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CONTENTS

Indicators of fiscal *policy: design and* applications for Chile

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Latin America's economies are prone to continual shocks, of both external and internal origin, giving rise to a marked variability in their growth rates. In order to reduce this volatility, it is necessary therefore to establish stabilization mechanisms, including in particular the instruments of fiscal policy. The economies' increasing variability is prompting the development of fiscal norms that incorporate anti-cyclical features. Such rules are based on the setting of medium-term public spending goals that are consistent with the economy's growth trend and level of public debt but are independent of the cyclical component of the level of activity. In such a system, tax revenues would perform the traditional function of stabilizers of economic fluctuations. Since fiscal policy is faced with an iniquitous combination of unpredictable income and rigid expenditure, it is desirable to devise indicators that distinguish between the transitory factors and the permanent factors which affect the public accounts. In this connection, fiscal discretionality indicators help to pinpoint medium-term fiscal problems and, when applied in the case of Chile, allow a more accurate measure of recent years' fiscal policy. The latter has been structured around the economy's growth trend path, avoiding cyclical adjustments of magnitude. The analysis shows that, after correction of the fiscal balance for the main exogenous changes in government revenues and expenditures, there emerges a fairly restrictive fiscal policy stance, aimed at controlling aggregate demand in the recent years of expansion of the level of activity.

I

Introduction

Recent episodes have served as a further reminder of the extreme vulnerability of the Latin American countries' economies. These economies are prone to continual shocks, of both external and internal origin, causing considerable variations in their growth rates. Historically, terms of trade cycles, volatility of foreign capital flow and unsustainable expansions of public and private spending have generated a marked instability in the economic development process. Moreover, the structural reforms carried out in the 1980s by most countries of the region, such as the opening up of the market in goods, the liberalization and globalization of financial markets and the reforms of the labour market, are likely to accentuate the variations in growth and employment.

This variability of the economy is undesirable when accompanied by maladjustments that are difficult to offset. Falling investment, rising unemployment and enterprise bankruptcies often have persistent effects on the development of productive capacities or the ability to generate productive employment. If one accepts the theory of a certain hysteresis or irreversibility in capital or labour markets, it is necessary to develop mechanisms and instruments aimed at reducing the volatility referred to. Paradoxically, economic liberalization imposes major challenges on macroeconomic intervention and management capability in the spheres of monetary and foreign exchange policy as well as fiscal policy. One important task in the coming years will be to implement effective intervention mechanisms that will ensure a minimum degree of stability in the economy and in public and private operators' decision-making on consumption and saving.

In particular, the economy's increasing variability affirms the need to formulate fiscal rules with anti-cyclical features in order to smooth out such fluctuations. Fiscal policy norms are based, on the one hand, on setting medium-term public spending goals that are consistent with the economy's potential growth trend and with the level of public debt but are independent of the cyclical component of growth, and, on the other hand, on the assigned function of tax revenues to stabilize economic fluctuations. Within the region, one of the main difficulties facing the authorities in fiscal policy management is the contrast between the vulnerability of their revenues and the inflexibility of their expenditures. One way of dealing with this situation is to devise instruments that will enable permanent fiscal decisions to be separated from the transitory factors which affect the public accounts. The most important of the short-term factors are fluctuations in the price of raw materials, inflation and the economic cycles.

How then are budgetary and taxation operations to be separated into a discretionary component that will reflect the arbitrary dimension of government action and an automatic component that will describe the effects of current trends on the budget? By establishing discretionality indicators to allow the exogenous or endogenous origin of the budget balance to be distinguished. The construction of fiscal discretionality indicators can be very useful in budgetary policy design. In providing a fiscal deficit measure that is independent of the economic cycle and of the terms of trade cycle, it makes it possible to identify the fiscal authority's decisions more clearly and to calculate the magnitude of the deficit to be corrected by discretionary action. In this respect, discretionality indicators can help to pinpoint medium-term fiscal problems, to promote informed debate on budgetary policy and to strengthen fiscal discipline in periods of prosperity.

The following sections of this article comprise an examination of the advisability of establishing public spending norms to deal with and reduce fluctuations, thereby fostering stable rules of the game in the medium and long terms and ensuring the effectiveness of government action (section II); a description of the methods of constructing the main fiscal discretionality indicators, essentially related to the work of the Organization for Economic Cooperation and Development and the International Monetary Fund (section III); a presentation of the estimations made in the case of Chile in order to obtain the tax

elasticities and output trend path which will enable the discretionality indicators to be applied (section IV); an analysis of the results obtained, separating the trend, cyclical and discretionary components of public finances in Chile (section V); and finally a summary and conclusions (section VI).

II

What public spending norm?

In general, the effects of fiscal policy are evaluated directly on the basis of the budget balance, so that if the fiscal deficit (or surplus) increases or decreases, the fiscal stance is understood to have been either expansionary or contractionary. Such an interpretation is an oversimplification since the fiscal position is determined not only by government decisions but also by factors not directly under government control. The budget balance is an ambiguous indicator of fiscal policy because it reflects the impact of discretionary government action and at the same time the influence of current economic trends on the budget.

In periods of expansion, government revenues increase rapidly and expenditures relating to unemployment benefits or grants to economic sectors tend to diminish. Both factors produce a compressive effect on the deficit. Conversely, in times of recession, the low level of activity is highly detrimental to the budget balance, particularly if there is widespread unemployment. Government revenues and expenditures whose changes are linked to the economic cycle are known as automatic stabilizers. The extent of such stabilizers varies from country to country, reflecting the size of the public sector, the progressiveness of the system of taxation, the sensitivity of tax bases to fluctuations in economic activity, the generosity of unemployment benefit schemes and the sensitivity of unemployment to changes in output.

