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COMPARISON AMONG INDIRECT TAXATION METHODS FOR FINANCIAL SERVICES

Guillermo Peña*

May 25, 2025

Summary: Purpose: The present paper analyzes the current situation of taxation of financial services, pointing out the main alternative taxation methods. **Design/methodology/approach:** It is carried out an analysis of them, through the application of all of them to the same numerical example. **Originality:** Subsequently, a comparison of several methods is carried out based on the results of the numerical example and its essential characteristics. **Findings:** As a result, a method is found that is both approximately correct and feasible for taxing financial services in VAT, for example, by applying the recently proposed mobile-ratio method.

Keywords: Financial VAT, taxation methods, VAT, financial services, exemption

JEL: H21, H25

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1. Introduction

This article tries to shed more light on the study of the taxation of financial services in the VAT, through a comparison of the main methods of eliminating the exemption of these services in the tax, an analysis carried out following the same example common to all the approaches and that permits a better comparability and subsequent discussion of the results. It should be noted that in this work the mechanisms of some methods have been simplified to better reflect and compare them according to a common criterion.

This work is divided into the following sections, apart from this introduction. Section 2 describes the main facts related to financial services in the VAT and its current problems. Section 3 presents the main methods and evaluates them following a common criterion, and in Section 4 the results between the different methods are compared and the results are discussed. Section 6 provides further alternatives. Finally, Section 7 concludes.

2. Taxation Methods and Common Comparison Example

2.1. Exemption and comparison example

The exemption implies that financial activity is not taxed, but also that financial entities cannot credit input VAT on non-financial purchases. In this way, the State collects the VAT to be paid, which is equal to zero because a zero tax rate is applied to financial services, plus the VAT paid on financial purchases and which the entity cannot credit due to the exemption. It is usually positive.

The following example shows how the exemption is applied to several financial operations and how it affects non-financial operations. We are going to use this example throughout the entire paper.

A close economy is assumed where there is a banking sector, which we will generally refer to as “banking”, which carries out exactly the same financial operations for the same amount. In addition, there are consumers, Public Administration and companies. All financial operations carried out by financial institutions are provided half to consumers and half to companies. We assume that in all methods, financial entities and companies can pass on financial VAT to consumers and to other companies. The data is representative of a specific period (a quarter), but we assume that the same transactions are carried out in all periods.

Financial institutions cannot credit input VAT on non-financial purchases due to the exemption. Non-financial operations can be seen in Table 1, assuming the current tax rate in Spain of 21%. Non-financial purchases amount to 25 euros, where the input VAT not credited is 5.25 euros.

Table 1. *Non-financial operations in the exemption*

Non-financial operations	Gross amount	VAT rate	Input VAT
Non-financial purchases	25	0.21	5.25

Financial operations include the gross amount of the operation, plus a fix commission, the same for all operations, and a variable commission where we assume that the non-creditable input VAT is proportionally distributed based on the amount of the sum of the absolute values of the financial operations of other years for each of the operations, as shown in Table 2.

Financial entities distribute total profits of 12 euros and incur personnel costs of 125 euros. Totalizing, profits and salaries sum up to 137 euros. Furthermore, the bank margin (difference between interest receipts and payments) is 150 euros and the total commissions rise to 17.25 (fix and variable commissions) and non-financial purchases amount to 25 euros, with input VAT not being included. creditable of 5.25 euros. Totalizing, margin plus commissions net of taxes (subtracting input VAT) minus input VAT also achieves up to 137 euros.

Table 2. *Financial operations in the exemption*

Financial operations	Gross amount	Variable Commission	Fix commission
Loan	4000	2.55	3
Deposit	-4000	2.55	3
Loan interest	200	0.13	3
Deposit interest	-50	0.03	3
Total	150	5.25	12

The profits of banking are:

$$\begin{aligned}\Pi_B &= I - G = D + IP - P - ID + CV + CF - IVA_s - CNF - W = \\ &= 4000 + 200 - 4000 - 50 + 5,25 + 12 - 5,25 - 25 - 125 = 12\end{aligned}\quad [1]$$

Where I are the income, G Expenses, D the amount of the deposits, IP interest on loans, P the amount of the loans, ID interest on deposits, CV the variable commissions, CF fix

commissions, IVA_s the input VAT, CNF non-financial commissions and W the salaries.

