

Foreign Capital Flows and Defence Expenditures: Patterns of Causation and Constraint in Pakistan

Robert E. Looney

ABSTRACT

This analysis shows the extent to which defence expenditures have affected the borrowing decisions of the government of Pakistan. Has the government resorted to increased borrowing in these markets to expand allocations to the military? Or, in contrast, have increased defence expenditures tended to restrict access to external credit? Weapons purchased with scarce foreign exchange lead to the availability of fewer resources for the import of investment goods essential for self-sustaining growth. On the one hand, external financing of defence expenditures would reduce the short-run sacrifices often associated with military expenditures. On the other hand, it appears that international lenders such as the International Monetary Fund (IMF) may be increasingly inclined to restrict lending to countries with high levels of defence expenditures.

RÉSUMÉ

Cette analyse montre à quel point les dépenses de défense influent sur les décisions d'emprunt du gouvernement du Pakistan. Le gouvernement a-t-il recours à plus d'emprunts pour augmenter les crédits militaires ? Ou, au contraire, l'augmentation des dépenses de défense tend-elle à réduire l'accès à l'emprunt extérieur ? L'achat des armes avec le peu de devises étrangères disponibles réduit les ressources pour l'importation de biens d'investissement essentiels à une croissance autonome soutenue. D'un côté, le financement extérieur des dépenses de défense réduirait les sacrifices à court terme souvent liés aux dépenses militaires, mais de l'autre, il semble que les prêteurs internationaux comme le Fond monétaire international (FMI) auraient de plus en plus tendance à imposer des restrictions sur les prêts aux pays qui ont des dépenses de défense élevées.

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INTRODUCTION

Weapons purchased with scarce foreign exchange lead to the availability of fewer resources for the import of intermediate and investment goods essential for self-sustaining growth. A reduction in military imports does not necessarily imply an equivalent increase in investment. Some leakage in consumption or other imports could occur. However, there is little doubt that lower defence imports would help alleviate foreign exchange scarcity (Deger and Smith, 1985).

In the same vein, Hewitt (1991) notes that in general, countries that spend more on the military in the long run must obtain financing by lowering private consumption expenditures, lowering private investment expenditures, lowering expenditures on other government programs, and by obtaining additional resources from abroad. Here, the conventional wisdom is that whatever choice is made, the country is likely to experience lower current consumption and lower future rates of growth, with the exact mix depending on how the expenditures are financed. Clearly, on the one hand, external financing of defence expenditures would reduce the short-run sacrifices often associated with military expenditures. On the other hand, it appears (Dawn, 1996) that international lenders such as the International Monetary Fund (IMF) may be increasingly inclined to restrict lending to countries with high levels of defence expenditures (Harris and Kusi, 1992).

This analysis aims to determine the extent to which defence expenditures have affected the borrowing decisions of the government of Pakistan. Has the government resorted to increased borrowing in these markets to expand allocations to the military? Or, in contrast, have increased defence expenditures tended to restrict access to external credit? Have the patterns of borrowing and expenditures for the military differed significantly from those of the non-defence portions of the budget? Have these patterns changed over time?

I. BACKGROUND

Sen (1991, p. 182-183) has outlined the connections between the debt problem and security. Security is defined here in the broadest possible terms to include economic, political and military aspects:

1. By reducing the import of essential commodities, the debt crisis can cause development failure. Lack of imported intermediate investment goods and technology reduces investment and productivity; this hampers economic growth. Low growth and development problems affect economic security.
2. A reduction in economic security erodes the political legitimacy of governments. In extreme cases it may also erode the legitimacy of states.
3. The ability of governments to spend on social, economic and infrastructural programs is hampered as increasing amounts of revenue are tied to public and publicly guaranteed debt servicing. For many Third World countries,

debt servicing and military expenditure take up 40-80% of all central government revenue, leaving very little for other essential needs.

