Monetary policy transmission: the Chilean case

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Introduction

In order to understand the workings of monetary policy in Chile it is important to bear in mind the special characteristics of its financial system. Chile has a quite free and developed financial system compared with most other developing countries. Credit markets operate without any ceilings, either on quantities or on interest rates, which are determined by the interplay of supply and demand. Reserve requirements are relatively low (9% on liquid assets and 3.6% on time deposits); they are not used for monetary policy purposes and have remained almost unchanged for the last two decades.

Financial markets are relatively deep and long-term-oriented. Financial savings amount to 75% of GDP, and stock market capitalisation is close to 100% of GDP. There is also an important sector of institutional investors, consisting mainly of insurance companies and private pension funds (AFPs), which have a long-term horizon. Pension funds alone manage funds in the order of 35% of GDP, representing approximately one-quarter of financial liabilities and stock market capitalisation. These characteristics allow the central bank to conduct open market operations at both short and long term, targeting market interest rates and liquidity.

There are two other basic factors that have conditioned the development of monetary policy as well as exchange rate policy during the 1990s. A first factor has been the ending of restrictions on foreign currency holdings and the alleviation of the foreign exchange scarcity, so notorious during the previous decade. A second factor is the high degree of indexation that was so favoured and is still prevalent in the Chilean economy despite the considerable progress made in reducing inflation.

The massive inflow of foreign capital that began in 1990 dramatically changed the environment for monetary policy. It was also a tremendous obstacle to maintaining a high and stable real exchange rate, which had

been the basic aim of economic policy throughout the second half of the 1980s. As could be expected, when foreign capital began to flow freely again, this aim frequently clashed with the attempt to use monetary policy to rein in domestic expenditure. In order to alleviate this situation as far as possible, an unremunerated reserve requirement on foreign loans and deposits was adopted in 1992, designed mainly to curb short-term capital inflows. The intervention band for the exchange rate was widened from 5 to 10 %, and more recently was further increased to 12.5 % in order to permit greater exchange rate flexibility.

At the same time, the Chilean economy has been subject to a high degree of indexation that has prevented a more rapid drop in inflation. Consequently, a policy of gradual reduction of inflation has been adopted rather than an abrupt or radical decline to the levels of industrial countries. Indexation has been operated in the labour market and in the financial sector as well as being applied in the tax system. The main instrument of indexation has been the *Unidad de Fomento (UF)*, whose value rises on the basis of the past month's increase in the consumer price index. Indexation practices have so strongly conditioned Chilean economic policy that monetary policy uses the real interest rate as its instrument (instruments are denominated in the UF), and the exchange rate band is indexed to the consumer price index.

1. Monetary policy in Chile

From the creation of the Central Bank of Chile in 1925 until 1974 monetary policy was mostly subordinated to fiscal deficit financing. Credits to the Treasury were the first source of basic money creation in the country. Initially, the central bank financed any fiscal deficit virtually automatically, but from the 1940s it also extended credit for the development of a number of productive sectors. Money grew at an unsustainable rate, bringing annual inflation to a permanent two-digit level. In spite of many efforts made to bring discipline to monetary policy, the situation deteriorated progessively, culminating in an inflation rate of over 100 % in the early 1970s.

In the mid-1970s the situation changed abruptly. Radical economic reforms were implemented in order to modernise the economy and finally curb inflation. The fiscal deficit was cut sharply and the Chilean

peso was pegged to the US dollar, accompanied by major capital account liberalisation. At first the exchange rate was fixed against the dollar with periodic mini-devaluations, but in 1979 a completely fixed exchange rate was introduced. Monetary policy was once again passive, dictated by balance-of-payments considerations and the need to maintain the fixed exchange rate. This economic policy collapsed in 1982, with the worst economic crisis in Chile since the Great Depression of the 1930s. From 1982 to 1985 monetary policy was oriented towards recovery from the economic depression and the collapse of the financial sector.

In 1985 the central bank adopted an entirely new approach, which is still followed today. With a capital account less open than in the second half of the 1970s and an exchange rate band, the monetary authorities could influence market interest rates and at the same time maintain a narrow foreign exchange intervention band. Since then, monetary policy has focused on keeping the growth rate of aggregate spending in line with that of the economy, and in turn curbing inflation. Nevertheless, in the second half of the 1980s the economy was still depressed, facing severe external restrictions, and a high and stable real exchange rate (depreci- ated domestic currency) was needed in order to promote exports. Faced with a trade-off between inflation control and maintaining a competitive real exchange rate, the monetary authorities gave priority to this second goal, indexing exchange rate policy.