The public income obtained by the Administration from these operations is:

$$R = IVA_s = 5,25 . \quad [2]$$

The profits for customers (consumers and companies) are:

$$\begin{aligned} \Pi_p &= CNF-D - IP + P + ID - CV - CF + W = \\ &= 25 - 4000 - 200 + 4000 + 50 - 5,25 - 12 + 125 = -17.25 \end{aligned} \quad [3]$$

The total profits in the economy will be (1) + (2) + (3):

$$\Pi_T = \Pi_B + R + \Pi_p = 12 + 5,25 - 17,25 = 0 . \quad [4]$$

Summarizing, the economy would be as it appears in Table 3.

Table 3. *Economic situation by sectors and total economy with exemption*

	Total revenue	Total expenses	Profits	Change
Financial entities	4217.25	-4205.25	12	0
Public sector	5.25	0	5.25	0
Private Economy	4200	-4217.25	-17.25	0
Total			0	0
GDP (Assets)			17.25	0

The GDP has been represented by the total assets that society has generated in a period, and the "change" column will be used to see the difference between each method that we will examine with the exemption method. The Total represents the sum of total Assets and Liabilities.

2.2. Zero rate (Zero-rating)

As Mirrlees et al. (2011) and Gendron (2008) indicate, this method consists of establishing a 0% tax rate on financial operations and, thanks to it, banks can claim creditable VAT.

Returning to the numerical example, if we apply the zero rate to financial operations, then the financial institution can credit all input VAT, and therefore has no longer to establish a variable commission where 100% of input VAT not credited is distributed among consumers.

Non-financial operations are not modified, with the exception of input VAT, which goes from being non-creditable to creditable.

Table 4. *Financial operations with the zero rate method*

Financial operations	Gross amount	Variable Commission	Fix commission
Loan	4000	0.00	3
Deposit	-4000	0.00	3
Loan interest	200	0.00	3
Deposit interest	-50	0.00	3
Total	150	0.00	12

In financial operations, financial institutions stop applying the variable commission to their customers, since they do not need to transfer the input VAT to them because now they can credit it. In the example in Section 2.1, the economy would look like this:

Table 5. *Economic situation by sectors and total of the economy with the zero rate*

Sector	Total revenue	Total expenses	Profits	Change
Financial entities	4217.25	-4205.25	12	0
Public sector	5.25	-5.25	0	-5.25
Private Economy	4200	-4212	-12	5.25
Total			0	0
GDP (Assets)			12	5.25

Table 5 shows that this method would mean a loss to the public administration of 5.25 euros, which is the input VAT that financial institutions credit. The bank is not affected because it offsets the credit with the elimination of the variable commission. The non-financial private economy earns the 5.25 euros that it stops paying in variable commissions. Therefore, the only beneficiaries with respect to the exemption will be consumers and companies, in equal parts.

Let's see, below, the advantages and disadvantages of this method. Regarding the advantages, first of all, we highlight that non-financial companies will not have to pay the transfer of the tax, since the zero rate allows the credit of the VAT paid by financial entities, eliminating the overtaxation of companies and avoiding, therefore, the cascade effect (Zee, 2005) and the incentive effects of vertical integration when the VAT chain is reestablished. Second, Gendron (2008) shows that this method significantly reduces the distortions and complexity of other methods.

However, applying zero rate to all types of operations (business to business (B2B) and business to consumer (B2C)) suffers from four main disadvantages that will be explained

in order of importance. First of all, it is worth highlighting disadvantages in terms of collection. The Public Administration does not collect neither the services that companies provide to each other, nor the services provided to final consumers. Furthermore, consumers do not contribute to the VAT collection (Gendron, 2008), which maintains the under-taxation of consumers (one could say that it even increases, since the cascade effect that the VAT passed through to them disappears, which are the non-financial purchases that banks could not credit) and a relatively significant revenue is lost with respect to the exemption, since VAT on inputs is no longer collected (Schenk, 2009), even though this collection was not efficient, due to the multiple distortions that it generated and that we have stated in Section 2.

Second, there is some complexity, since a distinction has to be made between financial and non-financial services, as it occurs in the exemption, which can lead to problems of definition and interpretation.

Third, distortions in competition stand out. The main distortion occurs when there are different relative prices between taxed and zero-rated services, which generates a non-neutral effect (Gendron, 2008).

Finally, the reduction in the degree of compliance through the reduction of the tax base is relevant. There is a potential increase in fraud (Gendron, 2016), because the zero rate does not allow sales control, and may increase the risk of overvaluation of purchases to obtain a greater credit. It also increases the risk of tax planning behaviors (Gendron, 2016). For example, the emergence of individual entrepreneurs would encourage to avoid paying the tax. The reason is that, as entrepreneurs can credit input VAT on inputs, unlike individuals, the conversion from final consumer to individual entrepreneur is encouraged. In this way, a method must be found that minimizes this type of damage.

