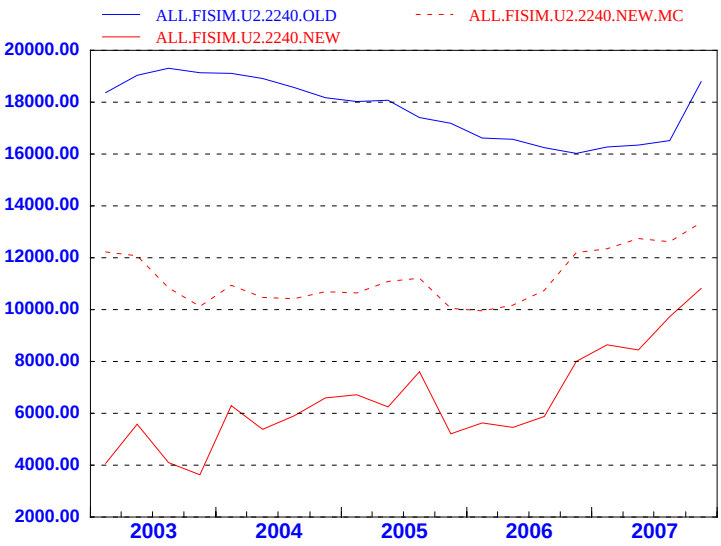
Total domestic economy



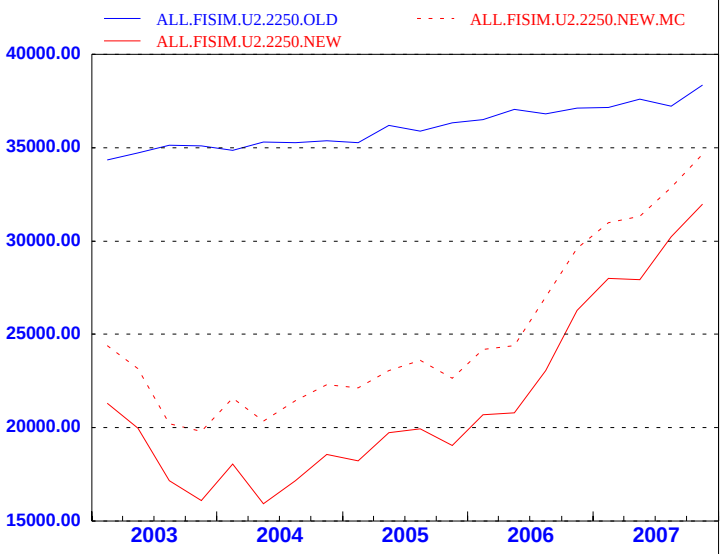
Bank output with domestic residents: regulation vs new approach

Estimated output on deposits and loans for the euro area
(EUR million)

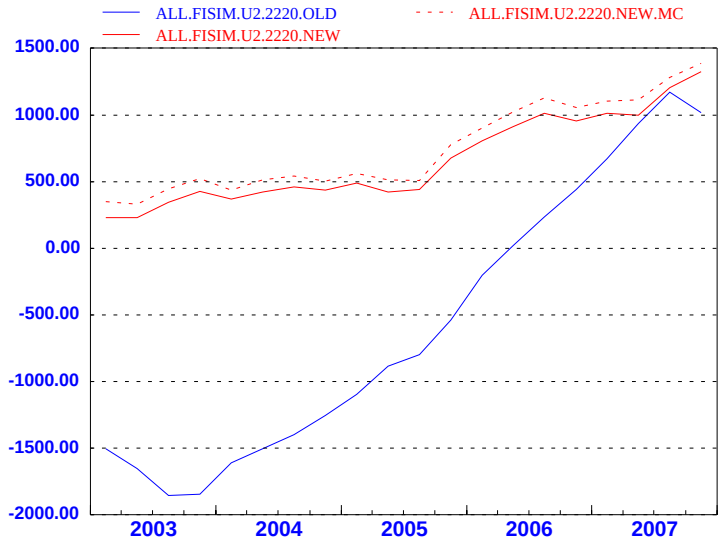
NFCs



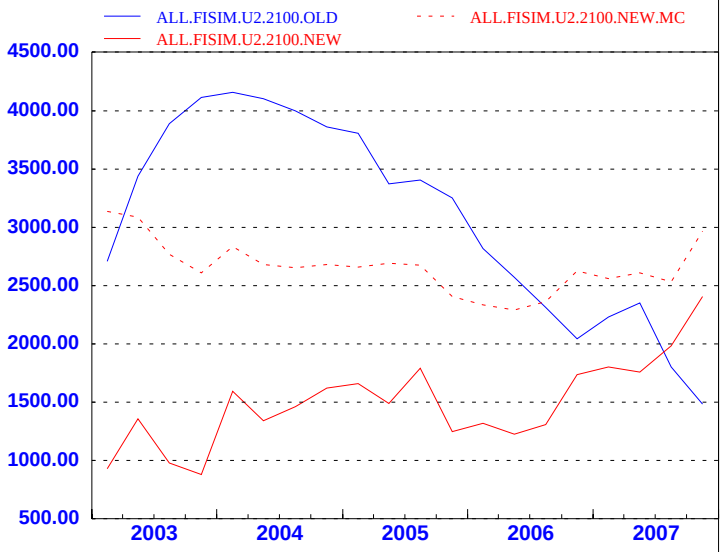
Households



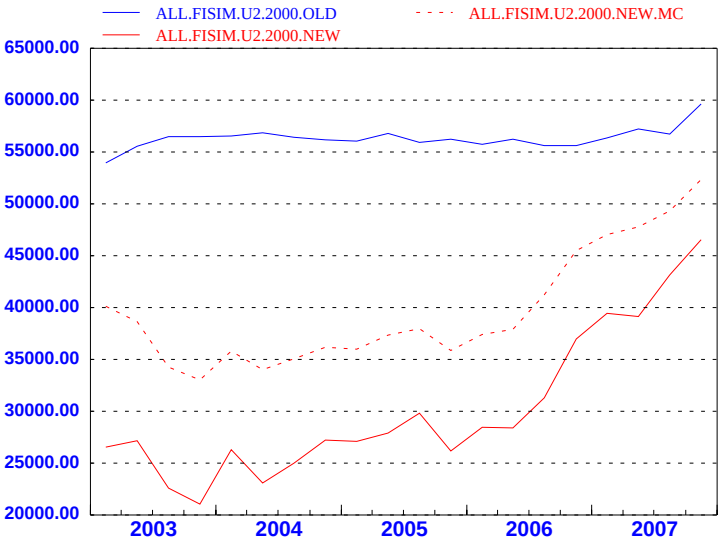
ICPFs



General Government

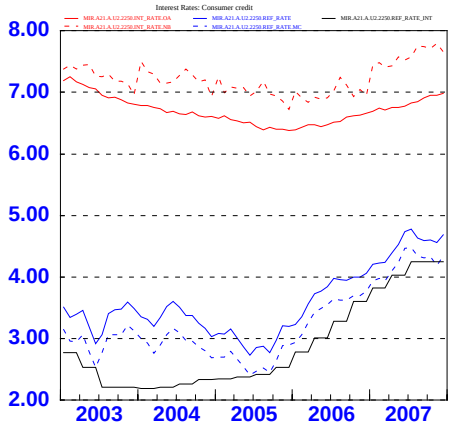


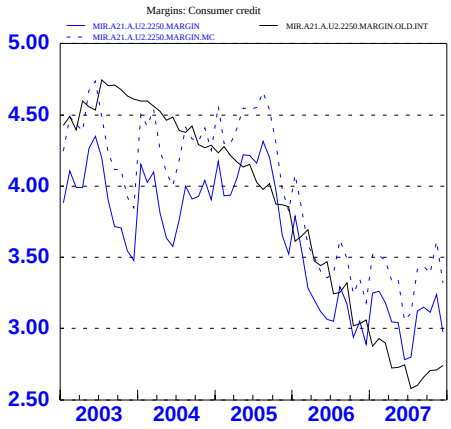
Total domestic economy

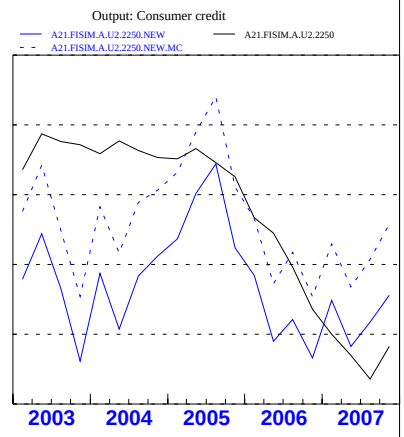


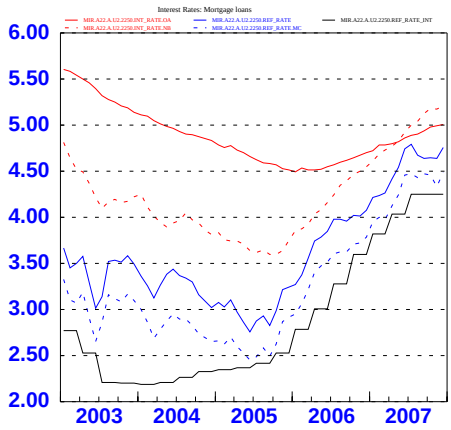
Bank output with domestic residents: regulation vs new approach

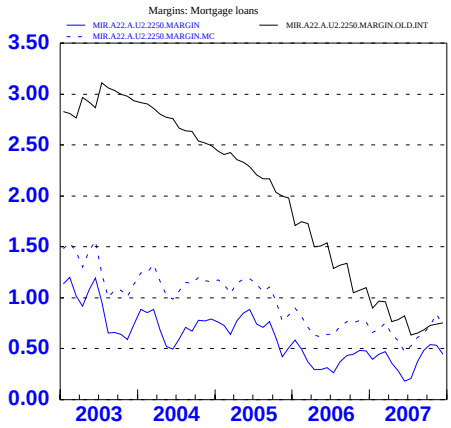
Estimated interest margins on loans to households for the euro area
(percentage points for interest rates and margins; EUR million for stocks)

