Remittances in Pakistan: Why They Have Gone Up and Why They Are Not Coming Down

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The flow of workers' remittances to Pakistan has more than quadrupled in the last eight years and shows no sign of slowing down, despite the economic downturn in the Gulf Cooperation Council and other important host countries for Pakistani workers. This paper analyses the forces that have driven remittance flows to Pakistan in recent years. A methodological innovation is that we study the behaviour of per capita remittances and draw a close link between remittances and remitters' earning capacity, in the belief that higher earning power leads to more remittances. Our main conclusions are that (i) the growth in the inflow of workers' remittances to Pakistan is in large part due to an increase in worker migration, (ii) the higher skill levels of migrating workers has helped boost remittances, and (iii) other imporant determinants of remittances to Pakistan are agricultural output and the relative yield on investments in the host and home countries.

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I. INTRODUCTION

The flow of workers' remittances to Pakistan has more than quadrupled in the last eight years. It reached more than $7 billion in 2008 or 4.2 percent of GDP. The strong increase in remittances makes them the most important source of foreign exchange after exports of manufactured goods. There is no sign of slowing down, despite the economic downturn in the countries of the Gulf Cooperation Council (GCC) and other important host countries for Pakistani workers. This paper analyses what is behind this strong increase in workers' remittances to Pakistan.

Our methodology for analysing remittances builds on and departs in some key aspects from traditional studies on drivers of remittances. Most of these studies, while aiming to explain individual motives for remittances, actually analyse aggregated flows of remittances. We focus instead on remittances per capita. From this perspective, the study identifies earning power in the host countries (proxied by the skill-type of jobs held prior to emigration) as a key driver of remittances. In addition, we regard remittances as part of an investment decision of the migrant/immigrant, which is influenced by factors that affect relative financial returns in both the home and host countries, such as interest rates, inflation, and exchange rates. We incorporate these new perspectives in the empirical investigation of Pakistan's remittances from a diverse group of host countries.

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Our main conclusions are that (i) the growth in the inflow of workers' remittances to Pakistan is in large part due to an increase in worker migration, (ii) higher skill levels among migrating workers have helped drive and sustain the increase in remittances, and (iii) other important determinants of remittances to Pakistan are domestic agricultural output and the relative return on investments in the host and home countries.

Section II presents stylised facts on workers' remittances in Pakistan. We look at recent trends in the sources and volume of remittances, trends in the volume and destination of worker migration, and then compare Pakistan to other countries that rely heavily on workers' remittances. Section III briefly surveys the existing literature on modelling remittance behaviour and then discusses empirical results based on a model that focuses on remittance per migrant worker. Second IV concludes the paper.

II. STYLISED FACTS

Remittances have long been an important source of foreign exchange for Pakistan, and its importance has grown in recent years.[1] In the 1970s and early 1980s, remittances grew rapidly to about 9 percent of GDP (about $3 billion). By the end of the 1990s, remittances had declined to a low of 1.5 percent of GDP as they dropped to about $1 billion while GDP grew rapidly in the 1980s supported by improved policies and deregulation. More recently, remittances quadrupled to more than $7 billion (4.2 percent of GDP; Figure 1) during the period 2002-2008.[2] The recent increase in the flow of remittances to Pakistan originates mainly from host countries in the Gulf (Figure 2). The rise in remittances from the United Arab Emirates (UAE) has been particularly strong (doubling in 2006-07–2008-09), bringing remittances from that country close to the level of remittances from the US ($1.7 billion in 2008-09). Remittances from Saudi Arabia and other GCC countries tripled in 2005-06–2008-09, while remittances from the US and Europe (including the UK) have risen only moderately.

**Fig. 1. Pakistan: Total Remittances, 1976–2008**
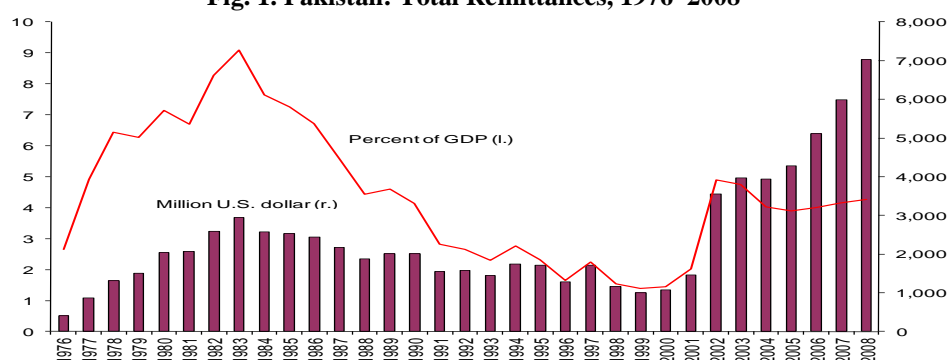
Source: World Bank, IMF, and authors' calculations.

