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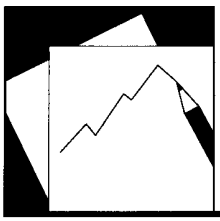

IMF Working Paper

Quasi-Fiscal Deficit in Nonfinancial Enterprises

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Quasi-Fiscal Deficit in Nonfinancial Enterprises

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Abstract

This paper discusses two ways of evaluating the quasi-fiscal deficit (QFD) and the link between them. It also suggests how to properly account for the QFD when calculating the overall deficit of the public sector. Finally, using an example of the energy market, it shows how to untangle a web of mutual nonpayments and properly evaluate the QFD generated in a sector characterized by the presence of both private and public agents.

JEL Classification Numbers: H24, H62

Keywords: quasi-fiscal deficit, implicit subsidies, tax arrears, payment arrears

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I. Introduction

The concept of a quasi-fiscal deficit (QFD) is a subject that often comes up in the policy papers of international financial institutions. Common examples include utility companies that provide services at prices below cost-recovery levels; public enterprises that purchase more resources than needed or at prices above market ones; and financial institutions that give out housing loans at rates below those prevailing in the market.

Several IMF papers discuss this concept. McKenzie and Stella (1996) look at the quasi-fiscal operations of financial institutions. Petri, Taube, and Tsyvinski (2002) propose two ways of evaluating the QFD in the energy sector—an end-product approach and a financial balance approach. Finally, two recent papers—by Chivakul and York (2006) and Saavalainen and ten Berge (2006)—apply this methodology to the cases of Ghana and the Commonwealth of Independent States (CIS) countries.

This paper takes another look at the methodology proposed by Petri, Taube, and Tsyvinski and discusses the link between the two estimation methods. It also introduces additional factors into the framework, such as explicit government subsidies and commercial borrowing. Next, it suggests a way of adding up the QFD and the regular budgetary deficit. Finally, using an example of the electricity market, it shows how to evaluate a web of mutual nonpayments.[2]

II. The Quasi-Fiscal Deficit: Definition and Methodology

A. The Quasi-Fiscal Deficit: Its Components

Quasi-fiscal activities refer to operations that result in a net transfer of public resources to the private sector through nonbudget channels (IMF, 2001, pp. 27–32). They may have significant macroeconomic implications: not reported, they distort the picture regarding the government's true fiscal position as well as its size; they may generate significant contingent liabilities; they may lead to central bank losses, thus contributing to monetary expansion and resulting in crowding out and increasing debt; acting in the same way as taxes and subsidies, they may have undesirable redistributive effects.

In the example considered in this paper, the QFD and contingent liabilities arise because of the provision of services at low prices through publicly owned enterprises. These losses do not show up in the books until these entities experience financial distress and the state is forced to intervene and bail them out. The longer the enterprises manage to linger on, the bigger the bailout is likely to turn out to be.

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[2] The paper does not provide any numerical examples. For an application of discussed methodology, see IMF (2002).

An enterprise may find itself in distress not only because it is forced to provide services at low prices, but also because it does not have enough power to ensure full payment collection. Not being able to raise enough funds, the enterprise may finally be forced to cut down on necessary maintenance expenditures, operating inadequate and obsolete equipment, which in turn may result in additional output losses. Losses may also reflect tolerated theft.

Apart from constituting a factor contributing to future troubles, cutting down on maintenance is also a way of financing the QFD. However, it is not the only one. Often an enterprise facing payment arrears starts to run arrears itself with suppliers and tax authorities. The state is often reluctant to enforce payment of the tax arrears, since it is to some degree their cause. In the past, the authorities in such countries have resorted to various offset schemes, canceling debt of the state entities to the state-owned providers in exchange for the tax debt. Private agents unfortunate enough to have to deal with such enterprises, however—for example, as providers of supplies or labor—generally do not have such tools at hand, and find in turn their own businesses in trouble.

In the end, inadequate payments get woven into a complicated web of mutual arrears, being often two sides of the same coin, which makes their evaluation as well as an evaluation of the overall public sector deficit overly complicated.