In 1990 the Banco Central de Chile was granted a new Charter estab- lishing the autonomy of its Board from the political authority. The Charter also explicitly defined the Bank's objective as being "to ensure the stability of the currency system and the due payment of both domestic and foreign debts". Inflation stabilisation became the main target of monetary policy, albeit within the context of a gradual process, serving to minimise the costs in terms of employment and competitiveness. The Bank has since searched for the most efficient ways to fulfil this objective, taking into account the particular characteristics of the Chilean economy.

Since 1991 the Bank has operated with explicit annual inflation targets. These targets have been met every year. In implementing its policy, the Bank aims to achieve a level of interest rates, expenditure and output consistent with the stated inflation targets.

Market interest rates are freely determined by demand and supply conditions. The Bank influences market rates indirectly through its policy instruments. Until May 1995 monetary policy was implemented through

open market operations using 90-day real instruments (indexed to the UF). More recently it has shifted towards shorter-term instruments which have proved to be more efficient and flexible, with special focus on the overnight interest rate. Today the Bank offers a liquidity credit line at a discount rate and a liquidity deposit account, which together establish a ceiling and a floor for the overnight market interest rate. The fine-tuning of monetary policy is carried out through short-term repo and reversed repo operations within this market.

The Bank has medium-term debt instruments of 30 and 90 days (PDBCs and PRBCs respectively) and longer-term bonds ranging from 8 to 20 years (PRCs). All are auctioned twice a week in fixed amounts, so the market determines the yield curve. In view of the particular circumstances prevailing in Chile, all central bank debt is indexed to the consumer price index through the UF. It is important to note that in Chile all public debt is issued by the central bank and none by the Government.

2. Monetary policy transmission channels

Among the different monetary policy transmission channels, Chilean policy is mainly focused on the traditional interest rates/aggregate demand mechanism. In fact, the current policy pursues stabilisation of the growth rate of aggregate demand around the growth rate of potential output as an intermediate objective. Theoretically, this objective, together with a real exchange rate (RER) target, permits both control of the inflation rate and a sustainable external deficit, which are the final objectives of policy.

A key element in understanding why monetary policy has focused on aggregate demand is the extent and level of indexation of the economy. As mentioned above, most financial instruments, including those issued by the central bank, are indexed to the UF which is a unit of account that is adjusted on a daily basis taking into account one-month lagged inflation. This allows the monetary authorities to control the development of the real interest rate quite closely, giving a powerful policy instrument to control aggregate demand. The Bank offers an open window for overnight borrowing at a given UF interest rate. This rate, in turn, affects longer-term UF interest rates through the term structure, with the latter rates

approximating real interest rates.[1] It should also be mentioned that another benefit of using UF instead of simple nominal interest rates for conducting monetary policy is the clarity of the policy signal. While rises in UF rates are seen as an unambiguous indication of a contractionary policy, increases in nominal rates in a policy framework based on nominal variables may simply reflect a validation of a higher inflation rate.

The exchange rate transmission channel of monetary policy has been a central part of the Chilean monetary policy debate. While inflation decreased from an annual rate of 27.3% in 1990 to 6.6% in 1996, the real exchange rate appreciated by some 24.4%, implying that traded goods made an important contribution to the fall in inflation. Although, at first sight, it might appear that the authorities have used this channel to control inflation, the current account deficit objective places a major constraint on the trend of the real exchange rate. Thus, rather than being a pure contractionary monetary policy phenomenon, the observed appreciation has been the natural response of a growing economy and the result of the large exogenous capital flows that the emerging economies have received. Moreover, the authorities have tried to control capital inflows – and gain room for monetary manoeuvre without sacrificing real exchange rate objectives – by imposing an unremunerated reserve requirement on all capital inflows, with the exception of foreign direct investment, and by following an active sterilisation policy. Between 1991 and 1996 net reserves increased from US$ 6.6 billion to US$ 15.5 billion.

In its purest form, this unremunerated reserve requirement imposes a tax of the same nominal amount on all capital inflows, regardless of maturity. Thus, short-term capital pays a higher rate of tax than longer-term flows. Although it is still a controversial issue, this tax has allowed a positive (and significant) interest rate differential to be maintained vis-à-vis the developed world without inducing massive inflows. The covered interest rate differential was around 3% during 1996. New evidence shows that this tax has directly depreciated the real exchange rate by 3% and curbed capital inflows by US$ 700 million.