[1]Remittances are known to be an important source of growth for many developing countries. Iqbal and Sattar (2006) and Ahmed, *et al.* (2011), for example, provide empirical evidence for the case of Pakistan.

[2]Data on remittances are vulnerable to changes in measurement and only include remittances processed through formal (banking) channels. One should, therefore, be cautious when interpreting the data. In particular, in early 2000, Pakistan's foreign exchange system was liberalised, and since then spreads between the official exchange rate and the curb rate have been small. This may have resulted in a shift of remittance transfers from the *hawala* system to formal channels.

Fig. 2. Pakistan: Remittances by Host Country, 2004-05–2008-09
(in USD million)
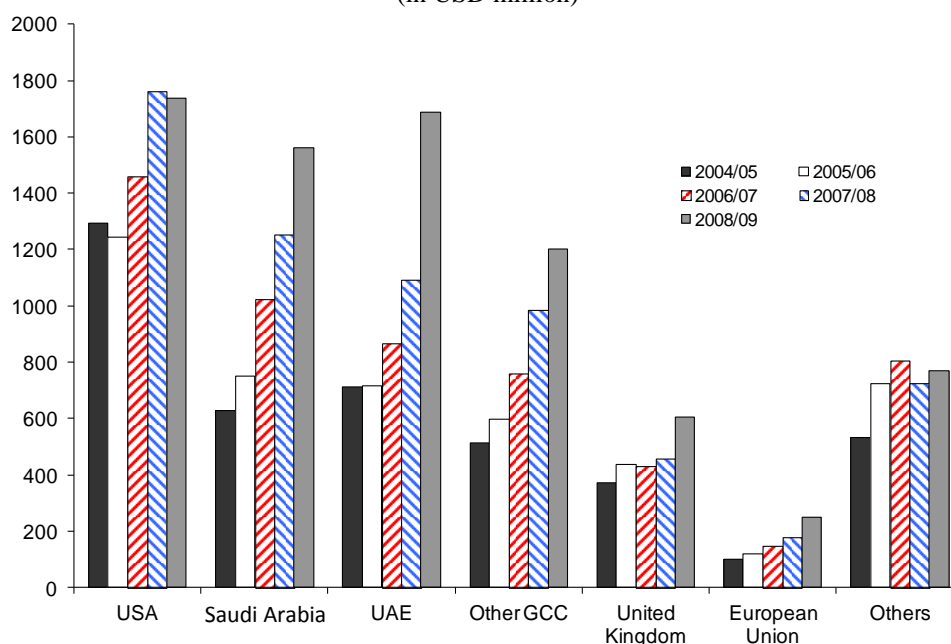
Source: IMF, State Bank of Pakistan, and authors' calculations.

By 2007 remittances had become the second most important source of foreign exchange after exports of manufactured goods. Even in the boom years of 2005–07, remittances were a more important source of foreign exchange inflows than direct and portfolio investment. Currently, remittances provide enough foreign exchange to finance almost 80 percent of Pakistan's oil imports. Historically, remittances have been relatively stable compared to direct investment and portfolio inflows; more recently, remittances have also been more stable than aid inflows [Table 1; see also Ahmed, *et al.* (2010)].[3] Mughal and Makhlouf (2011) find that remittances from Europe are the least volatile, while remittances from the Middle East and North America are more volatile, mainly due to fluctuations in the output of the host countries. The steadily growing remittances have become an important stabiliser of Pakistan's external account balance.

Table 1

*Volatility of Remittances and Other Balance of Payments Flows*

	Remittances	Exports	Aid*	FDI	Portfolio
1980-2009	50	15	47	96	227
1980-1989	22	15	39	42	121
1990-1999	32	4	31	34	144
2000-2009	31	6	59	73	444

*Aid includes official transfers and official loans to the government.

[3]The high volatility of FDI is associated with the privatisation of public enterprises.