For example, in 1993, cyclical factors caused almost one half of the fiscal deficits of the OECD countries (OECD, 1993). The recessionary climate in these countries and their worsening fiscal problems have given rise to the reappearance of studies aimed at differentiating the cyclical component of the budget. [1] In the case of some Latin American countries, the exceptional fiscal revival in the last few years most probably contains a substantial cyclical component, bearing in mind the upswing in economic activity and the disinflationary trends recorded in recent years. [2] It is no less important therefore to formulate indicators that will provide a medium-term view of the public accounts position in periods of prosperity.

Moreover, in recent publications, emphasis is being placed on the concept of sustainable deficit (Chouraqui, Jones and Montador, 1986; Blanchard, Chouraqui, Hagemann and Sartor, 1990; Buiter, 1988), which is defined as the primary deficit that ensures the stabilization (or reduction) of the public debt as a percentage of GDP. This primary balance is proportional to the previous debt and to the differential between the real interest rate and the growth rate of the economy. Blanchard, Chouraqui, Hagemann and Sartor (1990) propose fiscal sustainability indicators based on changes in the differential between the interest rate and the growth rate.[3] These indicators need to have a medium-term dimension, since cyclical movements in GDP and transitory fluctuations in interest rates, even when leading to a temporary rise in the public debt, do not mean either excessive deficits or unsustainable fiscal policies. It is consequently difficult to judge fiscal sustainability over very short periods. Finally, some authors single out, for policy-setting purposes, the deficit regulation component (Creel and Sterdyiniak, 1995). Under certain circumstances, public sector involvement may go beyond the spontaneous action of automatic stabilizers to the pursuit of discretionary policies, stimulating growth through increases in public spending or tax reductions that are not offset within a recessionary climate, or, conversely, curbing the expansion of the level of activity through adjustment policies.

[1] With regard to Spain, for example, see Fernández, Nadal and Sanz (1993) and Molinas (1994).

[2] Since 1992-1993, the public finances of most countries in Latin America have shown relatively controlled situations (ECLAC, 1994).

[3] For an application of these indicators to the case of Mexico, see Martner, 1995.

This breakdown of fiscal indicators highlights, on the one hand, the multiplicity of the fiscal authorities' conflicting goals and, on the other hand, the difficulty of evaluating the public accounts position using a mechanical approach. In this regard, there is no optimum approach to fiscal policy; any such policy should be guided by medium-term macroeconomic goals and not by accounting goals. In the quest for macroeconomic efficiency in fiscal policy, the following two questions have to be answered: What is the desirable level of output bearing in mind the external equilibrium, inflation and enterprises' financial situation? To achieve that level, should the public sector pursue an expansionary or a restrictive policy?

In highly variable economies such as those of the region, with periodic financing restrictions and difficulties in establishing active fiscal policies, it is desirable to set explicit public spending norms *throughout the cycle* so as to enable growth to be sustained when the economy is at the bottom of the cycle and the public debt to be reduced when the economy is at the top of the cycle. The notion of a fiscal norm can foster more stable rules of the game, to which the State is committed in the medium and long terms and which help to ensure the effectiveness of government action. Indeed, on the basis of such rules, economic agents have greater possibilities for realizing their consumption and investment expectations beyond the short-term fluctuations in the level of activity. The annual norm should refer not just to the fiscal balance, but primarily to the level of spending. In addition to the markedly procyclical nature of a balance norm –when an economy goes into recession, revenues and the fiscal balance are impaired– the spending norm can stabilize private transactors' expectations, since it makes the development of the economy more predictable, tends to minimize the distortions generated by government intervention and is closer to the factors that determine private transactors' profits. In other words, a public spending norm that is sustainable over time can help to reduce the volatility of the level of activity if monetary and exchange rate policies pointing in the same direction exist.

However, strict observance of a restrictive expenditure norm is easier when large deficits exist and is politically more difficult in the case of a surplus or of a small deficit, i.e., at the top of the cycle: in order to manage a shortage, it is first necessary to administer an abundance. Consequently, the clear identification, within deficits and surpluses, of the cyclical component (which is linked primarily to the automatic stabilizers and to the terms of trade cycle) and of the structural component (which affects the level of long-term debt) can help to increase the transparency of budgetary decisions.

Although the definition of a medium-term public spending norm that will cover the duration of the cycle constitutes a sound rule for fiscal management, the modalities for formulating such a norm are not simple. Indeed, the reference to a cycle presupposes a knowledge of its duration and its upper and lower limits. Indicators of this kind are not free from disagreement. As stated by Blanchard, Chouraqui, Hagemann and Sartor (1990), the persistence and nature of cycles are the subject of controversy; therefore, the cyclical adjustment of the deficit only makes sense if the economy returns to its growth trend path within a relatively short period of time. For example, in the European countries, unemployment stabilized in the 1980s at far higher levels than earlier, and it is consequently not certain that economic recovery reduces unemployment –and its attendant deficit– to previous levels.

A question which is thus crucial in methodologies of this kind, and one which is not devoid of difficulties, is the appropriate identification of the economic cycle and also of the cycle phase at which the economy finds itself, since perfect symmetry does not exist between the top and bottom of the cycle.

A second difficulty relates to the definition of the norm. It is clear that objective rules concerning spending do not exist. Three criteria would nevertheless merit consideration:

(a) The public spending norm must be consistent with the desired fiscal development over the period of the cycle. In particular, there must be consistency within this period between anticipated revenues that are dependent on the growth trend throughout the cycle and government expenditures of a permanent nature. This requires an ability to determine the trend rate of growth, which is a very complex exercise in the region, owing to the high variability of its growth rates. In this connection, a realistic evaluation of the economy's growth trend will prevent the public sector from becoming a sounding board for fluctuations in the economy and the terms of trade cycles.

