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Fiscal policy *and the economic cycle* in Chile

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This article studies the effect of the stabilization of fiscal expenditure and the anti-cyclical use of taxes as stabilization variables in the Chilean economy, through the calibration of a basic macro-economic model adapted to the actual conditions of that economy. The results show that some 25% of the variability of economic growth could be eliminated by obviating fiscal cyclical impulses through constant growth of public investment and consumption and through anti-cyclical taxes. On the one hand, it is proposed that a system of stabilization of the growth of fiscal expenditure should be established, through a system of rules and degrees of flexibility subject to specific clauses. An important element in the implementation of stabilization policies is a tax revenue stabilization fund which would register and store up the counter-cyclical reactions of the fiscal authorities and make fiscal expenditure independent of the revenue obtained at any particular point in the economic cycle. On the other hand, an analysis is made of both the feasibility and the efficacy of fixing the value added tax (IVA) in a more flexible manner, as well as the problems of inconsistency over time that this would cause. For this latter reason, an analysis is also made of the costs and benefits of supplementing more flexible application of the IVA with greater flexibility as regards income tax or tax incentives for investment. It is concluded that the State has a variety of instruments that could be used to implement an anti-cyclical policy, such as the possibility of establishing rules for the growth of expenditure, stabilization funds, and greater flexibility of taxes.

I

Introduction

The Chilean economy has displayed sustained growth for the past eleven years. The average annual growth rate of GDP in those years has been over 6.5%: far above the historical average for Chile. Although this growth has been high and sustained, however, it has shown substantial cyclical variations, with growth rates ranging from 3.3% in 1990 to 11% in 1992 (figure 1).

This cyclical behaviour may be ascribed to various causes, including the frequent shocks to which the Chilean economy has been subjected in that period and indeed throughout almost the whole of the country's history as an independent nation.¹ These shocks include both those of external origin, due to changes in the conditions prevailing in the international economy, and those of domestic origin, including the effects of changes in macroeconomic policies.

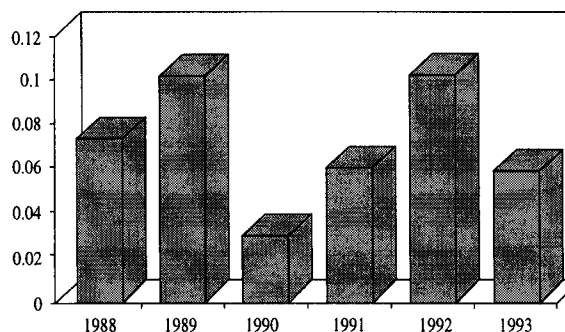
It is more or less generally agreed that these cyclical fluctuations in real economic activity are costly for the economy as a whole, as compared with a hypothetical situation of stable growth at the overall average rate. Variability of growth brings a greater level of risk into the economy, and this may negatively affect investment and future growth possibilities. Moreover, some of the effects of a transitory low growth rate are not completely offset in periods of high growth. In particular, the reduction of activity and employment in a period of low growth can have a substantial effect on the accumulation of human capital in the poorer sectors.

Since cyclical instability is undesirable, then, the question is whether public policy has elements at its disposal for smoothing out such variations. Here, we will analyse the possibility that fiscal policy may be defined on the basis of a scheme designed to moder-

□ A preliminary version of this article was presented at a seminar held in the Central Bank in January 1996. The authors wish to express their gratitude for the comments of José de Gregorio and Gonzalo Sanhueza and the valuable collaboration of Oscar Landerretche M. and Sergio Godoy. The contents of this article reflect the personal opinions of its authors, however, and in no way involve the institution for which they work.

¹ For an interesting summary of the shocks suffered by the Chilean economy in the course of its history, see Cortés, 1984.

FIGURE 1
Chile: Annual growth rate of gross domestic product between 1988 and 1993



ate such cycles, since the priority objective of monetary policy is to control inflation. The question we will investigate is whether or not stabilization of the growth rate of public expenditure at a level close to the growth rate of the potential product could have a significant effect on the variability of GDP growth. We will also try to see whether more flexible tax policy, defined in counter-cyclical terms, could be effective in this respect. In order to answer these questions, it is necessary to make a quantitative evaluation of the effects of public expenditure and tax policies on cyclical growth of the product.

It would also be interesting to find out how far fiscal policy defined on the basis of medium- and long-term conditions can moderate the cyclical effects, as compared with an expenditure policy defined on the basis of annual revenue. If expenditure depends on the income available at a given moment, and this in turn depends on the economic cycle, then it seems very reasonable to assume that the redefinition of expenditure policy could have a moderating effect on cyclical variability.

In the following sections, we will try to appraise the effect that various policies could have on public expenditure, as well as the likely effect of suitable management of indirect taxes on the stability of growth. First of all, we will review the main macroeconomic events that marked the 1988-1993 period

(section II). We shall then give a brief description of the model used to carry out the simulations for verifying the effects of the various fiscal policy options on the stability of growth, and the main results of these simulations will be presented (section III). Finally, section IV will sum up the main conclusions of the study.