A variant of this method should be highlighted, which applies the zero rate only to businesses (B2B), while consumers remain exempt. This variant has an additional disadvantage: input VAT on non-financial purchases needs to be distributed between taxable and exempt transactions, which generates complexity (Zee, 2005; Merrill, 2011; Keen, et al., 2016). Boadway and Keen (2003) also point out the cost derived from distinguishing between purchases made for personal or business use.

2.3. *Exemption with partial credit in inputs (exemption with input credits)*

This method consists of a partial recovery of the credit in the inputs. It is also known as the “partial input recovery” method and allows the credit of a percentage of the input VAT. Therefore, as Zee (2006), Gendron (2008) and Merrill (2011) point out, it is an intermediate method between the exemption, where inputs are not credited, and the zero rate, where 100 of input VAT is credited.

Let's continue with the practical case of this chapter and suppose that the creditable VAT amounts reaches the 75% of the total input VAT, following the case of Australia:

Table 6. *VAT credited on non-financial purchases*

% Tax-creditable		0.75
% non-creditable VAT		0.25

Non-financial operations	Gross amount	VAT rate	Input VAT	VAT credited
Non-financial purchases	25	0.21	5.25	3.9375

It can be seen that the calculation of the credited VAT is simple: the input VAT is multiplied by the percentage of creditable VAT and the amount is obtained.

In Table 7 it can be seen that the bank passes on the non-creditable input VAT to the private economy in the form of variable commissions and obtains a credit for the part of the input VAT that is creditable, which allows it to partially eliminate the variable commissions, so that financial entities charge only 1.31 euros in variable commissions, without changing their situation with respect to the exemption. The situation of the public sector does shift, since it obtains 3.94 euros less in revenue compared to the exemption situation due to the credit of 75% of input VAT on non-financial purchases by banks. The private economy benefits from the partial elimination of variable commissions, which amount ups to 3.94 euros.

Table 7. *Financial services and situation with the exemption with partial credit in inputs*

Financial operations	Gross amount	Variable Commission	Fix commission
Loan	4000	0.64	3
Deposit	-4000	0.64	3
Loan interest	200	0.03	3
Deposit interest	-50	0.01	3
Total	150	1.3125	12

	Total revenue	Total expenses	Profits	Change
Financial entities	4217.25	-4205.25	12	0
Public sector	5.25	-3.9375	1.3125	-3.9375
Private Economy	4200	-4213.3125	-13.3125	3.9375
Total			0	0
GDP (Assets)			13.3125	-3.9375

In this method, since the percentage is fixed in advance, the problem of proration, typical of exemptions, disappears. Thanks to this, it is possible to totally or partially eliminate the problem of the cascade effect. However, the problem of under-taxation of consumers remains.

2.4.Taxation of explicit fees and commissions

This method includes the mandatory taxation of all explicit charges of financial operations through the invoice credit method, which in this case can be applied directly. In addition, entities can credit input VAT on inputs.

In the method of taxing commissions, the distortion is due solely to the non-taxation of the financial margin, since both the commissions are taxed and the input VAT credited. Continuing with the numerical example of this work, when applying this method, Table 8 is obtained.

Table 8. *Financial operations with commission charges*

Financial operations	Gross amount	Variable Commission	Fix commission	financial VAT
Loan	4000	0.00	3	0.63
Deposit	-4000	0.00	3	0.63
Loan interest	200	0.00	3	0.63
Deposit interest	-50	0.00	3	0.63
Total	150	0.00	12	Output VAT: 2.52

In Table 8 it can be seen, on the one hand, that the variable commission disappears because the bank can credit the input VAT, and on the other, that the financial VAT is applied exclusively to the commissions, applying 0.21 to the 3 euros fix commission for each operation, amounting to 2.52 euros of output VAT.

Table 9 details the achievement of the result of the tax base, calculated as the sum of the fix commissions of the four operations, the amount where the VAT is applied and the

output VAT is obtained, with the bank being able to credit the $5.25 = 25 \times 0.21$ euros of creditable input VAT, so that the VAT to be paid amounts to -3.73 euros, as the difference between the output VAT and the credit for input VAT. The VAT on financial services is $2.52 = -3.73 + 5.25$, equal to the VAT to be paid plus the input VAT.

