Chilean Unremunerated Reserve Requirement Capital Controls as a Screening Mechanism

Abstract

This paper presents a model of Chilean style "speed bump" capital controls that interprets them as a mechanism for screening out volatile investor types. This interpretation is contrasted with a public finance explanation which views speed bumps as a tax on short term capital inflows that raises their relative price. A surprising result is that even though speed bumps raise the cost of capital, they may actually increase the level of inflows. These increased inflows are more stable because they are provided by patient investors. The lesson is that screening out volatile investor types stabilizes the financial environment. Speed bumps benefit both firms and patient investors by reducing the damage done by sudden exit, which increases the demand for and supply of capital.

Keywords: Speed bumps, capital controls, short term debt, screening mechanism.

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I Introduction

In the wake of the financial crises of the 1990s there has been much debate about how to stabilize global financial markets. One policy suggestion that has been received well by both progressives (Blecker, 1999; Grabel, 2002/03; Palley, 1999) and the mainstream (Council on Foreign Relations, 1999; Eichengreen, 1999) is that of Chilean-style "speed bumps."[1] Thus far, the case for speed bumps has been made largely on the basis of the twin empirical observations that short term debt was a significant factor precipitating the east Asian financial crisis, and that Chile has been able to tilt the composition of its inflows toward less risky longer-term capital. The current paper provides a theoretical analysis of speed bumps that validates this empirical case. The analysis is in terms of imperfect information, and has speed bumps serving as a mechanism for screening "good/patient" and "bad/impatient" investors. This approach fits squarely with the work of Nobel economist Joseph Stiglitz, who has been a prominent and vocal critic of the IMF and its approach to the financial architecture.

Speed bumps are a form of temporarily applied capital control aimed at discouraging inflows of short-term capital. They can be contrasted with traditional capital controls, such as imposed by Malaysia in 1998, which are aimed at preventing outflows of capital. Speed bumps can embody a number of different features including (i) a requirement that capital in-flows stay for a given duration (in Chile's case it was twelve months), (ii) placement of a temporary non-interest bearing reserve requirement on all capital inflows that is refunded after a specified period, and (iii) payment of a penalty in the event that a capital inflow reverses within a given period.

The paper examines the underlying microeconomic workings of Chilean-style speed bumps and advances a new theory that emphasizes their role as a screening device. This approach contrasts with the standard public finance approach which describes them as a tax on short term flows. The public finance approach argues that speed bumps lower the relative return to short-

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[1]. Paradoxically, just as opinion is converging on the benefits of speed bumps as an institution for tempering inflows of volatile short term capital, Chile is committed to eliminating them. "Investors to Watch Chile's Presidential Election as Candidates Pledge to Kill Controls on Capital," Wall Street Journal, 10 January, 2000.

term capital inflows, thereby discouraging such inflows. The screening approach maintains that speed bumps asymmetrically impact investors with a proclivity to short term flight (i.e. investors who are impatient or by driven herd instincts), which changes the composition of capital flows into the country. The model that is developed comes up with the surprising result that though speed bumps raise the cost of short term capital, they may also increase inflows of capital. Moreover, these increased inflows are more stable since the composition of inflows is shifted toward patient investors. This investor composition effect may explain why Chile managed to avoid a financial market contagion effect in the wake of the east Asian and Brazilian financial crises. Both of these analytical conclusions are supportive of speculations made by Grabel (2002/03) that speed - bump type capital controls could actually lower hurdle rates of return in developing countries.

II The public finance approach to speed bumps

The standard approach to explaining the effects of speed bumps emphasizes traditional public finance concerns. Speed bumps effectively impose a tax on short term capital inflows, thereby lowering the rate of return on such flows. Foreign investors therefore reduce their demand for short term liabilities and total inflows fall.

This effect is captured in the following simple model. Borrowers' demand for short term foreign loans is a negative function of the short term interest rate, and is given by

(1) $D = D(r,....)$ $\qquad\qquad D_r < 0$

where D = domestic borrowers' demand for short term foreign borrowing, r = interest rate on short term foreign borrowing. Financial markets are open to inflows of foreign capital, and foreign lenders view loans to domestic borrowers as a perfect substitute with other international lending. Consequently, foreign supply of loans is perfectly elastic at the going world interest rate, and given by

(2) $r = r^*$

where r^* = world short term interest rate.[2]where e = expected rate of exchange rate appreciation and p = country risk premium. Assuming a positive equilibrium in-flow of short term foreign capital, this implies that the equilibrium short term interest rate is equal to r^*. The equilibrium quantity of foreign short term lending is