This study does not deal with many important aspects of fiscal policy definition, including measures for optimizing the effectiveness of the various expenditure programmes, the size of the State, the level of public expenditure, and the objectives pursued by it. It is worth noting, however, that the adoption of any rule regarding the growth rate of public spending will naturally reduce uncertainty about this important macroeconomic variable. The fear felt by some sectors that the size of the public sector may increase and that the way the budget is handled may give rise to economic instability and

inflation –fears that have been borne out by past experience in Chile and other countries– adversely affects investment and holds back growth.

These considerations point to the desirability that the government should have tools at its disposal for coping with unexpected circumstances such as those caused by external events. The most important of these circumstances is a possible recessionary cycle, in the face of which the existence of a pre-determined limit on the growth of public expenditure, together with the current difficulties in modifying taxes in a flexible manner, would mean that the fiscal authorities' hands were tied. Likewise, if there was a situation of dual overheating of the economy, the existence of a formal commitment not to increase public spending more than the product would impede the adoption of a temporarily contractive spending policy because such a policy could not be offset by expansionary spending policies in subsequent years.

II

The Chilean economy, 1988-1993

Compared with previous years, the six-year period 1988-1993 turned in very favourable results. The average annual GDP growth rate was over 7%, after having been less than 1% in the period from 1982 to 1987. This higher growth was reflected in a lower unemployment rate: only 6% on average, compared with 14% in the previous six-year period. The Chilean economy has not only fully recovered from the crisis of the 1980s, which was reflected in the fact that in 1986 the level of GDP was only the same as in 1981, but has achieved sustained growth at rates much higher than those of the past.

The high average growth rate has been achieved in a context of markedly cyclical behaviour, which has made it necessary to effect two major adjustments in monetary policy during the period. Thus, the interest rate on Central Bank paper was substantially raised twice during this period, first in 1990 and later in mid-1992, to deal with growth rates of the product and of expenditure considered to be excessive in the light of the objectives in terms of inflation and the external accounts. The effectiveness of those adjustment processes was such that this period of vigorous economic growth has been accompanied

by rates of inflation which were not only low by Chilean standards but also showed a downward trend. Average inflation in the period in question was 17.5%, compared with 22% in the previous six-year period, and the annual rate went down from a high of 27.3% in 1990 to less than 10% in 1994. In this respect, it may be wondered whether support from fiscal policy in pursuing these objectives would help to reduce the magnitude of the economic cycle and make it easier to bring Chilean inflation down to rates comparable with those of the industrialized nations.

The years 1988 and 1989 were markedly expansionary, with the GDP rising by 7.3% and 10.2%, respectively, while inflation was 12.7% in the first of these years but rose to 21.4% in the second. The external situation was quite favourable, with trade surpluses of US\$ 2,218.6 million (9.2% of nominal GDP) and US\$ 1,578.1 million (5.6% of nominal GDP), respectively. The current account deficits were US\$ 167.4 million (0.7% of nominal GDP) in 1988 and US\$ 705 million (2.5% of nominal GDP) in 1989: both of these deficits were easily financed thanks to the heavy inflow of capital in these two years. For its

part, the public sector turned in a moderately expansionary performance in 1988, when real public absorption grew by 6.4%, and a contractive performance in 1989, when real public absorption went down by 1%.

In view of the expansion referred to earlier, the Central Bank—which is an independent body—decided on 8 January 1990 to raise the interest rate on its one-year paper from 8% to 9.7%, but not to raise the short-term rate, as it does now, thus causing a monetary shock to reduce expenditure and control inflation. The authorities' diagnosis was that over the previous two years there had been an expansion of aggregate demand that was not sustainable in the long term. This rise in interest rates, together with a better perception by the international financial system of the country risk, gave rise to a heavy inflow of capital which was absorbed by the Central Bank, whose reserves rose by 82% during the year.

In spite of this monetary adjustment policy, inflation showed a good deal of reluctance to go down in that year, although it must be acknowledged that some important price rises militated against anti-inflationary policy in 1990,² and their effects on a highly indexed economy like that of Chile tend to persist in time. The restrictive monetary policy was quite effective in bringing down the level of activity, which was reflected in a decline in the growth rate of GDP from 10.2% in 1989 to 3% in 1990, due above all to a substantial slackening of domestic spending (especially consumption expenditure) on the part of both the government and the private sector. The external situation, for its part, was quite favourable, with a highly positive trade balance of the order of US\$ 1,273.1 million (4.2% of nominal GDP) and a current account deficit of US\$ 648.0 million (1.9% of nominal GDP) which was easily financed by the heavy inflow of capital (especially short-term capital) whose causes were explained above. The public sector helped the adjustment of the economy in 1990 because public absorption fell by 5%.