4. Conflicts, particularly intra-state conflicts, increase as a result of development failures; this has a spill-over effect on inter-state relationships.
5. Arms imports, particularly in the Third World and in some European countries, have been a major contributory factor toward debt creation. While many of these debts were incurred by military and autocratic regimes, payments often have to be made by successive democratic governments.
6. North-South relations are affected. The political influence of the major powers is eroded if they fail to curb the debt problem, reducing their influence when it comes to conflict resolution in the South.
7. The breakdown of the world economic order, in part due to the debt crisis, can lead to major security problems such as those of the 1930s.
8. The problems inherent in the debt crisis can be used in a positive manner. Transfer of resources from the major powers to other countries can be linked to military expenditure reductions in recipient countries, success in arms control and the implementation of confidence- and security-building measures. However, this requires greater policy coordination than is currently present in the international security system.
9. The donor or creditor countries can do much more in transferring resources to debtors. In particular, reductions in military expenditure subsequent to the European peace process can potentially release huge amounts of resources that could be used productively to alleviate the economic burden of poorer countries.

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II. PREVIOUS STUDIES

Despite these studies, few attempts have been made to assess quantitatively the role of military expenditures in contributing to Third World indebtedness. In an early study of Argentina, Shubik and Bracken (1983) found that Argentina was able to amass \$33 billion in debt between 1978 and 1982, about \$5 billion of which went to arms purchases. They conclude this came about because, compared to the traditional contracting terms for foreign and public sector loans, international capital flows in the 1970s and early 1980s increasingly came with few strings attached to their use.

In another influential study, Brzoska (1983) found that by the late 1970s the net transfer of debt could have been about 20-30% less if debt-financed weapons imports had not been a factor.

Several cross-section studies have also examined the link between allocations to defence and external indebtedness. In an initial cross-section study (Looney, 1987) discriminant analysis was used to divide countries into two groups on the basis of their relative resource scarcity. The differentiating variables included

(a) gross inflow of public loans to exports in 1982, (b) total public external debt in 1982, (c) gross international reserves in 1982, (d) public external debt as a percentage of GDP in 1982, (e) average annual growth in imports for 1970-82, (f) external debt as a percentage of GDP in 1982, and (g) public external debt as a percentage of GDP in 1970.

The groupings, based on relative resource abundance, could be characterized as follows: Group I or resource-constrained countries were poorer, less economically dynamic nations. This group was heavily weighted with African and poorer Latin American countries. Pakistan, Burma and Sri Lanka were members of this group. Group II or relatively resource-unconstrained countries consisted of several major oil exporters and several of the more dynamic newly industrialized countries such as Mexico, Greece, India, Korea, Spain, Algeria, and Malaysia.

In terms of variable means (Looney, 1987, p. 16):

1. Group I (resource-constrained) countries resorted to a much higher (3.6 times) inflow of external public loans in 1982 relative to their exports that year.
2. On the other hand, the overall level of total public external debt in 1982 averaged nearly 4.5 times as much for Group II (relatively resource-unconstrained) countries than was the case for Group I countries.
3. The level of international reserves was also much higher for Group II countries—nearly 10 times as much as the average for Group I countries.
4. With regard to shares of debt in gross domestic product (GDP), however, Group I countries have much higher levels of attainment, averaging nearly twice as much as Group II countries in both 1970 and 1982. The debt service ratio to exports was correspondingly higher for Group I countries.
5. The rate of growth of imports was nearly 10 times higher over the 1970-82 period for Group II countries.

Group II countries were therefore considerably larger, more affluent and less reliant on external debt as a percentage of GDP. They tended to spend relatively large amounts on military activities, but not necessarily significantly greater amounts of their overall budgets.

These groupings provided useful contrasts to the role of military expenditures in external debt. For the resource-constrained countries (Group I) GDP and international reserves accounted for about 50% of the observed fluctuations in total public external debt with international reserves having a positive sign. Adding military expenditure increased the overall correlation coefficient to over 83%, with military expenditures being highly significant. Imports were also significant when added to the regression equation. As noted, these countries tended to be characterized by relatively low rates of growth in imports as compared to the unconstrained countries. They also had much higher levels of public external

debt. Clearly, external borrowing may be the only way these countries were able to maintain or increase their military expenditures.