(b) The public spending norm is not independent of the level of public sector borrowing. In particular, it is necessary to ensure that in the period of the cycle the level of borrowing leads to a development of the

debt which is sustainable in the medium and long terms. Calculations are usually made on the basis of the debt as a proportion of GDP; it might be preferred to adopt a criterion closer to that used by financial intermediaries for analysing the solvency of their debtors, such as the ratio between the burden of interest and government revenues. This indicator helps to show the relative size of the debt according to the level of interest rates. It also makes it possible to determine more precisely the impact of reductions in revenue on the sustainability of fiscal policy.

(c) The third –and not the least important– criterion avoids an overly technocratic view of the problem. The norm has to be justifiable to the public and parliament, since it is in fact of a political nature. One should not therefore be afraid of adopting general norms, such as the parallel development of expenditure and nominal GDP or simple index-linking of prices in a context of a falling share of public spending in the economy.

In addition to defining a satisfactory norm which would thus be independent of the economic cycle, the nature of government expenditures does not readily lend itself to such an exercise.[4] The dynamics of interest payments, for example, is dependent on the level of debt and changes in interest rates. Furthermore, there is within government expenditures a hard core which does not lend itself to simple reductions when called for. These expenditures are inflexible since they are based on often very widespread eligibility criteria that lead to problems of uncontrolled growth and to permanent expenditure, making a downward trend impossible in the event of an improved economic climate. The establishment of multi-annual programming can facilitate the imposition of restrictions within a more flexible framework than the budget year (Martin y Núñez del Prado, 1993; and Marcel, 1993). A spending norm is of course only possible on the basis of an explicit definition of the expected income throughout the cycle.

III

Fiscal policy indicators: methodological aspects

Variations in public-sector income or expenditure are automatic in nature when they respond to factors endogenous to the economic model and exogenous to the public sector, i.e. when they are changes in components of the budget that are sensitive to the influence of economic aggregates. Conversely, variations that respond to government decisions are discretionary in nature. An initial breakdown of the actual deficit thus distinguishes the automatic deficit and the discretionary deficit. This differentiation is not unimportant since all government revenues and expenditures are discretionary in origin, being in response to public policy decisions. Consequently, the concept of discretionality is necessarily relative, has a time dimension and is presented as a counterfactual exercise. The aim is thus to separate the component that responds to decisions which are controllable by the authority from the rest of the budget within the observed variations in items of government revenue and expenditure. In view of the adjustment possibilities that exist, the criterion of fiscal discretionality or neutrality is necessarily arbitrary, since it depends on the investigator's definitions.

In a restricted definition, it is a question of obtaining fiscal policy indicators that are independent of the economic cycle. The OECD indicator (Gramlich, 1990; OECD, 1993) separates the deficit into a cyclical component and a structural component. The behaviour of revenues and expenditures is expressed in a model when the economy departs from the growth trend path (box 1). The variation in public revenue or expenditure is cyclical in nature when it is caused by the difference between the actual output and the output trend. That is to say, the cyclical position of the economy gives rise to fluctuations that are reflected in the budget, particularly in tax receipts

[4] Marcel (1993) calculates that, in Chile, over 70 per cent of programmed public spending is predetermined by law, which demonstrates the degree of inflexibility of the budget.

Box 1
THE OECD STRUCTURAL INDICATOR

To obtain the cyclical deficit, OECD breaks down the budget into tax revenue, other revenues, expenditures on unemployment benefits and other expenditure. The cyclical component of tax revenue is obtained from its elasticity in relation to GDP and from the difference between actual GDP Y and trend GDP Y^* in year t:

$$\text{Cyclical revenues} = T_j \cdot \varepsilon_j \cdot \frac{Y - Y^*}{Y^*}$$

where T_j is actual tax revenue observed in t, corresponding to category j, which breaks down into personal taxes, corporate taxes, indirect taxes linked to production and imports and social security contributions, and ε_j is income elasticity in relation to GDP for the different tax categories j. Therefore, to estimate the cyclical revenues, it is necessary to estimate the income elasticities and output trend. On the expenditure side, in both the OECD indicator and the IMF indicator, only unemployment benefit expenditure is regarded as having a cyclical component. The formalization of the model is based on the assumption that the ratio between cyclical unemployment expenditure and total unemployment expenditure and the ratio between the cyclical unemployment rate and the total unemployment rate are equal:

$$\frac{\text{Cyclical unemployment expenditure}}{\text{Total unemployment expenditure}} = \frac{\text{Cyclical unemployment rate}}{\text{Total unemployment rate}}$$

The expression of cyclical unemployment expenditure is as follows: $\dfrac{\text{Cyclical unemployment rate}}{\text{Total unemployment rate}}$

Cyclical unemployment expenditure = (Total unemployment expenditure)

As regards the cyclical unemployment rate, this is obtained from the difference between actual GDP and trend GDP.

and in unemployment benefit expenditure. The same exercise can be carried out for the primary deficit, with the exogenous component corresponding to payment of interest on the external and internal debt being deducted.

As pointed out by Molinas (1994), this indicator has two advantages in relation to the actual budget balance: first, by providing a fiscal deficit measure that is independent of the economic cycle, it makes it possible to assess the fiscal policy stance adopted by the economic authorities in previous years; secondly, since the structural deficit is not automatically corrected when the growth trend path is resumed after a period of recession, the indicator makes it possible to identify the magnitude of the deficit to be corrected by discretionary action.

The IMF indicator emphasizes the concept of fiscal neutrality, which is defined as the sum of the cyclical deficit and the trend deficit. The trend deficit is linked to changes in income and expenditure in relation to the trend GDP (box 2).