In the course of 1991, the Central Bank gradually lowered the interest rates on its promissory notes in response to the slackening in activity and the decline in inflation. The GDP grew by 6.1% and infla-

² Such as the sharp rise in oil prices, the increase in the Value Added Tax (IVA) and some wage pressures such as the (real) rise in the minimum wage (which was raised by almost 45% in nominal terms in June).

tion finally responded to the adjustment policy by going down to 18.7%, compared with 27.3% the year before.³ With regard to the external sector, the trade balance turned in a surplus of the order of US\$ 1,575.9 million (4.64% of nominal GDP) and the current account deficit was practically nil, but the heavy inflow of capital continued, being reflected in a nominal increase of 24.2% in the international reserves. In view of this persistent entry of resources, in mid-year the Central Bank decided to take measures to stem the inflow of foreign exchange, especially of the shortest-term resources.⁴ The behaviour of the public sector was much more expansionary than the year before, and real public absorption rose by 7.1%.

During 1992 the GDP grew by 10.3%, while unemployment went down from 6.6% in 1991 to 4.9%—historically a very low level for the Chilean economy—and inflation sank to 12.7%.⁵ The external situation was very favourable, too, with a trade surplus of US\$ 749.2 million (1.8% of nominal GDP) and a current account deficit of US\$ 743.0 million (like-wise 1.8% of nominal GDP), easily financed from the capital inflows, which even made possible an increase in the international reserves. The public sector behaved in a clearly expansionary manner, with real public absorption growing by 13.1%.

The gradual rise in interest rates in 1992, and a less favourable situation as regards external demand, caused the growth rate of economic activity to slacken in 1993: the GDP grew by around 6% and the unemployment rate went down slightly to its lowest level in the last twenty years, while inflation tended

³ It must be recognized, however, that the lowering of tariffs and the fall in oil prices also played a significant role in this reduction of inflation.

⁴ The most important measures in this respect were the 2% revaluation and the establishment of a non-interest-bearing one-year compulsory deposit of 20% of external credits. This enabled the inflow of capital to be checked to some extent. The revaluation and the lowering of tariffs also represented the recognition by the economic authorities that the heavy inflow of foreign exchange registered in the last year and a half had a substantial structural or permanent component and was not just a temporary phenomenon, as had originally been thought.

⁵ Factors in this reduction in inflation were the nominal appreciation of the currency during the year, which amounted to only 3.8%, the sustained downward trend in oil prices, and the gradual raising of interest rates by the Central Bank in order to discourage domestic spending, which was felt to be growing too fast.

to go down slightly compared with the previous year. Because of the more sluggish performance of the external sector, which was reflected in a decline of some 8.5% in the terms of trade, the trade balance registered a deficit of the order of US\$ 978.6 million (2.2% of nominal GDP) –the first in over ten years– and the current account deficit came to US\$ 2,092.0 million (4.8% of nominal GDP). Although this deficit was the biggest in the decade it was nevertheless

financed without difficulty because the inflow of capital continued and the Central Bank's international reserves even grew by a little over 8%, from US\$ 9,009 million (21.8% of nominal GDP) to US\$ 9,759 million (22.3% of nominal GDP). The public sector behaved a good deal more moderately than the year before, aiding the adjustment to some extent with a growth rate of real public absorption of 6.4%.

III

The simulation model and its results

The model used in the simulations is a simplified Keynesian-type macroeconomic model,⁶ with only four behaviour functions: real private consumption, excluding expenditure on consumption directly financed by transfers from the public sector; real taxes, excluding public income from copper; imports of goods and services in real terms, and the real exchange rate. The other variables of aggregate demand, including transfers from the public to the private sector, private investment, public consumption and investment, and exports, are considered to be exogenous. Other endogenous variables, such as the GDP, are calculated on the basis of identities which incorporate both exogenous variables and those of behaviour.

The model is strictly real –that is to say, it ignores the monetary and financial effects of the measures employed– since it does not include the money market or interest rates as arguments to explain the behaviour functions presented. Nor does it cover the possible wealth effects of the fiscal policy adopted, or possible crowding out between government expenditure and investment through interest rates, because the effects of the interest rate mechanism are ignored in the interests of simplification, and investment is considered to be exogenous. What the model *does* include is the direct effect of public expenditure on private consumption (without transfers),

because when public expenditure increases, so does the GDP, and this in turn increases private consumption.⁷ This effect is partly offset by the increase in public income, which reduces disposable income.

Private consumption without transfers is defined as private consumption expenditure, excluding current transfers from the public sector, which are considered as income of groups having a unitary marginal propensity to consume. Private consumption without transfers is a function of private disposable income –which is calculated as national income (GDP) plus net factor income from the rest of the world, less taxes– and of that same consumption itself, after a lag period.⁸ Taxes not connected with copper, which include all current government income except that from copper mining, are a function of GDP.

⁶ Keynesian model along the lines of Blinder and Solow (1989), Christ (1967) and Frenkel and Razin (1987). The application of Keynesian models in an open economy with freedom of private capital movements is analysed in Mundell (1963), Fleming (1962) and Sachs and Larraín (1993).

⁷ This effect is among the possible results foreseen by the most extreme Keynesian model, in which aggregate supply is completely elastic and investment is not sensitive to interest rates, so that the effect of greater government spending increases the product demanded and supplied, which –other conditions being equal– increases private consumption. Furthermore, in this model increases in the GDP and absorption increase imports, for two reasons. First, through the direct effect of the GDP, as demonstrated below in equation (3), and second, because when absorption rises the real exchange rate falls: as the trend product is a given value, the ratio between it and absorption goes down, so that the real exchange rate falls –see equation (4) below– and hence imports rise. This increase in imports causes the GDP to go down, and this also reduces the effect of public spending on private consumption (without transfers).