B. Methodology

Let us consider state-owned enterprise E, which produces output C using input Y priced at level Q. E also pays taxes T, which for simplicity's sake are assumed to be exogenous, and invests I.[3] In order to finance its expenditures, E may receive direct subsidies S from the budget, or borrow explicitly in the amount of B.[4] Finally, D reflects E's profits, which might be distributed in the form of dividends.[5]

If the price of the output is P, then the cash budget constraint of the enterprise is as follows:

$$QY + T + I + D = PC + S + B \tag{1}$$

With S and B equal to 0, P reflects a cost-recovery price level, since for the given Q and D, enough funds are generated to cover production costs, tax and dividend payments, and

[3] For the sake of simplicity, investment is assumed to mean only maintenance and the replacement of depreciated capital.

[4] B is the borrowing net of principal and interest payments.

[5] Dividends are introduced in order to reflect the case of an enterprise that is partly owned by private investors.

investment needs. This means that if the state wants to subsidize consumers by providing services at a low price—that is, if it tries to decrease P—the only way to do so is to increase S or decrease D.

In addition to the mentioned costs, E may also incur additional costs of a quasi-fiscal nature:

If the enterprise is a provider of some public services, it may be forced to subsidize consumers and charge them lower prices, P_1. As a result, the enterprise incurs additional costs, $QFP = (P–P_1)C$, arising from the *tariff being lower than the cost-recovery level, P*.

If *tariff payments are not being made in full*, than E incurs additional costs, equal to $QFC = (1 – R^P)P_1C$, where R^P is a payment collection ratio, and is a number between 0 and 1.

The QFD may result in underinvestment (see below) and thus lead to *output losses L*, which could have been avoided if the maintenance had been done in a timely manner. These losses also represent the QFD, and can be characterized as output for which no payment was received, $QFL = PL$.

Note that the loss-related QFD can be split into two subcomponents. One of them, P_1L, represents the forgone revenue that could have been received at the prevailing prices had L been sold to consumers; the other, $(P–P_1)L$, represents losses arising from the fact that the actual price is less than its cost-recovery level.

The result of incurring quasi-fiscal losses is lower profits, D. However, if P_1, R^P or the initial level of profits D are very low, or if losses L are very high, enterprise E may face cash constraints and be forced to run arrears.

As discussed, one option is to run *payment arrears* $A^Q = (1 – R^Q)QY$ or *tax arrears* $A^T = (1 – R^T)T$, where R^Q and R^T are numbers between 0 and 1. The other option is to *underinvest* by the amount of $A^I = (1 – R^I)I$, where R^I is a number between 0 and 1.

It might be more appropriate to consider these arrears as loans, either from the tax authorities, suppliers of inputs, or, in case of A^I, from future generations. However, these loans are obviously provided at very low interest rates (if any at all), because otherwise, it would be more beneficial to borrow directly by increasing B. This means that E is receiving a service (a loan) at a price (the interest rate) below the market one—that is, E is receiving a quasi-fiscal subsidy.

The cash budget constraint for enterprise E thus looks as follows:

$$R^{Q}QY + R^{T}T + R^{I}I + D = P_{1}R^{P}(C - L) + S + B \tag{2}$$

Partial payments for supplies and taxes, partial investment, and dividend payments are covered by partial payments for output, explicit subsidies, and borrowing. Notice that enterprise E should receive payments in the amount of PC, but instead receives only $P_{1}R^{P}(C - L)$. This happens for three reasons: first, some output is lost; second, output is priced below cost-recovery levels; finally, payments are not received in full.

Rewriting equation (2) in a manner similar to that of equation (1) produces:[6]

$$QY + T + I + D - \underline{(1 - R^{Q})QY} - \underline{(1 - R^{T})T} - \underline{(1 - R^{I})I} =$$

$$= P_{1}(C - L) - \underline{(1 - R^{P})P_{1}(C - L)} + S + B$$

$$QY + T + I + D + QFC = A^{Q} + A^{T} + A^{I} + P(C - L) - \underline{(P - P_{1})(C - L)} + S + B$$

$$QY + T + I + D + QFC + QFP = A^{Q} + A^{T} + A^{I} + PC - \underline{PL} + S + B$$

$$QY + T + I + D + QFC + QFP + QFL = A^{Q} + A^{T} + A^{I} + PC + S + B$$

After regrouping the terms, equation (2) begins to look as follows:[7]

$$[QY + T + I + D - PC] + [QFP + QFC + QFL] = S + B + [A^{Q} + A^{T} + A^{I}] \tag{2a}$$

Here, $QY + T + I + D - PC$ represents what could be called a structural deficit, while $QFP + QFC + QFL$ represents a quasi-fiscal one. In order to finance the overall deficit, enterprise E may rely on explicit subsidies S, borrow explicitly B, or resort to quasi-fiscal means, such as running arrears $A^{Q} + A^{T} + A^{I}$.

