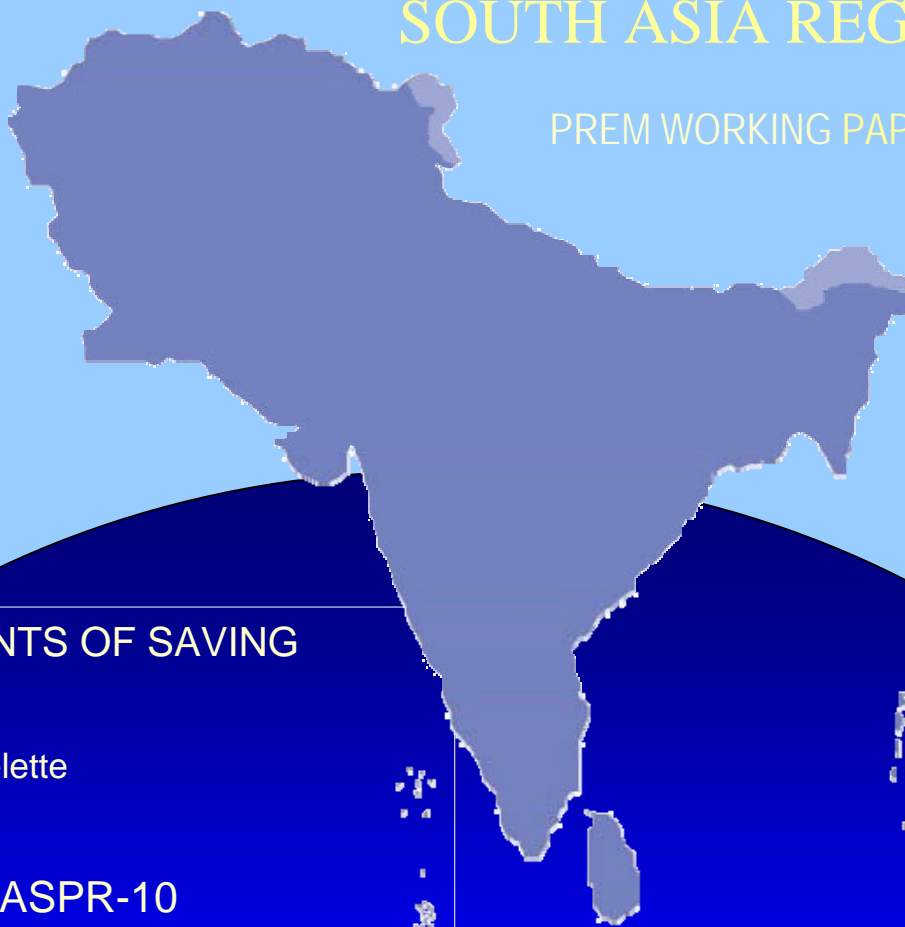


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## DETERMINANTS OF SAVING IN PAKISTAN

Gallina A. Vincelette  
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## **PREFACE AND ACKNOWLEDGEMENTS**

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## TABLE OF CONTENTS

I.	Introduction.....	1
II.	Saving Trends: Pakistan in Comparative Perspective.....	2
III.	Linkages between Saving and Macroeconomic Variables in Pakistan.....	8
IV.	Pakistan's Saving Function Estimation .....	11
V.	Policy Recommendations .....	13
Annex 1:	Theoretical Underpinnings of Saving Determinants.....	17
Annex II:	Variable Definitions, Measurement and Sources.....	20
Annex III:	Alternative Regression Specifications .....	21
References:	.....	22

## LIST OF TABLES

Table 1:	Saving Rates in Pakistan, Selected Years .....	2
Table 2:	Saving Determinants: Regression Results.....	12

## LIST OF BOXES

Box 1:	National Saving Scheme .....	4
Box 2:	Informal Saving Methods and Size .....	6

## LIST OF FIGURES

Figure 1:	Domestic Saving Rates for Pakistan and Comparators, 1970-2004.....	3
Figure 2:	Saving, Investment and Growth, 1973-2005.....	3
Figure 3:	Sectoral Composition of Saving in Pakistan in Comparative Perspective.....	5
Figure 4:	Gold Demand in World's Top-10 Markets .....	7
Figure 5:	Pakistan: Biivariate Relationships between Saving and Determinants .....	10



## **Abstract**

Pakistan has experienced strong spurts of economic growth since its independence in 1947, and the economy is in a rapid expansion again with an annual output growth averaging 6 percent for the last four years. To sustain this momentum, investment in physical and human capital and productivity increases are needed. However, with low domestic saving rate and low foreign direct investment, a key policy question for Pakistan is how to finance its rapidly growing economy in the medium term. Will Pakistan choose to increasingly rely on foreign saving in the form of international borrowing and/or FDI, or will it sharply reverse the recent downward trend in domestic saving? The paper argues that if Pakistan wants to sustain its growth and increase its investment without paying increasing shares of income in interest or dividends, it has to finance this investment by raising its domestic saving rate. We estimate the saving function for Pakistan with income, fiscal policy, financial development and demographic factors as its main determinants, and formulate specific policy measures for the increase of the saving rate in the medium and long term.





# DETERMINANTS OF SAVING IN PAKISTAN

## I. Introduction

Pakistan has experienced strong spurts of economic growth since its independence in 1947. The economy is in a rapid expansion again with an annual output growth averaging around 6 percent for the last four years. To sustain this momentum, investment in physical and human capital and productivity increases are needed. To finance investment, saving can come from domestic or foreign sources. In this respect, historical trends for Pakistan reveal two important observations. First, Pakistanis are not big savers, i.e. the country's domestic saving rate is lower than the one of other rapidly growing countries and of countries with similar income per capita. The domestic saving rate<sup>1</sup> in Pakistan has been around 12 percent on average for the last four decades or almost three times smaller the one in East Asia for the same period. Second, despite strong economic performance, foreign direct investment (FDI), although improving, is low in Pakistan by regional and world standards. For example, with strong growth rates in Pakistan (average 5.1) and East Asia (average 7.7) in the period 1970-2004, FDI inflows to total domestic investment ratio in East Asia is double the one for Pakistan. East Asia has sustained high growth rates in the last decades with a different magnitude of foreign capital flows in their domestic investment than the one in Pakistan. While the share of FDI in total investment has more than doubled since 1990 in Pakistan, it is still only at less than 7 percent of gross capital formation at present. This reflects low confidence of foreign investors in Pakistan.

Countries frequently rely on inflow of foreign savings in the form of capital or international borrowing to finance their domestic investment needs. However, international borrowing can rise or decline depending on cyclical movements, exchange rates, external shocks, and a host of other factors. In the long run, reliance on foreign capital is also unsustainable as international liabilities erode the national income base. Very few countries go without any international borrowing or lending in a particular year, and Pakistan is no exception. The difference between Pakistan and other fast growing economies like the ones in East Asia is that while inflow of foreign saving gave an initial boost to growth in these countries, domestic saving has been key in sustaining high rates of rapidly increasing domestic investment.<sup>2</sup>

Hence, in the short and medium run, if Pakistan wants to sustain its growth and increase its investment without paying increasing shares of income in interest or dividends, it has to finance this investment by raising its *domestic* saving rate. In the long run, the country will have to resolve its geopolitical challenges and to strengthen its markets and institutions in order to complement its domestic resources with FDI to meet its domestic investment needs.

The analysis of this paper shows that first, Pakistan's domestic saving rate is historically lower than the one of the fast growing Asian economies in absolute terms and when controlling for the level of economic development. Second, the domestic saving rate has considerably different structure in Pakistan from the one in the comparator East Asian countries, with corporate and public saving at significantly lower levels in Pakistan. Third, informal channels of saving are popular in Pakistan, and their economic significance (albeit difficult to quantify) could be as large as 2 to 4 percent of output. Fourth, based on regression analysis, we find that demographic, financial development, fiscal, and economic growth variables are statistically significant

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<sup>1</sup> Domestic saving rate in this paper is defined as the ratio of gross domestic saving in gross domestic product.

<sup>2</sup> See World Bank (2003).

determinants of Pakistan’s domestic and private saving rates, hence policy recommendations focus on these four factors.

The paper is structured as follows. Section II presents recent saving trends in Pakistan in comparative fashion. Section III investigates the relationship between Pakistan’s saving rate and main macroeconomic variables. Section IV estimates the saving function for Pakistan with income, fiscal policy, financial development and demographic factors as its main determinants. Specific policy measures that can be adopted to increase the level of domestic saving are discussed in section V.

## II. Saving Trends: Pakistan in Comparative Perspective

Historical data for Pakistan place the national saving rate at around 14 percent of GDP on average for the period 1973-2005 and the domestic saving at 11 percent of output on average for the same period (see Table 1).<sup>3</sup> While the national saving rate has been at comparable levels to the one in some of the fast growing East Asian economies, the domestic saving rate for Pakistan has been significantly lower (see Figure 1, left). This suggests that net income and current transfers from abroad comprise a rather larger component in Pakistan’s national saving than in the counterpart countries.