⁸ The auto-regressive process of consumption may be explained both by the existence of adjustment costs in consumption and by the formation of expectations regarding future income.

The real exchange rate (RER) represents the relative price between tradeable and non-tradeable goods. It is defined as the ratio between external prices measured in dollars—represented by the weighted average of the wholesale price indexes of the main trading partners, measured in dollars—and domestic prices measured in dollars, represented by the consumer price index divided by the nominal exchange rate. In the model, the rate of variation of the real exchange rate is an inverse function of the difference between the growth rates of aggregate expenditure and the trend product. Thus, a growth rate of expenditure which exceeds the growth rate of the trend product gives rise to an excess of demand for non-tradeable goods and hence tends to reduce the real exchange rate.

Lastly, the demand for imports is a function of the domestic product and the real exchange rate; it reacts to changes in absorption through the effect that the latter has on the real exchange rate. All the equations were calibrated to simulate the effective result. This was done by adding for each endogenous variable a representative series of exogenous shocks, defined in order to ensure that the model faithfully reproduced the results observed in reality. These series were employed in the various simulations.

The model is thus as follows (the variables market with $-$ are exogenous):

$$(1) RER = RER \frac{Y^T}{E}$$

$$(2) YcSPNoCu = YcSPNoCu(Y)$$

$$(3) Imp = Imp(Y, RER)$$

$$(4) Cstr = Cstr(YPD, Cstr_{-1})$$

$$(5) Y = Cstr + \bar{I} + \bar{G} + \bar{Tr} + \bar{X} - Imp$$

$$(6) E = Cstr + \bar{I} + \bar{G} + \bar{Tr}$$

$$(7) Ypd = Y - \overline{PFNR} - (\overline{YcSPCu} + \overline{YcSPNoCu}) - \overline{OYSP}$$

where:

RER : Real exchange rate
 Y : GDP
 Y^T : Trend GDP⁹

E : Domestic absorption
 $YcSPNoCu$: Current public sector income not connected with copper
 Imp : Imports
 $Cstr$: Private consumption without transfers
 I : Private investment
 G : Public consumption and investment
 Tr : Transfers from the public to the private sector
 X : Exports
 Ypd : Disposable private income
 $PFNR$: Net factor income from the rest of the world
 $YcSPCu$: Current public sector income connected with copper
 $OYSP$: Other public sector income.

The first four equations are behaviour equations, while the last three are basic identities of the national accounts. In order to be able to carry out simulations, equations (1) - (4) must be given a specific functional form as shown below:¹⁰

$$(1) RER_t = RER_{t-1} \cdot ((Y_t^T/Y_{t-1}^T) \cdot (E_{t-1}/E_t))^{a_0} \cdot a_1$$

$$(2) YcSPNoCu_t = B_0 + YcSPNoCu_{t-1} \cdot ((Y_{t-1})^{b_1})$$

$$(3) Imp_t = Imp_{t-1} \cdot ((Y_t^T/Y_{t-1}^T)^{c_1}) * ((RER_t/RER_{t-1})^{c_2})$$

$$(4) Cstr_t = D_0 + d_1 \cdot (Ypd_t) + d_2 \cdot (Cstr_{t-1})$$

The coefficients of these equations are given in table 1.

TABLE 1
Coefficients of the equations

Coefficient	Value
a_0	0.47000
a_1	1.03465
B_0	-23.00000
b_1	1.20000
c_1	1.20000
c_2	-0.40000
D_0	101.79045
d_1	0.53819
d_2	0.49219

⁹ The trend GDP is calculated by making the GDP for the period immediately before the starting period, in this case 1987, grow at the average growth rate for the period 1988-1993.

¹⁰ The subscript t in the variables represents the period. The equations shown here ignore the adjustment variable.

TABLE 2

Chile: Adjustments of constants

	Real exchange rate	Current income of public sector (non-copper)	Taxes	Private consumption, without transfers
1981	-8.60	-4.69	-13.00	282.66
1982	-5.22	-147.61	-217.34	-370.60
1983	5.02	-82.11	-66.79	-215.31
1984	1.27	48.14	53.13	-99.67
1985	10.94	-41.44	-49.39	-385.99
1986	5.03	-43.77	42.46	-340.13
1987	2.03	-0.25	110.78	-249.18
1988	3.56	-73.62	70.84	-150.30
1989	-3.69	-110.79	132.92	-62.53
1990	-2.90	-80.28	-0.65	-284.69
1991	-11.38	82.46	-53.44	-277.05
1992	-9.71	-11.70	118.65	-214.07
1993	-1.10	-28.79	99.19	-273.72

The values assumed for the elasticities represent plausible figures for them. As already explained, it was necessary to add to the equations shown here the adjustments given in table 2. This was done in order to reproduce exactly the behaviour of the economy. These adjustments represent the exogenous shocks which have affected the different behaviour variables and are not represented by the effects of the variations in the exogenous variables.

