Dependency Ratio, Foreign Capital Inflows and the Rate of Savings in Pakistan.

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I. INTRODUCTION

National savings are critically important to help maintain a higher level of investment which is a key determinant of economic growth. Although savings rates have fallen in many developing countries during the last two decades, Pakistan presents a unique picture of experiencing high rates of economic growth along with very low savings rates. In fact, the national savings rate of Pakistan is not only low compared to that in many countries with per capita income about the same as Pakistan's but it is even lower to that in some South Asian countries with lower per capita income.

Pakistan's economic performance during the last three decades has been impressive. Real gross national product (GNP) has grown at an average rate of 6.0 percent per annum since 1960. The national savings rate, on the other hand, has fluctuated around an almost horizontal trend (15 percent) during the same period. Thus, Pakistan's saving performance and its overall economic performance appear to be incongruous.

Although the low savings rates have become a major source of concern in recent years, not much attention has been devoted to highlight the key determinants of saving in Pakistan. In recent years, few studies have been done on this issue using both the time-series and cross-section data. Qureshi (1981); Abbot and DeRosa (1984) and Khan (1988) using time-series data have examined various determinants of household/national savings. Qureshi (1981) concentrated on economic determinants and found income and its rate of growth, the rate of return on financial assets and rate of inflation as key factors influencing household savings in Pakistan.[1] Abbot and DeRosa (1984) analysed the financial sector of the country and summarised the findings of various studies on resource mobilisation in Pa-

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[1]Qureshi (1981) estimated separate equations for each factors affecting household savings. In other words, he used piecemeal approach to measure the impact of these factors on household savings.

kistan. Khan (1988), in order to seek an answer for the causes of low savings in Pakistan, tested two hypotheses, namely, the financial repressionist and the financial structuralist and found overwhelming support for them.[2] Besides real income, the rate of return on deposits, unanticipated inflation, the variability of inflation and financial intermediation ratio (a measure of financial development) are found to have significant impact on aggregate savings in Pakistan.

Burney and Khan (1992) and Akhtar (1986, 1987), using Household Income and Expenditure Surveys (HIES) for the period 1984-85 and 1979 respectively, attempted to examine the impact of various socio-economic and demographic factors on household savings in Pakistan. Besides household income, the dependency ratio, various categories of education and age structure of the household head are found to be important factors influencing household savings.[3]

All these studies contribute to a better understanding of the various factors affecting savings in Pakistan. However, we believe that there are several other factors, besides income and interest rates, such as dependency ratio (within the context of time-series data), foreign capital inflows, foreign aid (project and non-project aid), changes in terms of trade and openness of the economy which may have contributed to the dismal performance of savings in Pakistan. The impact of these factors on savings rates have been examined extensively in many developing countries but to the best of our knowledge, these factors have never appeared together in the saving function of Pakistan.[4]

The purpose of this paper is to examine the impact the of above listed factors along with other economic and financial variables on the national savings rate of Pakistan using time-series data for the period 1959-60 to 1987-88.

The plan of the paper is as follows. The methodology and data are discussed in Section II while the results are reported and discussed in Section III. The policy implications that arise from the analysis are presented in the final section along with the concluding remarks.

[2]Financial repressionist argues that the low (or negative) real return on deposits caused by arbitrarily set ceiling on nominal interest rates and high and variable inflation rates are the major impediments to savings, financial deepening, capital formation and growth. Financial structuralist asserts that a widespread network of financial institutions and a diversified array of financial instruments will have a beneficial effect on the saving-investment process and hence, on growth. See Khan (1989) for a detailed discussion.

[3]Akhtar (1986, 1987) examines the impact of dependency ratio, urbanisation and education on household saving on a piecemeal basis that is, the impact of each of these factors on household savings is examined separately.

[4]See Fry (1989) for a discussion on these factors.

II. METHODOLOGY AND DATA

The national savings in this paper is derived from the basic national income identity;

$$Y \equiv C + I + X - M \qquad \qquad \qquad \qquad \qquad \qquad \qquad (1)$$

where Y is the gross national product, C is total (private and public) consumption, I is total (private and public) domestic capital formation, and $X-M$ is net exports of goods and services. National savings are derived by rewriting Eq. (1) as

$$Y - C \equiv I + X - M \qquad \qquad \qquad \qquad \qquad \qquad \qquad (2)$$

$$S \equiv I + X - M \qquad \qquad \qquad \qquad \qquad \qquad \qquad (3)$$

where S is national savings and is identical to total domestic capital formation adjusted for current account deficit.