The sum of the cyclical deficit and the trend deficit is what IMF refers to as the neutral budget deficit. The IMF indicator (Heller, Haas and Mansur, 1986; Chand, 1992) is thus obtained as the difference between the actual deficit and the neutral budget deficit, which is also defined as the "fiscal impulse". The IMF indicator elects to separate the cyclical and trend deficits –i.e., the two components of the neutral or automatic budget deficit– in order indirectly to obtain the fiscal impulse as the difference in relation to the actual deficit.

Box 2
THE IMF FISCAL IMPULSE INDICATOR

The IMF indicator elects to formalize the cyclical and trend deficits, the discretionary deficit or fiscal impulse being obtained as the difference in relation to the actual balance. Thus the main difference compared with the previous indicator is that this time the trend components of the deficit are model-based. For the modelling of the trend and cyclical deficits, a base year is chosen in which actual GDP is considered to coincide with trend GDP, so that a positive fiscal impulse is interpreted as expansionary with regard to the base year. It is assumed that trend revenues increase with unitary elasticity in relation to trend GDP, so that they represent in year t the same proportion of trend GDP as in the base year, where t_0 is the base-year tax ratio:

$$\text{Trend revenues} = t_0 \cdot Y^*_t$$

As regards the trend expenditures, excluding unemployment benefits, these are defined in the same way, so that they represent the same proportion of trend GDP as in the base year:

$$\text{Trend expenditures} = g_0 \cdot Y^*_t$$

where g_0 represents the base-year ratio of government expenditure to GDP, excluding unemployment expenditures.

The remaining government expenditure is regarded as having only trend and discretionary components. Unemployment benefits are separated into a cyclical component and a trend component. The latter component is defined with the assumption that the average benefit per recipient is maintained in real terms and that the number of recipients increases as the labour force increases. The cyclical unemployment expenditures are also determined in relation to the base year on the basis of the cyclical unemployment.

Finally the cyclical revenues are obtained from the difference between actual GDP and trend GDP, with the ratio between revenues and GDP for the base year being maintained:

$$\text{Cyclical revenues} = t_0 \cdot [Y_t - Y^*_t]$$

This definition implies a unitary elasticity of cyclical revenues in relation to actual GDP, which facilitates the calculations in comparison with the previous indicator. The IMF fiscal neutrality criterion includes revenues which, by reference to the base year, increase with unitary elasticity in relation to GDP and expenditures which increase with unitary elasticity in relation to trend GDP, again by reference to the base year. Thus, a revenue is regarded as neutral if its growth rate coincides with the rate of growth of actual GDP, and an expenditure is regarded as neutral if its increase is equal to that of trend GDP.

However, a fiscal policy indicator can also separate all the automatic components of the deficit which are beyond the authority's control. This definition is far broader inasmuch as it includes, for example, the effect of inflation on tax receipts, the impact of the price of raw materials on public enterprise profits and the rise in paid interest resulting from increases in interest rates or devaluation of the local currency. For example, in the OECD and IMF indicators just described, the effects of inflation on tax receipts or variations in interest rates or fluctuations in the price of raw materials produced by public enterprises are regarded as discretionary changes in the deficit. This is no doubt

due to the lesser relative significance of such mechanisms in the developed countries. As pointed out by Marcel (1993), the extent of the exogenous component and particularly of the external sector in the public finances of the Latin American countries makes it difficult to identify precisely the discretionary component of the budget. At the same time, the diversity of exogenous flows in the public accounts limits the application of fiscal policy indicators such as those of IMF or OECD. In the following section, fiscal policy indicators are calculated in the case of Chile, excluding the major exogenous external component in the country's public revenues: copper exports.

IV

Estimates in the case of Chile

The mechanical application of the fiscal indicators described above to the countries of Latin America can lead to results of little usefulness in countries which have different institutions and problems. As stated by Marcel (1993), the main requirements to enable indicators of this type to constitute an appropriate fiscal policy measure are the following: (i) substantial tax receipts so that the cyclical component of government revenues will be of some significance; (ii) a unified fiscal authority having some degree of control over a sizeable proportion of public spending; (iii) relatively limited exogenous sources of movements in public finances; and (iv) a certain degree of development of the financial market, so that fiscal policy can be distinguished from monetary policy.

In the case of Chile, the centralization of the fiscal authority, the limitations on municipal authorities' borrowing, the surpluses registered by public enterprises and the elimination of quasi-fiscal operations in recent years make it possible to evaluate fiscal policy on the basis of central government accounting. Moreover, owing to the existence of the Copper Equalization Fund (FCC), it is possible to separate from the public accounts the effects of unforeseen movements in the price of this metal.

Owing to the exceptional reduction in Chile's public debt in recent years and the relatively small difference between the real interest rate and the growth rate of the economy, the reference to public debt sustainability indicators is not of major significance in the present context. The fiscal policy has clearly been sustainable in recent years and, what is more, the public sector has prepaid substantial amounts of its external debt when it has had what are regarded as transitory revenues.

Moreover, the impact of inflation on real fiscal receipts is very limited, since most taxes are index-linked monthly to price changes. Inflation does not therefore represent a major source of distortion of tax revenues. [5] From the summarized characteristics of the public sector in Chile, it may be assumed that discretionality indicators represent an adequate fiscal policy measure. The empirical construction of such indicators calls for the use of econometrics to estimate the tax elasticities and trend output (box 3). Estimating tax elasticity is subject to continuous changes in the tax structure. In Chile, the main tax reform dates from 1975: it laid down the basic features of the level and composition of the tax burden (Carcioli, Barris and Cetrángolo, 1994), introduced value added tax (VAT), which was to become the central element of the system, and eliminated a large number of taxes. The subsequent reform of 1984 reduced income tax by removing progressivity from the system of personal taxes and by decreasing taxes on enterprise profits. In 1988, the VAT rate fell from 20 to 16 per cent and the rate applied to profits was again reduced. In 1990, the VAT rate rose to 18 per cent and the progressivity of the system was intensified by shortening the income brackets and increasing the rates on accumulated profits. Finally, the 1993 reform provided for gradual reductions in the rate of VAT and changes in the income brackets.