The results for the unconstrained countries were in marked contrast to those found present in the constrained group of nations. For these countries, military expenditures did not appear to have contributed to the overall accumulation of public external debt. In fact, when regressed as an independent variable along with merchandise imports, military expenditures assumed a negative sign.

In sum, at least since the early 1980s, the use of public external indebtedness to finance military expenditures has not appeared to be universal among developing countries. In fact, it is possible that a large group of relatively debt-free (where debt is measured as a percentage of GDP) resource-unconstrained countries have kept military expenditures within the limits imposed by self-financing, rather than risk jeopardizing their overall credit-worthiness.

On the other hand, the bulk of debt accumulated by the relatively resource-constrained developing countries may have stemmed from military expenditures and presumably arms imports. Apparently, the perceived need to expand defence expenditures by this group in the face of foreign exchange shortages has resulted in relatively high levels of external indebtedness.

In another study (Looney, 1989), using two stage least squares regression equations confirmed the findings noted above: military expenditures contributed to the overall debt position of the constrained countries, but not the unconstrained countries. It also appears that:

1. Both the constrained and unconstrained countries were, *ceteris paribus*, able to reduce their overall level of arms import through indigenous arms production, but perhaps because of their relative access to foreign exchange, the unconstrained countries were able to expand domestic production to a greater extent, thus replacing a larger volume of imports.
2. Foreign exchange shortage has likely forced the constrained countries to substitute personnel for imported equipment.
3. The unconstrained countries appear more able to reach an optimal mix between armed forces and total military expenditures.

In general, it appears that developing countries as a group have not placed excessive reliance on external financing to support the import of arms (Looney, 1989). Countries experiencing relative resource constraint (foreign exchange and domestic savings) have, however, used foreign borrowing to finance increased arms imports. This has also been the situation for financing total defence expenditures (Looney, 1987).

In these studies, Pakistan consistently falls into the constrained category (see table 1) with a high degree of probability. On this basis, the country might be expected to have to borrow extensively in external markets to fund its relatively high level of defence expenditures.

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Focussing more on military aid, Deger and Sen (1991) have examined the relationships between that source of funding and defence expenditures on the one hand and economic development and economic assistance on the other. Their findings suggest that

the possibility of crowding out between economic and military aid must be taken seriously. They also find evidence of crowding in—of donors viewing the two types of aid as complements rather than substitutes. (Deger and Sen, 1991)

The issue hinges on fungibility and the leakages that can occur throughout the economic system of aid recipients as foreign assistance filters through. Even tied economic aid raises the possibility that released resources will be used to finance greater military spending and arms imports. This implies, of course, a need to re-examine the specificity of development and security assistance programs, the selection of tied or untied aid, the use of general balance of payments or government expenditure support programs, and the need for conditional provisions that cover military variables. The links between project and policy reform lending also take on greater importance in the light of fungibility and leakages between civilian and military sectors.

As Khilji and Zampelli (1991) note, traditionally, the public finance literature regarding the impact of grants-in-aid on recipient expenditures has assumed that the recipient's budget constraint is altered according to the nominal or legal provisions of grant programs. In recent years, analysts such as McGuire (1982, 1987) have challenged this assumption by assuming that (a) the legal provisions of grant programs are unlikely to be fully known, given their extreme complexity, and (b) even if legal provisions were fully known, grant recipients can successfully circumvent such restrictions in a number of ways.

Based on these assumptions, McGuire formulated a model of aid assuming that a certain portion of earmarked grant funds can be converted into purely fungible, revenue-augmenting resources while the remaining portion effectively reduces the price of the aided good. In examining the case of Israel, McGuire found that U.S. military assistance was used for military purposes whereas economic assistance was used as another source of fungible revenue.

In their examination of Pakistan, Khilji and Zampelli (1991, p. 1102-1103) found the following:

1. U.S. unconditional assistance, whether for defence or non-defence purposes, is fully transformed into purely fungible resources.
2. Pakistan's marginal propensity to spend internal and external fungible resources on public sector goods and services is approximately 0.26, implying that one additional rupee in fungible resources will raise public spending by 0.26 rupees(Rs) with 0.08 Rs going to defence and 0.18 Rs to non-defence. The remaining 0.74 Rs goes into private sector consumption.