Despite the recent surge in nominal terms, Pakistan's remittance inflow remains modest as a percentage of GDP, and it is sourced from a limited number of host countries. In 2008, Pakistan's remittances were only 4.2 percent of GDP, which is significantly lower than some of its peers (Figure 3). Other developing and middle-income countries such as Lebanon (24 percent), Jordan (22 percent), and the Philippines (11 percent) seem to benefit much more from their export of labour. More than half of the remittances originate from the GCC region, with the US (22 percent) and the UK (8 percent) as other important sources. This regional pattern closely mirrors the destinations of Pakistani labour migrants. According to official estimates, there were about 4 million registered overseas Pakistani (workers and students) in 2004, of whom 1.9 million were employed in the Middle East (most in Saudi Arabia), followed by Europe (1.1 million, of whom about 800,000 are in the UK), and the US and Canada (850,000). Including illegal immigrants, the total number of overseas Pakistanis is estimated at around 7 million.[4] The majority of these workers are employed in construction, while many others are employed in retail, transportation services, and tourism.

Fig. 3. Remittances in Selected Low- and Middle-Income Countries, 2008
(in percent of GDP)
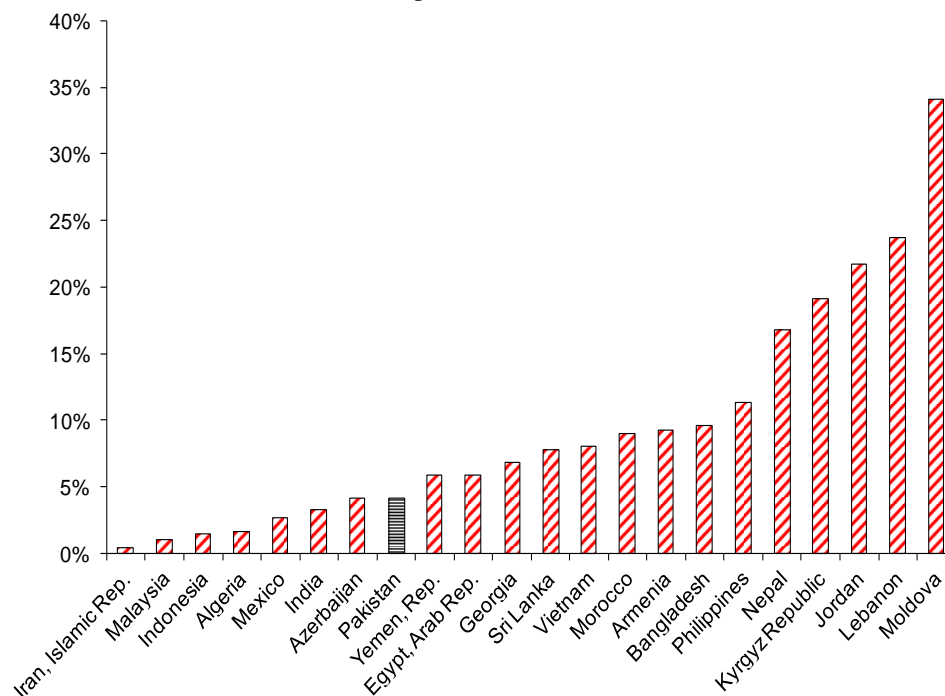
Source: World Bank.

The recent increase in workers' remittances to Pakistan appears to have coincided with a sharp rise in migration. For example, migration has doubled since January 2007 to almost 38,000 per month in June 2009. Worker migration to the UAE, however, has

[4]Pakistan (2006).

declined by 43 percent from its peak in April 2008 to about 12,000 workers in June 2009 (Figure 4). While in 2008 the UAE was the destination for about half of all Pakistani migrants, in the second quarter of 2009 it received only one third of all Pakistani migrant workers. The drop in migration to the UAE was offset by an increase in migration to Saudi Arabia (from a monthly average of 11,500 in 2008 to 18,400 in the second quarter of 2009).[5] Labour migration to the European Union (including the UK) tripled from January 2007 to June 2009, but the volumes are still small (400–600 workers per month). Labour migration to the US is also small (only a few dozen workers per month), which indicates that the high volume of remittances from this host country comes from the large Pakistani diaspora—as is also true for the UK.