[5] Conversely, inflation does have an impact on real public spending in the short term, primarily owing to the annual system of indexing salaries and pensions paid by the public sector. Thus, when inflation increases, a short-term fiscal surplus is generated, which constitutes a major mechanism of fiscal stabilization (Marcel, 1991).

Box 3
CHILE: ESTIMATION OF THE TAX FUNCTION AND TREND OUTPUT

To calculate the fiscal discretionality indicators it is necessary to estimate econometrically the income elasticity of tax revenue and the potential output.

Estimation of an aggregate tax function

Annual tax revenue T is estimated as a function of GDP (y) and of its own lagged values for the period 1976-1993. The lower-case letters denote logarithms, and the values in brackets are Student's T values. Two dummy variables are also introduced; these modify the value of the constant for the periods 1984-1987 and 1988-1990:

$$t = -5.82 + 1.11\ y + 0.25\ t_1 + 0.067\ D84\text{-}87 - 0.10\ D88\text{-}90$$
$$\text{-(14.7)}\quad (16.0)\quad (4.77)\quad (5.01)\quad (-6.56)$$

$R^2 = 0.99$, $\sigma = 0.022$, $DW = 2.15$, $N(\chi^2) = 0.16$, AR 1-2 $F(1,11) = 1.55$, $ARCH$ $F(1,11) = 0.53$, $RESET$ $F(1,13) = 0.03$.

The estimation has adequate statistical properties: no autocorrelation of errors is detected (D-W and AR 1-2 tests), there is normality (the result of the $N(\chi^2)$ test is close to zero) and homoscedasticity (ARCH test) in the residuals, and there are no functional specification problems (RESET test). The short-term income elasticity is 1.11 and the long-term income elasticity is 1.49. This means that tax receipts fluctuate with GDP in a more-than-proportional manner. The average lag of the equation is 1.5 years, which reflects the tax collection period.

Estimation of trend output

The calculation of the GDP trend path is based on the OECD truncated trend methodology (Gramlich, 1990). This consists simply of estimating different trend growth coefficients for different periods. The method enables the trend and cyclical components of output to be easily separated. The regression of GDP against different trends over the period 1976-1993 produces the following results:

$$y = 11.2 + 0.0618\ Trend + 0.0149\ Trend_{76\text{-}81} + 0.1\ D82 + 0.03\ D83$$
$$(240.1)\quad (39.2)\quad (16.58)\quad (4.89)\quad (1.58)$$

$R^2 = 0.99$, $\sigma = 0.017$, $DW = 1.97$, $N(\chi^2) = 0.82$, AR 1-2 $F(2,11) = 1.53$, $ARCH$ $F(1,30) = 1.19$, $RESET$ $F(1,12) = 0.29$.

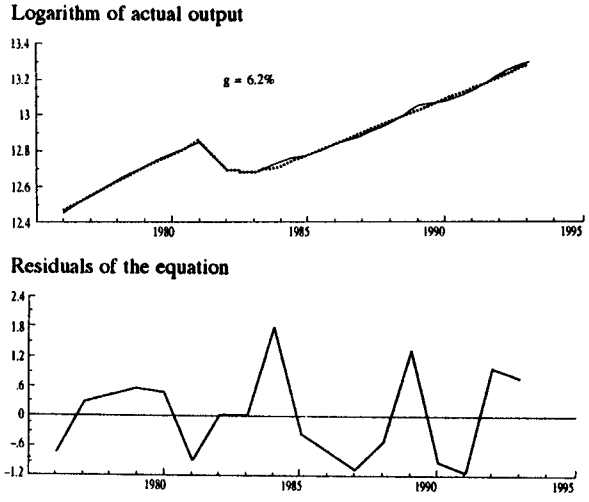
The variable $Trend_{76\text{-}81}$ takes the value of the trend between 1976 and 1981 and 0 in the rest of the sample; variables $D82$ and $D83$ take the value 1 in 1982 and 1983 respectively and 0 in the remaining periods. A trend rate of growth of 6.2 per cent is obtained between 1984 and 1993, which value rises to over 7.5 per cent for the years 1976-1981. The statistical tests display an adequate estimation, with no autocorrelation and with normality in the residuals.

Moreover, one major source of fiscal revenue is that of taxes on specific products, in particular fuels, whose rates have behaved in a procyclical manner, increasing in periods of recession to cover reductions in VAT revenue, and decreasing in periods of expansion. Finally, successive trade reforms have reduced and standardized tariff rates, lessening the relative weight of these duties in the tax structure.

The main difficulty in estimating tax functions is constituted by the frequent changes in tax policy with regard not only to rates and bases but also to the progressivity of the system. One way of dealing with this problem is to estimate variable coefficients using the Kalman filter method. The method employed here is different, since it makes use of dummy variables in order to allow for the changes brought about by the tax reforms (box 3). The estimations show that the recent tax reforms have affected primarily the level of fiscal revenue (which is reflected in the changes in the intercept of the equation), but not so much the progressivity of the system (measured by the income elasticity) or the tax collection periods (Martner, 1995). The tax elasticity obtained in the short term is greater than one, which shows that fiscal revenue is highly sensitive to economic cycles.

In estimating the trend output, an annual mean growth rate of 6.2 per cent between 1984 and 1993 is obtained. The sustainability of such a high trend rate of growth is debatable, although it corresponds to the movement of the Chilean economy over the last 10 years. This implies that growth rates which differ from this mean are regarded as cyclical and affect the calculation of automatic revenues and expenditures.

FIGURE 1
Chile: Trend output and actual output



Source: Own calculations.

For example, a growth rate of less than 6 per cent indicates negative cyclical income.