**Table 1: Saving rates in Pakistan, selected years**

	2000	2001	2002	2003	2004	2005p	Average 1973-2005
National Saving	15.8	16.5	18.6	20.8	18.7	15.1	13.99
Public Saving	-0.1	1.6	1.8	1.7	3.7	2.6	1.54
General Government	-0.9	-0.1	0.2	0.0	1.6	0.9	-0.06
Others	0.8	1.7	1.6	1.7	2.1	1.7	1.82
Private saving	15.9	14.9	16.8	19.1	15.0	12.5	12.44
Household saving	14.0	13.1	14.8	16.8	13.2	10.8	12.13
Corporate saving	1.9	1.8	2.0	2.3	1.8	1.6	1.26
Domestic Saving	17.1	17.8	18.1	17.6	16.4	13.2	10.83

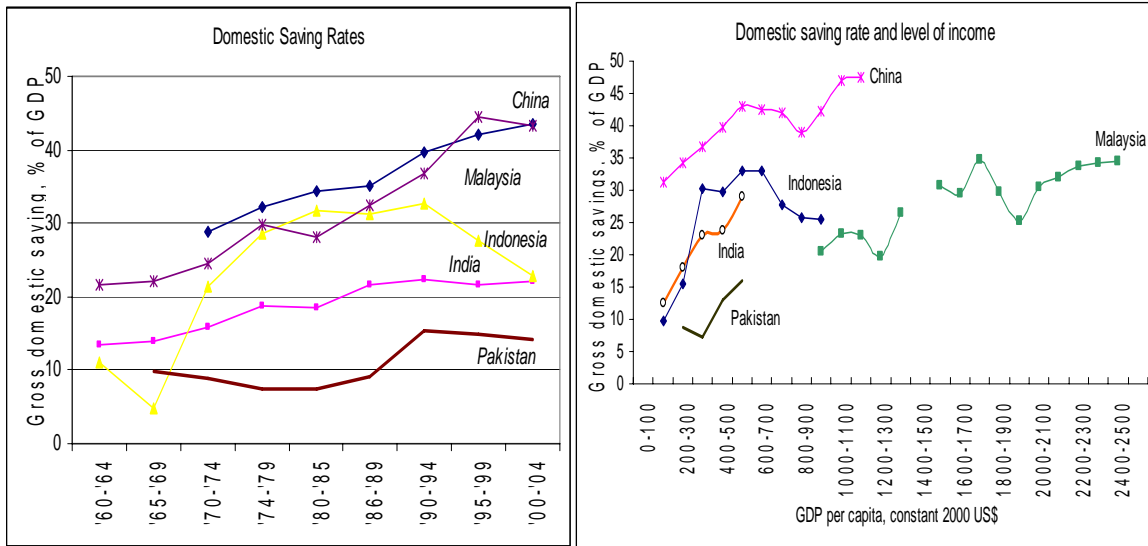
Source: National Bank of Pakistan.

Controlling for economic development, we reach similar conclusions regarding the **domestic saving** rate of Pakistan, i.e. the rate is at lower levels than the one in countries with comparable GDP per capita levels (see Figure 1, right). Moreover, the responsiveness of the Pakistan’s domestic saving rate to changes in the GDP per capita growth is lower than in the comparator countries. For example, a one percent increase in the income levels (measured by the GDP per capita in constant 2000 US\$) increases Pakistan’s domestic saving rate by 0.06 percentage points. The estimated coefficient for Pakistan ( $\beta_{\text{Pakistan}} = 5.52$ ) is lower than the estimated ones for China ( $\beta_{\text{China}} = 12.42$ ), Indonesia ( $\beta_{\text{Indonesia}} = 7.97$ ), and Malaysia ( $\beta_{\text{Malaysia}} = 7.55$ ).<sup>4</sup> This suggests that the elasticity of the saving rate to changes in the level of income in Pakistan is smaller than in other fast growing economies with similar income levels.

<sup>3</sup> National saving rate is defined as the share of domestic saving plus net income and net current transfers from abroad in gross domestic product. Gross domestic saving is calculated as GDP less final consumption expenditure (total consumption). Domestic saving rate is the ratio of gross domestic saving to GDP.

<sup>4</sup> The estimated functions for Pakistan, Malaysia, Indonesia and China are  $y(\text{Gross domestic saving in GDP}) = \alpha + \beta \cdot \ln(\text{GDP per capita, constant 2000 US\$})$ .

**Figure 1: Domestic saving rates for Pakistan and comparators, 1970-2004**

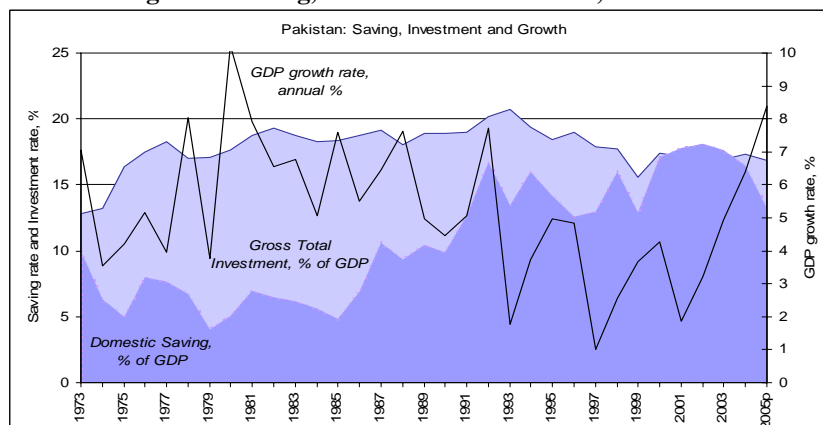


Source: Data Development Platform, World Bank

Note: Gross domestic savings are calculated as GDP less final consumption expenditure (total consumption). Gross national savings, including net current transfers is equal to gross domestic savings plus net income and net current transfers from abroad.

Saving trends in Pakistan reveal cyclical patterns much like saving trends in the rest of the world (see Figure 2). The domestic saving trend of Pakistan is marked by a notable increase in the early 1990s, from an average rate of 8 percent of GDP in the 1980s to 17.5 percent of GDP in 1991. High returns on the National Saving Scheme (NSS) instruments, especially over 1993-99, attracted individual and institutional deposits and explain the boost in saving (see Box 1). Saving rates have declined since 2003, despite strong economic growth in the country. Moreover, from a brief domestic resource surplus in the early 2000s, Pakistan is currently facing a domestic resource gap of around 3.5 percent of output. With a gross domestic investment rate of only 18 percent of GDP in recent years and a widening domestic resource gap, targeted growth by the government of 6 percent or higher is unlikely to be achieved.

**Figure 2: Saving, Investment and Growth, 1973-2005**



Source: National Bank of Pakistan for saving and investment data; World Bank Development Data Platform for GDP data. Data for 2005 are projected.

### Box 1: National Saving Scheme

The National Savings Scheme (NSS) is a set of government-owned saving instruments, raised through various bonds and accounts usually with tenors of 3, 5, and 10 years. National Saving Centers started sales of Savings Certificates in 1971, and presently there are 4.2 million NSS account holders in Pakistan. NSS is administered by the Central Directorate of National Saving (CDNS), an attached department to the Finance division of the Ministry of Finance. It borrows funds directly from the Pakistan retail sector through seven different national savings schemes. Returns on NSS certificates are tied to Pakistan Investment Bonds (PIBs) with a significant premium. NSS certificates are sold on “tap” so that the volume of NSS cannot be controlled by CDNS, Ministry of Finance or the State Bank of Pakistan (SBP).

The NSS has been an important source of long term funding for the government, as it raises nearly half of the domestic financing of the government debt. The Budget Wing of the Ministry of Finance decides on the interest rates on the NSS instruments, and also gives the CDNS a target amount of borrowing at the beginning of every year. Until 2001, NSS certificates were issued at yields far in excess of market rates with social protection purposes. In practice, however, private individuals as well as institutional investors could buy NSS certificates from CDNS branches, post offices, and banks. Thus, NSS certificates were very attractive, crowding out other debt instruments and leading to very high interest costs. From the perspective of the government, NSS instruments were a costly and unsustainable way to finance government debt.

In 2001, the government banned institutional investors from buying NSS certificates and linked the return on NSS certificates to market-determined PIB yields, albeit with a mark-up. This has resulted in a substantial reduction in NSS rates. Moreover, domestic commercial banks were prohibited from selling NSS certificates in 2003 to better control the volume of issuance. At present, further re-organization efforts are on the way, taking advantage of the attractions of the system, namely, its broad investor base and attractive distribution system. The efforts are concentrated on reforming the NSS instruments. Aligning yields on NSS instruments to market rates is only a first step in meeting the challenges of reforming the capital markets in Pakistan. Introducing new market-oriented products, computerizing the NSS, and building capacity are among the weaknesses to be overcome.