Having defined national savings we write down the saving function in Equation (4) which we intend to estimate to achieve the main objectives of the paper.

$$S/Y = \alpha_0 + \alpha_1 y_p + \alpha_2 y + \alpha_3 \gamma + \alpha_4 D_R + \alpha_5 XM$$
$$+ \alpha_6 TOT + \alpha_7 FCI + \alpha_8 A_d \qquad \qquad \qquad (4)$$

where S/Y is the savings rate and is expressed as the ratio of national saving to GNP (both in current prices), y_p is real per capita income, y is growth rate of real GDP, γ is real interest rate defined as nominal interest rate adjusted for expected rate of inflation, D_R is dependency ratio, XM is the total trade (export plus import) as a ratio of GDP, used to measure the openness of the economy, TOT is the terms of trade, FCI is foreign capital inflows and A_d is foreign aid to GNP rato.[5]

Before we close this section a few words regarding data and their sources are in order. The data corresponding to national savings have been derived from Equation (3) for which all the information pertaining to various components of national income account are taken from *Pakistan Economic Survey, 1989-90*. The data pertaining to per capita income, growth rate of real GNP, terms of trade, openness of the economy measured by percent share of exports plus imports in the GDP are taken from the various issues of *Pakistan Economic Survey*. The data for one year and over but less than two years time deposits rates are taken from the various issues of *Monthly Bulletin* of the State Bank of Pakistan. Finally, the data for

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[5]For theoretical justification of different variables included in Eq. (4), see Khan *et al.* (1992).

foreign capital inflows, as measured by current account deficit, are taken from the various issues of *Pakistan Economic Survey*. These are reported in US dollars but converted to rupees by multiplying with the average exchange rate of the respective years.

III. EMPIRICAL RESULTS

Equation (4) was estimated by using time-series data for the period 1959-60 to 1987-88, applying the technique of Ordinary Least Squares (OLS). Since we identified several factors that may affect the savings rate, our initial run suggests that not all the factors are important in explaining this rate in Pakistan. Hence, we searched for the key factors affecting adversely or otherwise the savings rate. While the most preferred results corresponding to Equation (4) are reported in Table 1 the other results are documented in Appendix A.

Table 1

Estimates of National Saving Rate [The Preferred Results]

Variables	I	II	III	IV
Intercept	1.30	1.38	1.50	1.69
	(3.83)*	(5.00)*	(5.72)*	(4.56)*
Per Capita Income (y_p)	0.00015	0.00015	0.00017	0.00019
	(3.43)*	(4.35)*	(5.29)*	(4.16)*
Dependency Ratio (D_R)	−1.79	−1.89	−2.06	−2.36
	(3.50)*	(4.52)*	(5.22)*	(4.32)*
Real Interest Rate (γ)	0.002	0.0008		
	(2.56)*	(1.20)		
Foreign Capital Inflows (FCI)		−0.47	−0.54	
		(3.50)*	(4.51)*	
Foreign Aid (A_d)				−0.0025
				(0.89)
$\overline{R}^2$	0.56	0.70	0.70	0.44
DW	1.69	1.46	1.56	1.72
SER	0.016	0.013	0.013	0.018

Note: *t*-statistics are given in parentheses.
    *Denotes significance at 5 percent level.

The empirical results, corresponding to four alternative specifications of Equation (4), are reported in Table 1. On the whole, the results are quite satisfactory. The explanatory power ($\overline{R}^2$) and Durbin-Watson (*DW*) statistics are both acceptable, and the standard error of the regression (*SER*) is low, suggesting a good specification of the model.

As regards *per capita income*, it is found to have a strong effect on the national savings rate. Table 1 shows that the coefficient is positive and statistically significant and accords with most of the previous studies for developing countries. The marginal propensity to save (MPS), calculated at the mean value, is 0.10. The income elasticity of saving, again calculated at the mean value, is 0.76 which suggests that a one percent increase in real income (GNP) raises national savings by 0.76 percent in Pakistan.