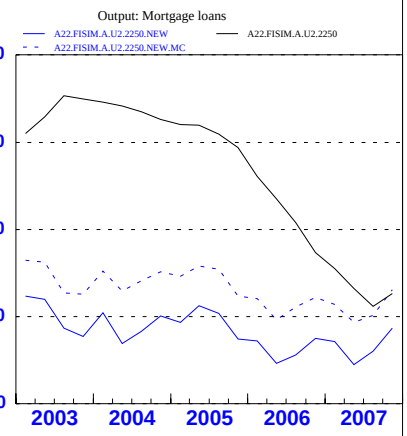


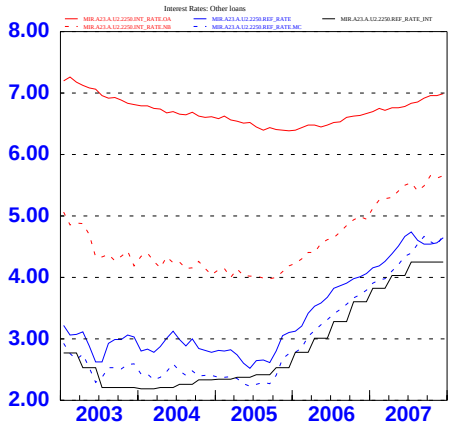


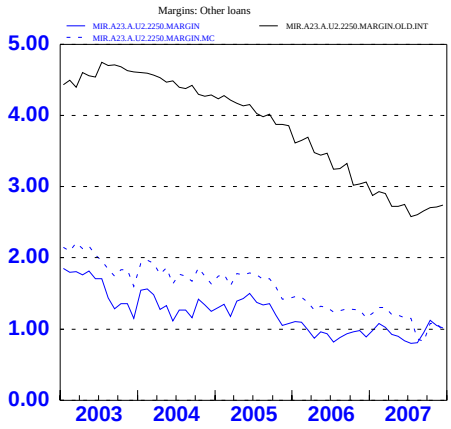


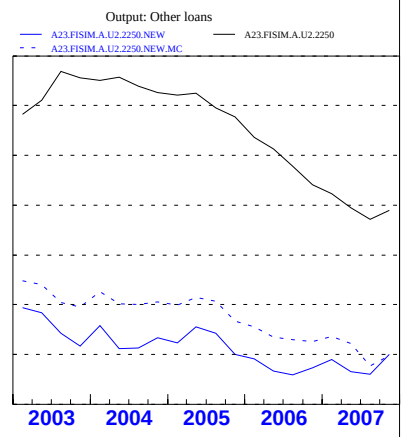


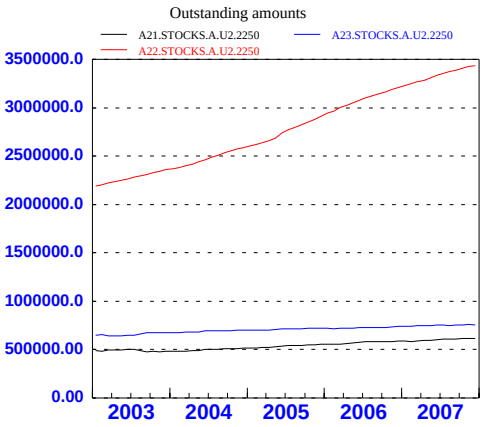






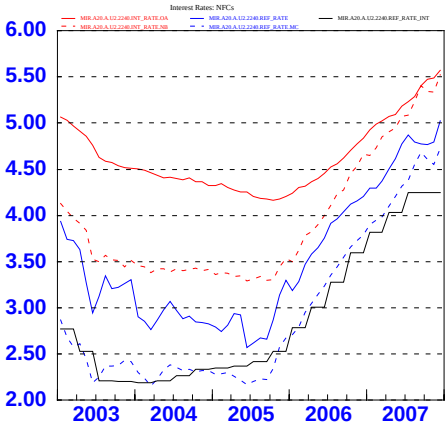


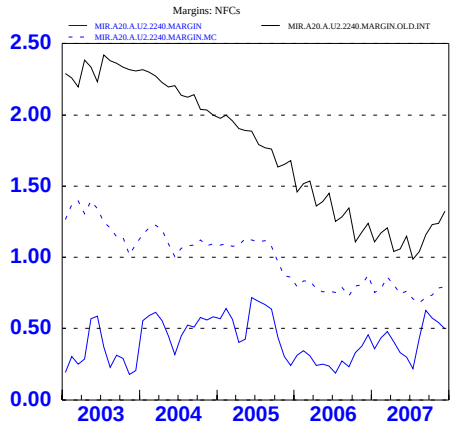


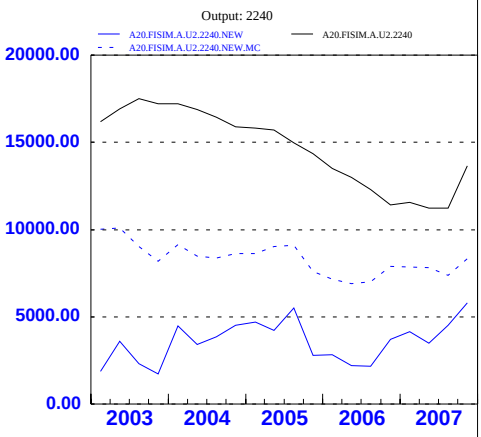


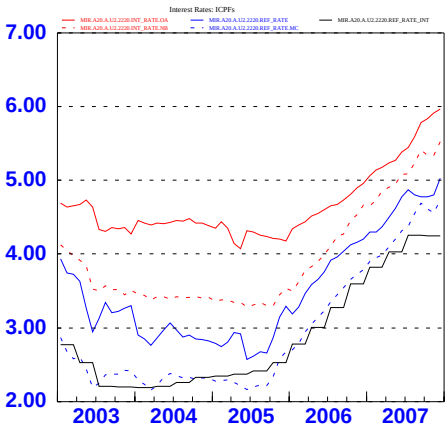
Bank output with domestic residents: regulation vs new approach

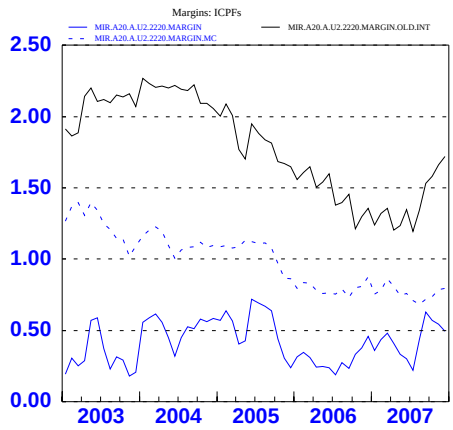
Estimated margins for other sectors in the euro area
(percentage points for the interest rates and margins; EUR million for stocks)

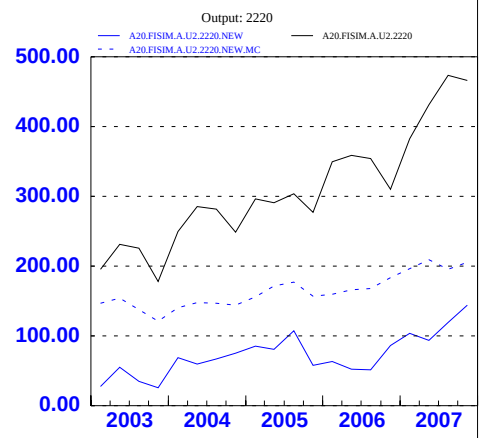


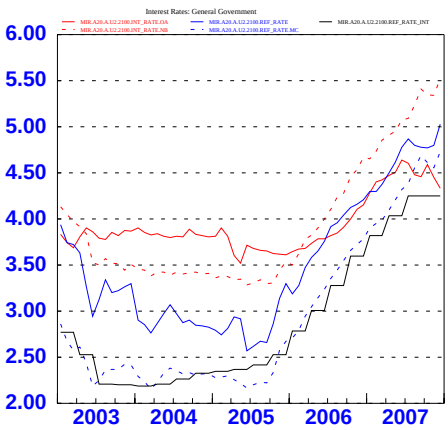


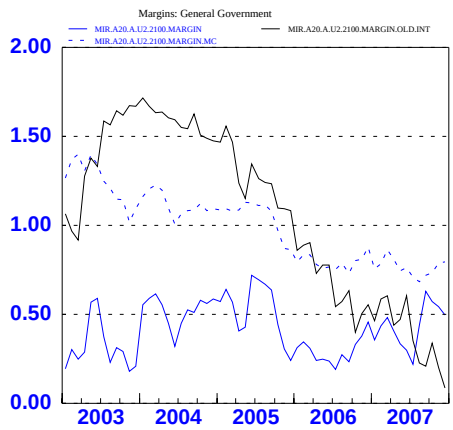


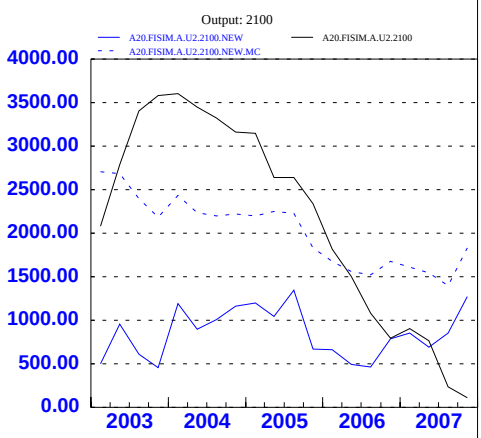


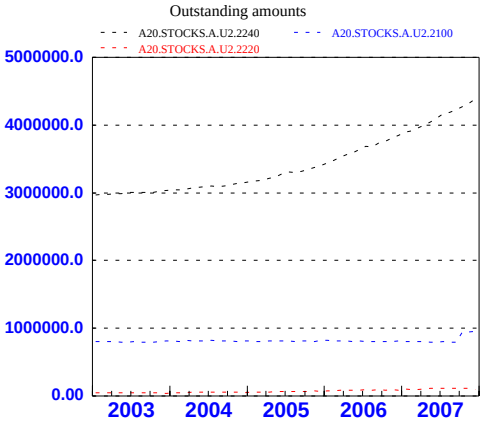








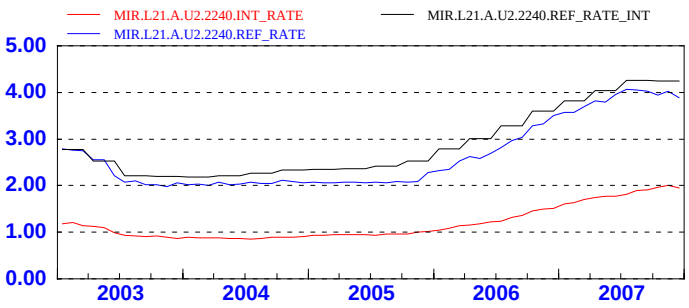




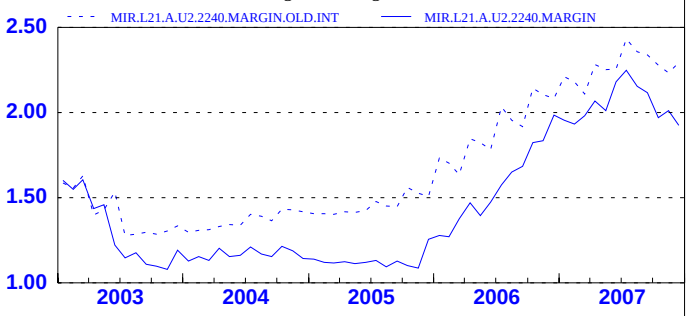
Bank output with domestic residents: regulation vs new approach

Estimated interest margins on deposits by NFCs in the euro area
(percentage points for interest rates and margins; EUR million for stocks)

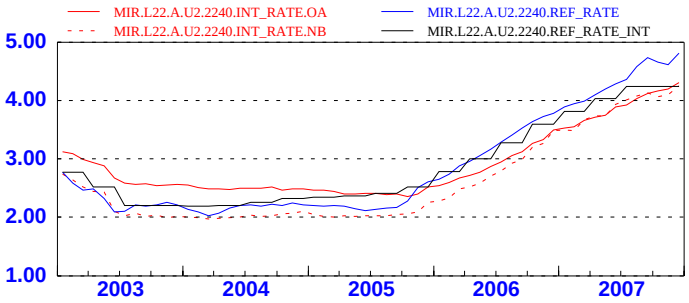
Interest Rates: overnight



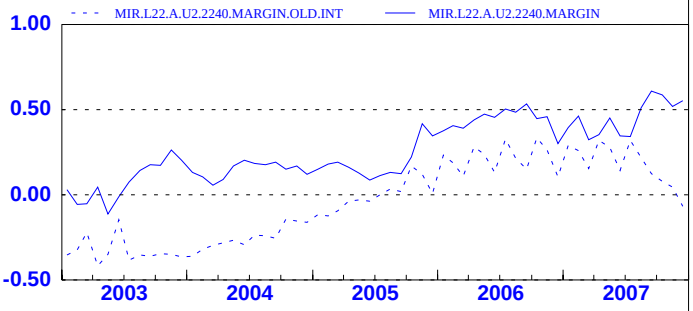
Margins: overnight



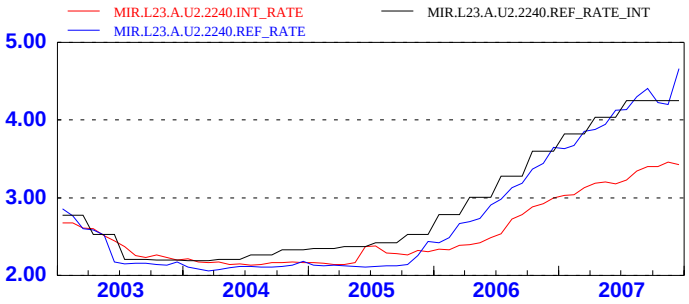
Interest Rates: with agreed maturity



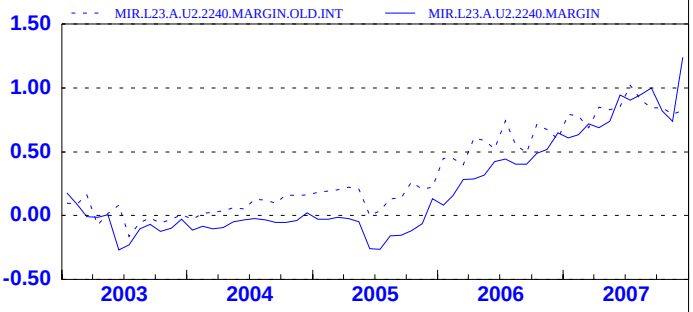
Margins: with agreed maturity



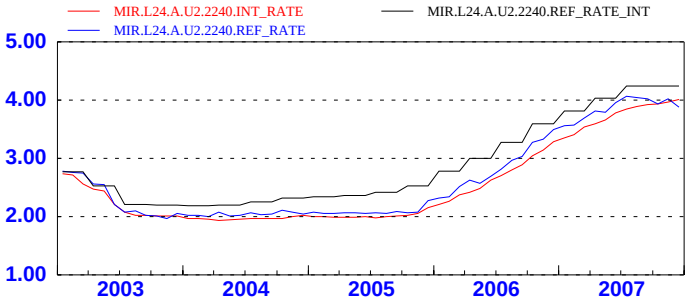
Interest Rates: redeemable at notice



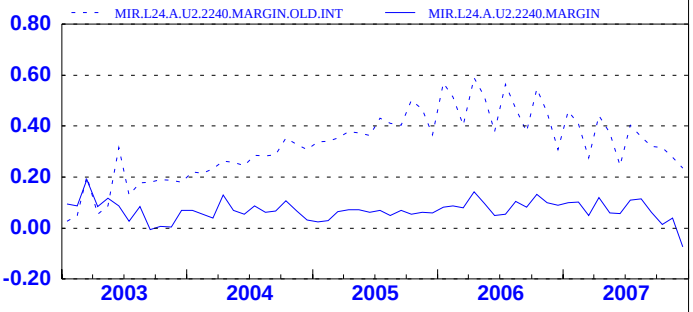
Margins: redeemable at notice



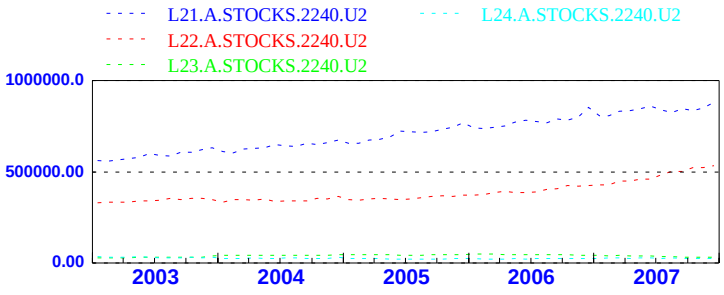
Interest Rates: repurchase agreements



Margins: repurchase agreements



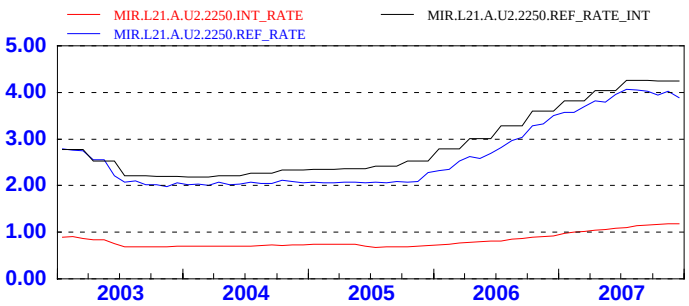
Outstanding amounts



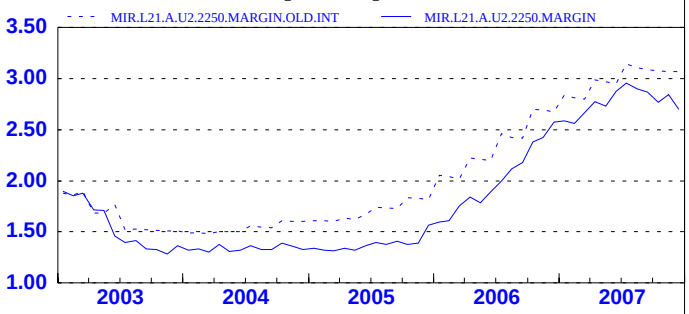
Bank output with domestic residents: regulation vs new approach

