

A Conceptual Approach to the Creation and Allocation of Central Bank Profits in the Euro Area

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I. The Problem

There has been a debate, especially in Germany, on how the net profits of the European Central Bank (ECB) and the national central banks (NCBs)¹ are allocated and to what extent Germany will suffer from disadvantages resulting from the reallocation of these net profits according to the Statute of the European System of Central Banks (ESCB) and of the ECB. Nearly all studies on this subject have in common that they analyse only parts of the whole story of the creation of central bank net profits in the Euro area.² That is why a systematic analysis of central bank net profit creation and allocation is needed. In the following, a general concept for dealing with this problem is presented.

II. The distribution of monetary competence in the Euro area

The distribution of competence as regards monetary operations between the ECB and the NCBs is provided by the Protocol (No. 3) on the Statute of the ESCB and of the ECB (in the following the Articles mentioned refer to this Protocol). In accordance with Article 14.3, general competence as regards monetary policy in the Euro area is allocated to the ECB. The NCBs are an integral part of the ESCB and shall act in accordance with the guidelines and instructions of the ECB. Neverthe-

¹ In the following, the term "NCB" exclusively refers to those NCBs which take part in EMU. Therefore, the term „ESCB“ refers to the Eurosystem.

² Cf. Gros (1993); Männig/Hunger (1996); Remsperger (1996); Apholte/von Köppen-Mertes (1997); Friedrich (1997); Hasse (1997); Lange/Nolte (1997); Larbig (1997); Läufer (1997); Männig (1997); o.V. (1997); Sinn (1997); Sinn/Feist (1997); Wenger (1997); Gros (1998); Lange/Nolte (1998); Nolte (1998); Rösl/Schäfer (1998a); Rösl/Schäfer (1998b); Schobert (1998).

less, the NCBs are allowed to perform monetary functions on their own responsibility and liability which do not interfere with the objectives and tasks of the ESCB, such as the NCBs' transactions with international organisations, which include the selling and acquisition of foreign exchange assets and precious metals, the holding of assets and the conducting of doing banking business including borrowing and lending operations (Article 31.1).³ Furthermore, the NCBs can dispose of their foreign exchange working balances up to a certain amount above which the approval by the ECB is compulsory in order to ensure consistency with the exchange rate and monetary policies of the Community (Article 31.2). Probably this also applies to the ESCB-independent disposition of the NCBs' domestic assets and liabilities which shall be restricted to outright operations.⁴ ESCB-independent lending operations by the NCBs or even the supply of an ESCB-independent standing facility are excluded.

It is plausible that it is necessary to restrict the ESCB-independent money creation potential of the NCBs. On the other hand, a categorical prohibition of all kinds of ESCB-independent operations would have implied a "European socialization" of the entire stock of assets of the NCBs and would have meant an undue interference with the sovereignty of the EU Member States. In any case, it is necessary to identify these ESCB-independent operations.

III. Systematization of the sources of the central banks' net profits

The performance of monetary policy in the Euro area is recorded in the balance sheets as well as in the profit and loss (p&l) accounts of the ECB and NCBs. All operations which are performed by the ECB are classified as ESCB-specific and can easily be identified through the balance sheet and p&l account of the ECB. As regards the NCBs, however, not all items of their balance sheets and p&l accounts are related to ESCB-specific operations; some of them, rather, refer to ESCB-independent operations. Therefore, the balance sheet of each NCB should analytically be split into two: an NCB-ESCB balance sheet which embodies all monetary

³ The term "foreign exchange asset" includes securities and all other assets in the currency of any country or units of account and in whatever form held. Cf. Article 23.

⁴ Exceptions are the operations of the NCBs for their administrative purposes and for their staff (cf. Article 24) as well as for the above mentioned operations with international organisations.

operations for the purposes of ESCB operations, and an NCB-ESCB-independent balance sheet containing all ESCB-independent operations. Figure 1 illustrates this concept.

IV. The creation and allocation of the ECB net profit

1. *Balance sheet basics and operational monetary policy of the ECB*

Figure 2 shows the basic structure of the ECB balance sheet. According to Article 30, the NCBs provide the ECB with foreign reserve assets, other than Member States' currencies, IMF reserve positions and SDRs, up to an amount equivalent to 5.000 million Euro.⁵ Each NCB is credited by the ECB with a claim equivalent to its contribution. Furthermore, the ECB has the right to hold and manage IMF reserve positions and SDRs and provide for the pooling of such assets. The basic financial provision of the ECB is completed by the transfer of the NCBs' share in the subscribed capital of the ECB.

In the ESCB operational monetary policy is pursued almost entirely by the NCBs⁶. All open market operations by the ESCB are transacted on the accounts of the NCBs. Only fine-tuning reverse operations are transacted by the ECB, e.g. buying and selling outright or under repurchase agreement, conducting foreign exchange swaps, and taking fixed-term deposits. However, such operations shall be conducted only in exceptional cases. Thus, it can be stated that the supply of central bank money within the Euro area is principally not based on asset or liability side operations by the ECB. Only the issue of ECB-debt certificates may play a significant role. Though they shall be issued by the NCBs the interest burden has to be borne by the ECB. In Figure 2 those items in the balance sheet and p&l account of the ECB are presented in brackets which are principally redundant because of the lack of monetary operations by the ECB, but which should be made evident on systematic grounds.