Note that, given the definition of P, the structural deficit cannot be different from zero. If it is negative (i.e., if there is a surplus), P is too high, and if it is positive, P is too low. Another factor that can be adjusted is the level of profits D, which, however, has to remain nonnegative.

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[6] Rearranged terms are underscored for better tractability.

[7] Note that the QFC and QFP components refer to the amount of output equal to $C - L$.

Hence, as equation (2a) demonstrates, the QFD can be evaluated in two ways: from "above the line," by adding up its subcomponents—similar to what Petri, Taube, and Tsyvinski (2002) refer to as an end-product approach[8]—or from "below the line," by summing up the financing means, both quasi-fiscal and fiscal (such as *S* or *B*)—similar to what Petri, Taube, and Tsyvinski (2002) refer to as a financial balance approach.

At this point, it is worth considering a number of issues. First, how does one measure the cost recovery price *P*? Equation (1), which provides a theoretical basis for such calculations, is actually not particularly useful in practice—for example, it is difficult to measure necessary investment needs. An alternative approach makes use of the prices prevailing on world markets. This may not be appropriate either, since the economy may have an advantage in production of a good, and hence be able to deliver it domestically at lower prices. Raising prices because of higher world prices often turns out to be unfeasible for political reasons.[9]

Second, why is the QFD often referred to as an implicit subsidy? Let us draw an analogy. Imagine that the fiscal authorities start with a balanced budget and decide to increase subsidies. The result will be a budget deficit caused by these subsidies. In a similar fashion, when a state-owned enterprise provides services at prices below cost recovery, it provides an implicit subsidy to consumers, causing a QFD.

Finally, note that this methodology is simplified and ignores several factors that make reality more complicated. First of all, inadequate prices are likely to result in higher consumption (which would also imply that higher amounts of inputs are needed) and lower taxes (thus reducing budget revenues). Evaluating these differentials, however, is extremely tricky, since it requires data on various elasticities, which are difficult to obtain.

Moreover, it is often the case that low prices for certain consumer groups induce higher prices for other groups. This may allow for average prices to remain at the appropriate levels. For example, in many transitional economies, energy prices are lower for residents but higher for industrial consumers. This cross-subsidization distorts the economy's price structure and undermines producers' competitiveness in external markets. At the same time, in internal markets, higher input prices are likely to lead to higher output prices, thus passing costs onto consumers.

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[8] Saavalainen and ten Berge (2006) estimate the QFD for the electricity sector of the CIS countries using an aggregate formula: $QFD = PC / (1 - l) - P_1 C R^P$, where l is the loss rate. It can be demonstrated that the QFD defined this way can be broken into the three components described in the text.

[9] Saavalainen and ten Berge (2006) use World Bank estimates based on the opportunity costs of alternative uses of inputs.

C. The Overall Deficit of the Public Sector

Figuring out the overall deficit of the public sector, which would combine the budget itself and that of enterprise E, is a somewhat confusing matter complicated by existing mutual nonpayments.

Suppose that the QFD of E is:

$$QFD = QFD_P + QFD_R$$

where QFD_P represents the QFD emerging from the provision of services to public institutions, and QFD_R the QFD emerging from the provision of services to the rest of the economy.

Meanwhile, the budget deficit of the government on a cash basis is equal to government spending G on services other than those provided by enterprise E, the provision of direct subsidies S to enterprise E, and the purchases of services $P_I R^P C_P$ from enterprise E, net of tax payments $R^T T$ by enterprise E:[10]

$$BD^{CSH} = G + S + P_I R^P C_P - R^T T = [G + S + PC_P - T] + [A^T - QFD_P]$$

Note that $G + S + PC_P - T$ is what the budget deficit would have been in the absence of quasi-fiscal components A^T and QFD_P. The first reflects nonpayments to the state, and increases the cash deficit; the second represents nonpayments by the state, and decreases it. Note also that in absence of the QFD, there is no need to provide enterprise E with subsidies S.

In order to evaluate the overall deficit of the public sector, one needs to calculate the *minimum financing* required to cover both the budget deficit and the QFD of enterprise E.

Financing budget in the amount of $G + S + PC_P - T$ would allow for full payments by the budgetary institutions to enterprise E and elimination of QFD_P. If, in addition, enterprise E is financed by an amount equivalent to QFD_R, it will then be able to pay off its tax arrears, A^T, and will no longer require explicit subsidies S.