(4) $D = D(r^*, ...)$ $\qquad D_{r^*} < 0$

Now suppose that the monetary authority imposes a k percent reserve requirement on all short term capital inflows. In this event the return to foreign short term lenders adjusts such that

(5) $[1 - k]r = r^*$

where k = reserve requirement ratio. The non-interest bearing reserve requirement means that foreign investors only earn interest on [1 - k] of each dollar loaned, and the interest rate must rise to compensate them so that their return equals that available in global financial markets. The equilibrium interest rate and level of short term foreign borrowing are then given by

(6.a) $r = r^*/[1 - k]$

(6.b) $D = D(r^*/[1 - k], ...)$

The equilibria with and without the reserve requirement are shown in figure 1. Initially there is total borrowing of D_0. The interest rate is r^*. Introduction of the reserve requirement shifts the perfectly elastic foreign demand for short term liabilities up, and raises the equilibrium interest rate to $r^*/[1-k]$. Total short term borrowing falls to D_1. This outcome is consistent with the claim that speed bumps decrease short term inflows.

Since the price of long term capital is also set in world markets and is unaffected by the introduction of speed bumps, the volume of long term inflows remains unchanged. Putting the pieces together, total inflows therefore fall but the proportion of long term inflows rises.

III Speed bumps as a screening device: the case where borrowers are negatively impacted by sudden withdrawals

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[2]. Equation (3) assumes perfect substitutes and no exchange rate risk. If these assumptions do not hold, then the relationship becomes $r = r^* + e + p$

The traditional public finance approach to speed bumps focuses on discouraging short term borrowing by raising its relative cost. In the background there is a belief that short term borrowing is deleterious, and therefore ought to be discouraged. This section presents an alternative interpretation of speed bumps which views them as a screening mechanism. The model focuses on the total level of inflows, emphasizing the damage done to investors by sudden exits of capital. It describes how speed bumps can help screen out capital flows from sources which are prone to flight, and this improves the stability and quality of capital inflows. Consequently, there can even be an increase in total inflows as the reduction in damage done by capital flight of unstable investors raises returns to stable investors who then become willing to provide lend more.

Suppose there are two types of foreign investor consisting of patient investors (type A) and impatient investors (type B). Investors know which type they are, but borrowers cannot observe the type from which they are borrowing. The proportion of patient type A investors is x, and the proportion of impatient type B investors is [1 - x], where $1 > x > 0$. Patient investors invest in countries on the basis of fundamentals and for the long haul, and therefore have a relatively low probability (q_A) of withdrawing their money in the short term (i.e. next twelve months). Impatient investors are subject to investment fads and fashions, and have a relatively higher probability (q_B) of withdrawing their funds in the short term. Thus, $q_B > q_A$ where $1 > q_B > q_A > 0$. For simplicity, the probabilities of withdrawal across investor types are assumed to be independent. Foreign investors can earn an expected return of r^* on international capital markets. Finally, in the event that an investor withdraws their funds, this imposes a cost of c per dollar on the domestic borrower.[3]

[3]. This cost can be thought of as a composite cost that includes both internal and external components. One effect is that sudden withdrawals cause the price of short term issues to fall which raises interest rates and contributes to greater variability of interest rates, thereby raising firms' ex-ante costs of financing. It can also be associated with a depreciation of the exchange rate which raises the burden of foreign currency denominated debt. This hurts individual borrowers, and also hurts the macro economy by causing a shortage of aggregate demand and reducing the value of collateral to back foreign borrowing needed to finance investment.

Under such conditions, speed bumps can be used to improve economic outcomes. This can be seen by comparing the equilibrium outcome when there are no speed bumps with the outcome when there are speed bumps.

Case I: no speed bumps. In the case where there are no speed bumps, borrowers are unable to distinguish between lender types. The result is a pooled equilibrium in which all foreign lenders are paid the same rate of return. The expected marginal return to borrowers from an additional dollar of foreign borrowing is given by

(7) $MR = D^{-1'}(r) - xq_Ac - [1-x]q_Bc$

where $D^{-1'}(r)$ is the partial derivative of the inverse of the loan demand function. The marginal cost of funds is the market interest rate which is given by

(8) $MC = R$

Foreign lenders require a return equal to that available on the international capital market so that

(9) $R = r^*$

Equating (7) and (8) and using (9) yields

(10) $r^* = D^{-1'}(r) - xq_Ac - [1-x]q_Bc$

The pooled equilibrium is illustrated in figure 2. The fact that foreign lenders withdraw their funds with some positive probability, thereby causing damage to borrowers, results in the demand for foreign loans schedule shifting down from $D_0(.)$ to $D_1(.)$. The equilibrium quantity of borrowing is then determined by the intersection of the adjusted loan demand schedule and the perfectly elastic foreign loan supply schedule.