Table 9. VAT to be entered, borne and situation of the economy with commission tax

1)=3*4	Tax base	12
2)=1)*0.21	Output VAT	2.52
3)=25*0.21	Creditable input VAT	5.25
4)=2)-3)	VAT to be paid	-3.73
5)=3)	Input VAT	5.25
6)=[2)-3)]+5)=4)+5)	VAT financial services	2.52

	Total revenue	Total expenses	Profits	Change
Financial entities	4217.25	-4205.25	12	0
Public sector	7.77	-5.25	2.52	-2.73
Private Economy	4200	-4214.52	-14.52	2.73
Total			0	0
GDP (Assets)			14.52	2.73

In the situation of the economy, it can be seen how both the input VAT and the output VAT constitute income for the Administration, being $7.77 = 5.25 + 2.52$ euros and the credit represents an expense of 5.25 euros.

It can be seen that the bank passes on the VAT of its commissions to the private economy, and obtains a credit for the input VAT that allows it to eliminate the variable commissions, so that the bank does not change with respect to the situation with exemption. The public sector does change, since it obtains 2.52 euros more in revenue thanks to the tax on commissions, but loses 5.25 due to the credit of VAT on inputs, so that the administration ends up losing a total of $5.25 - 2.52 = 2.73$ euros. The private economy profits from the elimination of variable commissions, but has to pay VAT on fix commissions, increasing its profits to 2.73 euros.

This method has different advantages. The first and main advantage of holding explicit commissions taxed is that these types of charges are easy to tax through the credit-invoice method. Second, this method promotes economic efficiency by reducing the over-taxation

of companies—which causes the cascade effect—and the under-taxation of consumers (Merrill, 2011).

However, three main disadvantages stand out. First, the financial margin is still exempt, and thus, not all the value added is being taxed. In this way, the full elimination of consumer under-taxation is not achieved and, therefore, tax collection levels remain low. Second, incentives are created to replace explicit commissions with implicit margins, due to the fact that banks can increase their financial margin in order to compensate for losses due to the levy of commissions, or reduce these charges and instead increase the implicit margin achieved from intermediation between savers and debtors. The reason that this approach, which directly applies the credit-invoice method, cannot be extended to implicit margins is that it is very simple to apply for explicit commissions, but is very complicated to apply for implicit margins charged to products such as loans and deposits. This is because most financial services do not have an explicit price. It should be noted that financial products or services where explicit commissions are applied represent a very small part of total financial transactions. Third, the financial entities are forced to differentiate between taxable and exempt purchases in order to claim the credit of the tax established on productive factors, which generates numerous compliance costs.

Gendron (2008) considers that this method is an intermediate form between exemption and complete taxation of financial operations. A variant of the method consists of taxing only agency services (broker services, stock transactions...).

2.5. Gross interest method

As the name suggests, VAT is imposed on the gross interest on loans. Financial institutions cannot claim the credits (Mullins, 2006 and Gendron, 2008). The gross interest method is as distorting for deposits as the exemption, since interest on deposits is not taxed.

The example in section 2.1 would be as explained below. Table 10 shows how VAT would be applied to the financial services in the example in this chapter, following the gross interest method. VAT is applied, therefore, to the gross amount of interest on the loans, 200 euros, that is, the financial institution passes on $42 = 200 \times 0.21$ euros. Since financial entities cannot credit input VAT from inputs, they apply the amount to financial operations as a variable commission, just as was the case with the exemption.

Table 10. *Financial services with the application of the gross interest taxation method*

Financial operations	Gross amount	Variable Commission	Fix commission	financial VAT
Loan	4000	2.55	3	0
Deposit	-4000	2.55	3	0
Loan interest	200	0.13	3	42
Deposit interest	-50	0.03	3	0
Total	150	5.25	12	Output VAT: 42

Table 11 shows, however, how the VAT on financial services is calculated, as a difference between the VAT to be paid, which in this case is equal to the output VAT due to the absence of creditable VAT, plus the input VAT.

It can be seen that it is a method similar to the exemption, but including a positive tax on the gross interest of the loans granted. The administration gains with respect to the exemption the 42 euros that the bank charges in VAT for the interest on the loans, since it has income worth 47.25 euros, which the private economy contributes in the form of borne and passed-on financial VAT, and does not incur any expenses since the input VAT is not creditable. The non-financial private economy loses with respect to the exemption what the Administration gains, that is, 42 euros, since it loses the amount it pays to use financial services.