The other monetary policy channels – credit aggregates and other asset prices – have received less emphasis and have been less explored in the Chilean policy debate, although they are potentially important. As for

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[1]   The short-term UF interest rate is not as closely related to the real interest rate because of the delay in the calculation of the UF. This delay means that the UF is an imperfect indexation mechanism.

credit and other monetary aggregates, there is the problem of the high instability of nominal interest rates that results from the use of UF rates in monetary policy. Arbitrage and the way the UF is calculated imply that a three-month nominal operation has the following interest rate:[2]

$$i_{90} = r_{UF} + \pi_{t-1} + \pi_t$$

where r_{UF} is the UF rate (very stable in the short run) and π_t is inflation in month t. In this set-up i_{90} is highly variable because monthly inflation is extremely volatile. This complicates the task of disentangling and taking into account monetary aggregates in the transmission of monetary policy. As for other asset prices, it is worth mentioning that stock market changes probably have some impact on aggregate demand through wealth effects, especially in view of the fact that the private pension system significantly increases the extent to which changes in stock prices affect agents' wealth.

Empirically, the transmission of monetary policy in Chile starts with the overnight UF rates affecting the medium-term UF market rates. A simple correlation between market and overnight rates is 0.92, showing that the initial policy in fact translates into a market reaction. The correlation with the external interest rate is close to zero for both domestic interest rates, so no spurious correlation – caused by a third interest rate – exists.

The second step in the transmission is the effect of market rates on the gap between aggregate demand and output growth. Error correction estimates show the following type of relationship for quarterly (log) changes in total aggregate demand (*AD*):

$$\Delta AD_t = 0.62 * \Delta AD_{t-1} - 0.01 * \Delta UFrate_{t-1} + OtherEffects$$

with *OtherEffects* denoting lagged disposable income.[3] Thus, a 1% increase in the UF interest rate produces a 1% decline in the growth rate of aggregate demand after one quarter. This effect increases to 2.2% after one year (measured against the starting level).

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[2] For simplicity this equation shows an operation that starts on the tenth day of the month.
[3] *OtherEffects* also include the error correction term.

The third step in the transmission of monetary policy is the impact of a decline in the gap between the growth rate of aggregate demand and that of output (*Gap*) on inflation, in particular non-traded goods inflation. Traded goods inflation follows international inflation and the rate of devaluation of the nominal exchange rate. Since the latter is managed inside a nominal band, traded goods inflation is indirectly controlled by the authorities. Non-traded goods inflation shows the following relationship:

$$\pi_t^{NT} = 0.60 * \pi_{t-1}^{NT} + 12.14 * \Delta Gap_{t-2} + 12.15 * \Delta Gap_{t-3} + OtherEffects$$

with *OtherEffects* including wage inflation and the nominal exchange rate. Thus, a 1% drop in the aggregate demand/output growth gap reduced inflation by 0.1 percentage points after two quarters. After three quarters this effect increases to 0.3 percentage points, after six quarters to 0.5 percentage points and after two years to 0.6 percentage points.

Finally, it is worth examining what happens empirically with the real exchange rate after an increase in domestic interest rates. With this exercise one can check whether a contractionary monetary policy is too costly in terms of the current account objectives. Theoretically, through the financial market channel a contractionary policy produces an appreciation of the real exchange rate, while through the goods markets it may produce a depreciation (following a fall in the demand for non-traded goods). If higher rates did not imply an appreciation of the real exchange rate one could conclude that the unremunerated reserve requirement has been effective in the sense of allowing a tight monetary stance without sacrificing the real exchange rate objective. Estimates using monthly data show the following relationship for the real exchange rate (*RER*):

$$\Delta RER_t = 0.185 * \Delta RER_{t-1} = 0.003 * \Delta UFrate_{t-1} + OtherEffects$$

with the parameter of the UF interest rate not being significantly different from zero. *OtherEffects* mainly comprise productivity measures. At all events, the point estimate shows that a 1% increase in the interest rate depreciates the real exchange rate by 0.3% after one month. This provides evidence that the exchange rate channel is not operating through the financial market (or that the unremunerated reserve requirement is working as designed).

In sum, the transmission mechanism of monetary policy in Chile follows the traditional interest rate/aggregate demand channel. An increase in central bank interest rates moves market rates, and these rates decrease the gap between aggregate demand growth and potential output growth. In turn, this fall in the gap reduces non-traded goods inflation with some lag. The exchange rate channel is fairly well controlled through capital flow measures (viz. the imposition of an unremunerated reserve requirement) and an active sterilisation policy.