Case II: speed bumps. Now suppose the monetary authority imposes speed bumps which take the form of having lenders pay a penalty z per dollar in the event that they decide to withdraw their funds within a given period (say twelve months). In this case the loan supply for type A foreign investors is given by

(11) $r_A - q_Az = r^*$

The loan supply for type B investors is given by

(12) $r_B - q_Bz = r^*$

Comparing (11) and (12) reveals that the interest rate required by type Bs is greater than that required by type As since

$r_B > r_A$

The introduction of speed bumps differentially impacts type A and B investors because of their different probabilities of withdrawal. The difference in likelihood of incurring the penalty cost then results in type A and B investors voluntarily separating with regard to the terms on which they are willing to lend. Since the cost of borrowing from type B investors now exceeds that of borrowing from type A investors, the country has an incentive to only borrow from type As and a separating equilibrium is achieved.

The specifics of the equilibrium are as follows. The expected marginal return to borrowing, the marginal cost of borrowing, and lenders' required interest rate are given respectively by

(13) $MR = D^{-1'}(r) - q_A c$

(14) $MC = r$

(15) $r = r_A = r^* + q_A z < r^* + q_B z$

The equilibrium quantity of borrowing is obtained by solving

(16) $D^{-1'}(r) = r^* + q_A z + q_A c$

The speed bump equilibrium is illustrated in figure 3, and is compared to the no speed bump equilibrium. The schedule D_0 refers to the expected MR of borrowing when there are no sudden withdrawals. The schedule D_2 refers to the expected MR of borrowing when only type A lenders participate in the market. The schedule D_1 refers to the expected MR of borrowing when both type A and B lenders participate in the market. When both types participate, the expected costs of withdrawal are larger, and the MR schedule is therefore lower. The schedule r^* is the supply of loans when there are no speed bumps and both types participate. The schedule r_A is the supply of foreign funds when there are speed bumps and just type A lenders participate. The effect of speed bumps is to impose a cost on lenders, and this does raise the cost of funds. However, the benefit to borrowers comes in the form of a higher expected return to projects because of reduced likelihood of unanticipated withdrawals. As long as the speed bump cost is moderate, the upward shift of the MR schedule exceeds the upward shift up of the supply schedule, and the level of foreign borrowing actually increases even though the cost of borrowing also increases. The economy is made better off in that it can now undertake more projects. The source of this gain is the change in the composition of lenders which results from bad lenders (type B) dropping out of the market.

IV Further refining and generalizing the model: the case where lenders are also harmed by sudden withdrawals

The above analysis assumes that only borrowers are negatively impacted by sudden withdrawals of funds. However, lenders may also be negatively impacted so that a sudden withdrawal by type A lenders adversely impacts type B lenders, and vice-versa. Such an effect is commonly associated with bank runs. It means that policy measures (such as speed bumps) that improve the quality of the pool of lenders may actually reduce the cost of funds. This is because such measures discourage bad lenders, thereby reducing the negative externality on good lenders and inducing the latter to provide more funds.

In terms of the above formulation, let c_L be the cost inflicted on a lender in the event of a sudden withdrawal. For the two lender case with perfectly elastic loan supply schedules, the required rates of return for type A and B lenders then becomes

(17.a) $r_A = r^* + q_A z + q_B c_L$

(17.b) $r_B = r^* + q_B z + q_A c_L$

Thus, each lender has a negative externality on the other.

In the two lender case with perfectly elastic loan supply schedules, this negative externality would be sufficient to separate out the two types so that a screening mechanism (given by z) would not be necessary. However, in a more complicated environment in which each type of lender has a positively sloped loan supply schedule, such separation would not occur. Instead, types would differ in the amount of funds they would be willing to supply at any given interest rate. The country loan supply schedule would then be the sum of the loan supply schedules across different types.

This, suggests the following generalization of the above model. Let there be n types of lender, with EC^i being the expected cost incurred by a lender of the i^{th} types as a result of sudden withdrawals. This expected cost is given by

(18) $EC^i = E^i(Q(z), c_L)$ $\quad E^i_Q < 0, Q_z > 0, E^i_{cL} > 0, \quad i = 1,....., n$

where EC^i = expected cost, Q = quality of the pool of lenders, and c_L = cost to lender of a sudden withdrawal. The expected cost is a negative function of the quality of the lender pool because improvements in the pool quality reduce the likelihood of sudden withdrawals. The pool quality is itself a positive function of the speed bump, with the speed bump serving to screen out lower quality types. Finally, the expected cost is a positive function of the direct cost incurred in the event of a sudden withdrawal.