Estimated interest margins on deposits by households in the euro area
(percentage points for interest rates and margins; EUR million for stocks)

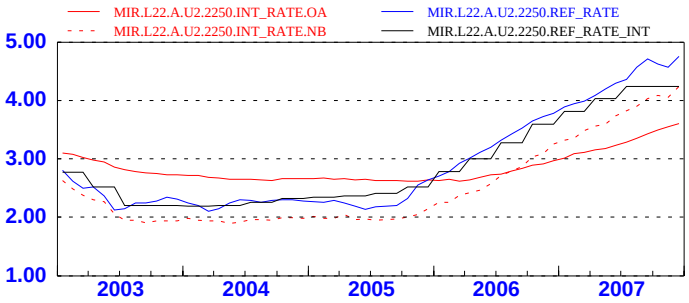
Interest Rates: overnight



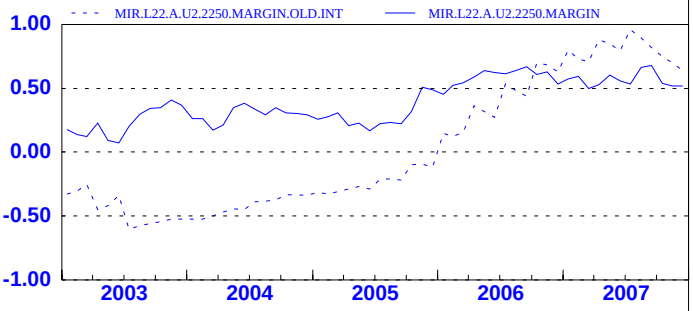
Margins: overnight



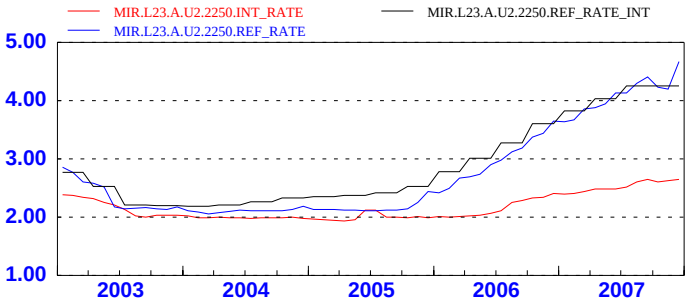
Interest Rates: with agreed maturity



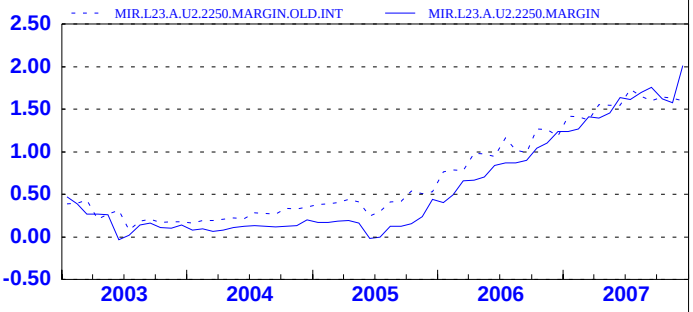
Margins: with agreed maturity



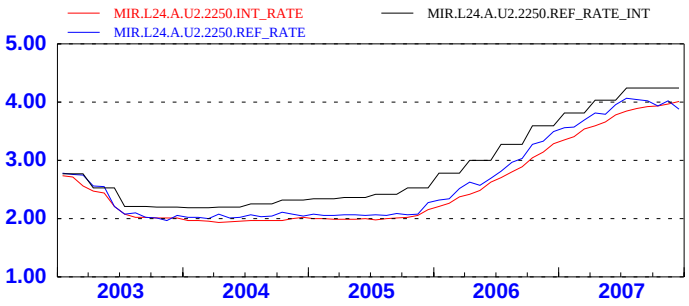
Interest Rates: redeemable at notice



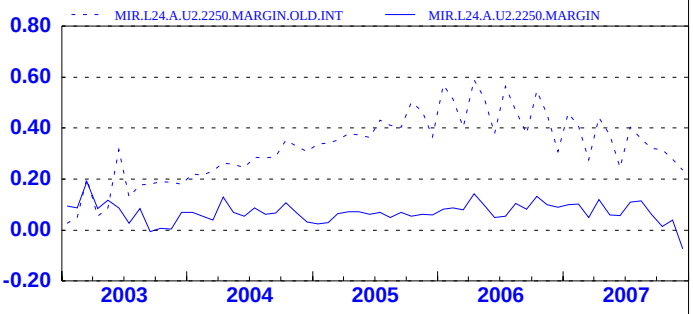
Margins: redeemable at notice



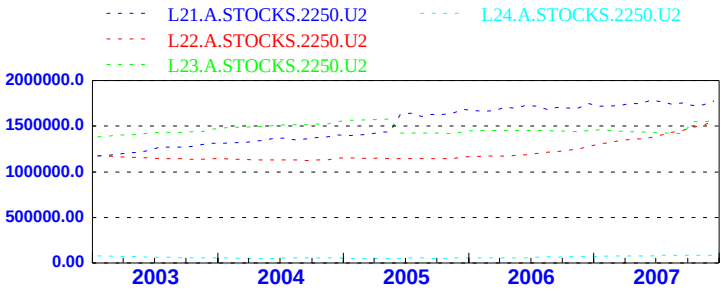
Interest Rates: repurchase agreements



Margins: repurchase agreements



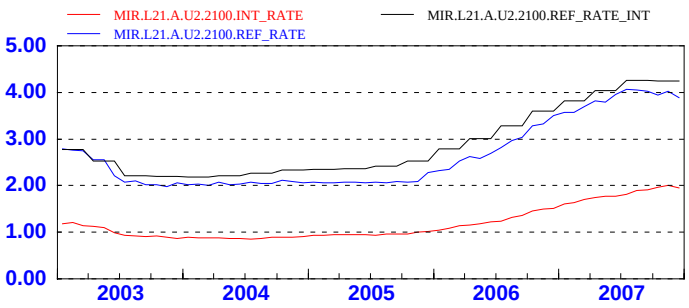
Outstanding amounts



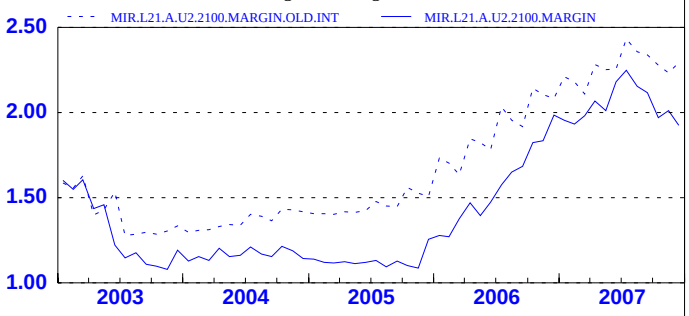
Bank output with domestic residents: regulation vs new approach

Estimated interest margins on deposits by the general government in the euro area
(percentage points for interest rates and margins; EUR million for stocks)

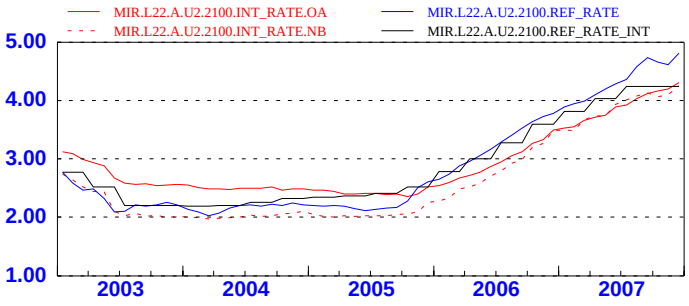
Interest Rates: overnight



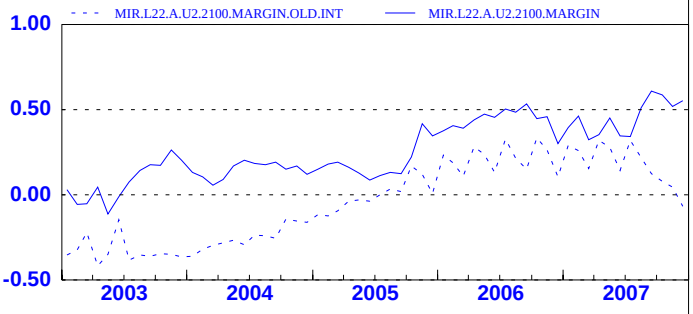
Margins: overnight



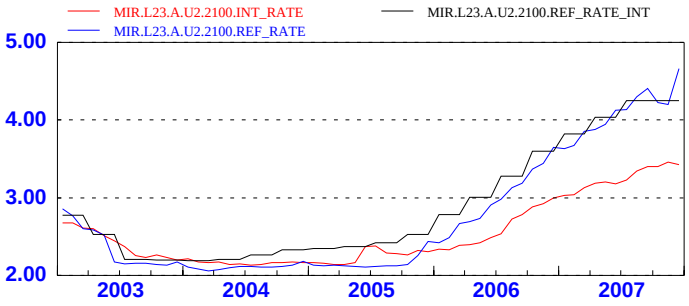
Interest Rates: with agreed maturity



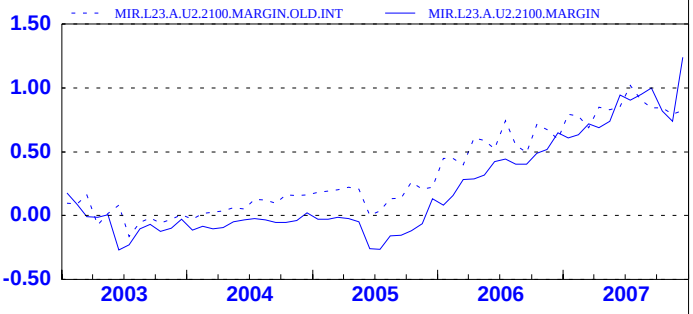
Margins: with agreed maturity



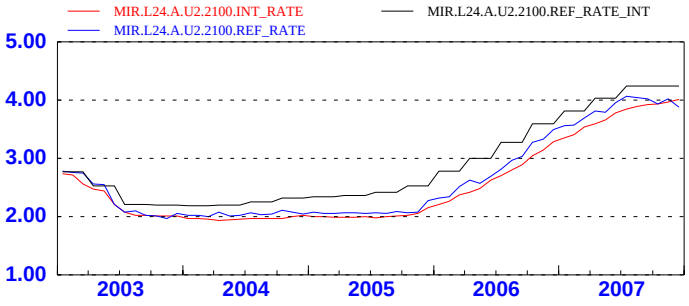
Interest Rates: redeemable at notice



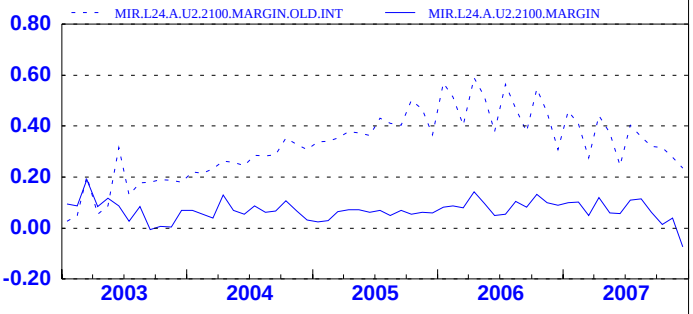
Margins: redeemable at notice



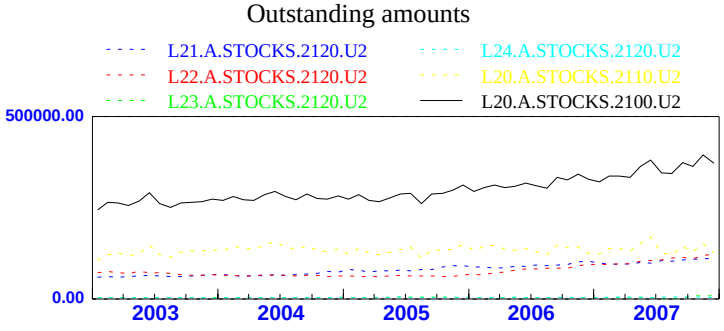
Interest Rates: repurchase agreements



Margins: repurchase agreements



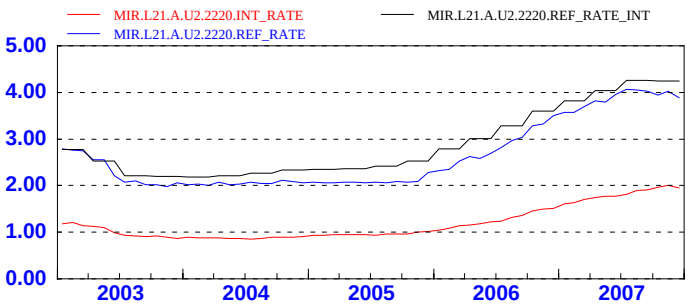
Outstanding amounts



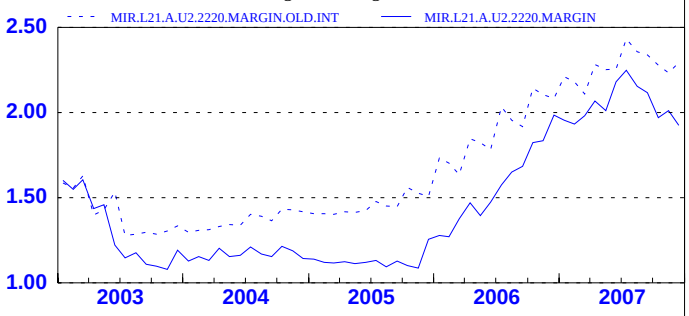
Bank output with domestic residents: regulation vs new approach