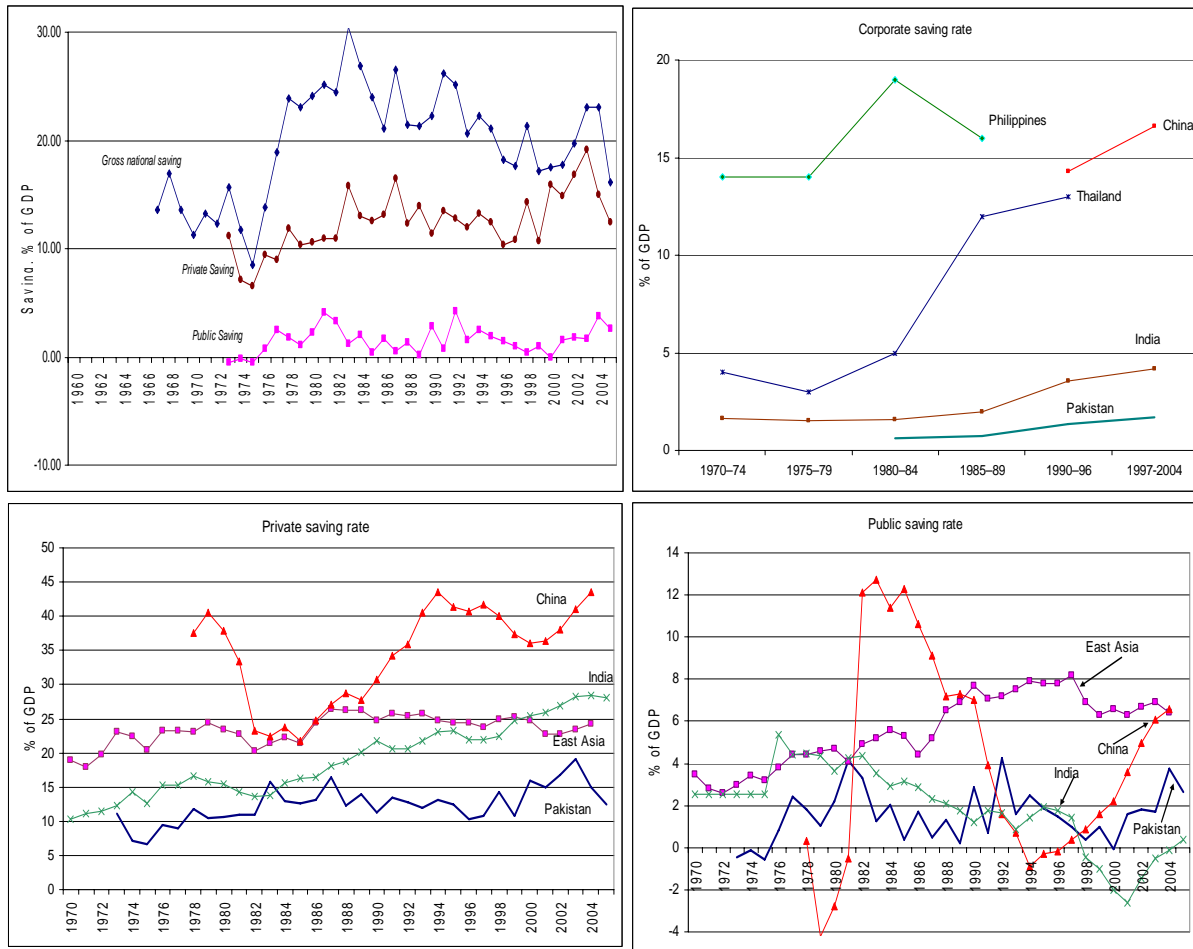
*Source:* Based on IMF (2004).

Sectoral breakdown of saving shows that **private saving** accounts for over 90 percent of national saving in Pakistan and preliminary data for 2005 place private saving at 12.5 percent of GDP (see Table 1). In comparative perspective, the private saving rate of China is three times the one of Pakistan, and the private saving rate of India is twice the one of Pakistan. **Household saving** is the largest component of private (and domestic) saving in Pakistan and has accounted for about 11 percent of GDP on average for the period 1981-2005. Since its peak in 2003, which may well be due to official recording of flows that already existed, household saving has declined in both nominal and real terms (see Figure 3).<sup>5</sup>

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<sup>5</sup> On remittances see Hyder (2003).

**Figure 3: Sectoral composition of saving in Pakistan in comparative perspective**



Source: Data for Pakistan from State Bank of Pakistan. Data for other countries and regions from International Monetary Fund World Economic Outlook 2005.

Pakistan households save in conventional financial instruments such as various types of deposits, NSS instruments, mutual funds, GP fund, and cash. However, even if all forms of financial saving are accounted for, the financial saving rate of Pakistan is below 10 percent of GDP; and considerably lower than the one in East Asia (and especially China) and even India (see Figure 3). Although deposits of scheduled banks (stock) have been growing steadily in the last several years in Pakistan, their penetration is still low at around 40 percent of GDP, compared with 190 percent of GDP in China. There are 192 bank deposit accounts per 1000 people in Pakistan, compared to 1250 in Malaysia.<sup>6</sup> Given that saving motives are universal across the world, namely consumption smoothing, bequest, and/or inheritance, we expect that saving in unofficial forms in Pakistan is prominent. To quantify informal saving in Pakistan, however, is challenging for obvious reasons. In Box 2, we discuss various forms of informal saving in Pakistan and attempt to proxy their economic significance.

<sup>6</sup> Bank deposit accounts are deposit accounts, including checking, savings, and time deposit accounts for businesses, individuals, and others. Data for 2004, from World Bank Development Data Platform.

## Box 2: Informal Saving Methods and Size

A significant portion of household saving in Pakistan remains in informal instruments and/or physical assets, including gold. These savings are not entirely captured by aggregate statistics, but anecdotal evidence suggests that their size is significant. Moreover, they could yield significant returns if pooled to finance productive investment in an environment of rapid growth. We describe some of the forms of such informal saving in turn.

**Remittances** are an important source of household saving in Pakistan. After September 11, 2001, Pakistan saw a rise in the officially recorded remittances which partly explains the peaking of official household (and consequently domestic) saving in the following two years, despite a comparatively higher than previous level of consumption and investment expenditures (financed partly also by remittances). Observers have estimated that at least 12 percent of remittances are saved in Pakistan in both financial and non-traditional forms of saving (see below).<sup>7</sup> Since no credible aggregate data exists with respect to the share of remittances that is saved in non-financial instruments, we cannot re-estimate household saving with precision. However, knowing that unskilled, skilled, service and clerical workers remit higher portion of their saving compared to professional and business workers, and that the former group remits primarily towards poorer households (which tend to save more than urban ones and in non-financial saving instruments), we can safely assume at least half of the saving from remittances is not captured by formal statistics.<sup>8</sup> This saving could add as much as 2 percentage points to the official household saving rate in Pakistan.<sup>9</sup>

The *Hundi/Hawala network* is a popular way for remittances to reach its recipients in Pakistan. The network is an alternative remittance system, which operates outside of or parallel to formal banking or financial channels. It channels expatriates' saving from abroad to Pakistan through informal channels and without paper trail of money transfer. Usually, the remitter brings cash to a *Hawala* broker outside Pakistan, after which the broker contacts another member of the network in Pakistan and gives disposition instruction (amount, destination) less small commission to a counterpart broker in Pakistan, who in turn delivers the money to the final recipient. There is no money transfer or a promissory instrument between the brokers; they only acquire balance sheet positions against each other. Even though the transaction likely involves two currencies, there is no record of a purchase or sale of foreign exchange -- this is the most distinguished feature of *Hawala*. The system works entirely on an honor and trust basis. Apart from commission, *Hawala* brokers earn profits through bypassing official exchange rates, as funds enter the system in the source country's currency and leave the system in the recipient country's currency. Transfers via *Hawala* channels are often faster, reliable, reach remote destinations, often benefit from a better exchange rate, and can be much cheaper than transfers through established, licensed financial institutions. It is believed that *Hawala* channels of remittances transfer are being used to a limited extent after September 11, 2001, and expatriates have started sending money via formal channels.

Official aggregate data on household saving does not capture another popular method of individual saving, i.e. the informal *committee system* or *basi* which brings together regular (monthly or weekly) contributions of friends and neighbors into one pot and extends it to each member on a rotational basis. The mechanism is popular among small firms, too (Nabi 1988). Such schemes could involve many people/firms and last up to two years. The aggregate size of informal saving of this type is hard to define with precision in the absence of micro data. On the corporate side, however, an enterprise survey estimates that 13.6 percent of Pakistani firms' new investments are financed by informal sources, family, or friends; placing Pakistan on top of the scale only after Indonesia and Cambodia.<sup>10</sup> Assuming this is an accurate estimate, the size of

<sup>7</sup> See Nabi and Hamid (1982), p. 25.