Table 11. *VAT to be entered, borne and situation of the economy with gross interest taxation*

1)	Tax base	200
2)=1)*0.21	Output VAT	42
3)	Creditable input VAT	0
4)=2)-3)	VAT to be paid	42
5)	Input VAT	5.25
6)=[2)-3)]+5)=4)+5)	VAT financial services	47.25

	Total revenue	Total expenses	Profits	Change
Financial entities	4217.25	-4205.25	12	0
Public sector	47.25	0	47.25	42
Private Economy	4200	-4259.25	-55.25	-42
Total			0	0
GDP (Assets)			55.25	42

The main advantage of this method, in its theoretical formulation, is that it allows positive collection derived from the taxation of the gross interest on the loans without giving up the collection of input VAT on inputs.

This system also has problems and disadvantages. We highlight two. First, the cascade effect occurs by maintaining the non-credibility of input VAT on non-financial purchases, thereby obtaining inefficient collection and, in addition, the tax is applied to both the cash price and the financing (Mullins, 2006). This is because capital gains are usually taxed, in addition to the implicit margin, because all the interest on the loans is taxed and not only the part corresponding to the charge—value added—, representing inefficient collection. Second, the charge implicit in other services, such as deposits, is not taxed. Therefore, the under-taxation of consumers remains partially, and the differentiation between taxable and exempt services is not eliminated, also creating incentives to replace taxed margins with untaxed charges.

2.6. Addition method

The European Commission (1997) explains how this method works: the tax is calculated considering the sum of salaries, capital costs and business profits as the tax base. It is an accounts-based method, not transaction-by-transaction like the credit-invoice method, being incompatible with the latter, so that registered companies are not allowed to claim the VAT paid on purchases in systems of the VAT where an account-based method is not applied. The addition method is based on the fact that the value added generated by a company is equal to the compensation paid or payable to its employees or owners.

In the example in Section 2.1, the results in Table 12 would be obtained, without modifying the non-financial operations. We assume that banks can charge VAT on inputs by applying the addition method throughout the economy. Table 12 shows the mechanism for obtaining financial VAT through the addition method and the situation of the economy. The tax base is obtained by adding personnel expenses (125 euros) and profits (37 euros). The output financial VAT is calculated by applying the general rate to the tax base of 162(=125+37) euros, obtaining 34.02(=162*0.21) euros.

Table 12. *Obtaining the VAT to pay and situation of the economy with the addition method*

Personal expenses	Profits	Taxable base=Profits + Personnel expenses	Output financial VAT=Base*0.21
125	37	162	34.02

	Total revenue	Total expenses	Profits	Change
Financial entities	4217.25	-4205.25	12	0
Public sector	39.27	-5.25	34.02	28.77
Private Economy	4200	-4246.02	-46.02	-28.77
Total			0.00	0.00
GDP (Assets)			46.02	28.77

The total income of the public sector is equal to the VAT payable plus the input VAT, $39.27(=34.05+5.25)$ euros, and the expenses are the credit of 5.25 euros, being the profits of the public sector equal to the VAT charged. The financial sector earns the 12 euros of profits and the private economy loses what the financial sector and the public sector earn jointly. It can be seen that the addition method would have the same effects on the economy as the cash flow method.

The main advantages of this method are its simplicity and the full taxation of the value added generated by financial services. The addition method has, however, numerous drawbacks.

First, the addition method is the least manageable method of establishing a consumption tax. Therefore, the principle of simplicity is violated. Despite this, Bird and Gendron (2005) consider this method as a simple solution.

Second, it highlights the incompatibility of the addition method with the credit-invoice method for the provision of financial services: if financial services were provided only to families, then the addition method would allow an efficient VAT for financial transactions. The problem is that financial entities also provide financial services to other companies. The entity does not determine the value added on a transaction-by-transaction basis, which is necessary for VAT to be transmitted from the financial institution to the company. Therefore, the company will not be able to credit the input VAT and there will be a cascade effect. In addition, the financial institution is making purchases of financial and non-financial services, which would have to include both types of purchases. But since VAT from non-financial entities is being collected using the credit-invoice method, then it is inappropriate to include the salaries and profits associated with those purchases in the tax base. At the same time, it is necessary to credit taxes on inputs that correspond to purchases from non-financial companies. This is too complicated.

Third, we must point out the origin of the base: the addition method determines the value added through the contributions of employees and owners, which is why the destination of purchases does not appear in this method. Consequently, there is no simple way to exclude the value added of exported products.

Fourth, we must mention the non-compliance with the income tax: to facilitate compliance, the way for measuring profits under the VAT addition method is traditionally the same as that defined by the income tax, whose measure is not suitable for this VAT

method for several reasons. One of them is that under a consumption-type VAT, both current and capital expenses are fully creditable, while in the income tax only the amortizable part over the life of the capital is credited from capital expenses. There is no credit for non-depreciable capital, such as land, and inventories cannot be credited unless they are resold.