The overall necessary financing, and hence the overall deficit, becomes:

[10] For simplicity's sake, E is assumed to be the only taxpayer in the economy.

$$[G + S + PC_P - T] + QFD_R - S =$$

$$= [G + S + PC_P - T + A^T - QFD_P] + [QFD_P + QFD_R] - A^T - S = \quad (3)$$

$$= BD^{CSH} + QFD - A^T - S$$

Equation (3) demonstrates that the overall deficit of the public sector equals the budget deficit, calculated on a cash basis, plus the QFD, *net* of explicit subsidies and tax arrears (which represent implicit subsidies). These two are subtracted because on the one hand, they increase the budget deficit, while, on the other, they constitute a means of financing enterprise E's QFD. Had it not been necessary to finance enterprise E, there would have been no need to run such a budget deficit.

D. Several Enterprises

As with the overall public sector deficit, an estimation of the QFD in a market where there are many enterprises, both private and public, is complicated by the chain of mutual nonpayments. Let us consider a hypothetical energy market where different types of agents, some private and some public, are present. This section concentrates only on estimating the nonpayment component of the QFD, since its calculation is the most complicated.

It is assumed that there are:

1. consumers (both private and state related), which receive energy from distributors (both private and state-owned);

2. energy distributors, which purchase energy from the state-owned wholesale energy market (WEM);

3. WEM, which itself is supplied by state-owned generators; and

4. generating companies, which buy inputs from suppliers. These suppliers can be identified with the consumers.

Now imagine that, during the first stage, the consumers generate payment arrears with the distributors. These can be denoted as X_{SS}, X_{PS}, X_{SP}, and X_{PP}, where the first subscript denotes the nature of the consumer (state-owned versus private) and the second one denotes the nature of the distributor.

During the second stage, new arrears are generated, which can be denoted as Y_S and Y_P, where once again the subscript denotes the nature of the distributor. Next, WEM runs

arrears of W with the energy generators, which in turn run arrears of Z_S with state-related suppliers and arrears of Z_P with private suppliers (see Figure 1).

Let us assume that the private agents operate efficiently—i.e., that they do not generate debts beyond what they are owed. In other words, let us assume that:

$$Z_P \geq X_{PS} + X_{PP} \text{ and } X_{SP} + X_{PP} \geq Y_P \tag{4}$$

Now, as in the previous section, let us calculate the *minimum financing* required to cover the nonpayments of all the enterprises involved.

In the absence of any other distortions (such as mispricing and output losses), a payment of Z_P by the generating companies to the private suppliers should allow the latter to clear their debts to the energy distributors (i.e., to eliminate X_{PS} and X_{PP}). A subsequent payment of X_{SP} by the state consumers should allow the private distributors to pay off their debts to the wholesale market (Y_P). That leaves a closed chain of four state-owned participants ($\rightarrow X_{SS} \rightarrow Y_S \rightarrow (W - Y_P) \rightarrow Z_S \rightarrow X_{SS} \rightarrow$), all of which can clear their debt if the biggest debtor initiates payment.

Thus, the nonpayment component of the QFD can be calculated as:

$$QFC = Z_P + X_{SP} + \max(X_{SS},\ Y_S,\ W - Y_P,\ Z_S) \tag{5}$$

Since private agents are assumed to be efficient (equation 4), it follows that:

$$QFC \geq X_{PS} + X_{PP} + X_{SP} + X_{SS} \tag{6}$$

i.e., *from below* the *QFC* can be measured by the nonpayments of final consumers. However, such a method is likely to underestimate the *QFC*, since state-owned distributors and producers may be generating additional debts that are not being taken into account.

From equation (5) it follows that if four enterprises consequently owe one another a dollar in a closed chain, then the QFD is neither four dollars, as it would be if all the debts were added up, nor zero. It is, in fact, one dollar, since all that is needed to clear all the debts is financing in the amount of one dollar.