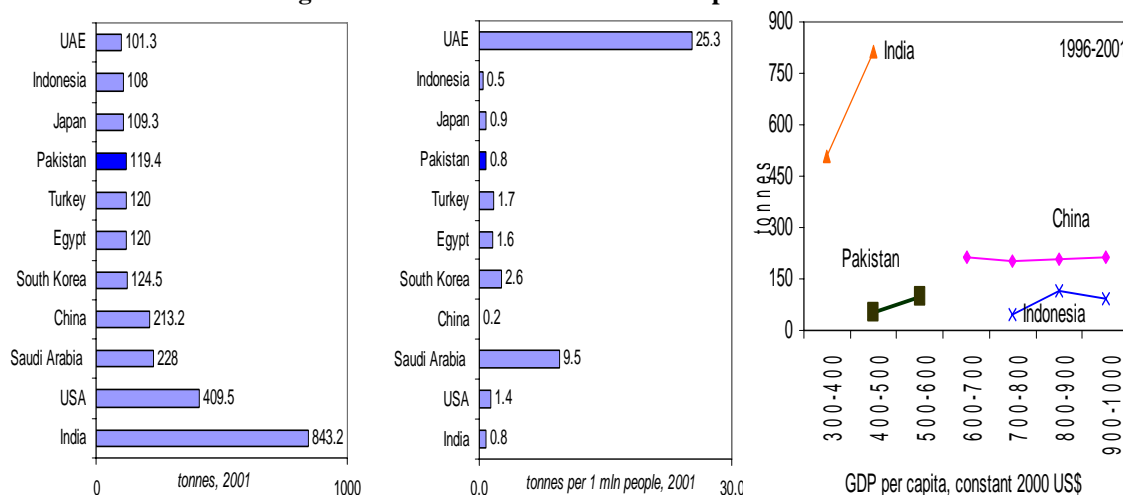
<sup>8</sup> For micro characteristics and determinants of saving, see Khan and Nasir (1999).

<sup>9</sup> Following assumptions are made: (i) households save 12 percent of remittances; (ii) half of saving from remittances is in informal instruments; (iii) the estimate of saving from remittances in informal instruments is added to official household saving numbers.

<sup>10</sup> Data accesses at <http://rru.worldbank.org/EnterpriseSurveys>.

investment from informal sources would be around 2.8 percent of GDP. Obtaining credit from informal sources is especially popular in rural areas.<sup>11</sup> According to the results of a rural finance survey, informal sources account for 78 percent of loan volume in rural Pakistan.<sup>12</sup> Moreover, 93 percent of households in this survey borrow exclusively from informal sources.<sup>13</sup> Household saving often take the form of **gold and silver**, which is another popular informal instrument of saving in Pakistan. According to the World Gold Council, Pakistan is among the top-ten countries ‘consumers’ of gold in the world, with consumption at 119 tonnes in 2001 (see Figure 4, left). This could add between 0.25 and 0.45 percent of GDP to household saving if formalized into traditional saving instruments.

**Figure 4: Gold Demand in World’s Top-10 Markets**



Source: World Gold Council

Despite a large amount of aggregate saving held in gold in Pakistan, the propensity to save in gold is almost identical to the one in India (Figure 4, middle), and yet India’s domestic saving rate is almost double the one of Pakistan. Similarly, on a per capita basis, Pakistanis seem to consume less gold than some of the comparator countries (India, China, and Indonesia) where not only domestic saving, but also gold consumption is considerably higher than in Pakistan.

Although we try to proxy the economic significance of informal saving in Pakistan’s economy, a simple addition of these numbers to the official private saving rate would be erroneous for at least two reasons. First, these are only rough estimates. Second, there is a real danger of double counting. Instead, these estimates should be taken as an indication of the significance of informal saving and the need for further microeconomic research.

**Corporate saving** in Pakistan account for about 10 percent of private saving and 1.3 percent of GDP on average for the period 1981-2005. Compared to the fast-growing economies of East Asia, and especially to China, the level of corporate saving in Pakistan is negligible (Figure 3). Observers attribute the rise of overall saving in East Asia precisely to a surge of corporate profits which became a significant source of investment in several of the countries in East Asia.<sup>14</sup>

<sup>11</sup> Hook (1997).

<sup>12</sup> The Rural Finance Survey covers data for 1995/96. See Khandaker and Faruqee (2001).

<sup>13</sup> See Faruqee and Khandker (2001).

<sup>14</sup> In Thailand, during the 1970s and 1980s, corporate saving accounted for almost 45 percent of total private saving and 8.5 percent of GDP on average, and reached 13 percent of GDP in the first half of the 1990s. The share of corporate saving rose sharply during the late 1980s to around 60 percent of total private saving, or 13 percent of GDP. Corporate saving rate in the Philippines between mid-1970s and 1990s was in the neighborhood of 15-20 percent of GDP. Corporate saving has accounted for more than a half of private saving in Malaysia. For more on corporate saving see Akyuz and Gore (1996) and Deaton (1999).



**Public saving** account for around 10 percent of national saving in Pakistan, or 1.5 percent of output on average for the period between 1970 and 2005 (Figure 3). Government saving witnessed an increase in 2004, which could be attributed to some improvement in financial management of government resources (expenditure management) and somewhat tightened fiscal discipline. Albeit positive since 1976, public saving is still in the neighborhood of 3 percent of GDP, which is low when compared to the rate of public saving in East Asia.

Overall, in comparative perspective, saving rates in Pakistan are lower across the board than those in countries with similar income per capita. While the rate of household saving has been moderate for the last three decades (although still lower than the one in East Asia), corporate and public saving rates have been considerably lower in Pakistan than in the fast growing Asian economies. Even though informal saving is not accounted for by aggregate statistics in Pakistan, international comparisons are valid as similar issues of informality of saving exist across the world, and especially neighboring India – a country with similar cultural and saving habits, and yet considerably higher rate of domestic saving.

The recent decline in household and public saving rates in Pakistan juxtaposed to increasing domestic investment needs in a fast growing economy suggest that unless saving goes up, economic growth will suffer. To sustain its current growth momentum, without incurring the expenses of heavy international borrowing, Pakistan would need to (i) reverse the current low (and declining) trend of domestic saving and (ii) resolve its geopolitical challenges in order to attract FDI. Foreign direct investment could not fill the domestic resource gap even if it doubled; hence domestic saving is the only feasible source of extra funding unless Pakistan goes on an international borrowing spree with all of its consequences.

### III. Linkages between Saving and Macroeconomic Variables in Pakistan

How to bring Pakistan's domestic saving rate up to cover higher levels of its domestic investment? To answer this question, we need to understand the forces which affect saving in the long run. Annex I summarizes the main theoretical insights on the determinants of saving behavior. Theory points to a set of factors which influence saving decisions, including income and output level, financial development, fiscal (im)balances, and demographic factors.<sup>15</sup> First, we plot the bi-variate relationships between time series for saving and proxies of suggested determinants for Pakistan (see Figure 5), and second, we empirically test for their relevance in section IV.

Empirical evidence suggests that there is a strong association between saving rate and **real income per capita** and saving rate and **output growth** across countries and time. While saving and growth undoubtedly affect each other, the issue of causality has been contestable at the theoretical level (see Annex I). Carroll et al. (1993) and Rodrik (2000) try to settle the issues empirically and find that while income growth affects saving rates positively and permanently, higher saving rates lead to only temporary hikes in economic output. Saving has responded positively to gains in output in Pakistan in the long run (see Figure 5). Domestic saving rate in Pakistan reveals cyclical patterns, much like saving rates around the world. Negative shocks such as oil price booms, droughts, financial crises and others are followed by dips in saving. Income per capita and domestic saving rate exhibit strong correlation in the long term, too, as presented in Figure 5.

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<sup>15</sup> For an extensive literature review see Deaton (1999).

Financial development affects domestic saving rate, although its effect may be ambiguous (see Annex I). In the long run, empirical studies have established a strong positive relationship between financial development and saving. This relationship yields largely from the indirect effect of improved efficiency of financial intermediation, offering higher returns on postponed consumption (saving).<sup>16</sup> A developed financial system offers in general fewer credit constraints, and increased saving opportunities.