Fig. 4. Pakistan: Labour Migration Indices by Host Country, January 2007–June 2009

(January 2007 = 100)
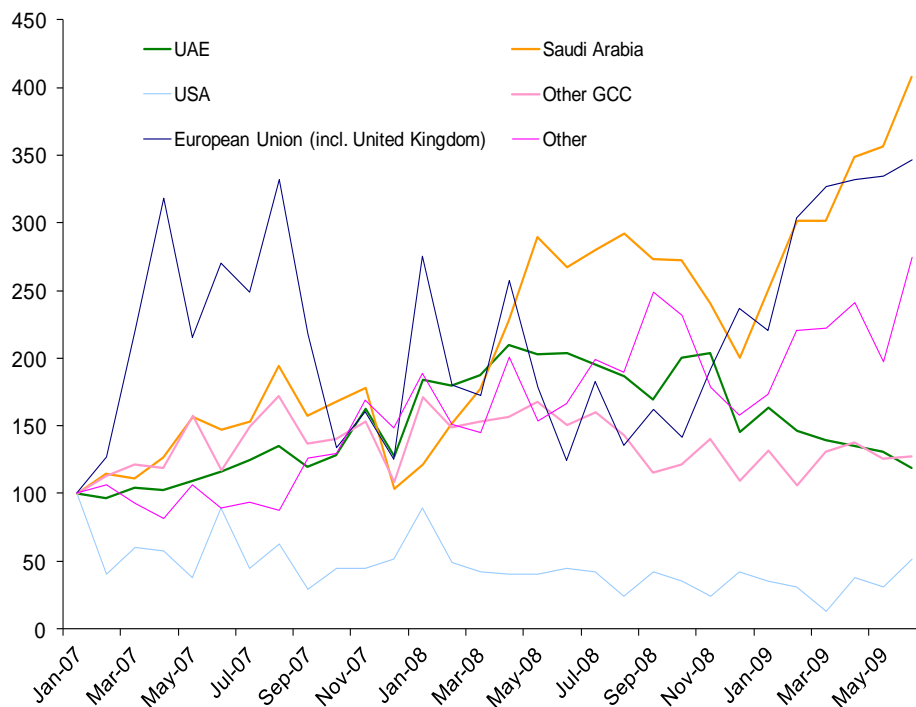
Source: Pakistan Bureau of Overseas Employment and authors' calculations.

In addition, over the past decade all host countries have seen the increase in the outflow of remittances to Pakistan outpace the inflow of workers from Pakistan, except for the European Union (Figure 5) indicating rising per capita remittances. The trend growth in per capita remittances has been particularly strong from host countries in the Gulf, with a similar pattern for the US and the European Union (including the UK).

[5]Saudi Arabia is an important source of remittances not just for Pakistan, but for many countries in the region [IMF (2009)].