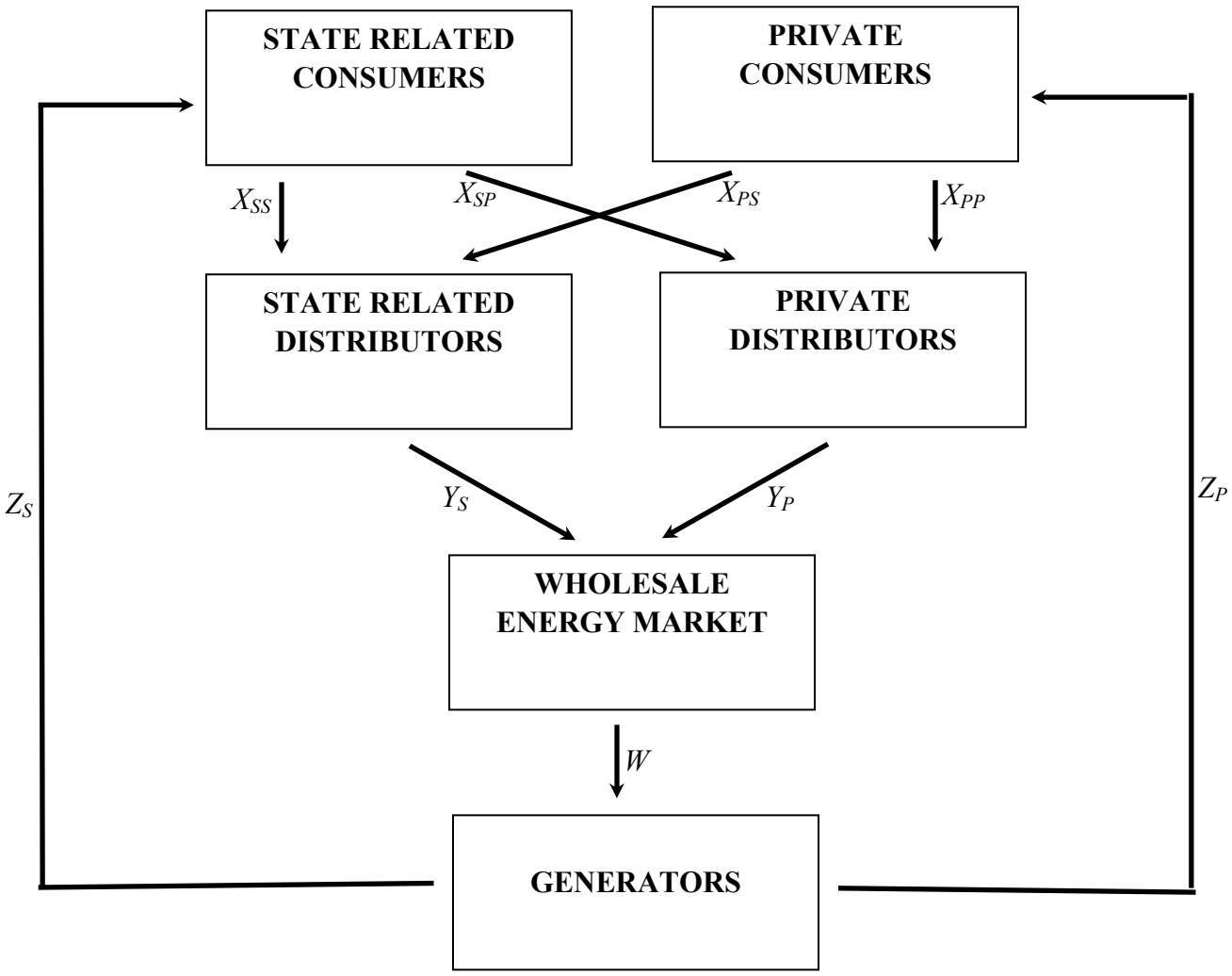
To understand this intuitively, imagine that a consumer initiates the chain of nonpayments by failing to pay one dollar to a distributor. This is the point at which the QFD is generated, since the distributor does not receive full payment for a provided

service. What happens next is simply a mere consequence. The distributor, now short one dollar, fails to pay the wholesale market, which in turn (and for the same reason) fails to pay the generator, which in turn fails to pay the supplier, which happens to be the consumer that started the chain reaction.

III. CONCLUSIONS

This paper discusses the various subcomponents of a QFD for the case of a state-owned nonfinancial enterprise. It shows how to evaluate them directly, as well as indirectly by looking at the financing means, both explicit and implicit. It also demonstrates the proper arithmetic for adding up the QFD and the budget deficit, by correcting for explicit and implicit subsidies to the industry. Finally, it shows how to evaluate the QFD in the case where several enterprises are linked by mutual payment arrears.

Figure 1. Structure of Nonpayments Between Participants in the Market



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