⁵ Further calls of foreign reserve assets beyond this limit may be affected by the ECB (Article 30.4). Only central banks of Member States are obliged to transfer foreign reserve assets to the ECB (Article 43.6).

⁶ Cf. ECB (1998a).

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1. ECB-assets		1. ECB-liabilities		2. ECB-net gain	
2. ECB-net loss					
Assets NCB-ESCB-Balance Sheet, Liabilities					
1. NCB-ESCB-assets		1. NCB-ESCB-liabilities			
2. NCB-ESCB-net loss		2. NCB-ESCB-net gain			
Assets independent Balance Sheet, Liabilities					
1. NCB-ESCB-independent assets		1. NCB-ESCB-independent liabilities			
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Figure 1: Sources of central bank net profits in the Euro area

2. The creation of the ECB net profit

The ECB can realize profits from its initial stock of assets as well as from monetary operations. As the latter are practically negligible, there are only two sources of ECB profits:⁷ interest income arising from the foreign reserve assets transferred by the NCBs as well as from the initial capital stock of the ECB. Revaluation gains are recorded on the revaluation account.⁸ The ECB expenditures consist of interest payments to the NCBs arising from the transferred foreign reserve assets as well as from ECB-debt certificates issued by the NCBs. In addition, there are depreciations.

The setting off of profit and loss items shows that the potential for net profit creation by the ECB is limited especially because the interest income arising from foreign exchange reserves as the most profitable source of income is transferred to the NCBs directly. This would be different if the ECB itself pursued operational monetary policy.

3. The allocation of the ECB net profit and covering of the ECB loss

According to Article 33 the net profit of the ECB shall be transferred in the following order: an amount which may not exceed 20% of the net profit is transferred to the general reserve fund subject to a limit equal to 100% of the capital; the remaining net profit is distributed to the shareholders of the ECB in proportion to their paid-up shares. In the case of a loss being incurred by the ECB, the shortfall may be offset against the general reserve fund of the ECB and, if necessary, against the monetary income of the relevant financial year in proportion and up to the amounts allocated to the NCBs.

V. The creation of net profits of the NCBs through ESCB operations

1. The structure of the NCB-ESCB balance sheet

According to Article 32.2 the amount of each NCB's monetary income shall be equal to its annual income derived from its assets held against notes in circulation and deposit liabilities to credit institutions. The term

⁷ Cf. p&l account in Figure 2.

⁸ Revaluation gains can only be set off against revaluation losses, not against ECB losses.

Assets	ECB-Balance Sheet	Liabilities
1. From the NCBs' transferred foreign reserves (including: from the NCB's transferred claims on the IMF) 2. Claims on NCBs arising from issued ECB-debt certificates 3. (Claims on residents) 4. (Claims on non-residents) 5. (Securities) 6. Other assets 7. ECB-net loss	1. (Banknotes in circulation) 2. (Deposits by resident deposit money banks) 3. (Deposits by public authorities) 4. (Deposits by other market participants) 5. Deposits by NCBs 6. Liabilities to NCBs arising from transferred foreign reserves 7. (Liabilities to NCBs arising from transferred claims on the IMF) 8. Liabilities to NCBs arising from issued ECB-debt certificates 9. Provisions for pensions 10. Capital 11. Revaluation account 12. General reserve fund 13. ECB-net gain	
Expenditure	ECB-Profit and Loss Account	Income
1. Interest paid to NCBs arising from NCBs' transferred foreign reserves (including: Interest paid to NCBs arising from NCBs' transferred claims on the IMF) 2. (Interest paid to the IMF arising from (own) ECB-liabilities to the IMF) 3. (Interest paid on fixed term deposits) 4. Interest paid to NCBs arising from NCB-issued ECB-debt certificates 5. Depreciation of premises, equipment, and furniture 6. Depreciation of foreign reserves 7. Other expenditure 8. ECB-net gain	1. Interest income arising from NCBs' transferred foreign reserves (including: interest income arising from NCBs' transferred claims on the IMF) 2. (Interest income arising from (own) ECB-claims on the IMF) 3. (Interest income arising from other external positions) 4. (Interest income arising from domestic assets) 5. Interest income arising from capital 6. Revaluation gains 7. ECB-net loss	

Figure 2: Stylized Balance Sheet and Profit and Loss Account of the European Central Bank

“monetary income” denotes the income accruing to the NCBs in the performance of the ESCB’s monetary policy function. These assets shall be earmarked by the NCBs, i.e. each NCB shall have an account which comprises ESCB-specific assets as well as the ESCB-specific banknotes in circulation and ESCB-specific deposit liabilities to credit institutions. As regards the practical identification of the ESCB-assets and -liabilities one should proceed as follows. After the transition period, each NCB has to allocate assets to its ESCB-banknotes in circulation and its deposit liabilities to credit institutions according to special criteria. In doing so, to simplify matters it seems reasonable for the present to allocate the banknotes in circulation and deposit liabilities to credit institutions completely to the ESCB. This first and final allocation determines the basic structure of an NCB-ESCB-balance sheet and could be termed as “deadline-earmarking”. All future NCB-ESCB operations should be recorded on this account so that a separation of ESCB operations from ESCB-independent operations can be realized successfully. This account could be interpreted as NCB-ESCB-balance sheet which covers all ESCB operations of an NCB. Figure 3 shows the principal structure of an NCB-ESCB balance sheet and its p&l account.