Table 1. Classification of developing countries on the basis of relative resource constraint, 1970-1982

Relatively constrained		Relatively unconstrained		<i>Foreign Capital Flows & Defence Expenditures in Pakistan</i>
Country	Probability of group membership	Country	Probability of group membership	
Pakistan	86.98	Greece	57.78	
Israel	69.34	India	84.91	
Honduras	83.48	Nigeria	89.07	
Cameroon	60.73	Indonesia	90.67	
Sudan	66.47	Egypt	68.20	
Costa Rica	92.64	Korea	89.95	
Bolivia	86.27	Rwanda	69.08	
Somalia	86.46	Turkey	66.95	
Tunisia	68.31	Spain	51.89	
Morocco	73.06	Venezuela	80.26	
Guatemala	54.91	Mexico	99.69	
Malawi	91.40	Brazil	99.02	
El Salvador	65.90	Algeria	76.44	
Mali	97.12	Philippines	55.78	
Paraguay	60.02	Libya	75.69	
Ecuador	56.61	Colombia	54.63	
Dominican Rep	74.12	Thailand	60.95	
Liberia	94.77	Malaysia	65.16	
Ivory Coast	84.42	Argentina	66.09	
Mauritania	96.04	Saudi Arabia	94.65	
Sierra Leone	86.06	Kuwait	81.31	
Panama	94.37	Syria	63.95	
Chile	70.09	Jordan	50.81	
Chad	87.18			
Uruguay	67.87			
Tanzania	79.87			
Uganda	88.76			
Ethiopia	70.24			
CAR	76.89			
Ghana	78.72			
Burma	82.91			
Sri Lanka	75.39			
Trinidad	77.62			
Zambia	95.88			
Peru	71.67			
Zimbabwe	86.68			
Kenya	86.61			

Source: Looney and Frederiksen, 1986, appendix 1.

- There appears to be little evidence of a "flypaper" effect of fungible U.S. aid. One additional rupee is treated the same regardless of its source. This suggests that the assistance targeted at government development projects seems to find its way into other uses that may not be consistent with development objectives, reinforcing donor concerns over the historical ineffectiveness of such programs.

The budgetary patterns of a number of Third World countries may also contribute to the use of foreign exchange for military expenditures or arms imports (Deger and Sen, 1991, p. 182–183):

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1. A percentage of total foreign exchange earnings from major exports is sometimes allocated to arms imports. Chile has done this with copper export earnings, and the Gulf states and Libya, with oil revenues. This insulates arms imports from any overall adjustments in the balance of payments.
2. During privatization programs, proceeds from the sale of state assets are partly earmarked for the military. This is particularly likely to occur in the defence industries, where the proceeds can be used to increase the salaries of military personnel, as was the case in Pakistan.
3. Pensions for military personnel are often substantially higher than those of other government employees. Early retirement at full pension or staff reorganizations with “golden handshakes” are often used to compensate defence personnel, particularly during periods of political instability. Because military pension funds are not subject to audit, their investment activities are often unknown.
4. Defence expenditures are resilient. When aggregate expenditure falls, the military sector’s share rises. Closer investigation at the country level is needed to find out how and why this reliance has occurred, particularly during periods of externally imposed austerity.
5. Some empirical evidence indicates that the impact of changes in military expenditure—and the nature of crowding out—is asymmetric. When defence spending rises, investment falls; then when defence spending falls, consumption increases. Thus, reductions in military expenditure may not be growth-inducing unless some mechanism is in place to ensure that resources released from the defence sector are applied to investment.
6. For most arms-importing countries, it is difficult to determine how the trade is being financed—through military aid, debt creation, compensatory trade arrangements such as offsets, or through cash transactions. Military debt-related statistics are useful, but they are unavailable from the debtor’s side.