2.7. Cash flow with TCA method

The cash flow method developed for financial services is a version of the previous approach applied to general goods and services, but adapted to financial services and to be compatible with the credit-invoice method. As indicated by the European Commission (1997), Gendron (2008) and Mirrlees et al (2011), all monetary flows from financial operations that reach the bank are treated as taxable sales whose VAT must be entered and all outflows are treated as taxable purchases whose VAT can be credited. In this way, cash flows from financial transactions are treated in the same way as non-financial purchases and sales. This method was developed by Hoffman et al. (1987) and Poddar and English (1997).

In the Tax Calculation Account (TCA) version of the method, the loan margin is taxed separately, obtained as the interest on the loans minus the interest of the indexation index, proxy for pure interest, and the margin on deposits, obtained as the difference between the indexed interest and the interest on deposits. Furthermore, we have assumed that commissions are also taxed, an assumption that we will maintain from now on.

A collection equivalent to the theoretical formulation of the addition method is obtained for aggregate effects. Assuming that the indexed interests are 100 euros, the financial operations would be in accordance with Table 13:

Table 13. *Situation of financial operations with the cash flow method with TCA*

Financial operations	Gross amount	Variable Commission	Fix commission	financial VAT
Loan	4000	0.00	3	0.63
Deposit	-4000	0.00	3	0.63
Loan interest	200	0.00	3	$(200-100+3)*0.21=21.63$
Deposit interest	-50	0.00	3	$(100-50+3)*0.21=11.13$
Total	150	0.00	12	VAT to be paid: 34.02

The cash flow method in its TCA variant is applied to the loans by subtracting the indexed interest (100) from the loan interest (200), all multiplied by the VAT rate. In addition, VAT commissions must be added to each operation ($3 \times 0.21 = 0.63$). On deposits, indexed interest is subtracted less deposit interest (50) and VAT is applied. In this way, the situation of the economy remains the same as in Table 18, with the basic cash flow method, since the VAT to be entered is the same.

As the European Commission (1997: p. 126) points out, regarding the TCA variant of cash flow and the taxation of financial services in general “more analysis is required”, especially with regard to the choice of the type of indexing. This is because the choice of a fix indexation rate does not take into account the characteristics of the transaction, such as the average maturity period, which leads to the VAT paid by depositors or borrowers only varying between financial institutions when the interest rate is different, although the competitive position or margin structure of the financial institutions is different. The opposite case may also occur, where the interest rate of a contract remains fix but the indexation rate changes, varying the VAT charged to the Administration. Although a type of indexation associated with the maturity of the contract would solve these problems and this possibility was studied by the consulting firm that carried out the experience with the European banks, this option turned out to be “not feasible” in practice (Ernst and Young , 1998), being necessary to apply the same type of indexation for all operations without taking into account variables such as the average maturity period of each product or the characteristics of each financial entity, with the problems that this entails.

2.8.Mobile ratio method

Being aware of the existing trade-off between neutrality and precision, on the one hand, and the need to simplify administrative compliance, on the other (Bird and Gendron, 2005), López Laborda and Peña (2018) have formulated a method that improves the previous methods. The resulting method seeks to solve the problems of the exemption and other methods described above, to be fully compatible with the invoice credit method and to be simple and more neutral than the different versions of the cash flow method proposed by Hoffman et al. (1987), Poddar and English (1997) and Zee (2005) and the hybrid method proposed by Bakker and Chronican (1985) and Bird and Gendron (2005). It seeks to tax all consumption of financial services using the general VAT rate and apply to all types of financial services, not just those provided by financial institutions, since non-financial companies sometimes also provide financial services to consumers or other

businesses (Zee, 2006). They have developed a method that exceeds these criteria, the mobile-ratio method.

In this method, all explicit charges (commissions) are taxed with the general VAT rate, since the credit-invoice method can be applied directly, without the need for any additional modification, and the financial margin by the mobile-ratio method. The financial margin can be calculated by an account-based method and then assign each value-added amount to its respective transaction through the ratio. Thus, the financial margin is obtained for each financial entity by the addition method, adding wages and salaries, profits and capital costs and subtracting commissions, and that of each non-financial entity as the difference between the interests received and paid as interest to other non-financial entities.