Fig. 5. Remittances and Worker Migration, 1997–2008

(1997 = 100)
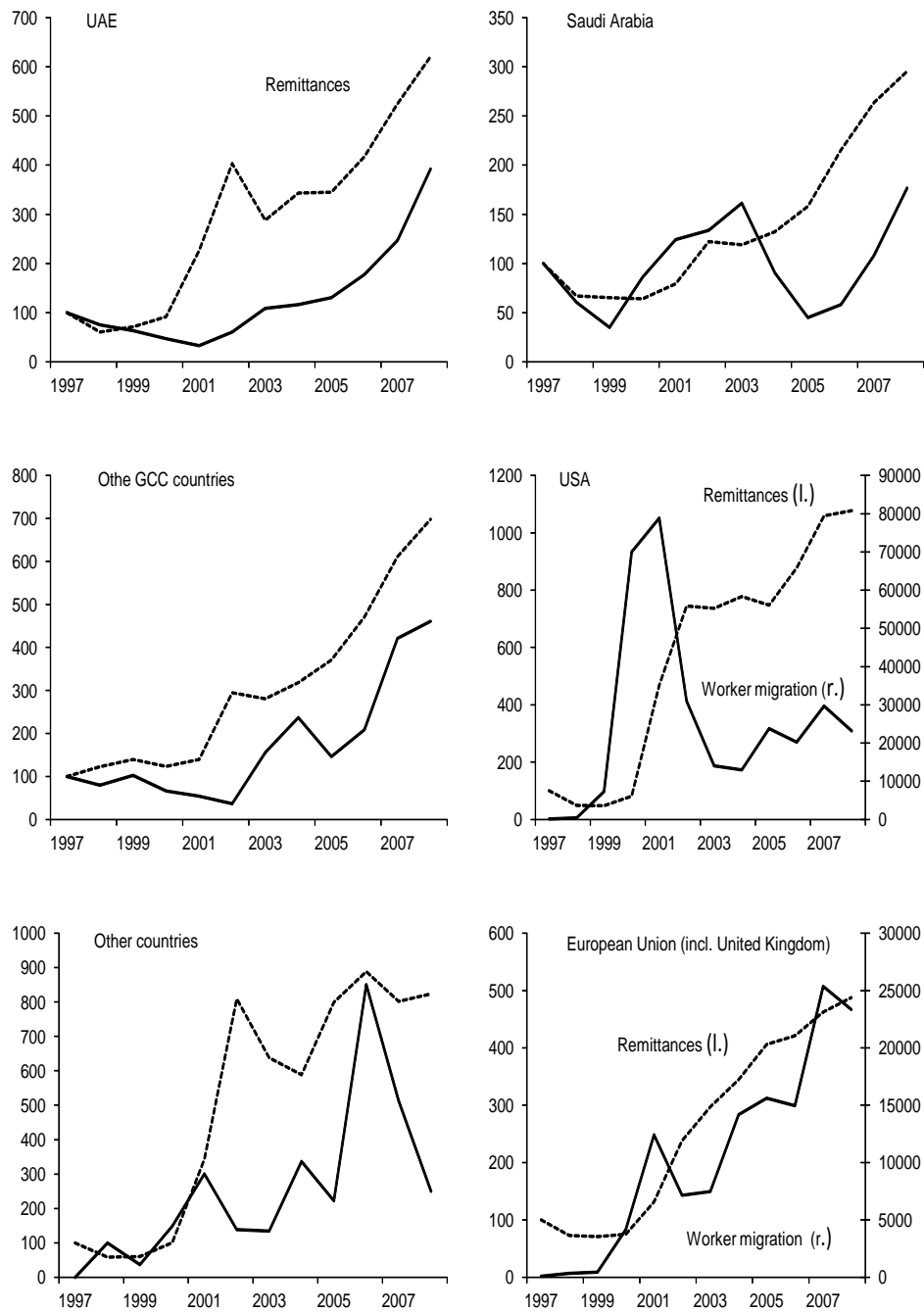
Source: Pakistani authorities and authors' calculations.

One potential explanation for the increase in remittances per migrant worker—which we will explore further in the next section—is the increase in the share of skilled labour exported by Pakistan. In recent years, the proportions of skilled and unskilled workers migrating from Pakistan have been about even. From 1994–2003, however, the share of skilled workers was 60 percent. As a result, the current pool of Pakistani workers overseas is likely to be more skilled than two decades ago (Figure 6), which may help explain why remittances from the Gulf countries increased faster than the number of Pakistani workers migrating to these countries. Skilled workers are less likely to be laid off during a recession, which may also explain why the global crisis so far has had no impact on the flow of remittances to Pakistan. This is also consistent with micro-data analysis by Nishat and Bilgrami (1993), who somewhat counter-intuitively suggest that higher skilled workers remit about 5.5 percent less than semi-skilled and unskilled workers. They also find, however, that remittances are highly correlated with income: higher skilled workers increase their remittances more than semi-skilled and unskilled migrants.

Fig. 6. Pakistan: Labour Migration by Skill Level, January 1981–June 2009
(Cumulative)

Source: Pakistan Bureau of Overseas Employment and authors' calculations.

Another interesting observation is the shift in the pattern of labour migration from Pakistan since the beginning of the global crisis and the contrast with remittances (Figure 7). The number of Pakistani workers migrating to the UAE has gradually declined since mid-2008, while the opposite is true for migration to Saudi Arabia and a diverse set of other countries (although the absolute numbers are much smaller for that group of host countries). However, the total remittance flow from the UAE has actually increased, while the increase in the number of Pakistani workers migrating to Saudi Arabia has outstripped the increase in remittances from Saudi Arabia. For the UAE, we observe a surprising break in the amount of remittances in November 2008. In the nine months before that date, average monthly remittances were $98 million, compared to $162 million in the nine months thereafter. Both the shift in host country and the jump in remittances from the UAE may be related to the global crisis, which has had a different

impact in Saudi Arabia and the UAE. In Saudi Arabia, the impact of the global crisis was mitigated by a large fiscal stimulus package, the absence of a real estate boom, and relatively sound banking practices. The UAE, on the other hand, was hit hard when the real estate bubble collapsed. This may help explain the shift in migration of Pakistani workers from the UAE—where many Pakistani workers are employed in the construction sector—to Saudi Arabia. These shifting remittance patterns suggest that remittances are clearly affected not just by wage income, but also by other factors such as immigrant workers' savings and investment decisions.