This model has not been estimated empirically, although the values of the elasticities used are based on estimates carried out earlier, since its objective is not to empirically estimate values for the parameters explaining the macroeconomic behaviour observed in Chile but to illustrate in a simplified form the relations that represent such behaviour in the country. The model was used to simulate the macroeconomic effects of changes in fiscal policy as regards the variability of the growth rate of public expenditure and the flexibility of indirect tax rates.

The exercise described below is designed to study the effect of fiscal policy on the cyclical behaviour of GDP in the period 1988-1993. This behaviour is measured by the standard deviation of the GDP growth rate from its trend values. The cyclical effect of fiscal policy is singled out through simulations that compare the fiscal policy applied during the period under investigation with a counter-cyclical fiscal

policy scheme which stabilizes the growth of public absorption and flexibilizes tax rates. This fiscal policy scheme consists of eliminating cyclic impulses of fiscal origin by stabilizing the growth rate of real public absorption, and offsetting cyclical impulses of private origin through changes in the rates of certain indirect taxes.

1. Simulation exercises

Three simulations were carried out (table 3). Simulation 1 was used as the basis for calibrating the model with the effective data. Simulation 2 consisted of modifying public expenditure while keeping the growth rate of public absorption constant throughout the period; it was carried out without changing tax rates, in order to single out the counter-cyclical impact attributable to control of public spending. Finally, simulation 3 maintained the constant growth rate of public absorption while incorporating temporary increases or reductions in the rates of certain indirect taxes, for counter-cyclical purposes.

The yield of the temporary increases or reductions in tax rates was limited to a value equivalent to 0.5% of annual GDP, in view of the practical difficulties in securing bigger changes in tax revenue. In order to obtain additional revenue equivalent to half a percentage point of annual GDP, it is necessary to increase the rate of the Value Added Tax (IVA) by one

TABLE 3

**Simulation exercises on counter-cyclical
fiscal policy, for the period 1988-1993**
(Percentages)

	Actual data	Simulation 1 (base)	Simulation 2 ^a	Simulation 3 ^b
Gross domestic product				
Average growth rate	7.12	7.12	7.12	7.15
Standard deviation of growth rate	2.79	2.79	2.41	2.12
Aggregate domestic debt				
Average growth rate	7.89	7.89	7.89	7.93
Standard deviation of growth rate	4.62	4.62	3.90	3.50
Total consumption				
Average growth rate	7.00	7.00	7.21	7.28
Standard deviation of growth rate	2.62	2.62	1.37	1.10
Public absorption				
Average growth rate	4.45	4.45	4.05	4.05
Standard deviation of growth rate	6.57	6.57
Imports				
Average growth rate	13.47	13.47	13.46	13.49
Standard deviation of growth rate	9.11	9.11	8.40	7.93
Disposable private income				
Average growth rate	7.13	7.13	7.18	7.41
Standard deviation of growth rate	5.74	5.74	6.91	7.94

^a Public expenditure was changed, while keeping the growth rate of public absorption and the tax rates constant.

^b While keeping the growth rate of public absorption constant, transitory increases or decreases were made in certain indirect taxes.

percentage point for a whole year, so that this scheme would require a band of variation of IVA of +/- one percentage point.¹¹ All increases in revenue were allocated to saving, as the growth rate of public absorption remained unchanged.

2. Results of the simulation

The variability of the growth rate of GDP was quite notable: over the period 1988-1992 it ranged from

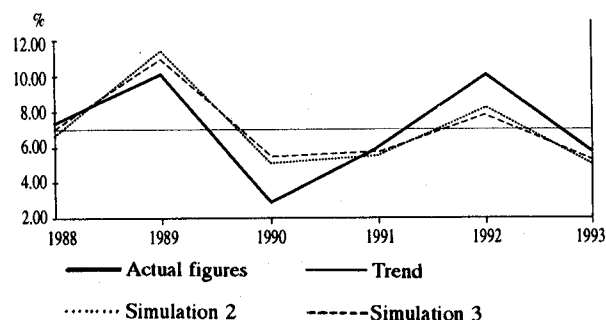
3.0% to 11% (figure 2). A simple interval for the GDP growth rate, at a level of confidence of 95%, would give a range from 2.4% to 12.6%, in view of the standard deviation observed in the sample. This indicates a substantial degree of uncertainty about the future behaviour of economic activity.

According to the simulation exercises, counter-cyclical fiscal policy would reduce the variability of GDP growth, as represented by its standard deviation, by 24%. This would be due almost equally to stabili-

¹¹ The use of other indirect taxes for this purpose cannot be ruled out *a priori*, but in view of its coverage, easy administration and rapid response the IVA would appear to be the most effective instrument for this objective. One reason for limiting the variation of the rate of IVA is based on the theoretical argument that it is best to avoid alterations in tax rates in order to avoid distorting relative prices and generating uncertainty about the policy outlook (for the bases of this argument, see Barro, 1979, and for a brief explanation of it see Blanchard and Fischer, 1989). The microeconomic argument in favour of a constant tax rate is at least partly offset by the macroeconomic argument stressing the reduced uncertainty that results from a more moderate cyclical variation in GDP, which is precisely what adjustable tax rates are supposed to promote.