A collection equivalent to aggregate effects is obtained with the theoretical formulation of the cash flow method with TCA, although the result for loans and deposits changes individually, highlighting that in the TCA the choice of the indexation interest requires certain discretion due to its difficulty in calculation, while the underlying indexation interest obtained by the analyzed method is quite representative of the interests of short-term bonds according to López-Laborda and Peña (2018). According to the formulation of these authors, the implicit pure interest would be 80 $(=(2*200*50/(200+50))$ euros. Knowing that the mobile-ratio is 0.6 $(=(200+50)/(200+50))$, the financial operations would be in accordance with Table 14:

Table 14. *Situation of financial operations with the cash flow method with TCA*

Financial operations	Gross amount	Variable Commission	Fix commission	financial VAT
Loan	4000	0.00	3	0.63
Deposit	-4000	0.00	3	0.63
Loan interest	200	0.00	3	$(200*0.6+3)*0.21=(200-80+3)*0.21=25.83$
Deposit interest	-50	0.00	3	$(50*0.6+3)*0.21=(80-50+3)*0.21=6.93$
Total	150	0.00	12	VAT to be paid: 34.02

This mobile-ratio method applies the ratio, calculated in aggregate by the addition method with data from the previous quarter, to the interest on loans and deposits, being equivalent to the TCA using a financial services gravity equation for the indexation index. VAT is levied on this amount, along with commissions.

3. Comparison between methods and discussion

In this section we analyze, initially, the consequences of the application of each method on each economic sector in terms of income and then we jointly evaluate all the methods according to, first, the impact on neutrality and, second, the advantages and disadvantages set out in the previous section.

Tables 15 and 16 show the situation of the economy for each method, ordered, as in Section 2, from lowest to highest tax on value added.

It can be seen that financial entities are affected in the same way in all methods, since in methods with input VAT credit variable commissions are eliminated and in methods without credit they are maintained, which allows financial entities not to be directly affected by VAT taxation on financial services.

The greatest variation occurs in the public sector and in the private economy, with the former earning what the latter loses and vice versa. The method with which the public sector loses more revenue with respect to the exemption is the zero rate, where the State loses the collection (on the other hand, inefficient) of the input VAT from the inputs that financial entities can credit. On the other hand, the Administration does not enter any VAT due to the presence of a tax rate equal to zero. On the other hand, the method with which the State obtains greater revenue is gross interest, but at the cost of taxing, in addition to the value added and the non-credited input VAT, the financial capital included in the part of the interest that does not include the financial margin.

The methods that exactly achieve optimal collection are the cash flow methods in their TCA version, addition and mobile-ratio methods. The approach that most closely approximates this optimal collection is the gross interest method, although it must be taken into account that collection is not efficient for the reasons explained above.

In the private economy, the opposite case occurs: the method with the least negative affection is the zero rate, followed by the partial credit in inputs, the tax on commissions and the exemption, all of them with collection less than optimal one and at the same level among them. The optimal collection comes from the cash-flow methods with TCA, addition, and the mobile-ratio method, and finally, the gross interest method, with collection that is higher than the efficient one since it taxes not only the value added but also part of the capital.

To improve comparability between the methods and present them in a more visual way, Table 16 identifies some desirable properties of the methods and assesses whether they are met or not, summarizing their main characteristics. To do this, a distinction is made between the exemption and modifications to the exemption and alternatives to it.

Table 15. *Main results of the numerical example applied to the methods.*

Method	Sector	Total revenue	Total expenses	Profits	Change
Exemption	Financial entities	4217.25	-4205.25	12	0
	Public sector	5.25	0	5.25	0
	Private Economy	4200	-4217.25	-17.25	0
	Total			0	0
	GDP (Assets)			17.25	0
Zero type	Financial entities	4217.25	-4205.25	12	0
	Public sector	5.25	-5.25	0	-5.25
	Private Economy	4200	-4212	-12	5.25
	Total			0	0
	GDP (Assets)			12	5.25
Partial credit in inputs	Financial entities	4217.25	-4205.25	12	0
	Public sector	5.25	-3.9375	1.3125	-3.9375
	Private Economy	4200	-4213,3125	-13.3125	3.9375
	Total			0	0
	GDP (Assets)			13.3125	-3.9375
Commission tax	Financial entities	4217.25	-4205.25	12	0
	Public sector	7.77	-5.25	2.52	-2.73
	Private Economy	4200	-4214.52	-14.52	2.73
	Total			0	0
	GDP (Assets)			14.52	2.73
Gross interest	Financial entities	4217.25	-4205.25	12	0
	Public sector	47.25	0	47.25	42
	Private Economy	4200	-4259.25	-55.25	-42
	Total			0	0
	GDP (Assets)			55.25	42
Addition, TCA and mobile-ratio	Financial entities	4217.25	-4205.25	12	0
	Public sector	39.27	-5.25	34.02	28.77
	Private Economy	4200	-4246.02	-46.02	-28.77
	Total			0.00	0.00
	GDP (Assets)			46.02	28.77