Estimated interest margins on deposits by ICPFs in the euro area
(percentage points for interest rates and margins; EUR million for stocks)

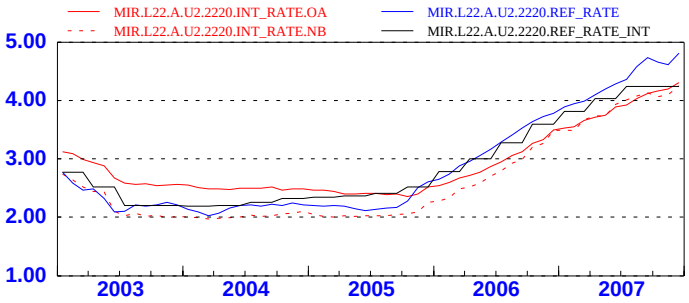
Interest Rates: overnight



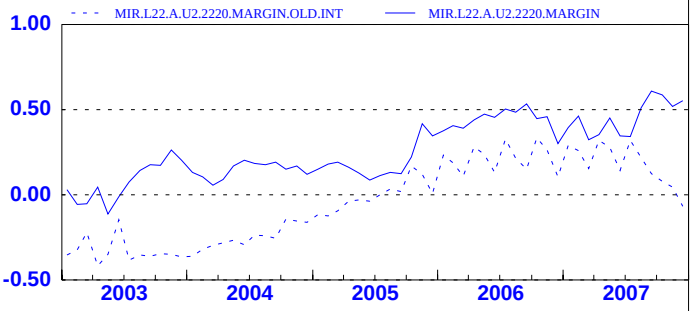
Margins: overnight



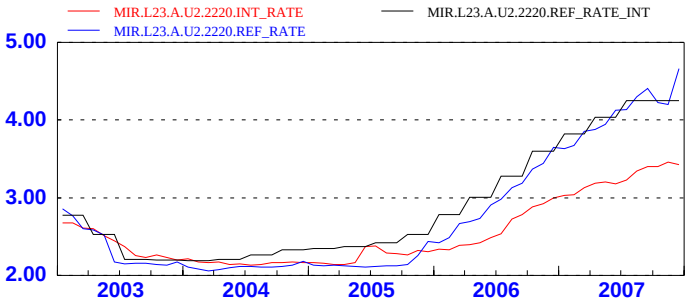
Interest Rates: with agreed maturity



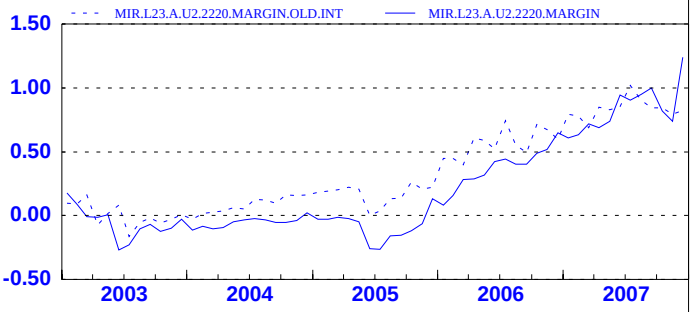
Margins: with agreed maturity



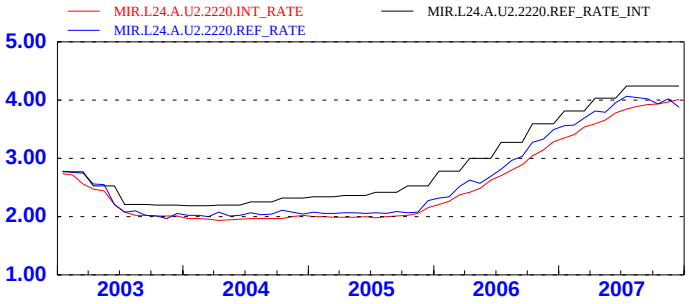
Interest Rates: redeemable at notice



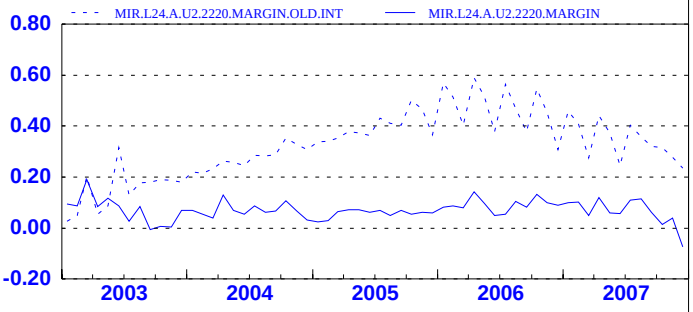
Margins: redeemable at notice



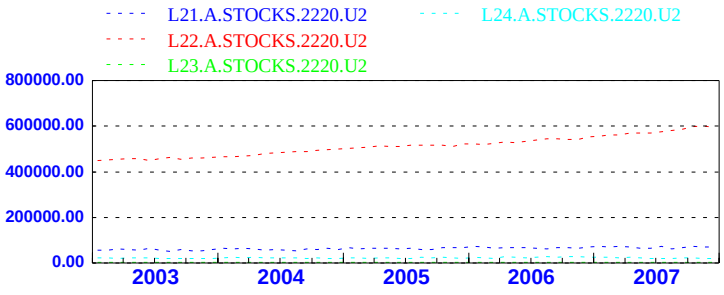
Interest Rates: repurchase agreements



Margins: repurchase agreements



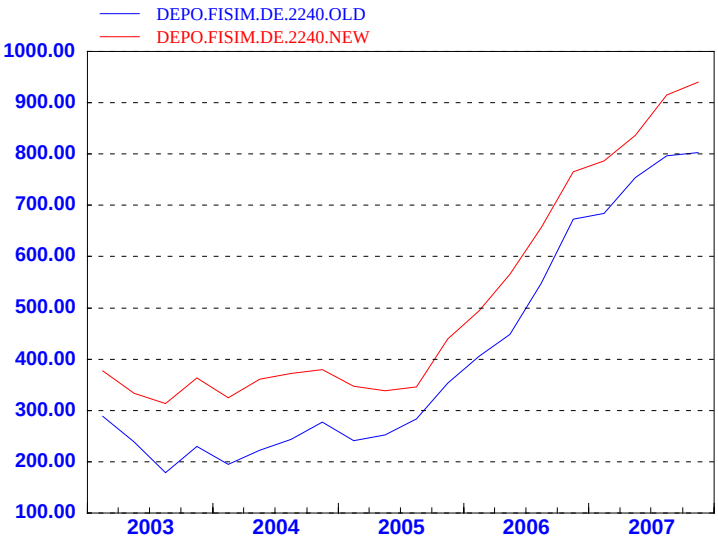
Outstanding amounts



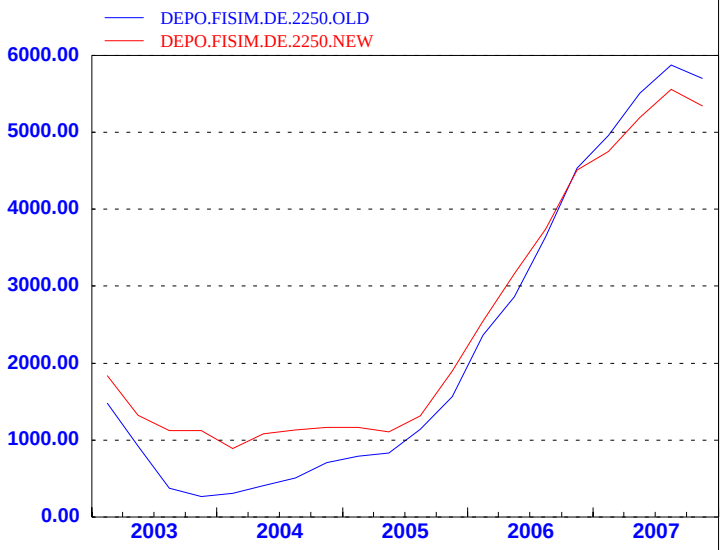
Bank output with domestic residents: regulation vs new approach

Estimated output on deposits for Germany
(EUR million)