FIGURE 2

Chile: Twelve-month rates of variation of gross domestic product



zation of the growth rate of public absorption and flexibilization of tax rates. Thus, a constant growth rate of public expenditure would reduce the variability of GDP by 14%, while the remaining 10% reduction would be attributable to flexibilization of tax rates.

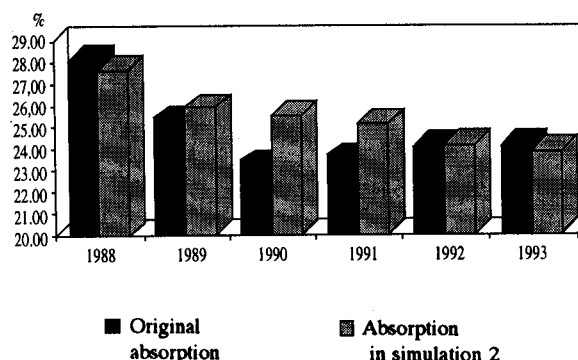
There has been a notable reduction over the period in the relation between public absorption and the product. From 1988 to 1993, the cumulative growth rate of macroeconomically significant public expenditure has been below the growth rate of GDP (figure 3). In the simulation exercises with counter-cyclical fiscal policy, the growth rate of public absorption remained almost at the levels of the base simulation, the only differences being in the gentler reduction patterns displayed by simulations 2 and 3 because they kept the rate of expansion of expenditure constant.¹²

Another significant point is the decline registered during the period under investigation in the proportion of GDP accounted for by taxes not connected with copper mining, which have not fully recovered since the 1990 tax reform. It should also be noted that the variability of the growth rate of taxation went down in the scenario where tax rates were variable. This indicates that the stabilization of the growth of GDP predominated over the effect of counter-cyclical variations in tax rates.

The variability of total consumption goes down when counter-cyclical fiscal policy is applied, but that of private consumption without transfers tends to remain steady. The explanation for this would appear to be that the variability of tax rates gives rise to variability of private consumption which is not offset by the greater stability of GDP growth. Indeed, the variation of disposable private income increases when a counter-cyclical fiscal policy like that described here is applied.

¹² The growth rate of public absorption was marginally reduced in order to avoid the mean growth rate of GDP from increasing in simulations 2 and 3. The indivisibility of the change in tax rates, which was kept at the level of increases or decreases of one percentage point in IVA (changes of 0.5% in GDP), explains the marginal increase in the growth rate of GDP in simulation 3.

FIGURE 3
Chile: Public absorption as % of gross domestic product



The global fiscal balance, including the estimated cash deficit of the Central Bank, becomes more variable when counter-cyclical policies are applied. Theoretically, this result is correct, because this takes place to the extent that fiscal policy actions offset cyclical impulses of private origin, and this effect is accentuated when taxes are used as an instrument for offsetting cyclical impulses of non-fiscal origin, since the variability of the fiscal balance then increases significantly compared with the base situation but rises only marginally when the cycle is eliminated.

The results obtained show that a by no means insignificant portion of the variability of GDP growth may be attributed to the variability of growth in public spending. Extraordinarily flexible fiscal policy is needed in order to eliminate the cyclical component of GDP, however. Such policy should act to offset cyclical impulses of private origin by using counter-cyclical taxes, while it should avoid fiscal cyclical impulses by keeping the growth rate of public investment and consumption constant. At all events, it is clear that cyclical impulses cannot be completely offset by fiscal policy: indeed, 75% of the cyclical variability of GDP cannot be offset by this means.

IV

Main features and problems of the proposed anti-cyclical fiscal policy

This article explores the possibilities open to the government for stabilizing the Chilean economic cycle (defined as the variability of GDP growth rate) by using the various instruments at its disposal. There is general agreement on the prejudicial effects on the economy of extreme variations in the GDP growth rate such as those registered in the case of Chile in recent periods. Such variability has harmful effects on domestic investment and hence on future growth possibilities.

The fact that the authorities have some scope for reducing cyclical fluctuations makes it desirable to study some possible procedures for this purpose, in view of the substantial cyclical variability displayed by economic activity in Chile in the 1990s and the frequent temporary shocks suffered in the past. In order to progress in this direction, however, budget discussions would have to cover a longer term: perhaps in terms of five-year expenditure programmes. This is impossible in the present political and legislative context, in which the present level of expenditure is discussed in the light of the tax and non-tax income available now or in the short term.

There are various aspects that need to be examined and clarified in connection with a proposal for counter-cyclical fiscal policy: the nature of the limitations to be placed on the growth of public expenditure, the types and degree of flexibility of taxes, and the characteristics of the necessary fiscal stabilization fund.