The *growth rate of real income* has very little effect on the national savings rate [See Appendix A]. The coefficient, though bears a positive sign, never reached the traditional level of significance. This finding is not altogether surprising because Fry (1991, 1989) has pointed out that the acceleration in the growth rate of real income will raise the national savings rate by a smaller amount, the higher is the dependency ratio. Pakistan can be characterised as a country with a very high dependency ratio (it ranged from 6.8 to 7.2). Hence, one earning member has to take care of 6 to 7 non-working members of the household. In such an environment it is hardly expected that the rate of growth of real income will have a significant impact on the savings rate. Hence, our finding does not accord with others who found positive and usually significant effects on the national savings rate.[6]

The *dependency ratio*, as shown in Table 1, has a strong effect on the national savings rate. The coefficient bears a negative sign and is statistically significant at the 5 percent level. The estimated parameter suggests that a one percentage point increase in the dependency ratio would reduce the national savings ratio by almost 2.0 percentage points. The negative effect of the dependency ratio on national savings rates found in this paper, is in complete agreement with the pioneering work of Leff (1969) and the subsequent work of Lahiri (1989); Fry (1991) and Burney and Khan (1992).

As regards the impact of the *real interest rate* on the savings rate, the coefficient is statistically significant with a positive sign [See Table 1 as well as Appendix A]. On balance, the substitution effect dominates the income effect which implies that an increase in the real interest rate increases national savings rate in Pakistan. Our findings are in complete agreement with Khan (1989) and Fry (1988, 1991)

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[6]See for example, Collins (1989); Mason (1988); Fry (1989, 1991) and Giovannini (1983, 1985).

on the positive and significant impact of the real interest rate on national savings.[7] The interest elasticity of saving calculated at the mean value is 0.07 which suggests that a one percent increase in the real interest rate will raise national savings by 0.07 percent. The low interest elasticity found in the case of Pakistan is consistent with Fry (1988, 1991) who concedes that the magnitude of the effect is small.

The changes in *terms of trade* do exercise a significant influence on the national savings rate in Pakistan [See Appendix A]. The coefficient is statistically significant with a positive sign and therefore, suggests that a deterioration in the terms of trade increases the savings rate. Our finding, thus provides empirical evidence to Obstfeld's (1982) recent theoretical work where he argued that saving may increase with the deterioration of the terms of trade.[8] Although, we do not find empirical evidence for the classical Harberger-Laursen – Metzler effect, our result should be taken with great caution for the following reasons. First, the most recent theoretical work shows that terms of trade responses depend on whether or not the terms of trade change is anticipated [See Fry (1989) for further detail]. Second, whether or not the change is perceived to be permanent or temporary.

The *openness of the economy*, as defined by the share of total trade (export plus imports) in GDP, has a significant impact on the national savings rate in Pakistan. The coefficient is statistically significant with a positive sign [See Appendix A] and suggests that greater openness of the economy raises the savings rate in Pakistan.

Foreign capital inflows have a strong effect on the national savings rate in Pakistan. A cursory look at Table 1 shows that the coefficient of foreign capital inflows is statistically significant with a negative sign. The elasticity of saving with respect to foreign capital inflows, calculated at the mean value, is – 0.21, which suggests that a one percent increase in foreign capital inflows reduces national savings by 0.21 percent. Contrary to the orthodox viewpoint, our finding provides abundant support to the Griffen-Enos hypothesis and accords with most of the subsequent studies on this topic for developing countries. The negative impact of

[7]The positive and significant impact of real interest rate on national saving rate confirms the existence of financial repression in Pakistan. For detailed discussion on this issue, see Khan (1989).

[8]We argue that the effect of terms of trade deterioration on saving ratio will depend crucially on the income elasticity of savings. The terms of trade deterioration will increase saving ratio if the income elasticity of saving is less than unity and *vice-versa*. Harberger and Laursen and Metzler have postulated that real income falls with a terms of trade deterioration and if the income elasticity of saving is less than unity then fall in income will reduce savings by less than proportionately. Hence, the saving ratio will rise with terms of trade deterioration. In the case of Pakistan, the income elasticity of saving is less than unity (0.76) and as such the result is contrary to Harberger and Laursen and Metzler.

foreign capital inflows suggests that the most part of external assistance has been used for consumption purposes and that it has discouraged saving efforts by both the private and public sector in Pakistan.