However, in the short run, financial development may affect saving negatively. For example, increased availability of and access to credit allows households and firms to finance higher consumption at a certain income level, and hence reduce their saving. **Domestic credit to the private sector** as a share of output is often a variable used to measure the degree of financial liberalization. It also captures consumers' access to borrowing. When corporate saving in GDP is juxtaposed to domestic corporate credit in GDP, a negative association between the two variables emerges (Figure 5). This suggests that higher credit availability and relaxation of credit constraints in Pakistan has led to a decline in the firms' propensity to save, *ceteris paribus*. Although, financial sector liberalization and the recent banking sector development in Pakistan have contributed to the expansion of domestic credit to firms and households, corporate savings (often proxied with retained company profits) has plummeted. Thus, while the long run relationship between financial development and saving might be positive, the short and medium term effect of increased availability of credit has yielded lower domestic saving.

There is a strong positive relationship between saving and **real interest rates**. As presented on Figure 3, the elasticity of both the domestic saving rate and the private saving rate to changes in the real interest rate on deposits is found to be prominent in Pakistan. Real interest rates have been negative or hovering around zero in positive territory in the last few years, and in fact have exerted an inverse impact on saving. Private saving responds stronger to movement in the real interest rate in comparison to domestic saving, which implies higher sensitivity of private agents to interest rate shifts than of non-private ones.<sup>17</sup>

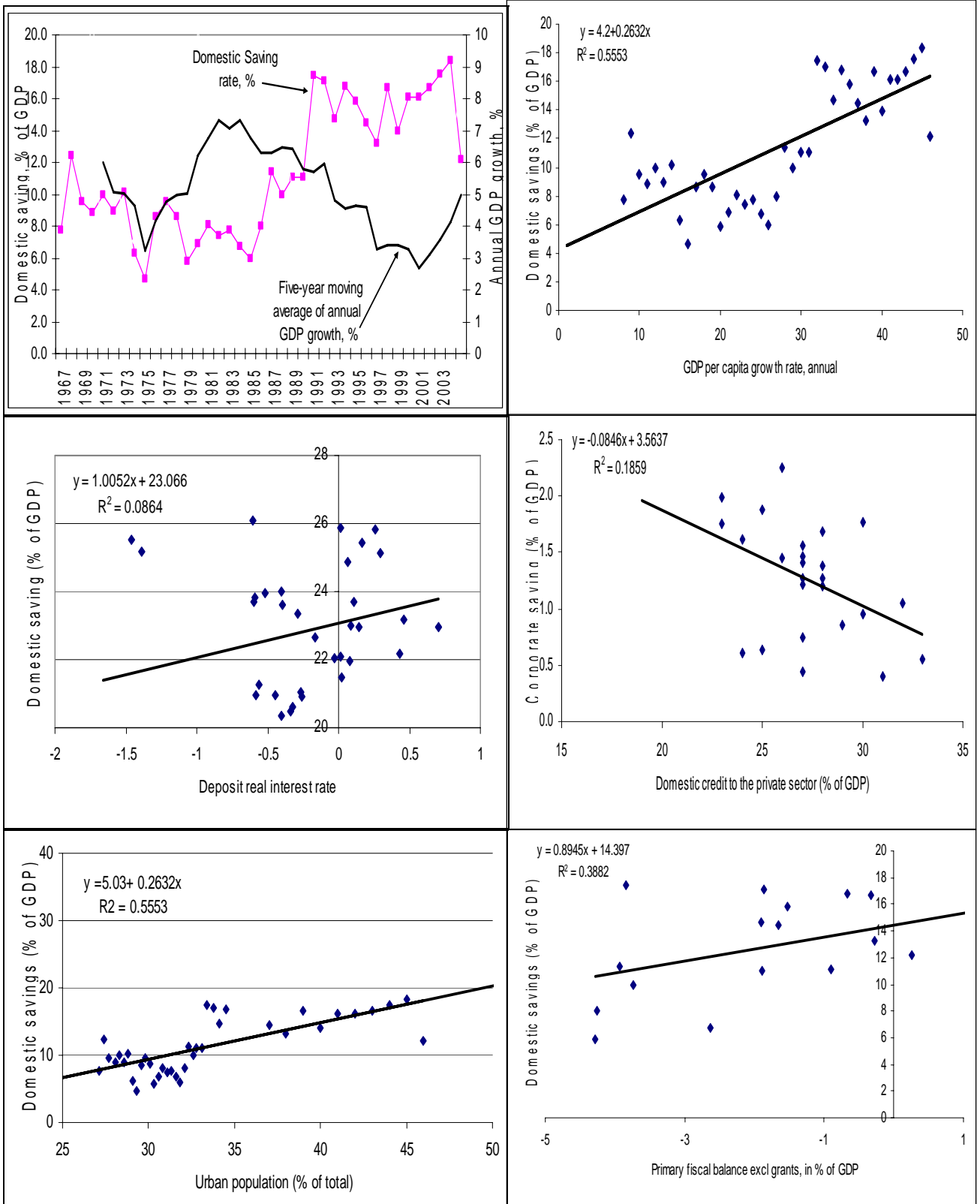
Changes in domestic saving (and especially changes in the government saving rate) for the most part should follow changes in **fiscal policy**, in particular the ability to reduce and keep the primary deficit low. Chronic government budget deficits, generally, depress the saving rate. Historically large budget deficits in Pakistan were brought down to 4 percent of GDP (deficit after grants) in FY01. Since then the fiscal deficit has been around 3 percent of GDP. Primary fiscal balance (excluding grants) as a share of output has also moved into positive territory since FY00. And domestic saving, including government saving, has responded positively to lower fiscal deficits (see Figure 5). This relationship between saving and primary fiscal balance for Pakistan implies that efforts should be directed towards narrowing fiscal imbalances even further.

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<sup>16</sup> See e.g. Bandiera et al (2000).

<sup>17</sup> The slope of the estimated coefficient of real interest rate on deposits ( $\beta$ ) is 9.6 when private saving ratio is plotted against real interest rate on deposits.

**Figure 5: Pakistan: Biivariate Relationships between Saving and Determinants**



Source: SPB and DDP WB. Population data and projections from UN's World population prospects database.

The tendency to save more at middle age and less at young and old ages is in the core of the life-cycle hypothesis (Modigliani 1970). With increasing share of working age population in Pakistan, saving is expected to grow, given that people tend to save during their “active” years. Starting in the mid-1990s, Pakistan has been on a path of rapid demographic shifts in the structure of its society. The share of working age population in total has been growing steadily, and according to UN projections, the peak of the demographic transition of the country is expected between 2040 and 2045, when 66.1 percent of the people in Pakistan will be at an age between 14 and 65. There is a strong positive relationship between the share of working age population in total and saving, as shown on Figure 5. Similarly, the association between urbanization and saving is a strong and positive one for Pakistan (see Figure 5). These relationships between saving and **demographic factors** are particularly important for the country, as it looks for policies to boost its saving and effectively manage its demographic transformation.

#### IV. Pakistan’s Saving Function Estimation

While the bi-variate relationships discussed above reveal important insights of the interaction between saving rate and various macroeconomic and structural variables, in this section, we bring these variables together to estimate Pakistan’s saving function. The specification for Pakistan is based on a function like the one presented in Annex 1 and is similar to other empirical models. We assume that saving depends on four types of variables, which include income, financial development, fiscal position, and demographics. The objective here is to provide a framework to address how changes in the independent variables have affected saving over the last decades in Pakistan, which will be the basis for policy interventions to boost the saving rate in the future.

The structure of the model is as follows:

$$S_t = \gamma S_{(t-1)} + \beta X_t + u_t,$$

where  $S_t$  is the saving rate in year  $t$ ;  $S_{(t-1)}$  captures the extent to which past year saving rate affect the current year saving rate;  $X_t$  is a matrix of explanatory variables in year  $t$ ; and  $u_t$  is the error term. The core economic determinants of saving,  $X_t$ , include the annual rate of growth of gross domestic product, the share of urban population in total population, the ratio of domestic credit to the private sector to GDP, and the ratio of primary fiscal balance to GDP. The estimation results are based on ordinary least square regressions.<sup>18</sup> Annex II presents definitions for all variables, their measurement, and data sources.

There are data caveats, which impede our estimation efforts and should be kept in mind. First, data coverage is not uniform across all macroeconomic variables we use. For example, while domestic saving rate data is available for the period 1967-2005, private saving rate data is available only from 1973 onwards. Second, saving in Pakistan is measured indirectly via investment. National saving is calculated as a residual in the national income accounts, and in turn, domestic saving is derived from national saving less net income and net current transfers from abroad. Thus, national saving is entirely subject to the accuracy of the gross investment numbers and the balance of payments statistics. While the balance of payments numbers are reliable, we cannot be confident about the accuracy of the investment numbers due to non-

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<sup>18</sup> The properties of the dependent variables time series (growth domestic saving rate and private saving rate) are examined for the presence of unit root, i.e. whether the series are stationary or not. Given the small number of observations ( $N = 21$  or  $33$  in the specifications in Table 1), the evidence in support of non-stationarity is inconclusive. Thus, we assume that the time series are stationary.

reporting and a large informal sector. Third, household saving may be understated due to popular informal saving mechanisms, believed to be prominent in Pakistan (see Box 1). Given these limitations, the estimates presented below should be treated with due caution.