2. The NCB-ESCB-p&l account

The annual profits derived from the NCB-ESCB assets are equivalent to the “monetary income” of each NCB. According to Article 32.4, the amount of this monetary income shall be reduced by an amount equivalent to any interest paid by an NCB on its deposit liabilities to credit institutions in the performance of its ESCB operations. By analogy to the NCB-ESCB balance sheet, this setting of ESCB profits against ESCB expenditures may be interpreted as the NCB-ESCB-p&l account. The balance on this account represents the annual net profit of an NCB arising from its ESCB operations. In the following, the creation of this net profit will be analysed in detail within the structure of the NCB-ESCB-p&l account.

As was mentioned above, the monetary income of an NCB is dependent on those assets which are earmarked as assets held against ESCB-specific notes in circulation and deposit liabilities to credit institutions. The amount of the monetary income of each NCB, which is based on the deadline-earmarking-assets, will depend decisively on the extent to which, e.g., non-interest bearing gold reserves or interest-bearing foreign

issue of banknotes or in exceptional circumstances for specific losses arising from monetary policy operations undertaken for the ESCB. It is not quite clear whether the NCB-ESCB-p&l account also contains the interest payments for fixed-term deposits and for the deposit facility, but the intention of Article 32.4 warrants such an assumption. These considerations, however, are not applicable to interest payments arising from ECB-debt certificates because they are issued by the ECB on its own account though they are sold to the market by the NCBs. In the NCB-ESCB balance sheet this procedure is recorded only as a “pass-through” item, which does not affect the NCB-ESCB balance. Finally, it has to be classified how revaluation gains and losses of the ESCB-specific assets are recorded in the balance sheets. According to the ECB accounting rules⁹, the ESCB positions shall be valued at market rates and prices. Unrealized gains arising from revaluations which will take place at the end of each quarter, will not be recognized as income but will be credited to a revaluation account. Unrealized losses will be taken to the p&l account at the end of the year if they exceed previous revaluation gains registered in the revaluation accounts on the liabilities side. Such losses may only be reserved on subsequent realization of the asset or liability in question and not against any future unrealized gains. During the year, unrealized losses will not have an impact on the profit of the ESCB. Unrealized losses resulting from the revaluation of a given security, or a foreign currency, or a holding of gold are not netted against unrealized gains in other securities or currencies.

The balance which originates from the offset of the described special costs against the monetary income should be designated as NCB-ESCB net profit (or loss) or as monetary (net) income.

3. The allocation of the monetary (net) income of the NCBs

According to Article 32.5, the NCBs’ monetary (net) income shall be pooled and the resulting sum shall be allocated to the NCBs in proportion to their paid-up shares in the capital of the ECB. Only those NCBs participate in the pooled monetary income which have paid up their subscribed capital fully. Before allocating the pooled NCB-ESCB net profit to the NCBs the Governing Council may offset a loss incurred by the ECB against the general reserve fund of the ECB and, if necessary, against the monetary income in proportion and up to the amounts allo-

⁹ Cf. ECB (1999), p. 4.

cated to the NCBs. Further, if the Governing Council decides that the application of the key for allocating the ECB's net profit results in significant changes in NCBs' relative income positions, the amount of income to be allocated shall be reduced by a uniform percentage which shall not exceed 60% in the first financial year of EMU and which shall decrease at least 12 percentage points in each subsequent financial year¹⁰. The resulting "NCB-ESCB net profit after reallocation" in addition to the NCB-ESCB-independent net profit of an NCB shall be transferred to the national budget. This allocation remains in the national sovereignty.

4. *The reallocation of the monetary (net) income*

The described allocation of the pooled monetary (net) income implies reallocation effects between the NCBs if an NCB's share of contributions to the pool differs from its paid-up share in the ECB's capital. This is the reason why there is so much criticism: NCBs which realize a relatively high share of the EMU monetary base have to take over an equivalently high contribution to the financing of the monetary pool. If this contribution is durably higher than its respective paid-up share in the ECB capital, the NCBs face a "de facto socialization" of parts of their assets which they have brought into EMU.¹¹ There is no denying the fact that this is principally true. However, the discussion may be disarmed by referring to the outlined NCB-ESCB-p&l account. On the one hand, it is unclear which of the NCB's assets are allocated to the ESCB. Thus, those NCBs of Member States with a relatively high share of the EMU monetary base could keep their (gross) monetary income low simply by their being allowed to incorporate a relatively high proportion of non-interest bearing assets into their starting ESCB portfolios. On the other hand, there are a number of deductible costs which could reduce an NCB's factual share of financing the pool. These possibilities principally do not detract from the general reallocation problem, but only reduce the absolute amount of reallocation.