It is observed that the methods that add a greater number of desirable properties that are not met are the account-based and zero-type methods, while the methods with more desirable properties are the mobile-ratio method and cash flow with TCA. , without there being any desirable property that they totally violate. A middle ground is found in the

partial credit, explicit commission taxation and gross interest methods, with only two properties that do not fully comply.

Table 16. *Comparison of characteristics between the different methods (I)*

Exemption and exemption modifications				
Method	Exemption	Zero type	Exemption with partial credit in inputs	Commission tax
Variants				Tax agency services
waterfall effect	Yes	No	Not approximately	Reduces it
Undertax consumers	Yes	Yes	Yes	Reduces it
Invoice credit compatibility		Yes	Yes	Yes
Tax Collection	VAT on inputs	Zero	A percentage of VAT on inputs	Tax rate*Fees
Advantages	Simplicity	Simplicity	Application of the same reduction percentage for the same type of transactions	Simplicity
Disadvantages	Economic distortion	Low collection	Maintains undertaxation on consumers	Does not tax the margin
Sources		Poddar (2003), Joseph (2004), Schenk & Zee (2004), Bird and Gendron (2005), Gendron (2008)	Poddar (2003), Schenk & Zee (2004), Bird and Gendron (2005), Gendron (2008)	Poddar (2003), Bird and Gendron (2005), Gendron (2008)

Alternatives to exemption				
Method	Gross interest taxation method	Addition	Cash flow method	Mobile Ratio
Variants		Offset addition	TCA, truncated TCA, portfolio TCA	Modified Mobile-Ratio
Waterfall effect	Yes	Yes	No	No
Undertax consumers	Sometimes	Yes	No	No
Invoice credit compatibility	Yes	No	Yes	Yes
Tax Collection	Less than optimal for financial institutions	Optimal for financial institutions	Optimal for financial institutions	Approximately optimal in aggregate for financial entities
Advantages		Simplicity although not very manageable	Conceptually attractive	Simple, manageable and quite precise while feasible
Disadvantages	It does not tax the interest of depositors nor can input VAT be credited from inputs	Distorts the economy	Not feasible in practice, liquidity problems with basic cash flow	Requires calculation and modification of the ratio each quarter
Sources	Bird and Gendron (2005), Gendron (2008)	Poddar (2003), Schenk & Zee (2004), Bird and Gendron (2005), Gendron (2008)	Poddar & English (1997), Bird and Gendron (2005), Gendron (2008)	Lopez-Laborda and Peña (2018), Nenikova and Angelov (2019)

Source: own elaboration

4. Concluding remarks

The main conclusions obtained are the following. First, the elimination of the VAT exemption for financial services allows improvements in the tax principles of efficiency, equity, sufficiency and simplicity. The increase in efficiency is due to the elimination of distortions generated by under-taxation of consumers, over-taxation of companies, the cascade effect and vertical integration. There is a progress in equity, since financial services are largely consumed by high-income people. In sufficiency, progress is a consequence of greater collection. Finally, the elimination of the exemption enhances the simplicity principle by eliminating administrative and compliance complexities arising from the exemption.

Second, from the comparison of the methods of taxation of financial services in VAT, it is concluded that the methods of application at the transaction-by-transaction level are more economically desirable, although financial services are not fully taxed, compared to those based in bank accounts. Methods have been developed in the literature that are formally correct, but difficult to apply, highlighting cash flow methods, so they have not yet been implemented in any country, despite attempts in the European Union. On the other hand, in several countries, practices of taxing financial services in VAT have been successfully tested, either through a partial taxation compatible with the invoice credit method or a full taxation of these services through a account-based method, but not compatible with the VAT chain.

Finally, in this work we propose as an alternative to existing methods the “mobile-ratio” method developed by López-Laborda and Peña (2018), which uses a periodically updated ratio to assign a company's financial margin to each financial transaction. obtaining an approximately full tax on the value added of financial services. This method meets all desirable criteria that the exemption does not meet and improves existing methods. Furthermore, this practice can also be applied to financial services provided by non-financial companies, eliminating possible incentives for financial disintermediation and, therefore, an erosion of the tax base.

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