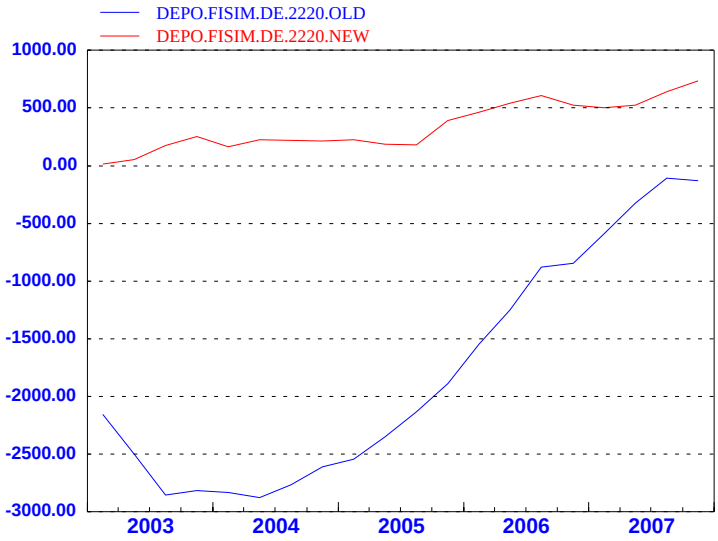
NFCs



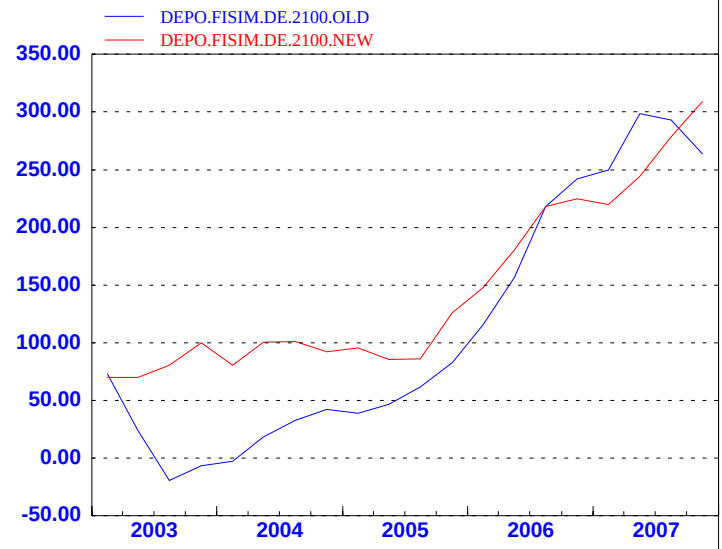
Households



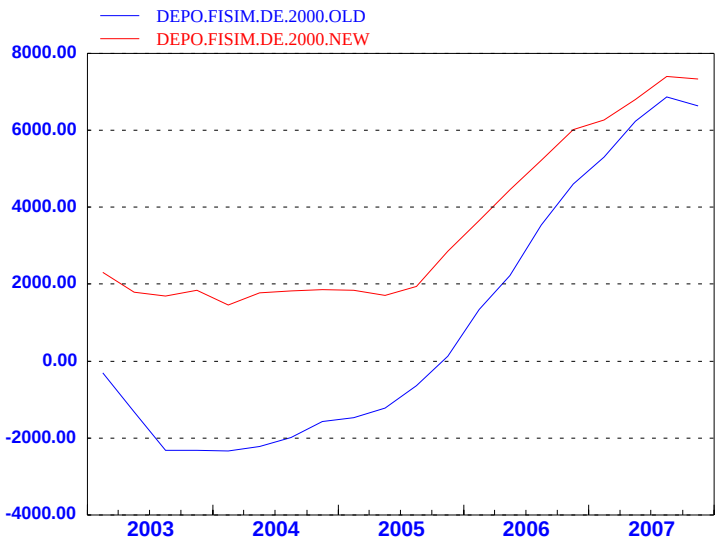
ICPFs



General Government



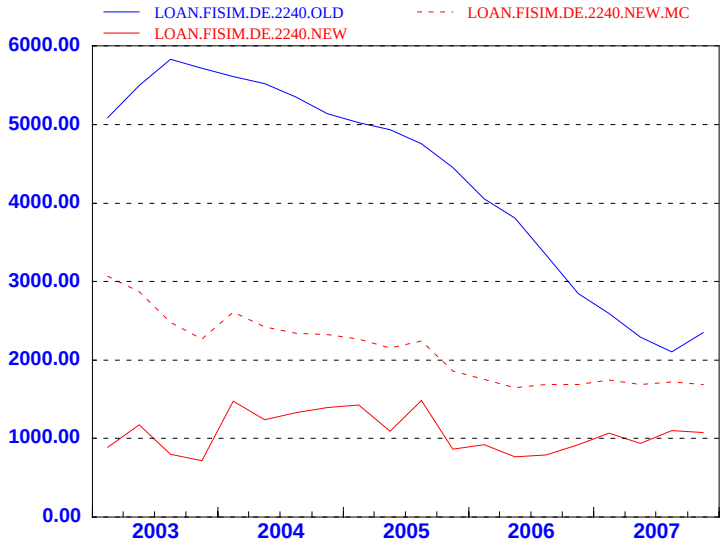
Total domestic economy



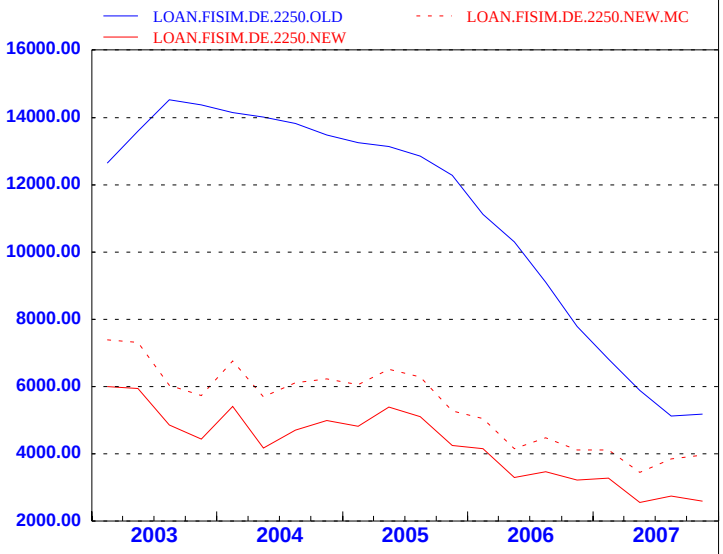
Bank output with domestic residents: regulation vs new approach

Estimated output on loans for Germany
(EUR million)

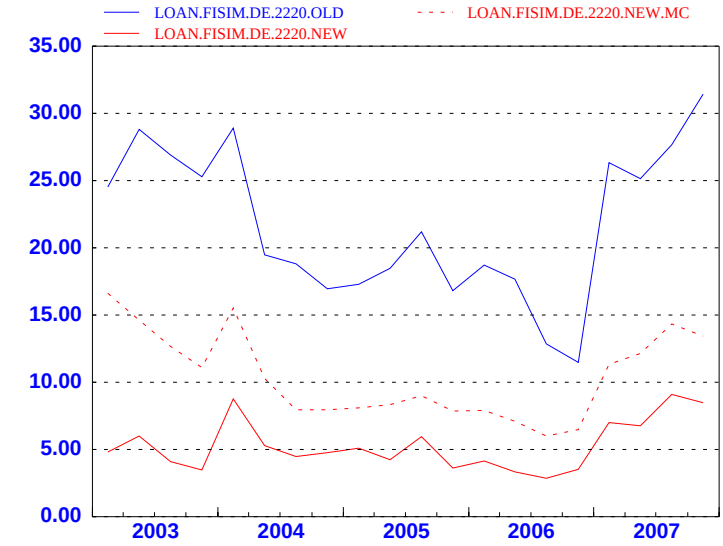
NFCs



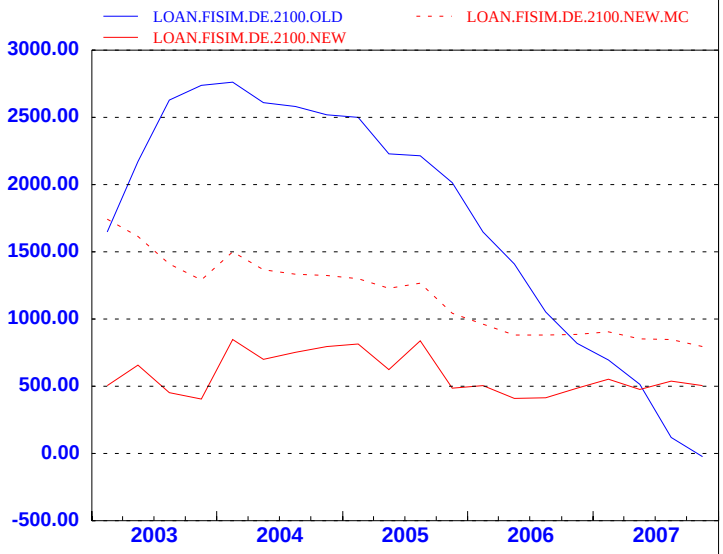
Households



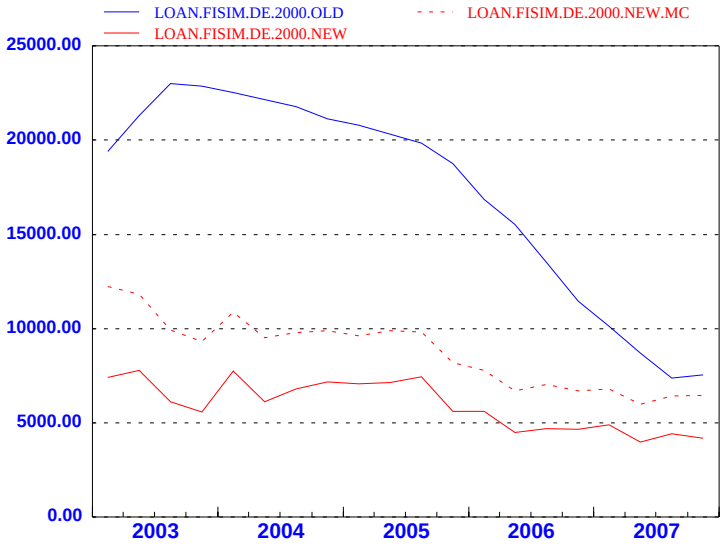
ICPFs



General Government



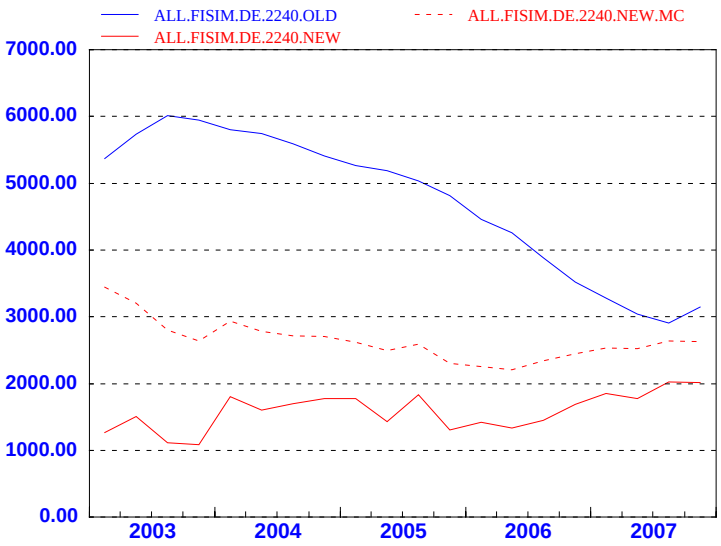
Total domestic economy



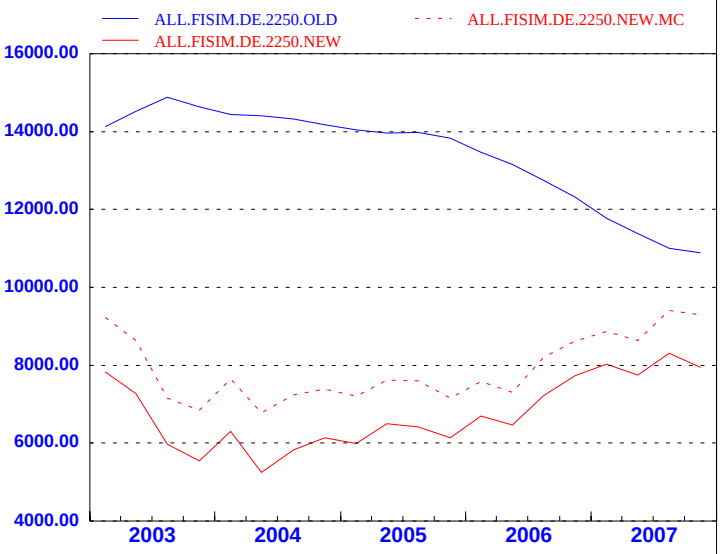
Bank output with domestic residents: regulation vs new approach

Estimated output on deposits and loans for Germany
(EUR million)