Special attention should be directed to the effects of cross-border flows of base money on reallocation. If, e.g., a German importer pays for his imports from Italy through a remittance order, this transaction is reflected in the Bundesbank's ESCB balance sheet as an accounting

¹⁰ Cf. Article 51.

¹¹ Cf. *Sinn/Feist* (1997); *Gros* (1998).

exchange on the liabilities side. This transaction causes an “interlinking clearing balance” (ICB) on the liabilities side of the Bundesbank and on the asset side of the Banca d’Italia. The effect is that the Bundesbank’s net monetary income increases because its interest payments due to the reduced minimum reserves of German credit banks on accounts with the Bundesbank decrease, whereas the Banca d’Italia’s monetary income decreases due to its higher interest payments incurred by the newly emerged minimum reserves of the Italian credit institutions on accounts with the Banca d’Italia. Generally speaking, this implies that NCBs with an ICB on the liabilities side have a higher and those NCBs with an ICB on the asset side have a lower net monetary income. Referring to the NCB-ESCB net profit after reallocation, however, this result is not as problematic as it seems at first sight. Though it is correct that the Banca d’Italia’s net monetary income is less, it is on the other hand liable to contribute correspondingly less to the financing of the pooled monetary income. Thus, it is a zero sum game which is effectuated because the increased interest payments on minimum reserves of the Banca d’Italia are as high as the increased monetary income of the Bundesbank. That is why ICBs in the ESCB balance sheets of the NCBs do not cause reallocation effects¹². This is explicitly shown in the derivations in the annex.

VI. The creation of NCB’s net profits through ESCB-independent operations

1. The NCB-ESCB-independent balance sheet

Figure 4 shows the NCB-ESCB-independent balance sheet. Referring to the previous chapter, the initial issue of the NCB-ESCB-independent items can only be identified after a successful deadline-earmarking of the ESCB-specific items of an NCB. According to our interpretation of Article 32.2, on the liabilities side of an NCB-ESCB balance sheet only the ESCB-specific banknotes in circulation and the ESCB-specific deposit liabilities to credit institutions are recorded. As mentioned above, in order not to complicate the matter it seems reasonable to earmark the whole national monetary base of each NCB at the beginning of EMU as ESCB-specific. Consequently, all other positions on the liabilities side are not ascribed to the ESCB. Therefore, deposits by public

¹² Furthermore, there are no additional distortions caused by offsetting the pooled monetary (net) income against an ECB loss. Cf. *Rösl/Schäfer* (1998b), p. 161.

authorities and private resident non-banks as well as by non-residents are recorded as NCB-ESCB-independent positions on the liabilities side. This also applies to provisions for pensions, to the capital, and to the reserves of an NCB. It seems reasonable to ascribe all claims on residents by an NCB to the ESCB because the NCBs are not allowed to grant ESCB-independent credits to residents. On the basis of this initial issue of the NCB-ESCB-independent balance sheet all ESCB-independent operations of an NCB should be recorded. This seems to be the only way to register the “ESCB-independent” banknotes in circulation and deposit liabilities to credit institutions.

2. The NCB-ESCB-independent p&l account

The profits and costs resulting from the identified ESCB-independent assets and liabilities should be recorded on the NCB-ESCB-independent p&l account. Primarily, the costs originate from deposits by central banks and international institutions. Apparently, this seems of importance especially for those Member States the currencies of which (more or less) were used as international reserve currencies before EMU. Furthermore, interest payments on international lendings could play a significant role. There are also depreciations of equipment and foreign reserves. The latter should reasonably be recorded on the revaluation account, analogous to the depreciation of ESCB-specific assets. Profits from ESCB-independent operations result from ESCB-independent assets, from foreign reserves, other foreign claims, and from those domestic assets which have been acquired in the course of the NCB's ESCB-independent activities. The balancing of these profits and costs shows the NCB-ESCB-independent net profit or loss.

3. The allocation of the NCB-ESCB-independent net profit

In the Statute there is no specification referring to the ESCB-independent net profits of the NCBs. Consequently, it is up to the national legislations to provide for the allocation of these profits.

Assets	NCB-ESCB-independent Balance Sheet	Liabilities
1. Non-ESCB assets:		1. ESCB-independent banknotes in circulation
– foreign reserves		2. ESCB-independent deposit liabilities to credit institutions
– claims on non-residents		3. Deposits by public authorities
– securities		4. Deposits by private resident non-banks
– other assets		5. Deposits by non-residents
		6. Provisions for pensions
		7. Capital
		8. Revaluation account
		9. Reserves
2. NCB-ESCB-independent net loss	10. NCB-ESCB-independent net gain	