Table 2 presents the results of the estimated saving function for Pakistan.<sup>19</sup> The results fit the expected direction of relationship in all four groups of determinants. To test for persistence, we use the lagged saving as an independent variable. The coefficients are positive in the first two regressions presented below, but not statistically significant. This implies that previous period saving influences current period saving in Pakistan, but not necessarily in statistically significant ways.

Changes in income per capita and economic output are found to be a statistically significant determinant of private saving in Pakistan, holding all other variables constant. A one percent increase in the annual growth rate is expected to add 0.34 percent to the private saving rate, ceteris paribus (2). While economic growth affects positively domestic saving, the relationship is not statistically significant in the specification below (1). Although we find no evidence of a “wealth effect” in the regressions, i.e. the tendency of households to increase spending in response to an increase in the value of their asset holdings, the inconsistently significant coefficient of GDP per capita growth rate may suggest the emergence of such tendencies in the background.

**Table 2: Saving Determinants: Regression Results**

	(1)	(2)	(3)
	Dependent variable: Domestic Saving Rate		Private Saving Rate
	Private Saving Rate		Domestic Saving Rate*
<b>Determinants</b>			
Lagged Dependent Variable	0.28 (1.40)	0.12 (0.63)	<b>0.48</b> (2.91)
GDP Annual Growth Rate	0.15 (0.58)	<b>0.34</b> (1.75)	0.01 (0.05)
Urban Population in Total population	<b>2.75</b> (3.34)	<b>0.79</b> (3.62)	<b>0.88</b> (2.97)
Domestic Credit to the Private sector, % of GDP	<b>-0.47</b> (-1.94)	-0.06 (-0.39)	0.08 (0.54)
Primary Fiscal Balance, % of GDP	-1.2 (-2.65)	--	--
Real Deposit Interest Rate, %	--	<b>1.91</b> (1.87)	--
NSS Annual Flow, % of GDP	--	--	-0.00001 (-1.54)
Adjusted R2	0.78	0.54	0.80
N	21	31	33

*Note:* Estimates are based on ordinary least square (OSL) and cover the period 1970-2004. Domestic saving rate is the ratio of gross domestic saving to GDP. Private saving rate is the ratio of private saving to GDP. Bold coefficients indicate significance at least at 10%. t-statistics is reported in brackets. \* Excludes NSS.

Financial sector variables (proxied by either the share of domestic credit to the private sector in GDP or the real interest rate on deposits) affect the saving rate in Pakistan in a statistically significant way (Table 2). An increase in the share of private sector credit in output is associated with a decrease in domestic saving in GDP, all other things held constant. A percentage point increase in domestic credit to the private sector would lead to around 0.47 percentage point decrease in the domestic saving rate, all other things being equal (1). This result is particularly

<sup>19</sup> Annex III presents alternative specifications of the same model where we control for income per capita instead of economic growth in the regressions. The results are very similar to the ones reported in Table 2.

important for Pakistan, given the recent consumer and corporate credit expansion along with rapid asset price appreciation that have put a downward pressure on saving in Pakistan. Credit to the private sector variable in (1) is capturing the effect of financial liberalization combined with the influence of very low or negative real interest rates, which have affected borrowing from the banking sector in a positive fashion.

The sign of deposit real interest rate elasticity of private saving is positive in (2), implying that the substitution effect is stronger than the income effect in the case of Pakistan (see Annex 1). There is a statistically significant relationship between the rate of private saving and real interest rates on deposits suggesting that households and corporations react rationally to movements of the interest rates. Negative and close to zero real interest rates have discouraged private saving, as a decrease of one percentage point impacts private saving by 1.9 percentage points, *ceteris paribus*.

In specification (3), we test for the effect of the annual NSS flow in output on the rate of domestic saving. The emerging relationship is negative and just misses the test for statistical significance. This suggests that some diversion from NSS instruments would be associated with improvements in aggregate saving.

Tightened fiscal discipline, and consequently, narrower fiscal balances are associated with higher saving in Pakistan (see Figure 5). In fact, a percentage point decrease in the primary fiscal balance would result in over one percentage point increase in domestic saving (1). This result reinforces the importance of prudent fiscal policies for Pakistan.

The estimation results suggest that demography also plays a very important role in saving decisions in Pakistan. We use the share of urban population in total as a proxy of these demographic changes. The variable is statistically significant in both specifications. The results in Table 2 show that a one percentage point increase in the share of urban population would result in 0.79 percentage point increase in private saving in GDP (2), and 2.75 percent increase in domestic saving in (1), all other variables held constant. It is interesting that urbanization carries a positive and statistically significant sign for Pakistan, in contrast to other country studies.<sup>20</sup> The explanation may be related to income and wealth as people in Pakistan move to the cities for jobs and enhanced earning opportunities. A complementary explanation could rest on the higher propensity of the rural population to save in informal non-financial instruments, left out of the formal financial system. In addition, access to saving instruments may be larger in urban centers than in rural and remote areas; the latter characterized by high incidence of poverty and uneven services (including financial services) delivery.

## **V. Policy Recommendations**

Based on the empirical findings presented above, we outline several policy recommendations for Pakistan on how to increase the rate of domestic saving in order to sustain the growth momentum without increasing dependency on external financing. The recommendations are presented in four groups -- income and economic growth policies, financial sector development, fiscal policy, and demographics -- reflecting the results from the regression analysis of the previous section.

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<sup>20</sup> See e.g. Loyaza, Schmidt-Habbel, and Serven (2000).

There is interaction among the macroeconomic variables in all four groups, and while we have treated their effect on Pakistan's saving rate separately for clarity, one should bear in mind how inter-linked they are. To take but one example: We have discussed the way saving responds to financial development and growth through separate channels. However, we have omitted the fact that financial development is associated with economic growth, and this interaction would affect saving decisions indirectly.<sup>21</sup> Availability of financial resources for investment may well increase with the development of the financial sector in a country, and consequently, would affect growth positively by improved factor accumulation. Even if the level of investment is kept constant, improved financial intermediation of resources is likely to result in better allocation of available funds for investment, leading to higher total factor productivity and growth. Thus, financial development would not only influence saving through financial liberalization or level of real interest rates, but its development would affect investment and resource allocation, inevitably leading to a response from aggregate income, which is also related to saving.

*Financial sector development:* Our regression results show that there is a strong, negative and statistically significant relationship between the share of domestic credit to the private sector in output and the domestic saving rate. In an environment of near-zero real interest rates and plenty of liquidity, private sector credit has grown rapidly since 2001 in Pakistan. However, the rapid monetary growth of the past few years has started to translate into inflation, especially in 2004-05 and 2005-06. If monetary policy remains loose, inflation may become a considerable threat to growth, not to mention a tax on the poor. In contrast, increasing real interest rates will reduce the growth of private sector credit, reduce the rate of growth of money supply in the economy, ease inflationary pressures, and hence provide incentives to save. Measures to increase returns to saving, through real interest rates increases, are imperative for creating an environment conducive to saving (and overall macro stability). Such policy is expected to produce positive implications on the domestic saving rate in Pakistan in the short and the medium term.

NSS certificates have been the most attractive financial vehicles for saving in Pakistan for the last three decades. However, setting the interest rate paid to NSS investors at a market level, compatible with T-bills and PIBs on an all-in cost basis, developing the PIB market, and resetting the base interest rate more frequently against market rates is likely to divert investors from NSS instruments. Being a very important challenge in the development of capital markets in Pakistan, NSS reform initiatives should be designed to offer a range of competitive saving instruments and reach a broad investor base. In this respect, speedy development of domestic capital markets is imperative. A major challenge in mobilizing household saving is to provide appropriate incentives so that households invest in financial assets with higher returns instead of putting money into physical ones such as land, housing, cattle, and gold. With the diminishing role of NSS, contractual saving is an excellent vehicle to fill in the demand gap for saving instruments with medium and long term maturity not only for individual but also for institutional investors. Development of contractual saving vehicles such as pension funds, mutual funds, insurance companies, etc. will have a direct positive effect on domestic saving. Well-developed contractual saving suggests a high level of professional specialization in the market, more funding for riskier projects, improved economies of scale and scope, reduced transaction costs, innovations in financial engineering and improved corporate governance and information disclosure.<sup>22</sup> Currently, the contractual saving market in Pakistan is thin and highly concentrated.

Development of the debt market is equally important to Pakistan in order to address medium and long term mobilization of saving, the development of institutional investors, the diversification of

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<sup>21</sup> See e.g. King and Levine (1997), among others.