Apart from *foreign capital inflows* we also used foreign aid as well as its component, such as project and non-project aid and examined their impact on the national savings rate. It can be seen from Table 1 as well as Appendix A that at no time were these variables found statistically significant. The coefficient of foreign aid, though statistically insignificant, bears a negative sign and hence accords with most of the studies for developing countries. The coefficient of project aid bears a positive sign but failed to reach the significance level. Overall, foreign aid (project as well as non-project) did not exercise any significant influence on the national savings rate in Pakistan.

IV. CONCLUDING REMARKS

Domestic resource mobilisation is one of the key determinants of sustained economic growth. Pakistan's performance with regards to domestic resource mobilisation has been poor despite maintaining a respectable economic growth rate. In fact, the savings rate in Pakistan is one of the lowest in the developing countries and as such the policy-makers are faced with the problem of harnessing sufficient resources for financing economic development.

Why the savings rate in Pakistan so low and what should be done to raise its level? The findings of this paper provide some answers to these questions. The most important factors that affect the national savings rate in Pakistan are per capita income, dependency ratio, real interest rate and foreign capital inflows. Raising per capita income, either by reducing the population growth rate or by raising the GNP growth rate, is bound to increase the national savings rate.

The high dependency ratio caused by the rapid increase in population has been the most important factor causing the savings rate to remain depressed. One earning member has been taking care of 6 to 7 non-earning members of the household. Hence, savings rates remain depressed. Slowing down population growth should be the key policy objective of the government.

The positive and significant effect of the real interest rate on the savings rate confirms the existence of financial repression in Pakistan. The findings of the paper suggest that the national savings rate is sensitive to changes in the real interest rate. A one percent increase in real interest rate is likely to increase the savings rate by 0.07 percent. What is required is the pursuit of realistic interest rate policies in the context of a liberalised financial market. The whole idea is to make the real interest rate sufficiently positive.

As regards the inflows of foreign capital the findings of this paper confirms its depressing effect on national savings in Pakistan. A one percent increase in the inflows of foreign capital reduces savings by 0.21 percent.

The empirical findings of this paper also suggest that a more open economy will raise the savings rate. The government has already taken steps in liberalising the foreign trade and payments sector. This measure is likely to raise savings rate in the years to come.

Appendix – A

Estimates of National Saving Rate

Variables	I	II	III	IV	V	VI
Intercept Term	1.25 (3.45)*	0.97 (2.60)*	1.44 (4.82)*	1.42 (5.31)*	1.31 (3.47)*	1.14 (2.94)*
Per Capita Income	0.00014 (3.22)*	0.00018 (4.12)*	0.00016 (4.31)*	0.00016 (4.69)*	0.00015 (3.33)*	0.00015 (3.38)*
GDP Growth Rate	0.0007 (0.45)	0.0005 (0.37)	0.0008 (0.57)			
Dependency Ratio	−1.72 (3.19)*	−1.45 (2.72)*	−1.97 (4.40)*	−1.95 (4.82)*	−1.80 (3.25)*	−1.58 (2.76)*
Real Interest Rate	0.0018 (2.48)*	0.0013 (1.98)*	0.0008 (1.16)	0.0006 (0.99)	0.0018 (2.31)*	0.0016 (2.14)*
Change in TOT		0.0002 (1.96)*			0.0002 (1.60)	
Opennes of Economy		0.49 (1.92)*				
Foreign Capital Inflows				−0.49 (3.47)*	−0.44 (3.40)*	
Total Aid					−0.0002 (0.07)	
Project Aid						0.0023 (0.83)
$\overline{R}^2$	0.54	0.62	0.64	0.73	0.53	0.55
DW	1.70	1.99	2.00	1.47	1.69	1.64
SER	0.017	0.015	0.015	0.013	0.017	0.016

Note: t-statistics are given in parentheses.
  * Denotes sigificance at 5 percent level.

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