The market demand and supply schedules and equilibrium condition are given by

(19.a) $D = D(r, Q(z), c)$ $\quad D_r < 0, D_Q > 0, D_c < 0$

(19.b) $S = \sum_{i=1}^{n} S^i(r, r^*, z, E^i(Q(z), c_L),...)$ $\quad S^i_r > 0, S^i_{r*} < 0, S^i_z < 0, S^i_E < 0$

$= S(r, r^*, z, Q(z), c_L,...)$ $\quad S_r > 0, S_{r*} < 0, S_z < 0, S_Q > 0, S_{cL} < 0$

(19.c) $D = S$

where as D = demand, S = supply, r = interest rate charged to domestic borrowers, r^* = international interest rate available elsewhere to lenders, z = size of the speed bump penalty, c = cost inflicted on domestic borrowers by sudden withdrawals, and c_L = cost inflicted on lenders by sudden withdrawals.

The demand for loans schedule is given by the economy's expected marginal benefit schedule. This demand for loans is a negative function of the market interest rate, and a positive function of the quality of the lender pool. The logic of this latter effect follows from the analysis in the previous section, since an improved lender pool reduces the likelihood of sudden withdrawals that inflict economic injury on borrowers. The quality of the lender pool is itself a positive function of the speed bump since a bigger speed bump penalty causes marginal bad types to exit the market. Lastly, loan demand is a negative function of the injury cost imposed by sudden withdrawals. A lower injury cost (c) increases the return to borrowing, thereby increasing demand for funds.

The supply of loans schedule is the sum of the loan supply schedules of different lender types. Each individual type's loan supply schedule is a positive function of the market interest rate, a negative function of the interest rate available in international markets, a negative function of the speed bump penalty cost, and a negative function of the expected cost inflicted by sudden withdrawals by other lenders. The overall market supply of funds is a positive function of the market interest rate, a negative function of the world interest rate, a negative function of the speed bump penalty, a positive function of the quality of the pool of lenders, and a negative function of the cost inflicted on lenders by sudden withdrawals.

The interesting feature of this loan supply schedule is that the speed bump has an ambiguous effect on quantity supplied. Differentiating equation (19.b) with respect to z yields

$$dS/dz = S_z + S_Q Q_z \gtrless 0$$

Thus, supply may either increase or decrease. A bigger speed bump penalty reduces quantity supplied by directly reducing the expected return to lenders, but it also increases supply by improving the quality of the lender pool which reduces withdrawal costs inflicted on good lenders by sudden exits of bad lenders. This increases the expected return to good types, thereby giving them an incentive to lend more. This latter effect shows how enhanced financial stability can raise the supply of funds despite the fact that achieving it requires the imposition of speed bump penalties which are a private cost.

These opposing effects (rate of return substitution versus financial stability) suggest that imposing speed bumps may initially improve supply conditions by driving out the worst lender types. However, as the level of the speed bump penalty is increased, this effect will reverse so that further increases reduce supply. This in turn suggests that setting of the size of the speed bump should be viewed as a policy choice problem, with the goal of policy makers being to maximize the total expected returns provided by foreign borrowing.

Solving for the equilibrium and using the implicit function theorem enables solving for the equilibrium interest rate schedule as a function of the exogenous variables. This equilibrium interest rate schedule is given by

(20) $r = r(z, c, c_L, r^*)$ $\qquad r_z \gtrless 0,\ r_c > 0,\ r_{cL} > 0,\ r_{r*} > 0$

The effect of a bigger speed bump on the equilibrium interest rate is ambiguous. Demand is increased which unambiguously puts upward pressure on rates, but supply could fall which would put downward pressure on rates. Henceforth, it is assumed that the demand side effect dominates so that $r_z > 0$.

The goal of the policy maker is to maximize the quantity of private borrowing to finance private investment, which involves solving the following program

(21) $\underset{z}{\text{Max}}\ V = D(r(z, c, c_L, r^*), Q(z), c)$

The first order condition is then given by

(22) $dV/dz = D_r r_z + D_Q Q_z = 0$

The economic logic behind the above problem and its solution is illustrated in figure 4. The solid lines represent the demand and supply schedules when there are no speed bumps, and the equilibrium interest rate and quantity of short term foreign borrowing is determined by the intersection of these schedules. The policy maker then adjusts the speed bump penalty which shifts both the demand and supply schedules upward, and the penalty is increased at the margin as long as it results in a larger marginal shift upward of the demand schedule than the supply schedule. The final equilibrium is determined by the intersection of the new demand and supply schedules given by the broken lines.