The residuals of the estimated equation (figure 1) show the development of the cycle around the trend, or the difference between actual output and the trend output. It can be seen that GDP remained below its trend value in the years 1990 and 1991 as a result of the 1990 adjustment, and rose above it during the last two years as a consequence of the strong growth in 1992. In 1994, growth was 4 per cent, which suggests that the difference between the two output levels was negative for that year. We now have the coefficients required to estimate the cyclical tax revenue.

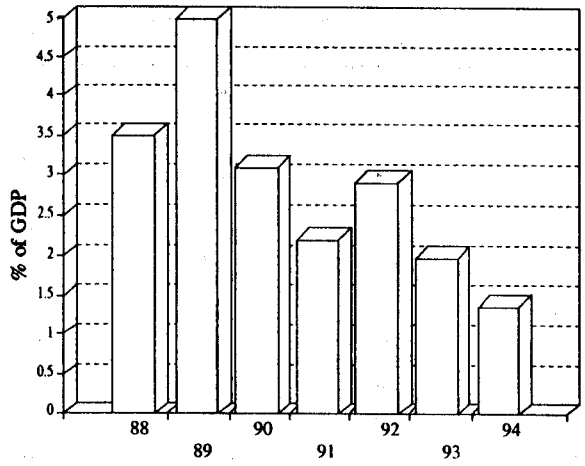
V

Trend, cyclical and discretionary components of public finances in Chile

Between the late 1970s and late 1980s, the Chilean public sector's relative size was reduced substantially, from approximately 40 per cent to less than 30 per cent of GDP. Public enterprise and social security privatizations and public spending controls made it possible to confront the crisis of the 1980s with relatively moderate deficits. Between 1988 and the present date, sizeable surpluses have been achieved in the public accounts (figure 2); the fiscal policy, despite its low relative significance, has made major contributions to the generation of domestic savings and to the economic stabilization processes.

The exceptional reduction in the public sector surplus observed in recent years might suggest that the fiscal policy has been less strict and more permissive since the establishment of democracy in

FIGURE 2
Chile: Overall central government balance



Source: Table 1.

1990. However, the following analysis shows that, after correction of this result by the removal of the main exogenous variations in government revenues and expenditures, a clearly restrictive fiscal policy stance emerges.

Table 1 shows the development of the Chilean central government accounts for 1989 to 1993. In this table, the overall surplus is calculated without including contributions to the FCC, a mechanism which offsets fluctuations between the anticipated price of copper for the budget year and the actual price. [6] For example, in 1989, the boom in this metal brought the public sector almost four GDP points; this income was entered in the FCC accounts and did not form part of the regular budget. The existence of this fund significantly reduces the volatility of the revenues and balance of the public accounts. It is the main exogenous source of public sector income which is not linked to the internal economic cycle. Consequently, the calculation of the surplus excluding contributions to this fund allows a more accurate approximation of its cyclical and discretionary components.

As regards the remaining public sector income, taxes are directly linked to the economic cycle, and operating income is itself dependent on public rate-fixing policies. Current transfers and social security taxes are subject to the prevailing legislation and are not directly dependent on the level of economic activity. Income from sales of copper is determined by fluctuations in the price of the metal abroad and by the difference between the price provided for under the budget law and the actual annual mean price. With the exception of tax revenue, the remaining income does not have a clear linkage to the internal economic cycle, even though the items relating to operating income, social security taxes and other income are to some extent sensitive to economic activity.

On the expenditure side, no major linkage between the cycle of activity and public spending in Chile can be assumed, inasmuch as unemployment benefits are low. [7] Although the remaining public expenditures may have a fairly cyclical development (in the sense that falls in the level of activity and in taxes generally give rise to adjustments in expenditure items that are more flexible in the short term, such as the purchase of goods and services or real investment), this linkage is not automatic, since it is dependent on discretionary government decisions.

Therefore, to calculate the OECD structural indicator for Chile, it is necessary only to estimate the elasticity of tax revenue as a ratio to GDP, in so far as this is the only cyclical income. In view of the absence of expenditures linked to the economic cycle, the magnitude of the cyclical deficit in Chile, and probably in most countries of the region, is somewhat smaller than for OECD, owing to the low significance of unemployment benefits.

The calculation of cyclical revenues for the years 1989-1993 (box 1) takes into account the dynamic structure of the estimated tax function, which means different elasticities for each year. Thus, in the first period, the elasticity corresponds to the short-term elasticity; in the second year, the effect of the variation in the difference between actual output and the output trend in the previous period is added to this elasticity. This structure describes the lagged effects which cyclical variations in output have on tax revenue. Since no other revenues or expenditures with cyclical components have been identified, the cyclical surplus is exactly equal to the cyclical revenues (table 2).

[6] The actual surplus is thus the overall surplus plus the accrued deposits in the FCC.

[7] Such a linkage did, however, exist in the past; during the phase of widespread unemployment in the early 1980s, emergency employment programmes were pursued, but these were discontinued as the unemployment rate fell.