With these warnings in mind, the following sections attempt to determine whether the Pakistani government has used foreign borrowing to maintain and expand the country’s allocations to the military.

An important issue to be resolved here is the timing of this borrowing: has defence spending led to subsequent borrowing, or has past borrowing relaxed the general budgetary constraint sufficiently to enable a subsequent expansion in funds allocated to the military? This is an important point because the timing of the expenditure and borrowing patterns will likely affect the manner in which defence expenditures affect the economy as a whole.

Table 2. Expansion and composition of public sector borrowing, 1953–1991

	Total Borrowing		Composition		<i>Foreign Capital Flows & Defence Expenditures in Pakistan</i>
	Amount (billion 1985 rupees)	Growth (%)	Domestic (%)	Foreign (%)	
1953	3358.4	—	80.11	19.89	
1954	2038.8	-39.29	92.31	7.69	
1955	3445.8	69.01	91.53	8.47	
1956	2016.4	-41.48	98.78	1.22	
1957	6865.3	240.48	98.53	1.47	
1958	6310.7	-8.08	99.29	0.71	
1959	8210.1	30.10	57.39	42.61	
1960	8316.9	1.30	86.28	13.72	
1961	4380.0	-47.34	78.54	21.46	
1962	5708.6	30.33	64.85	35.15	
1963	7842.1	37.37	51.93	48.08	
1964	7956.8	1.46	37.24	62.76	
1965	12694.4	-76.00	—	—	
1966	16798.1	-100.96	57.33	42.67	
1967	19383.1	52.69	12.98	87.01	
1968	13872.0	-28.43	15.44	84.56	
1969	13384.3	-3.52	31.23	68.77	
1970	18364.9	37.21	57.10	42.90	
1971	11669.5	-36.46	36.78	63.22	
1972	11129.0	-4.63	68.73	31.27	
1973	15243.9	36.97	24.55	75.45	
1974	13767.7	-9.68	38.77	61.23	
1975	27406.5	99.06	34.31	65.69	
1976	23991.8	-12.46	44.24	55.76	
1977	19281.2	-19.63	50.23	49.77	
1978	21012.0	8.97	56.94	43.06	
1979	29150.7	38.73	63.94	36.05	
1980	13033.7	-55.29	40.13	59.87	
1981	18183.4	39.51	54.12	45.88	
1982	11863.7	-34.76	58.99	41.01	
1983	21399.1	80.37	77.67	22.33	
1984	18873.6	-11.80	81.63	18.37	
1985	15048.0	-20.27	87.16	12.84	
1986	39742.5	164.11	87.82	12.18	
1987	28442.6	-28.44	81.32	18.67	
1988	24077.8	-15.34	58.18	41.82	
1989	42775.0	77.65	65.38	34.62	
1990	40981.0	-4.19	69.24	30.76	
1991	32390.0	-20.96	59.63	40.37	

Source: IMF, various issues.

III. PATTERNS OF BORROWING

The Pakistani government's borrowing has been erratic during the period covered (table 2). This pattern has characterized both borrowing from the domestic market and from foreign sources, with the result that the shares of each in total borrowing

have also changed drastically from year to year. In spite of these erratic movements, several patterns stand out:

1. Foreign borrowing does not appear to have been a major source of financing until 1959. In that year, it accounted for over 42% of domestic government borrowing. In the following year, however, it fell to 13.7%.
2. Foreign borrowing increased through most of the 1960s. In 1967, it reached a high of 87% of total borrowing.
3. Throughout much of the 1970s and into the mid-1980s, there was a gradual contraction in the relative importance of foreign borrowing.
4. After reaching a low of 12.2% of total borrowing in 1986, foreign borrowing has risen to around 40% in recent years.
5. In terms of absolute amounts, domestic borrowing has declined each year since 1987.

IV. CAUSATION

Several questions must be answered here: (1) To what extent have expanded rates of expenditure been financed with increased public sector borrowing in external markets? Do accelerations in expenditures lead to increased borrowing? After how long? (2) Does expanded borrowing subsequently constrain the government's ability to sustain or increase expenditures? and (3) If these constraints exist, are they more stringent for loans for defence or non-defence activities?