1. Restrictions on the growth of public expenditure

A counter-cyclical fiscal policy proposal would involve limiting the growth of public expenditure to the potential GDP growth. In order to get round the problem of measuring the potential GDP, it would appear to be reasonable to use as a reference standard a mobile average of the GDP growth rates. In order to prevent cyclical fluctuations from introducing too much variability into the growth rate of public expenditure,

it would seem desirable for that mobile average to refer to a relatively long period of time: say, ten years. It cannot be ruled out that, in line with structural objectives of the public sector, the growth rate of public absorption may be lower or higher than the average growth rate of GDP over the last ten years.

Since the objective of the proposal is to contain the impact on aggregate demand for goods and services, the public expenditure which must be limited is that corresponding to public absorption. This includes all central government consumption and investment expenditure that generates pressures on the aggregate demand for goods and services, including wages and salaries, purchases of goods and services, and transfers. Consequently, in the light of the concepts of expenditure currently used in preparing the public budget, it would be advisable to exclude for this purpose the items corresponding to financial investment (loans) and interest payments on the domestic public debt (mainly to the Central Bank) and the external public debt.

There can be no doubt that, whatever the way in which the growth of public expenditure is restricted, some degrees of flexibility and some safety valves must be left available for modifying the limits in certain circumstances. In particular, the government must retain some degree of discretionality with respect to the level of public investment expenditure or possible emergency situations, although deviations in these cases must be for fully justified reasons and must be compensated in the years following the period for which the budget was prepared.

2. More flexible treatment of taxes

The main candidate for flexible treatment is undoubtedly the value added tax (IVA), the rate of which was already made flexible to some extent in the tax agreement adopted by Congress which allowed the government to fix the rate of IVA between 16% and 18% as from 1996. The use of this

tax as a means of cyclical stabilization has various important advantages. First, its broad coverage means that quite small changes in its rate are sufficient to produce a significant effect in terms of revenue. Reasonable changes in the rate of IVA are more effective and give rise to fewer distortions than changes in other tax rates. Moreover, IVA is the tax that most directly affects consumption expenditure. And finally, the response to a change in its rate in terms of revenue is relatively immediate and does not give rise to major problems of evasion or administration.

The impact of a higher rate of IVA on expenditure takes place because the higher tax reduces disposable income, on which consumption expenditure depends to a large extent. Thus, the pro-cyclical application of this rate is a stabilizing element. Furthermore, as temporary changes in the rate of IVA change the relative cost of expenditure at the present moment, as compared with expenditure in the future, pro-cyclical fluctuations in this rate can do much to help stabilize the purchase of durable goods subject to IVA.

In spite of its positive effect on the level of activity, however, treating the rate of IVA in a flexible manner has a cost that must be taken into account: its pro-cyclical application will tend to affect the rate of inflation as measured in the short term, and this imposes certain limits on the potential use of this mechanism. As noted in the previous section, in order to change tax revenue by 1% of GDP it is necessary to change the rate of IVA by around two percentage points. Likewise, this cost highlights the need and desirability of making progress in reducing the practical importance of indexing mechanisms, which increase the vulnerability of inflation rates to cost shocks.

This limitation on the use of IVA as a stabilizing instrument suggests that it might be advisable to supplement this mechanism with some flexibilization of direct taxes (especially income tax), which do not have a direct impact on costs and prices. Since the revenue from income tax is relatively small, however, very significant changes would be needed in the tax rates in order to raise the amount collected by a more or less substantial margin, and this would have highly distorting effects. Furthermore, because of problems of coverage and evasion, in the short term the increase in the rate of income tax would tend to affect mainly salaried persons. Finally, it should be

borne in mind that income taxes are already stabilizing elements because of the nature of their present design.¹³

The foregoing options could be supplemented with more flexible treatment of tax incentives for investment. These incentives represent only a minor amount in terms of tax revenue, but they can do a great deal to help stabilize expenditure more during a cycle, because they make it possible to change the relative profitability of investing at present, as compared with putting off investment into the future. The risk involved in using this instrument is that it can open up loopholes for tax evasion.

If we consider that the tax rises would take place in contexts of strong expansion of aggregate demand, where there is a danger of high inflation, while the tax reductions would take place in fundamentally recessionary contexts, we see that the expectations anticipating the tax policy would become a pro-cyclical element. Consequently, the right moment for lowering or raising tax rates will depend on the way such expectations are formed and the degree of elasticity of demand in response to them.

Let us assume a scenario with expectations and agents that carry out inter-temporal substitution and therefore clearly perceive the relative prices of consuming now or in the future (typically with regard to durable goods). If the economy is passing through a recessionary period and a reduction in taxes is expected, then in the period between the announcement and the reduction there will be a contraction in demand, but regardless of whether there is any announcement or not, as the idea spreads in the market that a reduction in tax rates is on the way, then demand will begin to contract, and the agents will put off their decisions to invest in durable goods. In contrast, if the economy appears to be facing an upsurge in inflation, the agents will bring forward their decisions to invest in durable goods, thus once again producing a pro-cyclical effect.

¹³ In the case of profits tax, this is because the tax base has cyclical fluctuations which are a good deal more marked than those of the product. In the case of personal taxes, this is due to their progressive nature: when personal incomes rise, the increase in revenue is more than proportional, while the opposite occurs when personal incomes fall.