TABLE 1

Chile (central government): Economic classification
(Percentages of gross domestic product)

	1989	1990	1991	1992	1993
I. Total income	***23.6***	***22.1***	***23.7***	***24.4***	***24.6***
1. Current revenues					
Operating income	21.3	20.7	22.6	23.2	23.6
Social security taxes	1.7	1.5	1.7	1.6	1.6
Net tax receipts	1.7	1.7	1.6	1.6	1.6
Copper net of FCC	14.8	14.6	16.9	17.5	18.4
Transfers	1.9	1.6	1.1	1.3	0.7
Other income	0.2	0.2	0.1	0.1	0.2
2. Capital revenues	2.4	1.5	1.2	1.1	1.0
Sale of assets	1.8	0.9	0.6	0.6	0.4
Physical assets	0.2	0.2	0.2	0.1	0.1
Financial assets	1.6	0.8	0.4	0.5	0.4
Loan recovery	0.6	0.6	0.6	0.5	0.6
II. Total expenditure	***21.8***	***21.3***	***22.2***	***22.1***	***22.6***
1. Current expenditures	18.2	18.2	18.8	18.1	18.5
Personnel	3.6	3.7	3.8	3.8	4.0
Goods and services	1.9	1.9	2.0	2.0	2.0
Social security benefits	6.2	6.3	6.2	6.1	6.3
Interest on the public debt	1.7	1.9	2.2	1.4	1.3
Internal debt	0.5	0.6	0.9	0.4	0.4
External debt	1.2	1.4	1.3	1.0	0.9
Transfers	4.7	4.2	4.5	4.7	4.8
Other	0.1	0.1	0.1	0.1	0.2
2. Capital expenditures	3.6	3.1	3.3	4.0	4.1
Real investment	2.1	2.0	2.3	2.6	3.0
Financial investment	0.9	0.8	0.8	1.0	0.8
Capital transfers	0.6	0.3	0.2	0.3	0.2
Current account surplus (I.1-II.1)	**3.0**	**2.5**	**3.7**	**5.1**	**5.0**
Overall surplus (I-II)	**1.8**	**0.8**	**1.6**	**2.3**	**2.0**
Memorandum items					
Accrued deposits in the FCC [a]	3.8	2.3	0.7	0.3	-0.2
Use of the FEPP [b]	-	-	0.2	-	-0.1
Public debt repayment	6.8	2.4	2.1	1.7	2.1

Source: Chile, Government (1989, 1990, 1991, 1992 and 1993).
[a] FCC: Copper Equalization Fund.
[b] FEPP: Petroleum Price Stabilization Fund.

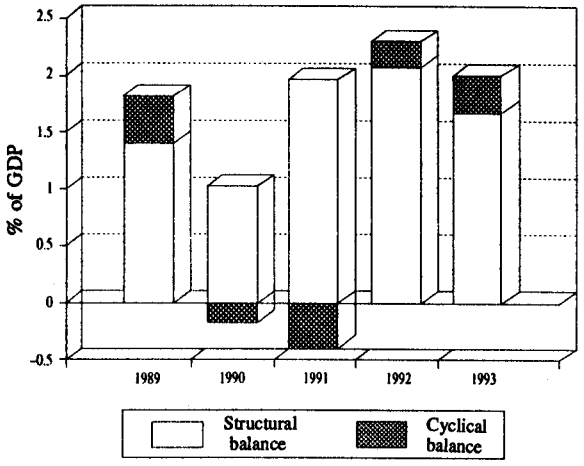
TABLE 2

Chile: Cyclical surplus and structural surplus
(Percentages of GDP)

	1989	1990	1991	1992	1993
Cyclical tax revenues	0.40	-0.17	-0.41	0.22	0.34
Structural tax revenues	14.43	14.77	17.36	17.32	18.07
Actual surplus	1.80	0.84	1.55	2.29	1.99
Variations		-0.96	0.71	0.74	-0.30
Cyclical surplus	0.40	-0.17	-0.41	0.22	0.34
Variations		-0.57	-0.24	0.63	0.12
Percentage of actual surplus	22.22	20.24	26.45	9.61	17.09
Structural surplus	1.41	1.01	1.96	2.06	1.65
Variations		-0.40	0.95	0.10	-0.41

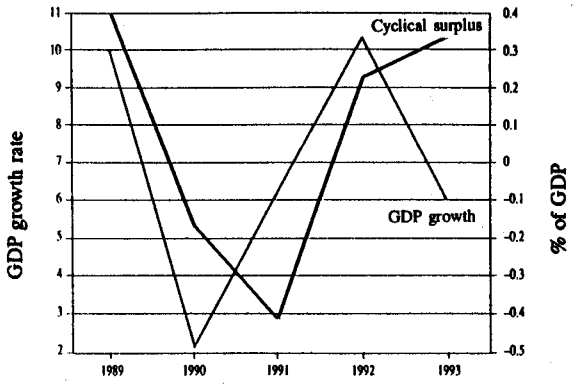
Source: Own calculations on the basis of table 1.

FIGURE 3
Chile: Cyclical and structural components of the fiscal surplus



Source: Table 2.

FIGURE 4
Chile: Economic cycle and budgetary cycle



Source: Table 2.

The exercise clearly shows the extent of the cyclical component of the surplus, which in some years amounts to more than 20 per cent of the actual balance (figure 3). The cycles of the economy have had major effects on the public finances; in the years of strong growth, transitory tax income constituted up to a maximum of 0.4 GDP points. Conversely, the 1990 adjustment meant a fall in fiscal revenue in relation to its trend during two consecutive periods.

The structural surplus indicator, or more precisely the variations in this surplus, make it possible to characterize the fiscal policy stance. The variations in the structural surplus are relatively small, having not amounted to one GDP point during the period analysed. Indeed, between 1989 and 1993 the Chilean economy did not have any major adjustment episodes or growth rates exceeding the trend path for more than one year. At the bottom of the cycle (1990) the structural balance tended to decrease, while at the top (1992-1993) the structural surplus tended to increase. These fluctuations reflect the anti-cyclical nature of recent years' fiscal policy (Marcel, 1993). Although this pattern can also be seen in the actual balance, the magnitudes are very different (table 1). Thus, whereas the fiscal balance was higher in 1992, the structural indicator showed a lower progression. This trend also manifested itself in 1993, when the reduction in the structural surplus was greater than the fall in the actual deficit, showing that the favourable position in the cycle concealed a slight deterioration in the public finances in that year. It is important to point out the time-lag existing between the economic cycle and the variations in government revenues (figure 4). The fluctuations in the level of activity were more forcefully felt in the following budget year, owing to the time-lag in tax collection periods. Thus, for example, the negative impact of the 1990 adjustment was greater in 1991, when the potential growth path was resumed. Also, the high growth rate of 1992 had more favourable effects on the surplus in 1993.