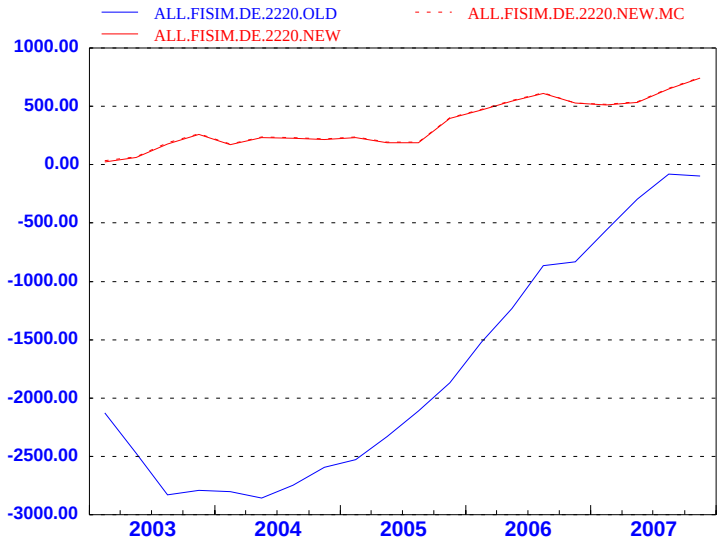
NFCs



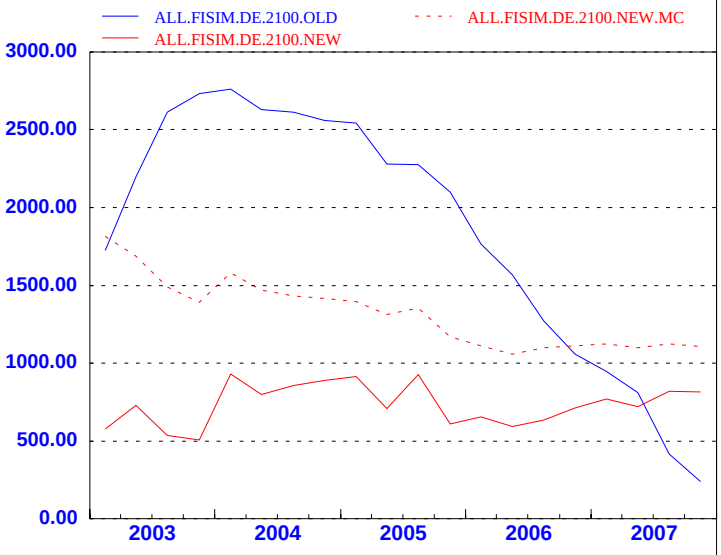
Households



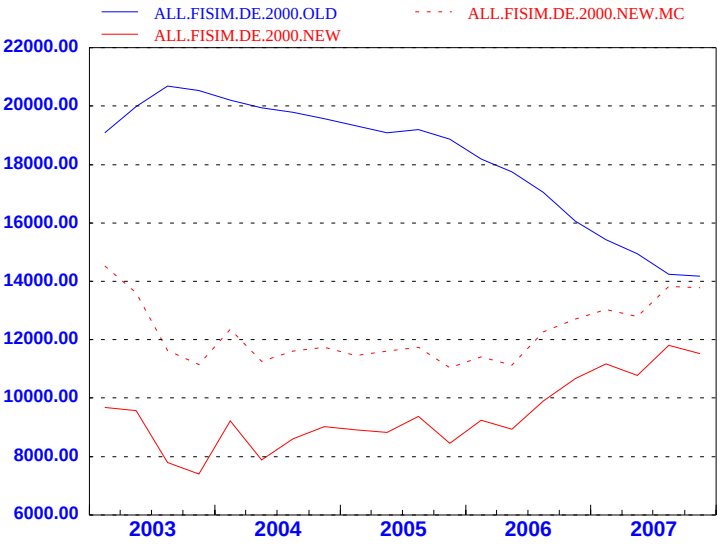
ICPFs



General Government

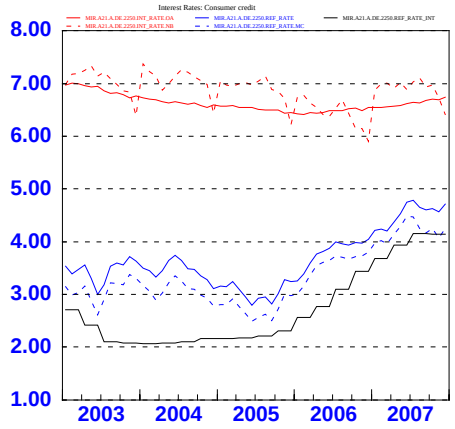


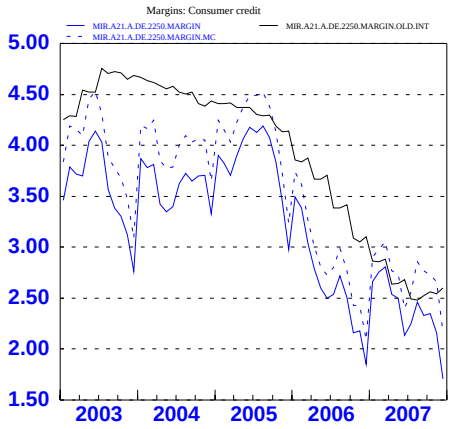
Total domestic economy

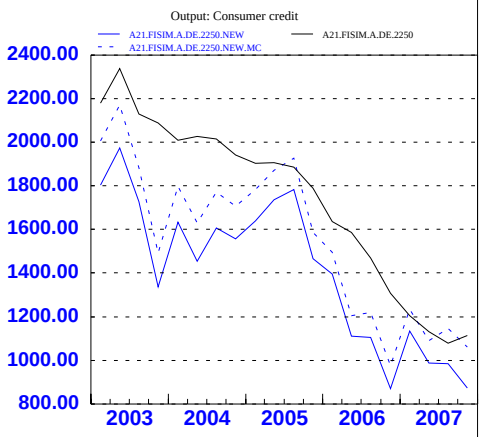


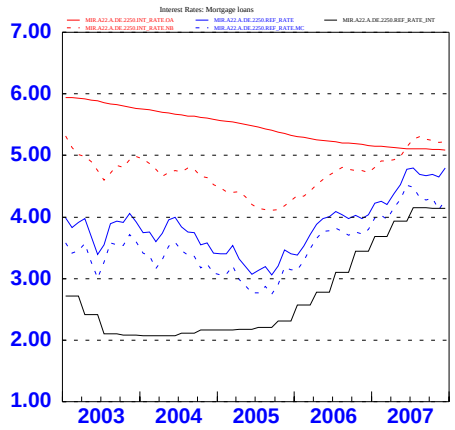
Bank output with domestic residents: regulation vs new approach

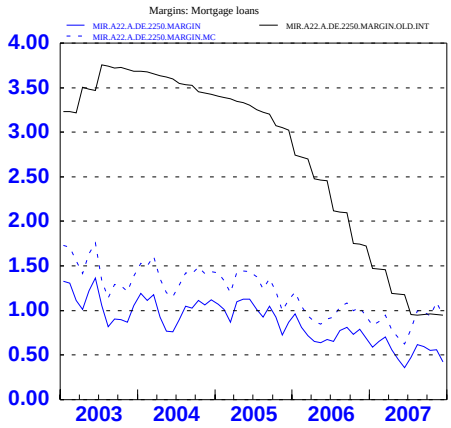
Estimated interest margins on loans to households for Germany
(percentage points for interest rates and margins; EUR million for stocks)

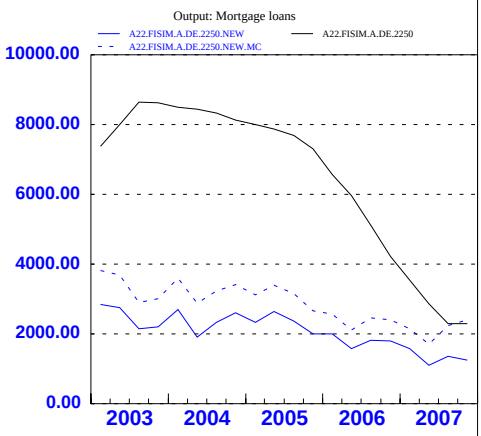


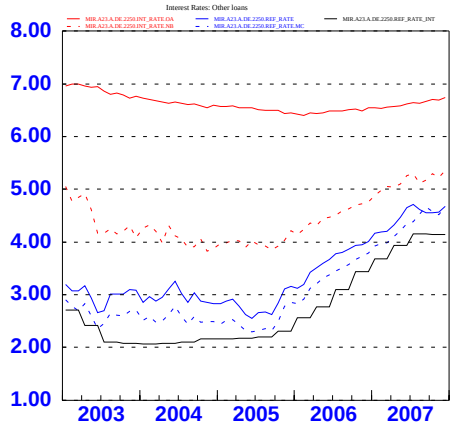


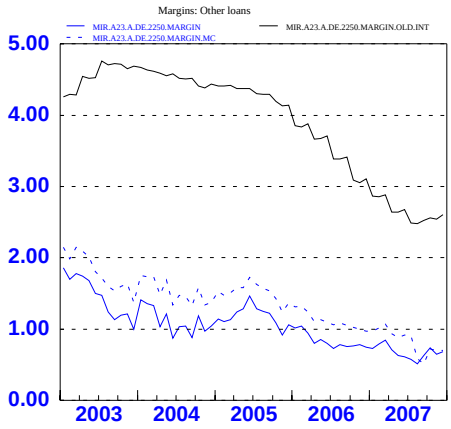


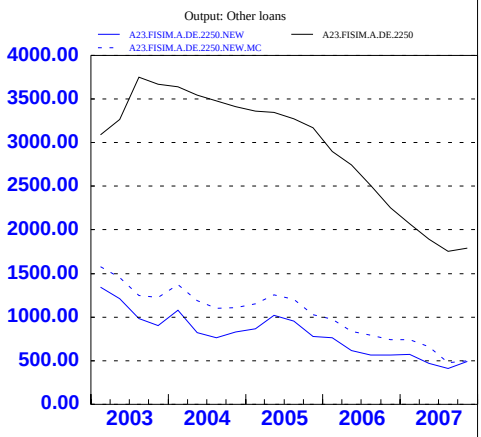


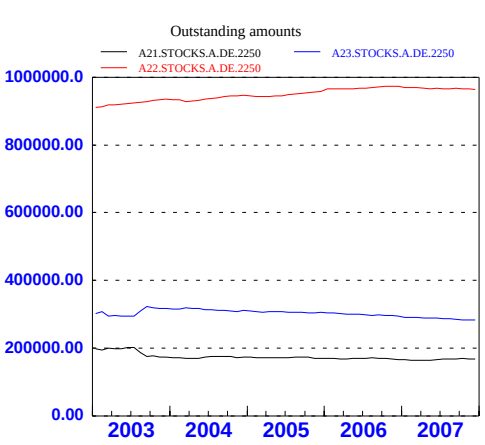






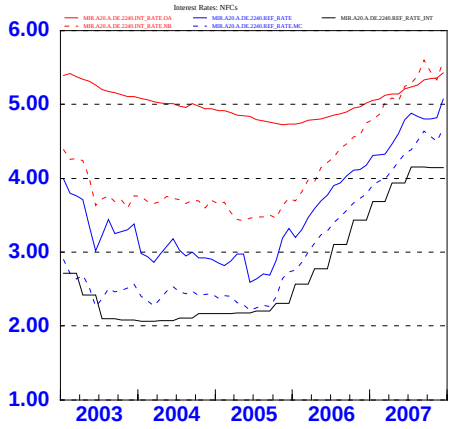


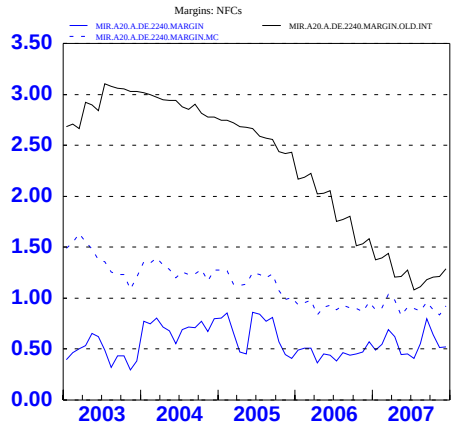


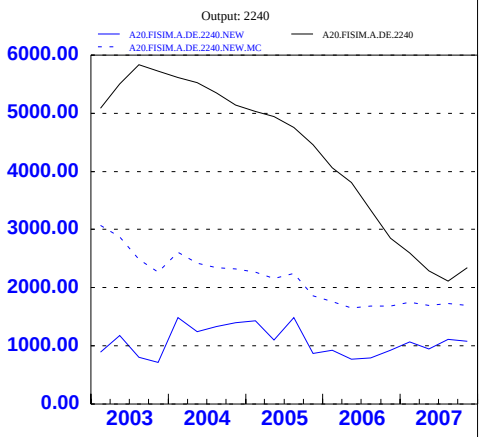


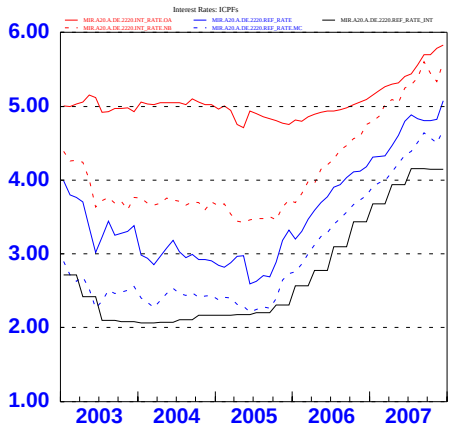
Bank output with domestic residents: regulation vs new approach

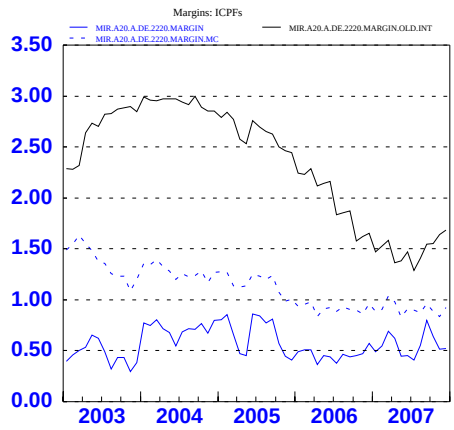
Estimated margins for other sectors in Germany
(percentage points for the interest rates and margins; EUR million for stocks)

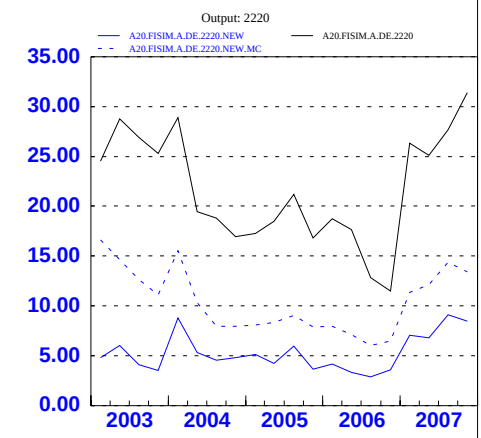


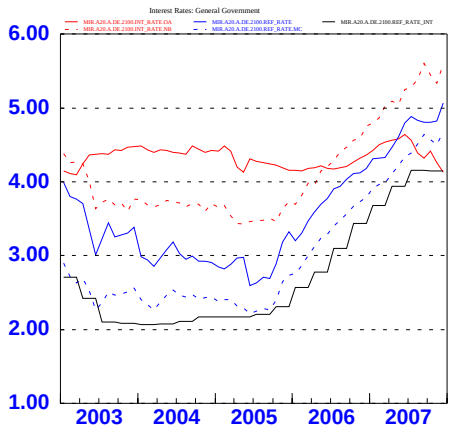


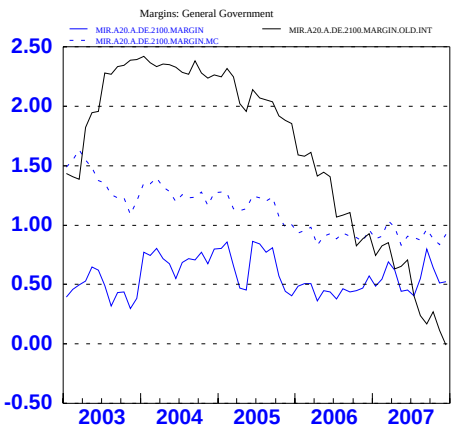


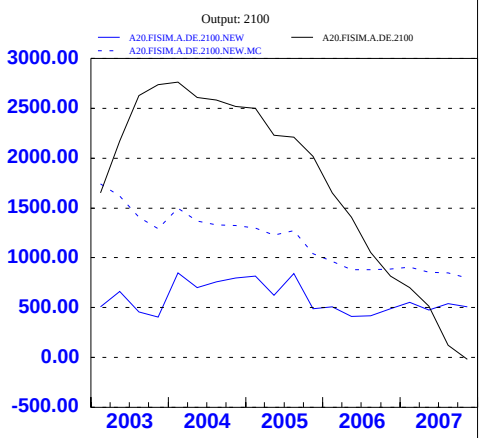


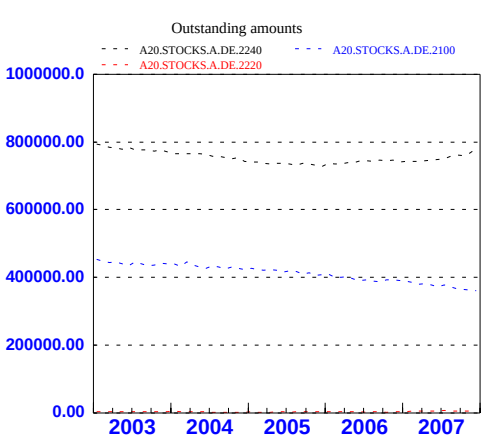








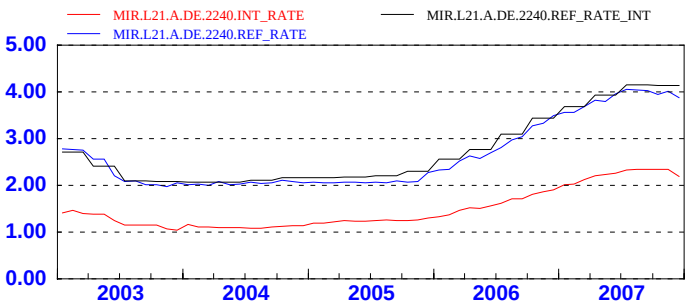




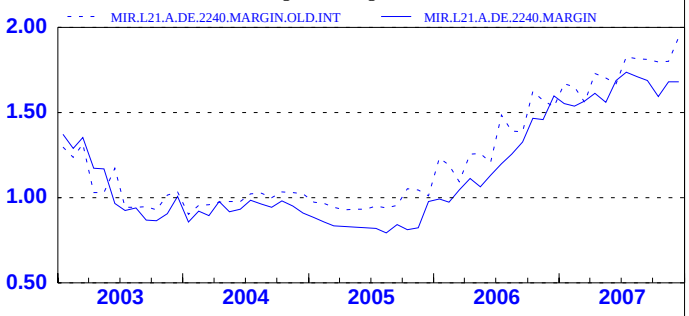
Bank output with domestic residents: regulation vs new approach