For an interior solution to exist for the above problem, increases in the size of the speed bump (z) must initially shift the demand curve by more than they do the supply curve. However, at some level of z, further marginal increases must shift the supply curve by more than they do the demand curve. The logic for such a pattern is that at low levels of z, small increases cause the most impatient investors to drop out but have little impact on good investors who plan to stay. The supply schedule therefore shifts little, but the elimination of bad types who adversely affect firms when they withdraw, has a large effect on demand. However, as z gets larger, it increasingly impacts good types, thereby reversing the relative size of the impact on the demand and supply of increases in z.

In sum, the above model illustrates how speed bumps can make an economy better off by separating out bad lender types. Interestingly, speed bumps may actually increase foreign short term borrowing despite the rise in interest rates. The reason is that the composition of lenders shifts toward good types, which lowers the expected cost of sudden withdrawals, thereby raising the benefit of borrowing. This result stands in contrast to the public finance account of speed bumps. The reason is that a screening approach recognizes that speed bumps shift up both the supply and demand schedules, whereas the public finance approach shifts up the supply schedule only.

V Empirical evidence

The above investor screening model of capital flow speed bumps has two empirical predictions. First, speed bumps should twist the composition of capital flows toward longer term debt (the public finance effect). Second, speed bumps need not reduce the level of inflows, and could even increase it (the screening effect). The case of Chile provides evidence that is supportive of both of these propositions.

Chile introduced a 20% un-remunerated reserve requirement in June 1991. This reserve requirement was increased to 30% on bank credit in August 1992. Subject to some further administrative tightening, the system remained largely unchanged until December 1996, at which time borrowing of less than $200,000 was exempted from the requirement. In March 1997 this exemption was lowered to $100,00. In June 1998 the reserve requirement was set at 10%, and finally in September 1998 it was set at zero.

Table 1 shows data on gross foreign capital inflows into Chile between 1990 and 1997. Short term flows are defined as those having a contracted maturing of less than one year. The immediately striking feature about this table is that there appears to have been a very sharp reduction in the proportion of short term flows, and that reduction coincides exactly with the introduction of un-remunerated reserve requirement on short term inflows.

Table 2 presents data on the maturity structure of Chilean external debt, and compares it with that of the entire western hemisphere region as defined by the IMF. This definition includes all countries except the U.S. and Canada. The western hemisphere grouping therefore serves as a control for changes in general practices in financial markets. The table shows that over his period the percentage of Chilean external debt that was short term tended to decline. The same is also true for the western hemisphere group considered as a whole. However, the last column of table 2 shows that the decline was greater in Chile than in the western hemisphere region. This is shown by the fact that the ratio of the percent of Chilean external debt that is short term to the percent of western hemisphere external debt that is short term declined.

Finally, table 3 provides data on total private external debt in Chile and the western hemisphere. Private external debt grew far more rapidly in Chile over the period 1990 - 97 than it did in the western hemisphere as a whole. This superior relative performance of Chile is consistent with the claim that speed bumps may actually increase total inflows by screening out bad type investors and thereby increasing the return to good type investors who become willing to invest more.

The data presented in tables 1 - 3 is of course just suggestive. Many factors have been at work regarding both Chilean and western hemispheric capital inflows. However, it is at least re-assuring that prima facie the data should be so supportive of the proposed screening mechanism interpretation of speed bumps.

V Some further policy considerations

In the above model increases in the rate of return available in international markets (r^*) cause the supply schedule to shift up and reduce the availability of foreign funds. Such increases can come from a strengthening of demand for funds in other national markets, or from structural improvements in other markets that increase stability and returns there. In Chile, this is being used as an argument to eliminate speed bumps, as evidenced by the following quote from the Wall Street Journal:

> "Last year, however, Chilean policy makers took their first steps toward reducing the controls. What changed? As other Latin economies have reformed, investors no longer viewed Chile as the only investment option in Latin America, even though its credit rating remains higher than many of its neighbors."

However, if the above model is correct, the elimination of speed bumps may not increase inflows into Chile and could have the opposite effect. This is because elimination of Chile's speed bumps will cause a worsening in the composition of lenders which will increase the extent and costs of financial instability, thereby resulting in reduced demand and supply for foreign capital.