Expenditure	NCB-ESCB-independent Profit and Loss Account	Income
1. Interest paid on (non-ESCB) external liabilities	1. Interest income arising from (non ESCB-) foreign reserves	
2. Interest paid on other (non-ESCB) deposits by non residents	2. Interest income arising from other (non ESCB-) external claims	
3. Depreciation of (non-ESCB) foreign reserves	3. Interest income arising from (non ESCB-) domestic assets	
4. Depreciation of premises, equipment, and furniture	4. Revaluation gains	
5. Other expenditure		
6. NCB-ESCB-independent net gain	5. NCB-ESCB-independent net loss	

Figure 4: Stylized NCB-ESCB-independent Balance Sheet and NCB-ESCB-independent Profit and Loss Account

VII. Indirect determination of the monetary income in the transition period

The distinction between ECB-specific, NCB-ESCB-specific and NCB-ESCB-independent components of the creation of central bank net profits in the Euro area, as proposed in this paper, seems to be in accordance with the Protocol. It is important to perceive that earmarking is needed as a strict realisation of this concept though it does not have to be installed immediately after the start of EMU.

Subject to Article 32.3 the monetary income of the NCBs may be measured according to an alternative method for a period of not more than five years if, in the judgement of the Governing Council, the NCBs' balance sheet structures do not permit the application of the direct earmarking method. It soon became clear that the ECB would apply this transitional arrangement¹³. Meanwhile, the ECB has decided on a transition period of three years so that the earmarking method will become compulsory for the NCBs from 1 January 2002 on¹⁴. During this transitional period the monetary income will be determined by multiplying a specified reference rate of interest by a defined liability base of the NCBs (indirect method). Until now, however, the term "liability base" has not been defined exactly besides the agreement that the banknotes in circulation shall not be included¹⁵. Yet, it seems to be clear that current accounts of the NCBs (covering the minimum reserve requirements) as well as liabilities resulting from the deposit facility, from fixed term deposits, from fine tuning reverse operations, and from deposits related to margin calls are included¹⁶. The interest rate on main refinancing operations is likely to become the reference rate of interest. The resulting (gross) monetary income of an NCB is set off against its expenditures in accordance with Article 32.4 generating the amount of the NCB's contribution to the financing of the pool. The allocation arrangements as regards the pooled monetary income, however, remain unchanged. Furthermore, the application of the indirect method does not exclude the reduction of the amount of income to be allocated according to Article 51.

The advantages of the indirect method of determining the monetary income in accordance with Article 32.3 are obvious. They consist of cost reductions in bookkeeping, accounting, and earmarking procedures. Further, for the NCBs the exclusion of the national banknotes in circulation mitigates the above-mentioned problem of income reallocation because in the transitional period the amount of the pooled and, therefore, reallocated income is reduced considerably. What is more, the difference between an NCB's share of contributions to the pool and its paid-up share in the ECB's capital is almost eliminated so that the controversial reallocation effects of the pooling arrangements are limited.

¹³ Cf. EMI (1997).

¹⁴ Cf. ECB (1998b), p. 5. According to the "simplified amendment procedure" of Article 41 the point of time when the earmarking shall be applied as well as the method of determining the monetary income may be amended.

¹⁵ Cf. ECB (1998b), p. 5.

¹⁶ Cf. Items 2.1-2.5 of the consolidated weekly financial statement of the Euro-system (ECB 1999), p. 3.

The indirect method may, however, imply other reallocation effects¹⁷. On the one hand, the rechanelling of additional NCB expenditures described above, which result from cross-border flows of base money, is not necessarily guaranteed. This is because, in the case of an ICB on the liability side, an NCB's share of contributions to the pool does not increase to the same extent as the reduction of interest payments on minimum reserves. Indeed, it decreases if, applying the indirect method, the NCB's monetary (gross) income is linked to the reduced deposits of the credit institutions¹⁸. On the other hand, additional distortions may be caused by fixing the reference interest rate. They occur if the assets of an NCB generate higher profits when they are earmarked as ESCB-assets than if the reference rate of interest is applied. The effect is that the respective NCB realizes higher ESCB-independent profits and, therefore, participates less in the financing of the pooled monetary income.

On conceptual grounds, too, the indirect method can only be regarded as a transitional solution. The determination of the monetary income has no direct link to the factual ESCB-profit situation of an NCB¹⁹. Therefore, the term "monetary income" has to be interpreted differently during the transitional period when the indirect method is applied and thereafter when the earmarking method is introduced.

Annex

Legend

Π_j	= Profit of NCB j without cross border payments
Π_j^C	= Profit of NCB j with cross border payments
$A_{ij}^{ESCB-ind.}$	= ESCB-independent asset i of NCB j
$L_{ij}^{ESCB-ind.}$	= ESCB-independent liability i of NCB j
A_{ij}^{ESCB}	= ESCB-specific asset i of NCB j
L_{ij}^{ESCB}	= ESCB-specific liability i of NCB j
a_{ij}	= Interest rate of asset i of NCB j
l_{ij}	= Interest rate of liability i of NCB j
r_r	= Interest rate for the minimum reserve
r_R	= Rate for the determination of the minimum reserve requirements
r	= Reference interest rate (when the indirect method is applied)

¹⁷ Cf. derivations in the annex.

¹⁸ Cf. derivations in the annex.

¹⁹ Cf. *Remsperger* (1996).