Estimated interest margins on deposits by NFCs in Germany
(percentage points for interest rates and margins; EUR million for stocks)

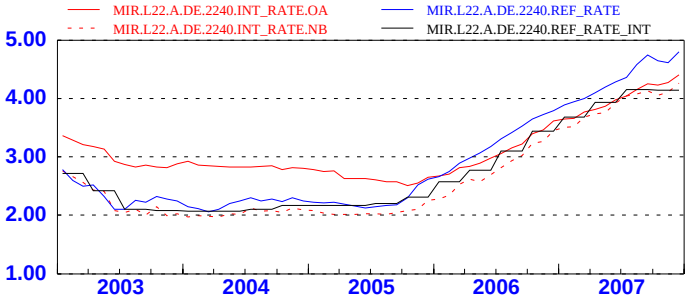
Interest Rates: overnight



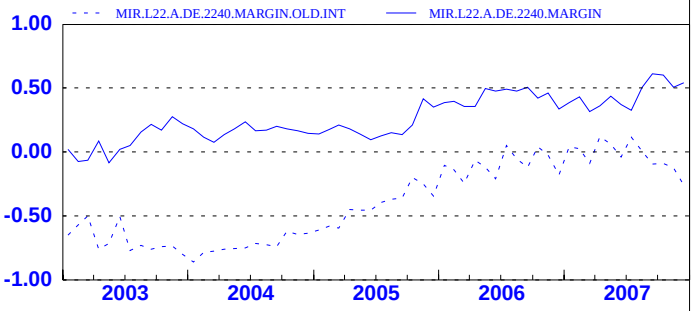
Margins: overnight



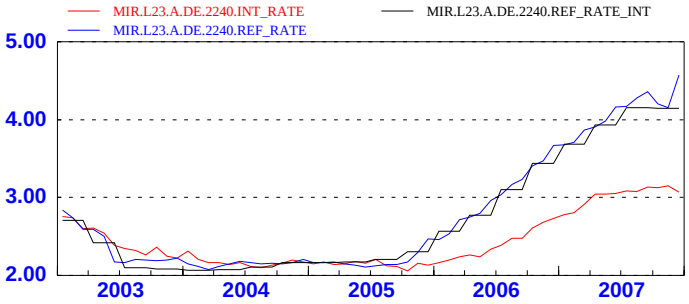
Interest Rates: with agreed maturity



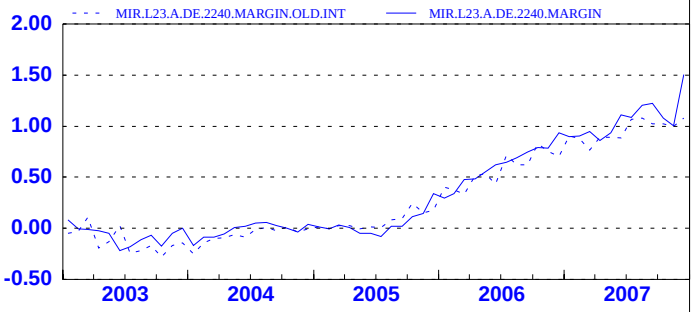
Margins: with agreed maturity



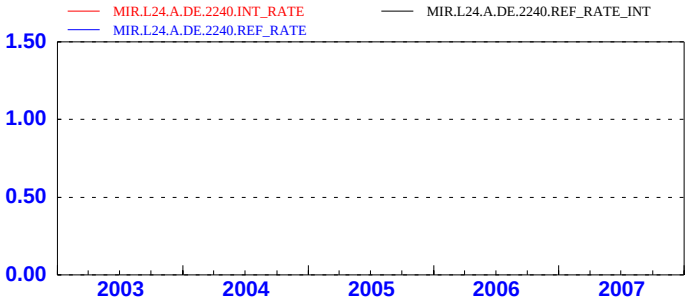
Interest Rates: redeemable at notice



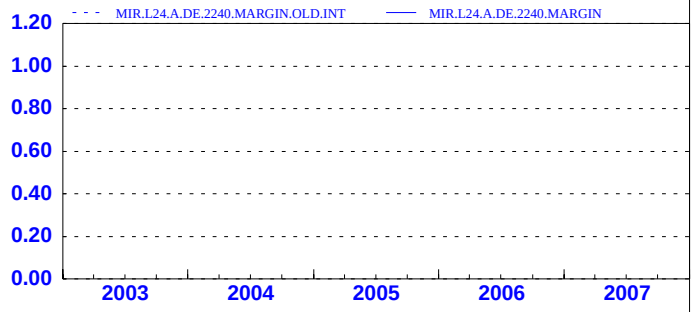
Margins: redeemable at notice



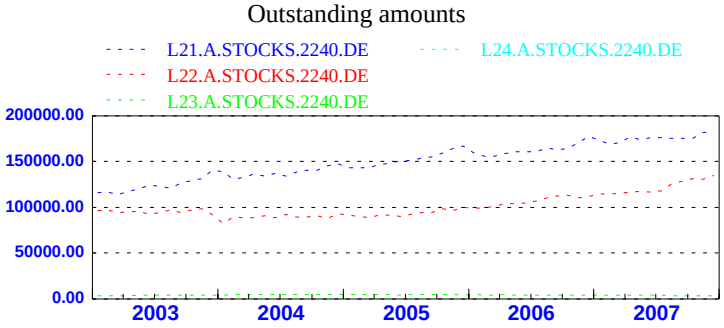
Interest Rates: repurchase agreements



Margins: repurchase agreements



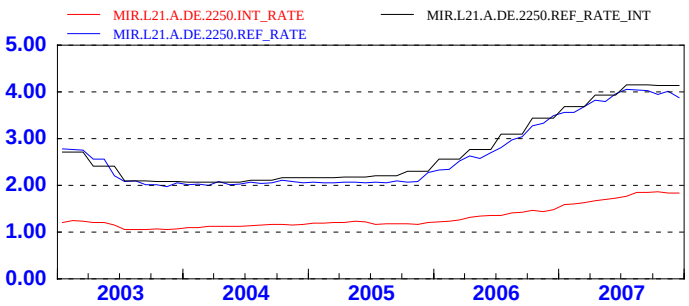
Outstanding amounts



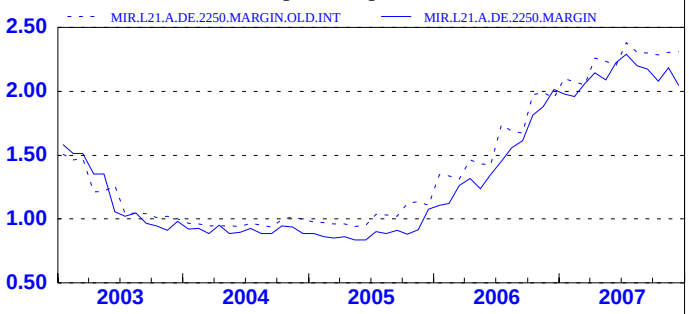
Bank output with domestic residents: regulation vs new approach

Estimated interest margins on deposits by households in Germany
(percentage points for interest rates and margins; EUR million for stocks)

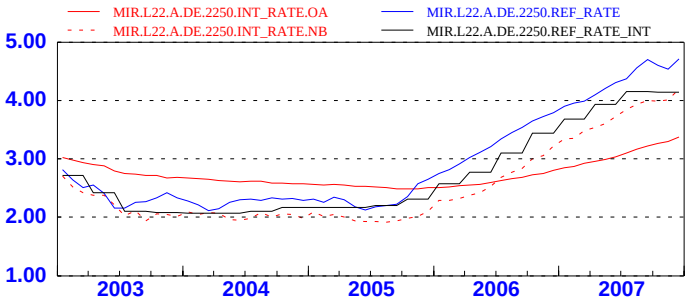
Interest Rates: overnight



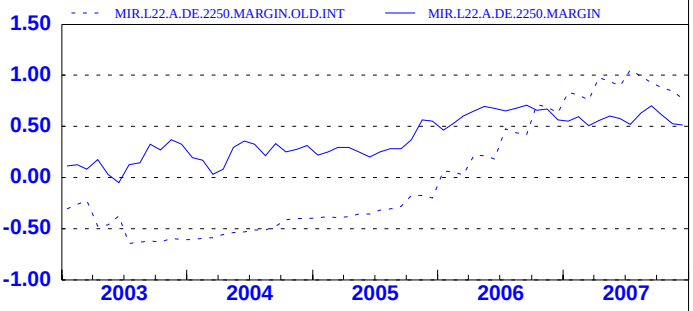
Margins: overnight



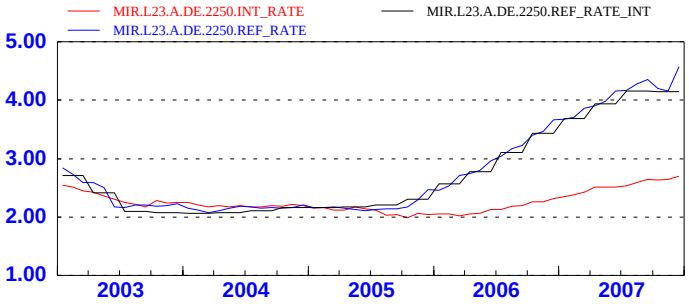
Interest Rates: with agreed maturity



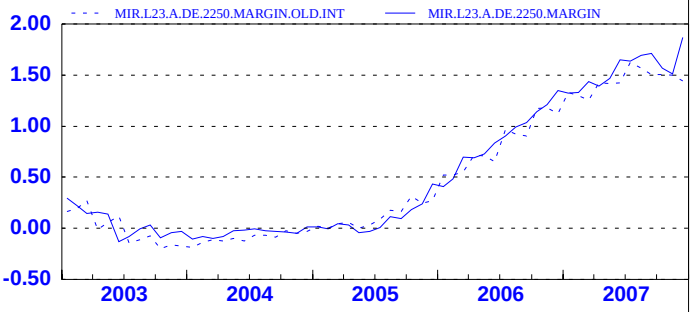
Margins: with agreed maturity



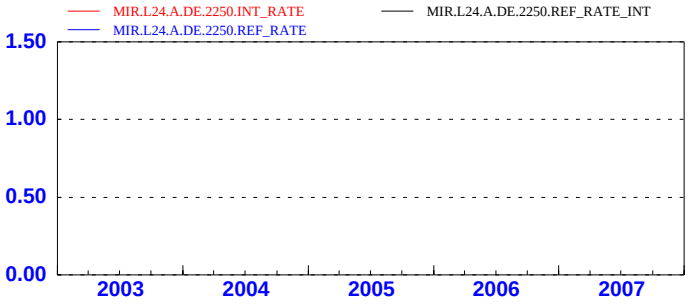
Interest Rates: redeemable at notice



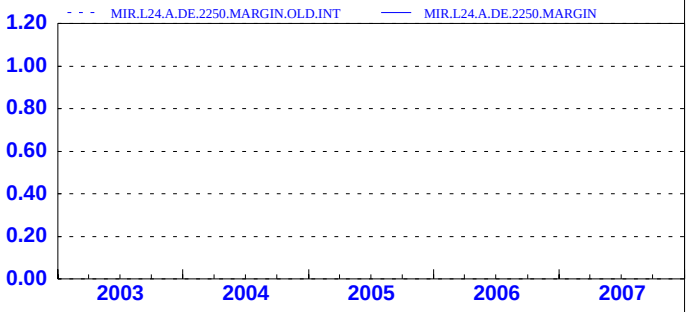
Margins: redeemable at notice



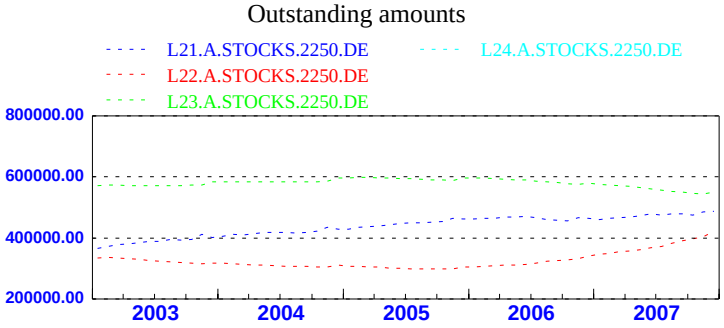
Interest Rates: repurchase agreements



Margins: repurchase agreements



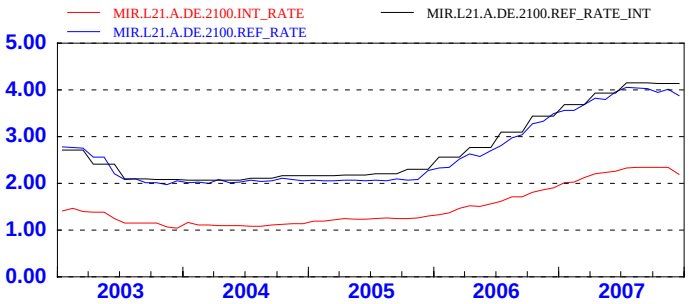
Outstanding amounts



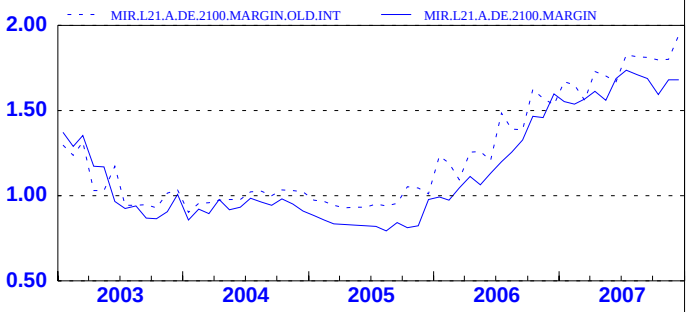
Bank output with domestic residents: regulation vs new approach