Ultimately, any statistical test for causation will be based on a number of arbitrary assumptions. Still, using a number of alternative specifications for the key variables, it is possible to make some credible inferences concerning the timing of savings and GDP or of savings and private investment.

The original and most widely used causality test was developed by Granger (1969, 1988). According to this test, which uses expenditures and borrowing, expenditures affect the growth in borrowing if this series can be predicted more accurately by past values of expenditures than by past rates of growth in borrowing. To be certain that causality runs from expenditures to borrowing, past growth rates in expenditures must also be more accurate than past values of borrowing in predicting increases in expenditures.

The results of Granger causality tests depend critically on the choice of lag length. If the chosen lag length is less than the true lag length, the omission of relevant lags can cause bias. If the chosen lag length is greater than the true lag length, the inclusion of irrelevant lags causes estimates to be inaccurate. While it is possible to choose lag lengths based on preliminary partial autocorrelation methods, there is no *a priori* reason to assume lag lengths are equal for all types of deficits.

To overcome the difficulties noted above, Hsiao (1981) developed a systematic method for assigning lags. This method combines Granger causality and Akaike's final prediction error (FPE), the (asymptotic) mean square prediction error, to determine the optimum lag for each variable. In a paper examining the problems encountered in choosing lag lengths, Thornton and Batten (1985) found Hsiao's method to be superior to both arbitrary lag length selection and several other systematic procedures for determining lag length.

Depending on the value of the FPEs, four cases are possible: (a) Expenditures cause borrowing when the FPE for borrowing activity decreases when expenditures are included in the borrowing equation. In addition, when borrowing is added to the expenditure equation, the FPE should not decrease; (b) Borrowing causes Expenditures when the FPE for expenditures increases or stays the same when expenditures are added to the regression equation for borrowing, and is reduced when borrowing is added to the regression equation for expenditures; (c) Feedback occurs when the FPE decreases when expenditures are added to the borrowing equation, and the FPE decreases when borrowing is added to the expenditure equation; and (d) No relationship exists when the FPE does not decrease both when expenditures are added to the borrowing equation and when borrowing is added to the expenditures equation.

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V. OPERATIONAL PROCEDURES

The data used to conduct the causation tests was derived from figures of International Monetary Fund (IMF, 1996) and the Stockholm International Peace Research Institute (SIPRI, 1996). All variables were deflated by the GDP deflator and are in constant 1985 prices. To ensure that the series were stationary (Pesaran, 1997), the variables were transformed into their annual growth rates.

As noted in table 2, the pattern of public borrowing in external markets can change significantly from year to year, masking some of the more stable, longer-run linkages between government programs and their ongoing need for funding. These longer-run borrowing needs can often be offset by shorter-run concern with macroeconomic imbalances such as stabilization, inflation, and balance of payment problems. For the purposes of the analysis here, longer-run funding commitments and short-run stabilization actions should be isolated with analysis that is focussed on the longer-run links between expenditures and borrowing.

Unfortunately, it is impossible to make such *a priori* functional distinctions in the data. Instead, we considered two alternative proxies for the longer-run borrowing commitments and for the short-run stabilization element. The basic assumption underlying these proxies is that a large component of public borrowing reflects an ongoing process that evolves slowly and cannot change rapidly. The first of the two approaches takes the trend level of real public sector borrowing as representing this ongoing expanding need for funding over and above the

Table 3. Pakistan: Government expenditures/anticipated foreign borrowing causality patterns