The exercise in this way identifies the fiscal policy stance with greater accuracy. In general, it is possible to observe an anti-cyclical trend in budget management, with substantial improvements in the structural surplus in the recent periods of expansion of the level of activity. However, it is also useful to break down this structural surplus into its trend and discretionary components, for which purpose the fiscal impulse indicator is calculated using the IMF methodology. In order to show the results of this exercise in the case of Chile (table 3), again disregarding cyclical components in government expenditures, 1989 was taken as the base year since it is the starting period for the analysis, although it does not adequately represent a neutral period in fiscal terms owing to the high growth recorded during it.

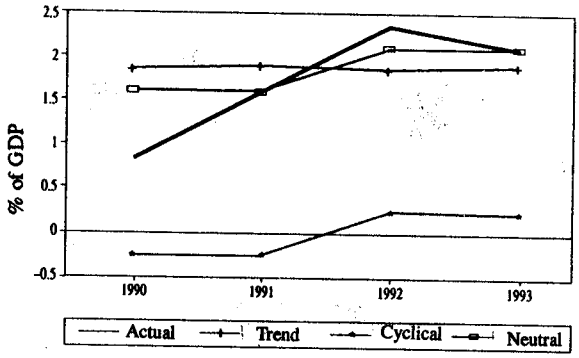
According to the IMF approach, revenues are regarded as neutral if their growth rate is the same as that of the level of activity. On the basis of this definition, discretionary revenues increased in Chile by

one GDP point in 1992 and 1993. If we compare these results with those provided by the structural indicator, we will see that the cyclical revenues were lower, since they are now being calculated on the basis of a unitary elasticity. As a corollary, there was an increase in the discretionary revenues. Also, owing to the favourable position in the cycle in 1992-1993, trend GDP increased less than actual GDP, resulting in a compression of the trend revenues and expenditures and an increase in the discretionary revenues and expenditures, when the latter are calculated as a ratio to actual GDP. According to this breakdown, the effects of recent years' fiscal policy have, with the exception of 1990, been neutral; indeed, the fiscal impulse indicator was nil in 1990 and 1993 (figure 5).

The breakdown of the structural surplus into its trend and discretionary components shows that a large share of this surplus is linked to trend determinants. According to these calculations, recent years' fiscal policy has not in general entailed any discretionary intervention, and the public sector has therefore not been a source of disturbance of the macroeconomic equilibria. This tends to show a fiscal management which seeks to avoid procyclical adjustments of the public finances and to ensure a sustainable public spending trend path. Fiscal programming has been structured around the potential growth of the economy rather than as a function of its cyclical fluctuations.

FIGURE 5

Chile: Breakdown of the actual surplus



Source: Table 2.

TABLE 3

Chile: Fiscal impulse indicator

	1989	1990	1991	1992	1993
Total revenues	23.63	22.14	23.74	24.38	24.58
Total trend revenues	23.63	24.03	24.09	23.23	23.32
Cyclical revenues	-	-0.25	-0.29	0.25	0.20
Neutral revenues	23.63	23.78	23.80	23.48	23.52
Discretionary revenues	-	-1.64	-0.06	0.90	1.06
Total expenditures	21.82	21.30	22.19	22.10	22.59
Trend expenditures	21.82	22.19	22.25	21.45	21.53
Discretionary expenditures	-	0.89	0.06	0.65	1.06
Actual surplus	1.80	0.84	1.55	2.29	1.99
Trend surplus	1.80	1.84	1.85	1.78	1.79
Cyclical surplus	-	-0.25	-0.29	0.25	0.20
Neutral surplus	1.80	1.59	1.56	2.03	1.99
Fiscal impulse	-	-0.75	-	0.26	-

Source: Own calculations on the basis of table 1.

VI

Summary and conclusions

Given the budget's vulnerability to variations in the macroeconomic environment, fiscal management requires an appropriate evaluation of potential resources in the medium term. For this purpose, it is necessary to identify the transitory phenomena that affect the government budget. Fiscal discretionality indicators in conjunction with other instruments make it possible to separate the transitory and permanent components of the public accounts, and thereby assist in removing the exogenous sources of budget movements from the macroeconomic analysis of fiscal policy and from income and expenditure decisions. The indicators used in this case enable the cyclical and structural components of the public accounts balance to be separated.

In this context it is desirable to advocate the establishment of a medium-term public spending norm that will make it possible to formulate clear rules of the game to which the State is committed and which will ensure the effectiveness of government action; such a norm should be consistent with the desired course of fiscal development throughout the cycle. This encourages the establishment of multi-annual programming mechanisms which are compatible with the economies' structural restrictions and will at the same time ensure a certain continuity in government action.

In the case of Chile, centralization of the fiscal authority means that fiscal policy can be evaluated on the basis of central government accounting. Also, the existence of the FCC, which separates in the public accounts the effects of unforeseen movements in the price of copper, and the tying of taxes to inflation make it possible to construct indicators that adequately measure the fiscal policy stance.

The application of fiscal discretionality indicators to the case of Chile has enabled the country's fiscal policy in recent years to be measured more accurately. In general, it is possible to observe an anti-cyclical tendency in budget management, with reductions in the structural component in years of lower growth and with substantial improvements in the structural surplus in the recent periods of expansion of the level of activity. This stems from the application of fiscal programming which is structured around the growth trend path of the economy and which avoids adjustments of magnitude in line with cyclical swings. The course of development of the fiscal balance has in fact been neutral in recent years, the growth rates of government revenues and expenditures having coincided with the increase in trend GDP.

(Original: Spanish)

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