D_j	= Aggregated deposit liabilities (used to hold minimum reserves) of credit institutions in the country of NCB j
D_j^{ICB}	= Deposit liabilities of the NCB j due to cross-border payments
DB_j	= Deposit liabilities of NCB j to credit institutions
X_j	= NCB j 's paid-up share in the ECB's capital
F_j	= Monetary (net) income of NCB j without cross-border payments
F_j^C	= Monetary (net) income of NCB j with cross-border payments
P	= Pooled monetary (net) income without cross border payments
P^C	= Pooled monetary (net) income with cross border payments
R_j	= Pooled monetary (net) income reallocated to NCB j without cross-border payments
R_j^C	= Pooled monetary (net) income reallocated to NCB j with cross-border payments
B_j	= Financing balance of NCB j without cross-border payments
B_j^c	= Financing balance of NCB j with cross-border payments

A. Determination and reallocation of the monetary income on the basis of the earmarking method

a) Situation without cross-border payments

The net profit of NCB _{j} when there are no cross-border payments is determined as:

$$(1) \quad \Pi_j = \sum_{i=1}^n A_{ij}^{\text{ESCB-ind.}} \cdot a_{ij} - \sum_{i=1}^n L_{ij}^{\text{ESCB-ind.}} \cdot l_{ij} + \sum_{i=1}^n A_{ij}^{\text{ESCB}} \cdot a_{ij} - \sum_{i=1}^n L_{ij}^{\text{ESCB}} \cdot l_{ij}.$$

The monetary (net) income of NCB _{j} (transferred to the pool) is:

$$(2) \quad F_j = \sum_{i=1}^n A_{ij}^{\text{ESCB}} \cdot a_{ij} - \sum_{i=1}^n L_{ij}^{\text{ESCB}} \cdot l_{ij} = \sum_{i=1}^n A_{ij}^{\text{ESCB}} \cdot a_{ij} - (r_r \cdot r_R \cdot D_j) - \sum_{i=2}^n L_{ij}^{\text{ESCB}} \cdot l_{ij},$$

with $L_{1j}^{\text{ESCB}} \cdot l_{1j} = (r_r \cdot r_R \cdot D_j).$

The pooled monetary (net) income of all NCBs _{j} is:

$$(3) \quad P = \sum_{j=1}^m \sum_{i=1}^n A_{ij}^{\text{ESCB}} \cdot a_{ij} - \sum_{j=1}^m (r_r \cdot r_R \cdot D_j) - \sum_{j=1}^m \sum_{i=2}^n L_{ij}^{\text{ESCB}} \cdot l_{ij}.$$

The reallocated pooled monetary (net) income to NCB_j amounts to:

$$(4) \quad R_j = X_j \cdot \left[\sum_{j=1}^m \sum_{i=1}^n A_{ij}^{\text{ESCB}} \cdot a_{ij} - \sum_{j=1}^m (r_r \cdot r_R \cdot D_j) - \sum_{j=1}^m \sum_{i=2}^n L_{ij}^{\text{ESCB}} \cdot l_{ij} \right].$$

The financing balance of NCB_j results from the difference between (4) and (2):

$$(5) \quad B_j = R_j - F_j \leq 0.$$

b) Situation with cross-border payments

The net profit of NCB_j when there are cross-border payments is determined as:

$$(6) \quad \begin{aligned} \Pi_j^C = & \sum_{i=1}^n A_{ij}^{\text{ESCB} \cdot \text{ind.}} \cdot a_{ij} - \sum_{i=1}^n L_{ij}^{\text{ESCB} \cdot \text{ind.}} \cdot l_{ij} + \sum_{i=1}^n A_{ij}^{\text{ESCB}} \cdot a_{ij} \\ & - (r_r \cdot r_R \cdot D_j) - (r_r \cdot r_R \cdot D_j^{\text{ICB}}) - \sum_{i=3}^n L_{ij}^{\text{ESCB}} \cdot l_{ij}, \end{aligned}$$

$$\text{with } L_{1j} \cdot l_{1j} = (r_r \cdot r_R \cdot D_j) \quad \text{and} \quad L_{2j} \cdot l_{2j} = (r_r \cdot r_R \cdot D_j^{\text{ICB}}).$$

The monetary (net) income of NCB_j (transferred to the pool) is:

$$(7) \quad F_j^C = \sum_{i=1}^n A_{ij}^{\text{ESCB}} \cdot a_{ij} - (r_r \cdot r_R \cdot D_j) - (r_r \cdot r_R \cdot D_j^{\text{ICB}}) - \sum_{i=3}^n L_{ij}^{\text{ESCB}} \cdot l_{ij}.$$

The pooled monetary (net) income of all NCB_s is:

$$(8) \quad P^C = \sum_{j=1}^m \sum_{i=1}^n A_{ij}^{\text{ESCB}} \cdot a_{ij} - \sum_{j=1}^m (r_r \cdot r_R \cdot D_j) - \underbrace{\sum_{j=1}^m (r_r \cdot r_R \cdot D_j^{\text{ICB}})}_{=0} - \sum_{j=1}^m \sum_{i=3}^n L_{ij}^{\text{ESCB}} \cdot l_{ij} = P.$$