<sup>22</sup> For an overview of the benefits and current status of contractual saving instruments see SBP (2004).

financial intermediation from commercial banks, and the introduction of advanced financial instruments. Thus far, the reform initiatives on this front have been limited to the introduction of primary dealership with market making obligation (in 2000), the prohibition of institutional investors from investing in the NSS products (2001), and extension of PIBs' maturities to 15 and 20 years (2004). This is a weak reform record, especially when one takes into account the fact that the last PIB auction was in May 2006 after a two-year gap and was very small. Weak activity on the bond market shows also poor investors' confidence. To improve liquidity and price transparency, the government should consolidate its debt issues to establish a better yield curve, and widen the securities market to include non-bank investors.

*Fiscal policies:* As demonstrated in the empirical analysis of Pakistan's saving determinants, and as theory would predict, there is a direct negative relationship between fiscal imbalances and saving rate. Budget deficits in Pakistan can be attributed to poor tax collection, on a very narrow tax base, and consequently very low tax-to-GDP ratio. Improved tax collection, including at the provincial and local levels and on services and agriculture, will allow the government to boost saving. Public sector saving are generated through tax increases and/or expenditure cuts. In theory, as governments increase their rate of saving, private saving is expected to decline. A decrease in saving of forward-looking private agents is a result of increased private consumption to match any increase in public saving. In practice, however, empirical evidence and international experience shows that a full Ricardian equivalence does not exist between public and private saving; i.e. public saving do not entirely crowd out private saving, but in fact raises the level of total domestic saving.<sup>23</sup>

The lesson for Pakistan is to step up its efforts in improving the low rate of tax collection. The tax-to-GDP ratio has remained at around 10-11 percent over the past few years. To this end, policy measures on both tax administration and tax policy side should be taken. Tax administration at the federal and provincial levels, while improving, is still poor. On the policy side, the reduction in import duties brought about by trade liberalization has reduced tax collections. This reduction is yet to be fully compensated by improvements in tax policy to include the growing service sector, and tax agriculture.

Going beyond fiscal imbalances, in the long run fiscal policy could have considerable effect on saving through the growth channel, stemming from the composition and efficiency of public spending. Fiscal policy has an important role in sustaining currently high growth rates in Pakistan, and indirectly, stimulating saving. Optimized expenditure envelope can provide the channels for growth and poverty reduction via public capital formation (i.e. investments of government and public enterprise). Creating fiscal space implies a shift to government investment projects with the potential to raise productivity and yield returns in the future or achieve social goals. Obvious candidates for government spending with a high contribution to long-term growth are infrastructure and human development. The government's Poverty Reduction Strategy Paper has a component focusing precisely on improving the management and effectiveness of public expenditures. Fiscal Policy and Debt Limitation Law was passed to ensure gains in fiscal and debt management as well as increasing social sector spending by the government. These efforts, however, could easily be derailed with mounting expenditure pressures, especially after the October 8, 2005 earthquake. Another issue of concern is the uneven capacity in provinces and sectoral ministries in absorbing an increased level of expenditures. Where public capacity is weak, private and non-governmental actors may be better suited to deliver goods and services.

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<sup>23</sup> See Lopez et al (2000) and Summers (2000)



*Demographics:* The regression analysis presented above offers evidence of the important role of demographic variables on saving. The urbanization ratio bears statistically significant influence on saving rates. This is to suggest that urban centers not only offer access to jobs and higher incomes, but also attract people with higher propensity to save in conventional ways. Moreover, capturing the informal saving in rural areas, channeling it into conventional forms, and consequently, productive investment, would increase the rate of return for the individual saver.

In a broader perspective, countries like Pakistan in a process of demographic transition experience strong short-term shifts in saving rates. The glut of working population in the middle phase of the demographic transition has a significant saving and growth potential if captured by a growing demand for workers with appropriate skills. For Pakistan to take advantage of the upcoming demographic transition and urbanization, investment in human capital will improve individual earning capacity, and ultimately contribute to economic growth.<sup>24</sup> However, in order for education to positively influence growth, the demand for skills needs to rise and absorb the capacity on the market. Otherwise, excess supply of workers could turn into staggering unemployment. For Pakistan, investment in human capital (education and health) becomes key to improve efficiency and competitiveness of the economy and ultimately contribute to its growth. Investing in human capital *now* will have unfailing influence on saving in the long run.

*Income and growth:* The empirical evidence suggests that the economic growth channel is a strong determinant of saving in Pakistan as both domestic and private saving have responded positively to increases in output. This implies that sustaining the growth momentum of the recent years is important in raising the level of domestic saving in Pakistan. Broadly, in the long run, policies that spur economic growth such as technological innovation or human capital development in fact would increase saving rates, too. In turn, increased level of saving will boost growth through the saving-investment link, and a virtuous circle between saving, investment, and growth will emerge.

To see a considerable boost in saving, income per capita needs to rise. Households around and below the poverty line save at rates close to zero as most of their income goes to subsistence. Empirical evidence from household surveys around the world suggests that people not only have different saving rates as they become older (life-cycle hypothesis), but also tend to save more as they become richer. However, their ability to save increases sharply only after income exceeds subsistence consumption levels.<sup>25</sup> Improved education and upgraded skills inevitably enhance the ability of people to earn higher income, and also save. This recommendation is consistent with the empirical work focusing on the importance of income for saving. Observers have concluded that in developing countries a doubling of income per capita is expected to raise the long-run private saving rate by 10 percentage points of disposable income, all other things being equal.<sup>26</sup>

The nexus of “high investment – high exports – high saving” of East Asia has relevance for Pakistan, and especially in increasing its corporate saving rate. Pakistan’s exports have been growing steadily and exporters have been operating near full capacity in the last several years. Reinvesting profit gains can become a steady source of growth of corporate savings. Maintaining competitiveness on international markets and improving the investment environment at home will be key to ensuring the sustainability of the growth momentum in Pakistan.

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<sup>24</sup> See Barro (1991) and Makiw et al. (1992).

<sup>25</sup> Atkeson and Ogaki (1991) and Ogaki et al. (1996) provide evidence in support of the hypothesis that below given subsistence levels no saving takes place for industrial and developing countries.

<sup>26</sup> See Loayza et al. (2000).

## ANNEX 1: Theoretical Underpinnings of Saving Determinants

Empirical studies on the determinants of saving, covering developing and/or industrial countries, use a reduced-form of saving equations, derived from consumption theory. The stylized specification of the saving model in a cross-country research postulates that the saving rate  $S_{it}$  in a given country (i) and year (t) is explained by the following factors:

$$S_{it} = \gamma S_{i(t-1)} + \beta X_{it} + v_i + \eta_t + u_{it} \quad (1)$$

where  $i = 1$  to  $N$  countries,  $t = 2$  to  $T$  years;  $X_{it}$  is a matrix comprising information on the explanatory variables for country  $i$  in year  $t$ ;  $v_i$  is a country specific effect; and  $\eta_t$  is a time specific effect; and  $S_{i(t-1)}$  captures the extent to which past saving rates affect current saving rates; and  $u_{it}$  is the error term. All variables on the right hand side are measured during the same period as the saving rate.

Differences among countries in cross-country data may reflect country-specific characteristics that jointly influence saving. These country specificities are often difficult to quantify and are frequently correlated with other observed independent variables in the regressions. Empirical studies usually deal with the country-specific effect in cross-country panel data by using fixed-effect estimation methods or first-differencing the regression equation and eliminating the country-specific effects from the estimation process.<sup>27</sup> By first-differencing (1), however, researchers often face a correlation between the differenced lagged saving rate and the differenced error term. In addition, the variables which comprise the matrix  $X_{it}$  may well be jointly endogenous with the saving rate, and thus the researcher will have to control for biases from simultaneous or reverse causation. To deal with these issues in panel regressions, researchers have used Generalized Method of Moments estimator with robust errors to correct for the heterogeneity in the error term.<sup>28</sup> In single country regressions, fully modified least squares regressions or ordinary least squares have been used as estimation techniques.<sup>29</sup>

While empirical studies on saving differ in the samples, model specifications, and estimation techniques, they generally agree on the types of factors comprising  $X_{it}$ , which influence the saving rate in the long term. Non-policy determinants of saving include usually persistence, income, growth, demographics, and macroeconomic instability; and policy determinants often investigate the effect of fiscal policy, pension reform, and financial liberalization, among others, on saving decisions. We summarize the theoretical underpinnings of each group of factors below.

Persistence: Saving rates show inertia, i.e. current and past rate of saving are serially correlated even when controlling for other factors.

Income: Both the permanent income hypothesis and the life-cycle hypothesis suggest that there are strong links between the level of real per capita income and saving rates. The permanent income hypothesis indicates that, following a temporary fall in income, individuals would draw on their saving to smooth consumption over time, and vice versa, i.e. unexpected income will largely be saved. According to the life-cycle theories, individuals go through increasing and then falling income relative to consumption in the course of their life.<sup>30</sup> Theoretically, however, the

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<sup>27</sup> See e.g. Elbadawi and Mwega (2000), World Economic Outlook (2005).