Estimated interest margins on deposits by the general government in Germany
(percentage points for interest rates and margins; EUR million for stocks)

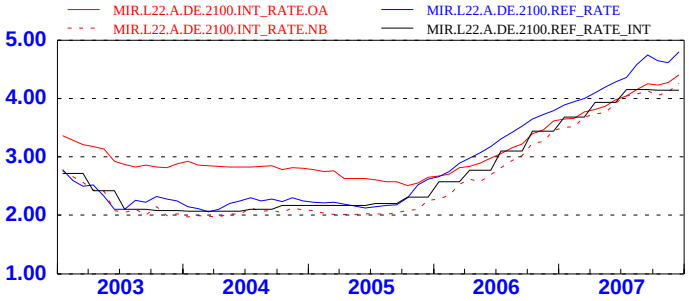
Interest Rates: overnight



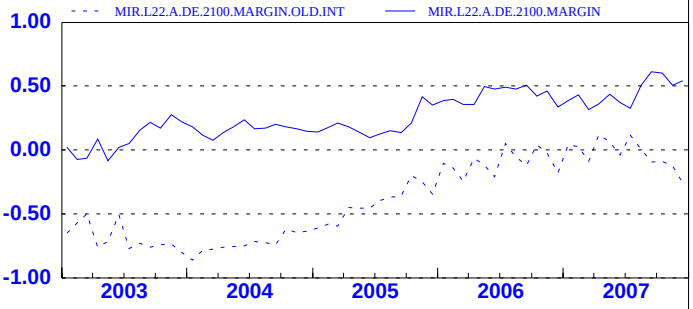
Margins: overnight



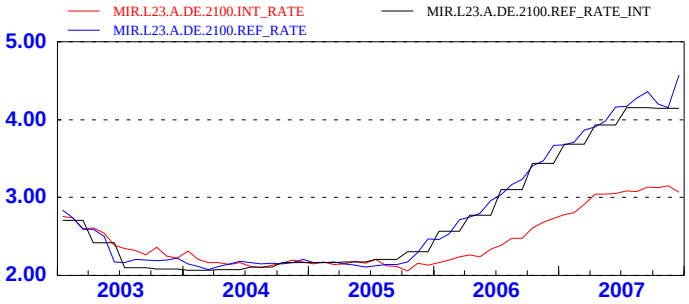
Interest Rates: with agreed maturity



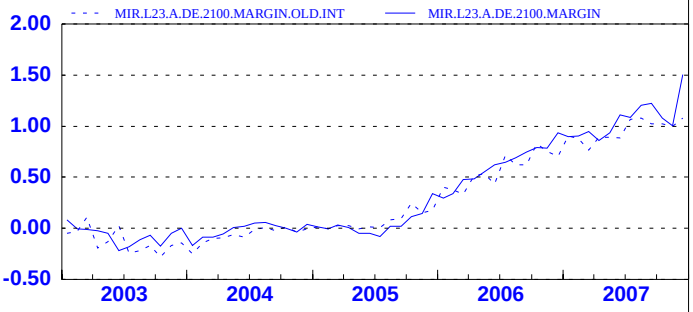
Margins: with agreed maturity



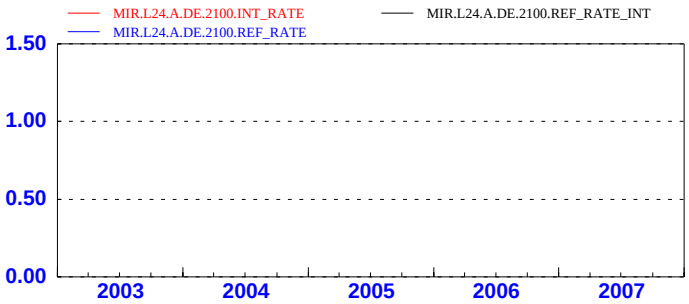
Interest Rates: redeemable at notice



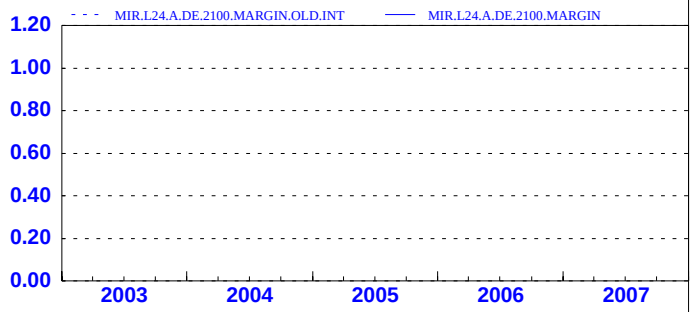
Margins: redeemable at notice



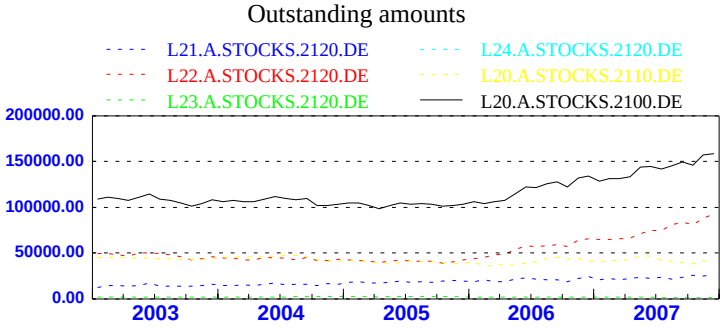
Interest Rates: repurchase agreements



Margins: repurchase agreements



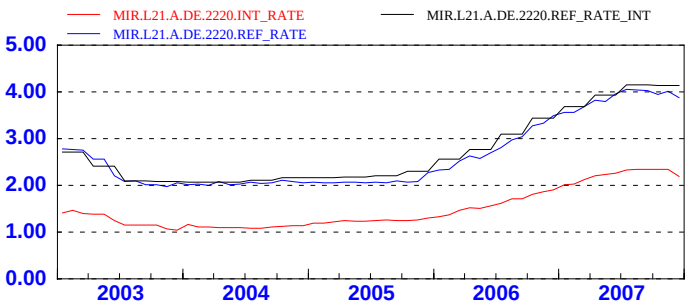
Outstanding amounts



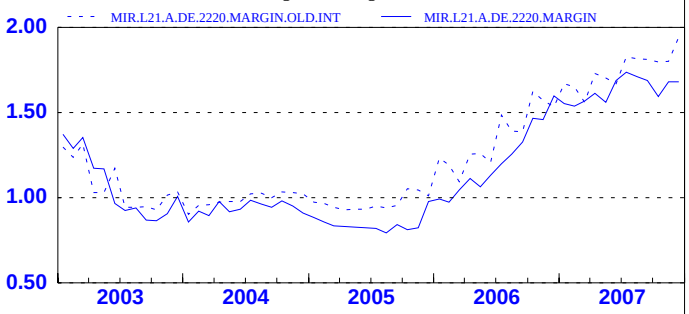
Bank output with domestic residents: regulation vs new approach

Estimated interest margins on deposits by ICPFs in Germany
(percentage points for interest rates and margins; EUR million for stocks)

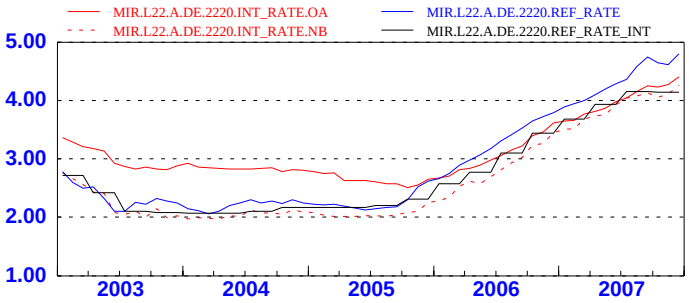
Interest Rates: overnight



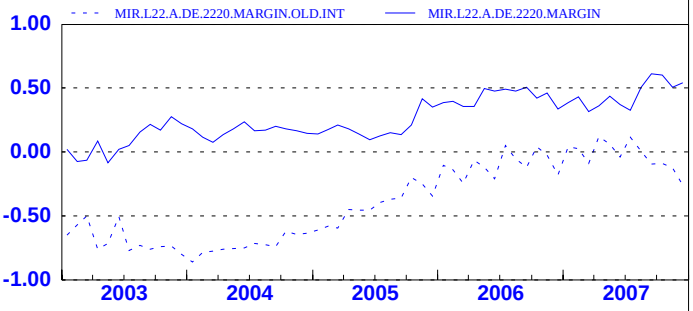
Margins: overnight



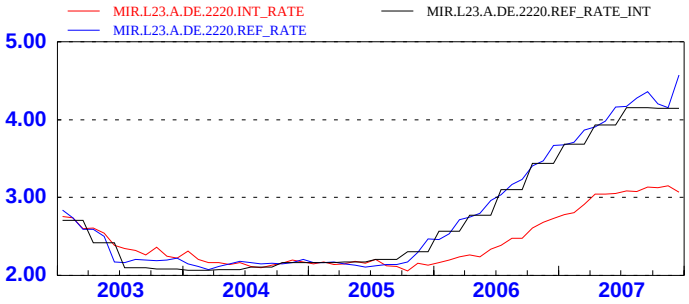
Interest Rates: with agreed maturity



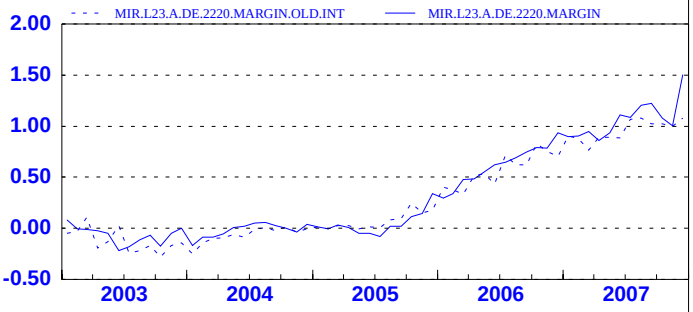
Margins: with agreed maturity



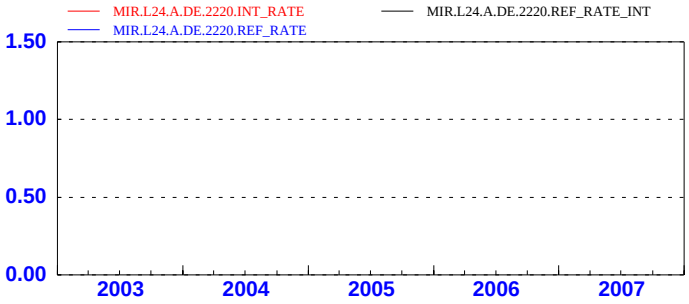
Interest Rates: redeemable at notice



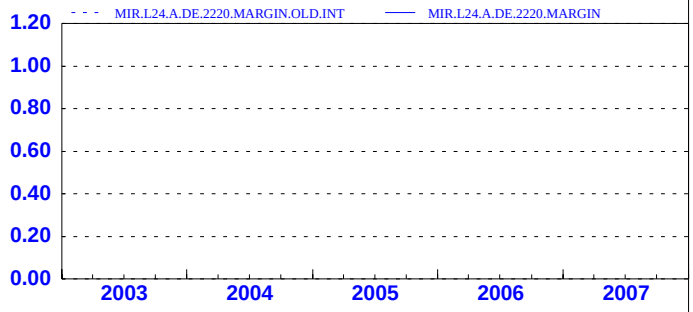
Margins: redeemable at notice



Interest Rates: repurchase agreements



Margins: repurchase agreements



Outstanding amounts