The effectiveness of measures taking a flexible approach to tax rates depends largely on the ability of the authorities to foresee the formation of expectations by the agents and, in the final analysis, on the timeliness of the adjustments in tax rates.

3. The stabilization fund: its nature and characteristics

The stabilization fund is designed to act as a complement to counter-cyclical fiscal policy and may be understood as the element which serves to record and store up the counter-cyclical reactions of fiscal policy. Defined in this way, it is obviously far from representing a global indicator of the results of fiscal management. Neither does it seek to measure the overall structural financial results, nor that part relating to the direct impact of the economic cycle on the public finances. These features rule out the imposition of drastic limitations on public sector financial management. The establishment of such a stabilization mechanism does not, however, solve the problem of whether the restriction of solvency is duly internalized by the public sector.

Consequently, the stabilization fund defined below should be viewed merely as an accounting record of the inflow and use of the extra resources deriving from the application of counter-cyclical fiscal policy. It would receive its income from the extra revenue obtained through changes in tax rates from the normal level established for IVA, and from the profits –if any– generated by the resources accumulated in the fund. These resources would go down if withdrawals had to be made on account of declines in revenue due to rates of IVA lower than those considered normal.

In order to give a more temporary nature to this type of policy, we believe that it is also necessary to place minimum and maximum limits on the size of the fund as a percentage of GDP. We suggest that the lower limit should be zero and the upper limit 8% of GDP, which would make it possible to cope with cycles like those of the Chilean economy. In the event that one of these limits were reached, we propose that an automatic tax correction mechanism should then come into play, with tax rises if the lower limit were reached, or withdrawals through the lowering of tax rates if the upper limit were attained. It may be recalled that expenditure would be restricted by the global limitation imposed on the growth of public spending.

In order not to impose immediately a highly restrictive situation in terms of the handling of this instrument, we believe that a fund equivalent to 2% of GDP should be taken as the starting point. This could be achieved through the transfer of part of the financial resources currently deposited by the government in the Central Bank. The resources generated by the fund should be deposited in the Central Bank and be managed by the latter body for the purpose of buying back its own debt. The Central Bank would, of course, take measures to sterilize the monetary consequences of this mechanism, just as it would in the case of any other public sector deposits.

Finally, with regard to the interest rate that the Central Bank should pay the government for the resources in the stabilization fund, one alternative would be an interest rate of zero, which would have the advantage of relieving the Bank's cash deficit, but another, perhaps more desirable, alternative would be to pay an interest rate in dollars on these deposits on the same terms as the rates paid on government promissory notes with the Central Bank.

V

Conclusions

In order to make a qualitative evaluation of the various options open to the Chilean government, several simulations have been made for the period 1988/1993, using a general, real and simple Keynesian-type model with four behaviour equations: real private consumption, excluding public transfers; real

non-copper taxes; real exchange rate, and real imports.

The results obtained indicate that the government could make a substantial contribution to stabilizing GDP growth. Thus, the standard deviation of GDP is reduced by 24% under a counter-cyclical fis-

cal policy in which the growth rate of public absorption is equal to that of mean GDP growth and the rates of indirect taxes (IVA) are used as a stabilizing element.

In the final analysis, it seems reasonable to study the possibility of planning expansions of public spending more carefully, so that they will help to reduce the magnitude of the economic cycles in the domestic economy. The model shows that at least 25% of the variability of GDP growth can be reduced through a policy of stabilizing the growth of expenditure and applying a counter-cyclical tax policy. It is necessary, however, to study more closely a number of institutional aspects which would be needed in order to ensure the effectiveness of such policy.

Firstly, with regard to the fixing of the growth rate of public expenditure, it is necessary to decide what is the most reasonable measurement period of the potential product, on the one hand, and what is the optimum period that the planning of public expenditure should cover, on the other. In the present study, we have come to the conclusion that using mobile averages covering ten years and five-year planning periods could be a reasonable criterion of a sufficiently long-term nature; in the same connection, it would be necessary to establish new rules for the preparation of the national budget, especially as regards degrees of flexibility and systems of compensa-

tion over time. An institutional aspect of crucial importance is the establishment of a stabilization fund to serve as a buffer between the variability of tax revenue (which is subject to economic cycles) and expenditure (which is normally subject to fixed rules). Such a fund should have upper and lower limits so that its resources are used on a transitory basis and there is less discretionality in their use.

Secondly, it is necessary to study the best mix of taxes that could be applied more flexibly, since the use of IVA alone could have some destabilizing effects on short-term inflation. Income tax and tax incentives for investment would appear to be suitable mechanisms for combining with IVA in this respect. An important aspect that needs to be studied is the inequitable impact that the adjustment can have on certain sectors. It is also necessary to bear in mind that some sectors of the population may not have access to credit markets, thus making it more difficult for them to move their consumption decisions over time. Furthermore, there are differences in the coverage of the various taxes and the degrees of evasion associated with them, and these factors may give rise to serious distortions when establishing greater flexibility. The efficacy of the proposed tax policy will depend essentially on the capacity to take timely action in response to changes in expectations.

(Original: Spanish)

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