<sup>28</sup> See e.g. Loayza et al. (2000).

<sup>29</sup> See Harjes and Ricci (2006).

<sup>30</sup> See Modigliani (1970).

ability to save would increase sharply only after income exceeds subsistence consumption levels.<sup>31</sup>

Growth: There is strong empirical evidence about the positive association between saving and growth across countries and time. However, the issue of the direction of causality between the two is unsettled. On the one hand, observers suggest that high growth rates tend to drive high saving rates.<sup>32</sup> The basic argument is that rapid per capita growth triggers saving as income rises faster than consumption. Modigliani (1970), using the life-cycle hypothesis, argues that a higher growth rate would, with no changes in the saving rate, increase aggregate saving because it would increase the aggregate income of those working relative to those who do not. On the other hand, growth is a function of investment in physical and human capital, and since investment is financed from postponed consumption (i.e. saving), then saving engenders growth.<sup>33</sup> Put differently, saving provides the capital needed for investment in human and physical infrastructure and thus itself (through increased capital accumulation) fuels growth. Neoclassical models such as Solow (1956) suggest that increase in saving generate higher growth only in the short run, while in the long run economic growth is only a function of technological progress and growth of the labor force. Rodrik has empirically examined this issue of causality and its short vs. long run implications, and finds that while growth transitions (arising from improved terms of trade) increase domestic investment and result in permanent increases in saving, saving spurts affect positively growth only temporarily.<sup>34</sup> Regardless of the direction of causality, saving and growth feed in each other, resulting in multiple growth-saving equilibria.

Demographics: Demographics present another group of factors that impact savings decisions. Size, age and composition of households influence saving behaviors. Models based on Modigliani's life-cycle hypothesis predict that saving follows an inverted U-shape pattern, i.e. saving rate is high at middle age, and low at young and old ages. Societies during the peak of demographic transitions (when the proportion of prime age workers is the highest) will save more than societies with a larger dependency ratio.<sup>35</sup> Empirical evidence at international and single-country level confirms the hypothesis that high dependency ratios have a negative effect on private saving rates.<sup>36</sup> This finding suggests that countries in a process of demographic transition may experience strong short-term shifts in saving rates.

Fiscal policy: Saving decisions are affected by changes in government spending on public goods or the level of taxes as such changes affect the demand for the economy's output of goods and services. In turn, the effect of changes in the supply of public goods on saving decisions depends on the degree of substitutability between private and public goods. Theoretically, a permanent rise in government saving will be fully offset by a corresponding reduction in private saving, leaving national saving unchanged, i.e. Ricardian equivalence. Empirically, however, the hypothesis does not hold, finding that the offset is often only partial.<sup>37</sup> Hence, fiscal instruments can influence the direction of saving rates. Policy variables such as tax exemptions or pension systems seem to have had impact on saving. For example, countries with pay-as-you-go schemes tend to save less than countries with fully-funded pension schemes.<sup>38</sup> The impact of pension reforms depends on the way transition deficit is financed and on the reform's efficiency gains. In

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<sup>31</sup> See Atkinson and Ogaki, (1991) and Ogaki et al. (1996).

<sup>32</sup> See e.g. Carroll et al. (1993), Rodrik (2000), Loayza et al. (2000), Modigliani (1986).

<sup>33</sup> See e.g. Levine (1997).

<sup>34</sup> Rodrik (2000).

<sup>35</sup> Modigliani (1970).

<sup>36</sup> See e.g. Loayza et al (2000).

<sup>37</sup> See e.g. Lopez et al (2000).

<sup>38</sup> See Samwick (2000) for supporting evidence. Schmidt-Habbel (1999) finds conflicting evidence from Chile.

the short run, pension reforms affect saving only if the transition is financed by reducing the non-pension public deficit (lowering the benefits to current retirees, imposing higher taxes on current generations, or lowering government expenditures), saving levels of current generation will decline, while those of future generation will rise, although their saving rates will not necessarily change. In the long run, mandatory saving requirements may well affect saving, too.

Financial sector development: Economic theory suggests that financial development may influence saving behaviors in ambiguous ways.<sup>39</sup> The ambiguity comes from the net effect of several simultaneous channels through which financial development could affect saving. For example, it is well established in the literature that financial repression through its below market (repressed) interest rates would exert negative impact on the intermediation of financial resources and consequently affect negatively the economy, including the saving rate.<sup>40</sup> However, financial liberalization (via raising interest rates in the absence of financial repression), could encourage consumer and housing lending, and suppressed saving by allowing individuals to access more resources and consume at a higher level than they would otherwise. At the same time, financial liberalization (again via increase in interest rates) can increase the level of saving as it makes saving returns more attractive than current consumption. Financial development also enriches the availability of instruments for saving which could ultimately influence saving in a positive way, too.

Similarly, interest rate fluctuations can impact saving through two separate channels (the income channel and the substitution channel), with opposite effects on agents' saving behaviors. The net impact on saving will depend on the relative size of the each of the effects. The former works its way as follows: a real interest rate increase makes individuals more prone to consume than save, as it would positively affect individual disposable income. The latter, however, suggests that higher effective interest rates would increase saving if the individuals are willing to postpone current consumption for high returns, and thus would provide the incentive to save. If the real interest rate affects saving negatively, the income effect will be exerting more influence than the substitution effect, and vice versa.

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<sup>39</sup> See Bandiera et al. (2000).

<sup>40</sup> McKinnon and Shaw (1973).

## ANNEX II: Variable Definitions, Measurement and Sources

The sample used in this paper comprises of macroeconomic annual time series data for Pakistan, covering the period 1970-2005. Data were derived from the State Bank of Pakistan, Development Data Platform of the World Bank, and the World Economic Outlook database of the IMF. The main series used are as follows:

*Annual percentage growth rate of GDP* at market prices based on constant local currency. Aggregates are based on constant 2000 U.S. dollars.

*Domestic credit to private sector* refers to financial resources provided to the private sector, such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable, that establish a claim for repayment. *Source:* World Bank Development Data Platform.

*Gross domestic product (GDP)* at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current Rupees. *Source:* World Bank Development Data Platform (based on national accounts data).

*Gross domestic saving* is calculated as GDP less final consumption expenditure (total consumption). Data are in current local currency (Rupees). *Source:* State Bank of Pakistan.

*Gross national savings* including net current transfers is equal to gross domestic savings plus net income and net current transfers from abroad. Data are in current Rupees. *Source:* State Bank of Pakistan. (National saving in Pakistan is calculated as a residual under the investment approach, i.e. the difference between gross total investment and net external resource inflow).

*Population* data and projections. *Source:* United Nation's Population Prospects data base.

*Primary Fiscal Balance* excluding current grants is calculated as the difference between overall fiscal balance and interest payments on external and domestic debt. Data are in current Rupees. *Source:* World Bank staff estimates.

*Private saving* is the sum of household and corporate saving. Data are in current Rupees. *Source:* State Bank of Pakistan.

*Real interest rate on deposits* is the end of the year rate on total deposits. It is calculated using the formula  $R = (\text{Deposit rate} - \text{CPI}) / (1 + \text{CPI})$ . *Source:* State Bank of Pakistan.

*National Saving Schemes Annual Flow (NSS)* is the value of a set of government-owned saving instruments, raised through various bonds and accounts during a fiscal year. Data are in current Rupees. *Source:* National Bank of Pakistan.

*Urban population* is the midyear population of areas defined as urban and reported to the United Nations. *Source:* United Nations, World Urbanization Prospects.

*Working age population* is the population in the age group 15 to 64. *Source:* World Bank Development Data Platform.

## ANNEX III: Alternative Regression Specifications

### Saving Determinants: Regression Results (Alternative Specifications)

Dependent variable:	(4)	(5)
	Domestic Saving Rate	Private Saving Rate
<b>Determinants</b>		
Lagged Dependent Variable	0.27 (1.42)	0.1 (0.55)
GDP per capita growth rate	0.21 (0.8)	<b>0.38</b> (1.92)
Urban Population in Total population	<b>2.78</b> (3.39)	<b>0.76</b> (3.7)
Domestic Credit to the Private sector, % of GDP	<b>-0.47</b> (-2.00)	-0.04 (-0.29)
Primary Fiscal Balance, % of GDP	<b>-1.21</b> (-2.67)	--
Real Deposit Interest Rate, %	--	<b>1.72</b> (1.69)
Adjusted R2	0.78	0.55
N	21	31

*Note:* Estimates are based on ordinary least square (OLS) and cover the period 1970-2004. Domestic saving rate is the ratio of gross domestic saving to GDP. Private saving rate is the ratio of private saving to GDP. All variables are measured in percent. Bold coefficients indicate significance at least at 10%. t-statistics is reported in brackets.

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