One widespread criticism of speed bumps is that since they only apply against capital that has newly entered the country, they only stabilize marginal capital flows and have no effect on foreign capital that has been resident for longer periods. The argument is that since this stock of existing foreign capital dominates inflows of new capital by many orders of magnitude, speed bumps are unlikely to be very effective in guarding against sudden exits. However, if speed bumps are a screening mechanism this need not be so. Speed bumps change the composition of investors by giving impatient types an incentive to drop out, and as a result of this compositional change, the stock of existing foreign capital is likely to be more patient in nature and less prone to flight. Such an effect helps explain why Chile managed to avoid a contagion effect from the east Asia crisis.

Finally, a legitimate question is can private markets enforce an equivalent outcome through appropriately designed contracts. To the extent that the costs of sudden withdrawal are purely internal, then private arrangements should be able to accomplish this. Indeed, this is the purpose of long and short term lending. However, if there are significant negative externalities to sudden withdrawal, operating through such channels as the impact of depreciation on foreign debt burdens, then markets will not internalize these costs and there is a place for government action.

References

Blecker, R.A., Taming Global Finance: A Better Architecture for Growth and Equity, Economic Policy Institute, Washington, DC, 1999.

Council on Foreign Relations, "The Future of the International Financial Architecture: An Executive Summary of the Findings of a Council on Foreign Relations Task Force," Foreign Affairs, 78 (November/December 1999), 169 - 184.

Edwards, S., "How Effective are Capital Controls?" NBER Working Paper 7413, November 1999.

De Gregorio, J., Edwards, S., and Valdes, O., "Controls on capital Inflows: Do They Work?" NBER Working Paper 7645, April 2000.

Eichengreen, B., Toward a New International Financial Architecture: A Practical Post-Asia Agenda, Institute for International Economics, Washington, DC, 1999.

Grabel, I., "Averting Crisis? Assessing Measures to Mange Financial Integration in Emerging Economies," Cambridge Journal of Economics, forthcoming 2002/03.

Palley, T.I., "International Finance and Global Deflation: There is an Alternative," in Michie, J., and Grieve-Smith, J. (eds.), Global Instability: The Political Economy of World Economic Governance, New York: Routledge, 1999.

"Investors to Watch Chile's Presidential Election As Candidates Pledge to Kill Controls on Capital," Wall Street Journal, Monday 10 January, 2000.

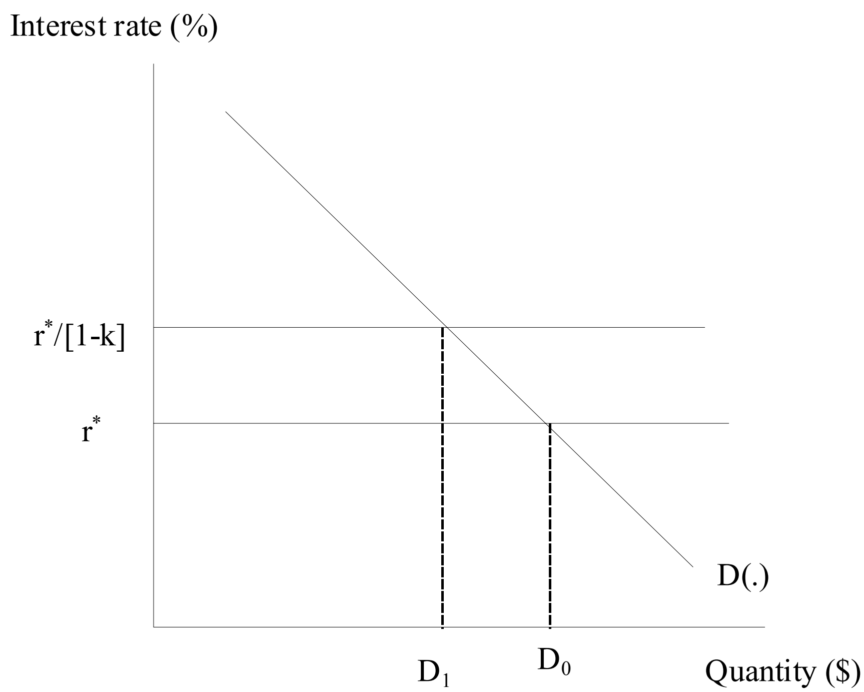

Figure 1 The public finance approach to speed bumps showing how they raise interest rates and reduce the amount of borrowing.