The reallocated pooled monetary income to NCB_j amounts to:

$$(9) \quad \begin{aligned} R_j^C = & X_j \cdot \left[\sum_{j=1}^m \sum_{i=1}^n A_{ij}^{\text{ESCB}} \cdot a_{ij} - \sum_{j=1}^m (r_r \cdot r_R \cdot D_j) - \underbrace{\sum_{j=1}^m (r_r \cdot r_R \cdot D_j^{\text{ICB}})}_{=0} - \sum_{j=1}^m \sum_{i=3}^n L_{ij}^{\text{ESCB}} \cdot l_{ij} \right] \\ = & R_j. \end{aligned}$$

Thus, the financing balance of NCB_j results from the difference between (9) and (7):

$$(10) \quad B_j^C = R_j^C - F_j^C \leq 0.$$

It is evident that the difference between the monetary (net) income of NCB_j in the alternative situations (with and without cross-border payments) amounts to:

$$(11) \quad F_j - F_j^C = (r_r \cdot r_R \cdot D_j^{ICB}).$$

This implies that an NCB which gets cross-border payments of base money from other NCBs has to fulfil additional interest payments on minimum reserve requirements (compared to the situation without cross-border payments) to the amount of $(r_r \cdot r_R \cdot D_j^{ICB})$. This amount exactly equals the difference between the financing balances of NCB_j (with and without cross-border payments):

$$(12) \quad B_j - B_j^C = (r_r \cdot r_R \cdot D_j^{ICB}).$$

Thus, whether an NCB gets a winner or loser position in the reallocation process of the monetary (net) income is independent of whether there are cross-border payments or not.

B. Determination and reallocation of the monetary income on the basis of the indirect method

a) Situation without cross-border payments

The net profit of NCB_j equals Π_j in (1):

$$(13) = (1)$$

The monetary (net) income of NCB_j (transferred to the pool) amounts to:

$$(14) \quad F_j = DB_j \cdot r - \sum_{i=1}^n L_{ij}^{ESCB} \cdot l_{ij}.$$

It is assumed that the “liability base” of the NCBs only consists of deposits of credit institutions.

The amount of the pooled monetary income is:

$$\begin{aligned}
 P &= \sum_{j=1}^m DB_j \cdot r - \sum_{j=1}^m \sum_{i=1}^n L_{ij}^{\text{ESCB}} \cdot l_{ij} \\
 (15) \quad &= \sum_{j=1}^m DB_j \cdot r - \sum_{j=1}^m (r_r \cdot r_R \cdot D_j) - \sum_{j=1}^m \sum_{i=2}^n L_{ij}^{\text{ESCB}} \cdot l_{ij}, \\
 &\text{with } L_{1j}^{\text{ESCB}} \cdot l_{1j} = (r_r \cdot r_R \cdot D_j).
 \end{aligned}$$

The reallocated pooled monetary income to NCB j amounts to:

$$(16) \quad R_j = X_j \cdot \left[\sum_{j=1}^m DB_j \cdot r - \sum_{j=1}^m (r_r \cdot r_R \cdot D_j) - \sum_{j=1}^m \sum_{i=2}^n L_{ij}^{\text{ESCB}} \cdot l_{ij} \right].$$

The difference between (16) and (14) is equal to the financing balance of NCB $_j$:

$$(17) \quad B_j = R_j - F_j \leq 0.$$

b) The situation with cross-border payments

The net profit of NCB $_j$ equals Π_j^C in (6):

$$(18) = (6)$$

The monetary (net) income of NCB $_j$ (transferred to the pool) is:

$$(19) \quad F_j^C = DB_j \cdot r - DB_j^{\text{ICB}} \cdot r - (r_r \cdot r_R \cdot D_j) - (r_r \cdot r_R \cdot D_j^{\text{ICB}}) - \sum_{i=3}^n L_{ij}^{\text{ESCB}} \cdot l_{ij}.$$

As cross-border payments imply a reduction of deposits of non-banks held by credit institutions and equally of liabilities of an NCB to credit institutions, it holds: $DB_j = D_j^{\text{ICB}}$.

Thus, the amount of the pooled monetary (net) income is:

$$(20) \quad P^C = \sum_{j=1}^m (DB_j - D_j^{\text{ICB}}) \cdot r - \sum_{j=1}^m (r_r \cdot r_R \cdot D_j) - \underbrace{\sum_{j=1}^m (r_r \cdot r_R \cdot D_j^{\text{ICB}})}_{=0} - \sum_{j=1}^m \sum_{i=3}^n L_{ij}^{\text{ESCB}} \cdot l_{ij} \neq P.$$

It is shown that contrary to the earmarking method the amount of the pooled monetary income is not independent of the sum of cross-border payments.