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	Measure of expenditures	Direction of causation (impact)	Optimal lag (years) strength
1958-1991			
(1)	Total Expenditures	Feedback (+,-)	(2,4) weak, moderate
(2)	Total Expenditures % GDP	Feedback (+,-)	(2,3) moderate
(3)	Defence Expenditures	ExpendBorrow (-)	(1) weak
(4)	Defence Expenditures % GDP	ExpendBorrow (-)	(1) weak
(5)	Non-Defence Expenditures	Feedback (+,-)	(2) moderate, weak
(6)	Non-Defence Expenditures % GDP	ExpendBorrow (+)	(2) strong
1958-1973			
(1)	Total Expenditures	ExpendBorrow (+)	(2) moderate
(2)	Total Expenditures % GDP	ExpendBorrow (+)	(2) moderate
(3)	Defence Expenditures	No Relationship	
(4)	Defence Expenditures % GDP	No Relationship	
(5)	Non-Defence Expenditures	ExpendBorrow (+)	(3) strong
(6)	Non-Defence Expenditures % GDP	ExpendBorrow (+)	(2) strong
1973-1991			
(1)	Total Expenditures	ExpendBorrow (+)	(1) moderate
(2)	Total Expenditures % GDP	ExpendBorrow (+)	(2) moderate
(3)	Defence Expenditures	Feedback (-,-)	(1,2) moderate
(4)	Defence Expenditures % GDP	Feedback (-,-)	(1,2) moderate
(5)	Non-Defence Expenditures	ExpendBorrow (+)	(1) moderate
(6)	Non-Defence Expenditures % GDP	ExpendBorrow (+)	(2) strong

Note: Summary of results obtained from Granger Causality Tests using a Hsiao Procedure to determine the optimal lag. The dominant pattern is defined as that with the lowest final prediction error. All variables are defined as the annual rate of growth and are in stationary form as indicated by the Augmented Dickey-Fuller (ADF) test. In the case of feedback the first term refers to the impact of the measure of expenditures on borrowing, while the second refers to the impact of borrowing on expenditures. Defence expenditures are from the Stockholm International Peace Research Institute (SIPRI, 1996), while economic data are from the International Monetary Fund (IMF, 1996).

expansion in public revenues. Deviations from this trend of real public sector borrowing are assumed to correspond to the stabilization component of borrowing.

A second approach is to make a distinction between types of borrowing on the basis of whether borrowing is expected or not. Again it is assumed that expected or anticipated borrowing is closer to the long-run borrowing needs of the government. This term is proxied by regressing real public sector borrowing on its value for the previous year. In this scheme, unexpected borrowing (the difference between actual and expected borrowing) would represent the component of borrowing affected by shorter-run stabilization considerations.

In the context of the causation tests, both measures gave generally the same picture of the interdependence of expenditures and borrowing. However, because the variables used in the causality tests were defined in terms of growth rates, the anticipated figures were felt to be conceptually superior to the trend values.

Relationships were considered valid if they were statistically significant at the 95% level of confidence. That is, if 95% of the time we could conclude that the relationships had not occurred by pure chance, they were statistically significant.

As noted above, there is no theoretical reason to believe that expenditure aggregates and borrowing have a set lag relationship—that is, that they affect one another over a fixed time period. To find the optimal adjustment period of impact, lag structures of up to four years were estimated. The lag structure with the highest level of statistical significance was the one chosen, which best depicts the relationship under consideration (the optimal lag reported in table 3). To assess the robustness of our findings, tests were conducted using several transformations of the key variables: the growth in the share of expenditures in GDP (total, defence and non-defence) as well as the actual growth rates of these categories.

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VI. RESULTS

The causality tests produced several interesting patterns (table 3) in the interrelationship between public sector expenditures and anticipated foreign borrowing for the period as a whole:

1. Increases in total expenditures provided a weak stimulus to increased external borrowing. This impact occurred with foreign borrowing affected by increased expenditures in the two previous years. There is also a stronger feedback effect, whereby increased external borrowing tends to place a constraint on future expenditures. This effect occurs over a longer time period with increases in foreign borrowing in the four previous years affecting the current year's increase in total real government expenditures.
2. Increases in the share of resources controlled by the government through expenditures (as a percentage of GDP) has a stronger impact on external borrowing. Here, it seems when the government wishes to increase the overall percentage of national resources spent by the public authorities, it must fund them through external sources. In turn, this borrowing acts as a weak constraint on further increases in the share of government expenditures in GDP.
3. In sharp contrast, increases in the growth rate of defence expenditures tend to reduce future borrowing in external markets. This effect is weak, but it holds for both defence and the defence burden. The lag between defence and external borrowing is only one year, with increased defence expenditures in the current year somewhat reducing the level of foreign funding contracted for the next year.
4. Non-defence expenditures follow a pattern similar to that of total expenditures. Increases in non-defence expenditures produce a fairly rapid lag (one year) and a strong expansion in external borrowings. In turn, this borrowing feeds back after a year to somewhat suppress the expansion in expenditures.