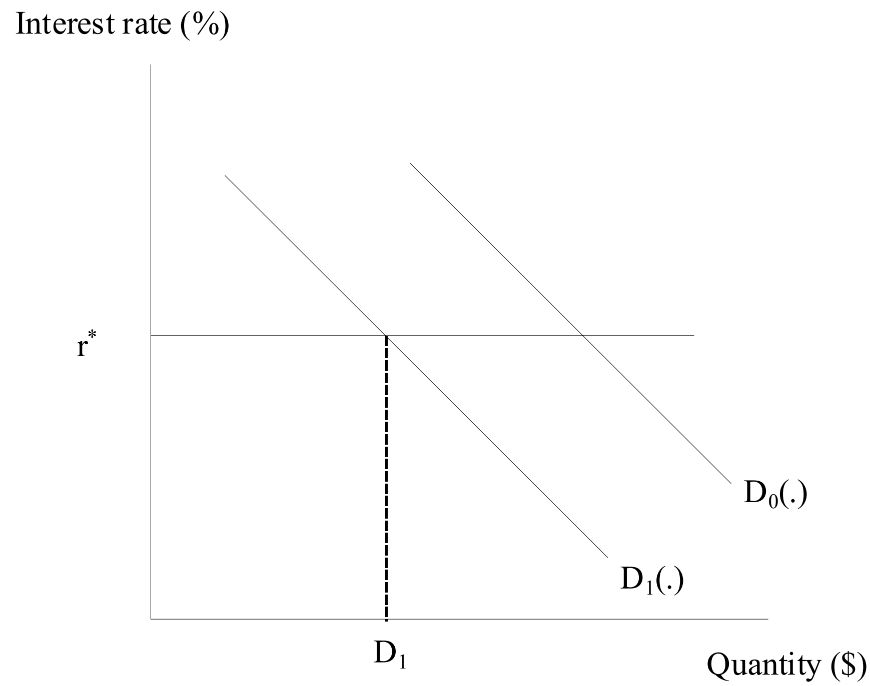

Figure 2 No speed bump equilibrium in a world where borrowers cannot distinguish between good (patient) and bad (impatient) lenders.

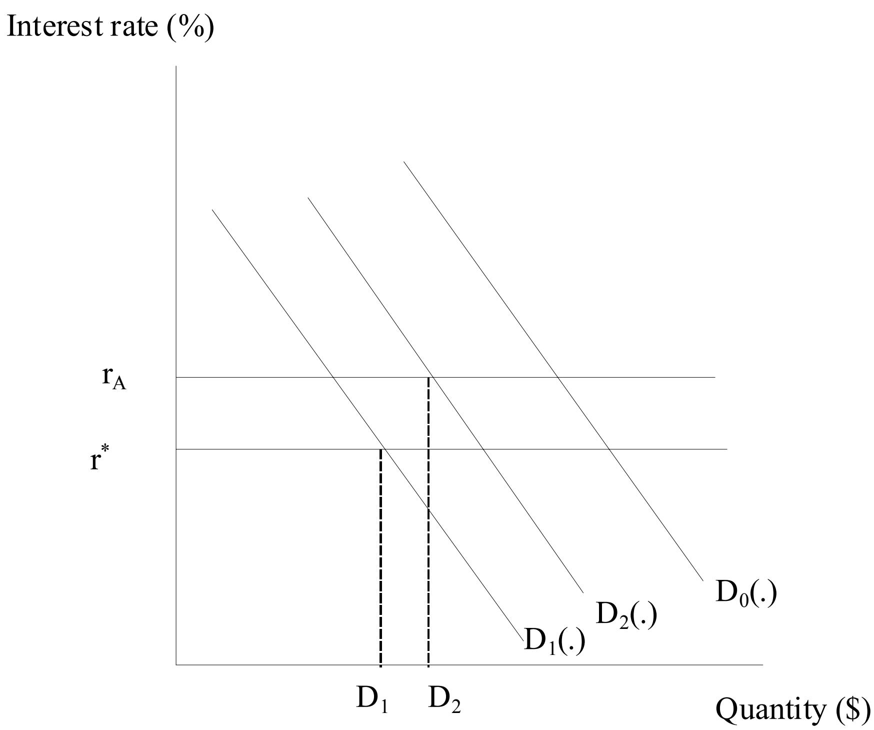

Figure 3 Speed bump equilibrium in which bad (impatient) lenders are screened out of the market.