The reallocated pooled monetary income to NCB_j is:

$$(21) \quad R_j^C = X_j \cdot \left[\sum_{j=1}^m (DB_j - D_j^{ICB}) \cdot r - \sum_{j=1}^m (r_r \cdot r_R \cdot D_j) - \underbrace{\sum_{j=1}^m (r_r \cdot r_R \cdot D_j^{ICB})}_{=0} - \sum_{j=1}^m \sum_{i=3}^n L_{ij}^{ESCB} \cdot l_{ij} \right] \neq R_j.$$

The financing balance of NCB_j equals the difference between (21) and (19):

$$(22) \quad B_j^C = R_j^C - F_j^C \leq 0.$$

Thus, the difference between the NCB_j 's amount of the financing of the monetary pool with and without cross-border payments is:

$$(23) \quad F_j - F_j^C = D_j^{ICB} \cdot r.$$

Finally, the difference between the financing balances of NCB_j in both situations is:

$$(24) \quad B_j - B_j^C = (F_j^C - F_j) + X_j \cdot \sum_{j=1}^m D_j^{ICB} \cdot r.$$

The comparison of (23) and (24) shows that the pooling and reallocation of the monetary (net) income on the basis of the indirect method is not necessarily appropriate to channel back the increased minimum reserve expenditures of an NCB with an ICB on the asset side to an NCB with an ICB on the liability side.

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Summary

A Conceptual Approach to the Creation and Allocation of Central Bank Profits in the Euro Area

The conceptual approach to the allocation of monetary competence within the Euro area leads to a tripartite system concerning the creation of central bank net profits: it is divided into an ECB-, NCB-ESCB-specific and NCB-ESCB-independent component. The expected amount of the ECB-net gain is rather limited due to the ECB's lack of operational activities. Furthermore it is unlikely that any noteworthy redistribution effects will occur. But the same does not hold for a considerable proportion of NCBs' net gains. According to Art. 32.2 of the ECB/ESCB Statute, the monetary net income of the NCBs are to be pooled and – in terms of our basic concept – have to be interpreted as ESCB-specific net profits generated by the NCBs. They are recorded following the deadline-earmarking-procedure. Resulting unwelcome redistribution effects might not be entirely avoidable, but they can be restricted by applying a suitable procedure. The analysis of the NCB-ESCB-independent component enquires into the scope for monetary policies left to NCBs even after entering the monetary union. This proportion of NCB-ESCB-independent net profits should be recorded separately and stay with each NCB, respectively. (JEL E 50, E 58, E 59)

Zusammenfassung

Entstehung und Verteilung der Zentralbankgewinne im Euro-Währungsraum Ein konzeptioneller Ansatz

Die Analyse der geldpolitischen Kompetenzverteilung im Euro-Währungsraum läßt eine konzeptionelle Dreiteilung der Notenbankgewinnentstehung in eine EZB-, NZB-ESZB- und NZB-ESZB-unabhängige Komponente zu. Aufgrund der mangelnden operationalen Tätigkeit der EZB ist die zu erwartende Höhe des EZB-Gewinns sehr begrenzt. Zudem sind größere Umverteilungswirkungen aus der Verteilung der EZB-Gewinne nicht zu erwarten. Dies gilt nicht für einen bedeutenden Teil der Gewinne der NZBen. Die gemäß Artikel 32.2 der EZB/ESZB-Satzung zu poolenden monetären Netto-Einkünfte der NZBen werden mit Bezug auf die Grundkonzeption als ESZB-Gewinne der NZBen interpretiert und nach dem Deadline-earmarking-Verfahren erfaßt. Entstehende unerwünschte Umverteilungswirkungen zwischen den NZBen können hierbei zwar nicht ausgeschlossen, bei geeigneter Vorgehensweise aber begrenzt werden. Die Analyse der NZB-ESZB-unabhängigen Komponente untersucht den geldpolitischen Spielraum der NZBen, welcher den NZBen auch nach der Gründung der Währungsunion verbleibt. Dieser Teil des Gewinns einer NZB sollte getrennt erfaßt werden und bei der jeweiligen NZB verbleiben.

Résumé

La création et l'allocation des profits de la Banque Centrale dans l'espace euro Une approche conceptuelle

L'analyse de l'allocation de la compétence monétaire dans la zone euro permet une division tripartite de la création des profits de la banque centrale, à savoir en un composant spécifique BCE, BCN-SEBC et un composant indépendant BCN-SEBC. Les profits nets attendus de la BCE sont très limités vu le manque d'activités opérationnelles de celle-ci. De plus, il ne faut pas s'attendre à des effets notables de redistributions provenant de l'allocation des profits de la BCE. Ceci n'est pas valable pour une partie considérable des profits des BCN. Selon l'article 32.2 des statuts BCE/SEBC, les revenus monétaires nets qui doivent être mis en commun sont interprétés, dans les termes du concept de base, comme profits du SEBC générés par les BCN. Ils sont enregistrés selon la procédure *deadline-ear-marking*. Des effets de redistribution indésirables entre les BCN ne peuvent certes pas être exclus, mais limités, en appliquant une procédure adéquate. L'analyse des composants indépendants BCN-SEBC examine la marge des politiques monétaires des BCN, même après leur entrée dans l'union monétaire. Cette partie des profits d'une BCN devrait être enregistrée séparément et rester auprès de la BCN respective.