5. Increases in the share of non-defence expenditures provide a strong impetus to expanded external borrowing. The average lag is around two years, with the government's efforts to increase the share of national resources allocated to this expenditure category resulting in a discernible increase in external borrowing requirements.

Several interesting changes occurred over time in the manner in which public expenditures interacted with foreign borrowing. For the first period (1958-1973):

1. Most of the relationships were relatively straightforward, with no apparent feedback effects present.
2. Both increases in the growth in total expenditures and in non-defence expenditures translated into strong borrowings in external markets. This occurred for both the increase in expenditures and the growth in their share of GDP. The lags between changes in expenditures and changes in external borrowings were fairly short—two years in most cases.
3. Expanded defence expenditures or increases in the defence burden were not facilitated by foreign funding. For both measures of military expenditures, no statistically significant relationship occurred with foreign borrowing.

Finally, for the more recent time period (1973-1991):

1. Increased rate of growth in total expenditures translated into a fairly rapid lag (one-year) and a strong increase in foreign borrowing. The same was true for increases in the share of national resources spent by the government, although here the lag was two years.
2. Defence expenditures provided an interesting contrast. Both increases in defence expenditures and in the defence burden interacted with external borrowing in a complex manner: increases in defence expenditures tended to dampen subsequent external borrowing in the next year. In turn, increased external borrowing over two years tended to reduce the expansion in defence expenditures and the defence burden.
3. Non-defence expenditures again followed a pattern similar to that of total expenditures, with a relatively strong expansion in external borrowing in the year following increased growth rates in non-defence expenditures or in the share of national resources allocated to non-defence activities.

CONCLUSION

Returning to the questions initially posed: Has the Pakistani government resorted to increased borrowing in external markets to expand allocations to the military? Or, in contrast, have increased defence expenditures tended to restrict access to external credit? Have the patterns of borrowing and expenditures for the military differed significantly from those of the non-defence portions of the budget? Have

these patterns changed over time? Based on the findings reported above, several conclusions can be made: increased defence expenditures have actually reduced future borrowing; this pattern is the opposite of that associated with non-defence expenditures; and the defence expenditure and reduced external borrowing pattern have strengthened over time.

The results are interesting from two perspectives. First, the results highlight several apparent contradictions. On the one hand, cross-section analysis suggests that Pakistan, as a relatively resource-constrained country, might be expected to resort to extensive external borrowing to support its level of defence expenditures. On the other hand, time-series analysis questions whether external borrowing has been a major factor in funding the country's expanded defence expenditures. If anything, this analysis suggests that concern over Pakistan's defence expenditures has caused foreign lenders to cut back on lending to that country.

These two sets of findings can be reconciled in several ways:

1. The cross-section analysis is largely for the 1970s and early 1980s, and the patterns found there may not have held up in subsequent years.
2. Pakistan may not be a typical resource-constrained country. The country has received considerable amounts of economic aid, and, as recent studies suggest, this aid may be quite fungible into the military acquisition process.
3. Given the nature of the data, time-series analysis must focus on longer-run trends. Much of the external borrowing for defence could be short-term and therefore not be detected by the causation tests.

Second, and perhaps most important, the results suggest that international lenders may have had *de facto* a policy in place for some time to restrict lending to countries that are perceived to allocate excessive amounts to the military. Specifically, recent public statements by the IMF and other international lending agencies to the effect that countries that increase defence expenditures will find their borrowing curtailed may, in fact, not be articulating a new policy, but instead simply publicly acknowledging an existing practice.

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