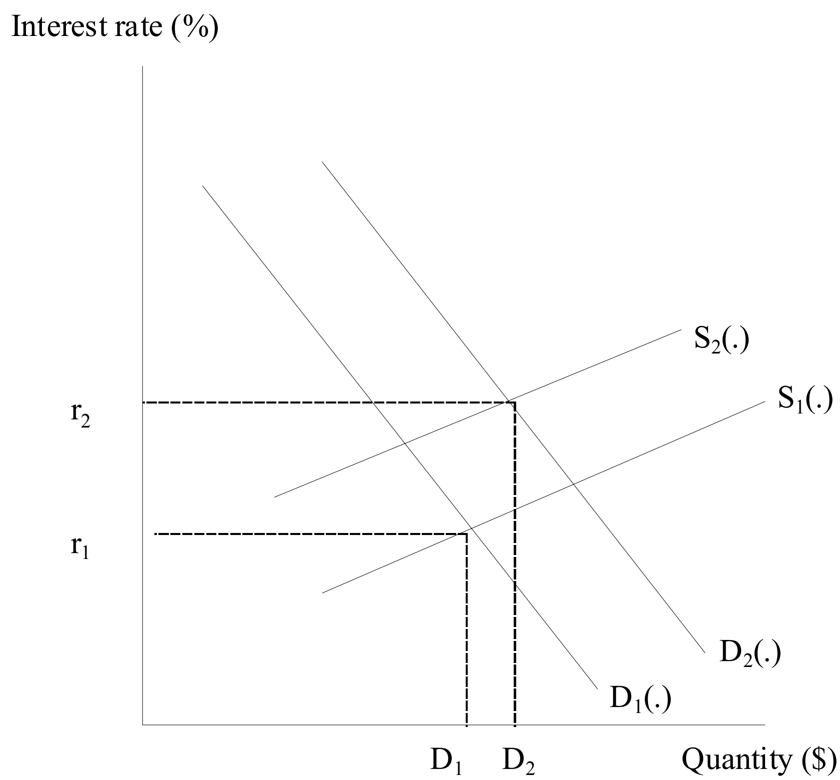

Figure 4 Speed bump equilibrium in a model with many types of lender and an upward sloping capital supply schedule.

Table 1 Gross foreign capital inflows ($ millions)into Chile, 1990 - 97.

Year	Short term flows	% of total	Long term flows	% of total	Total flows
1990	1,683,149	90.3	181,419	9.7	1,864,568
1991	521,198	72.7	196,115	27.3	717,313
1992	225,197	28.9	554,072	71.1	779,269
1993	159,462	23.6	515,147	76.8	674,609
1994	161,575	16.5	819,699	83.5	981,274
1995	69,675	6.2	1,051,829	93.8	1,121,504
1996	67,254	3.2	2,042,456	96.8	2,109,710
1997	81,131	2.8	2,887,013	97.2	2,887,013

Source: Edwards, 1999.

Table 2 Comparison of Chilean external debt and debt structure versus Western hemisphere region.

	<------- Chile ($ millions)--------->			<-- Western Hemisphere ($ billions)-->			Ratio
	Total external Debt	Short Term	% short Term	Total external Debt	Short Term	% short Term	% Short Chile: % Short W.Hemis.
1990	17,425	3,382	19.4	440.8	75.0	17.0	1.14
1991	16,364	2,199	13.4	463.0	86.0	18.6	0.72
1992	18,242	3,475	19.0	492.1	86.8	17.6	1.08
1993	19,186	3,487	18.2	537.8	91.3	17.0	1.07
1994	21,478	3,865	18.0	580.7	91.1	15.7	1.15
1995	21,736	3,431	15.8	641.4	106.6	16.6	0.95
1996	22,979	2,635	11.5	659.4	99.0	15.0	0.77
1997	26,701	1,287	4.8	682.2	85.3	12.5	0.38

Source: De Gregorio et al., 2000: IMF World Economic Outlook, May 1998, and author’s calculations.

Table 3 Total private external debt and annual growth

	<--------Chile------------>		<--Western Hemisphere–>	
	Private debt ($ millions)	Annual % change	Private debt ($ billions)	Annual % change
1990	5,633	–	296.4	--
1991	5,810	3.1	304.6	2.8
1992	8,619	48.3	331.4	8.8
1993	10,166	17.9	377.2	13.8
1994	12,343	21.4	411.6	9.1
1995	14,235	15.3	447.2	8.6
1996	17,816	25.2	476.4	6.5
1997	21,613	21.3	515.4	8.2

Source: De Gregorio at al., 2000, IMF World Economic Outlook, May 1998, and author's calculations.