Geopolitical events can also affect remittances, especially in the case of Pakistan. In the wake of the 11 September 2001 terrorist attacks, the US and other Western countries increased scrutiny of the bank accounts of Pakistani nationals. Some anecdotal evidence suggests that, to avoid the risk of their funds being frozen or confiscated, Pakistanis abroad transferred part of their accumulated savings to Pakistan and increased the share of their monthly savings held in Pakistan.

Fig. 7. Remittances and Worker Migration, January 2007–June 2009
(January 2007 = 100)
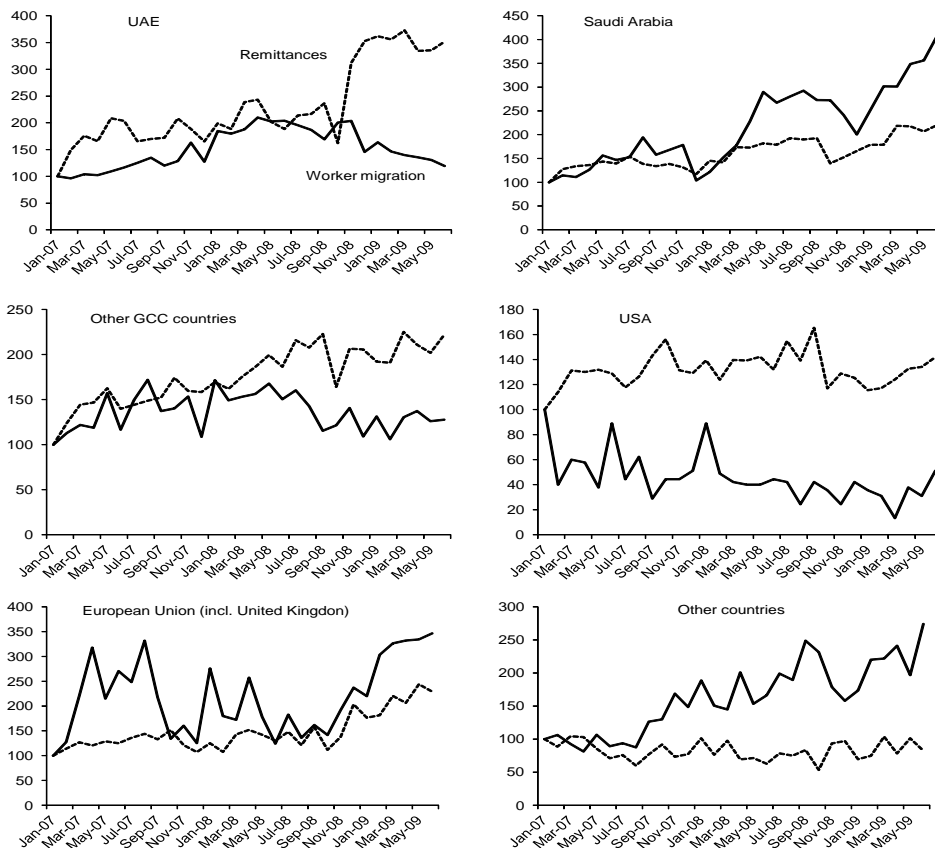
Source: Pakistani authorities and authors' calculations.

III. EMPIRICAL STUDY

As previewed in the previous section, remittances seem to have been driven by a host of factors such as migration, workers' skills, and economic conditions in the host country. This section tries to analyse empirically the various drivers of remittances after a brief review of the existing literature.

(a) Existing Empirical Studies and Our Model

The economic literature on remittances has been growing and falls into two broad categories: the drivers of remittances and the impact of remittances on growth, investment, and consumption in the receiving country. Chami, *et al.* (2008) provide a comprehensive overview of the recent theoretical and empirical literature on remittances.

The literature on remittance behaviour at the individual level identifies two motives for remitting, which can operate simultaneously in a remitter's decision to remit. The first is altruism [Johnson and Whitelaw (1974)]. The second is self-interested exchange from the remitter [Lucas and Stark (1985) and Hoddinott (1994)], where remittances are paid as compensation for relatives in the home country who provide services such as child care, financing of emigration, and tending to businesses interests. Becker's work on merit goods (1991) complements this literature by providing a theoretical framework for a more unified analysis of remittance decisions [see also Chami (1998) and Mulligan and Philipson (2000)]. A particularly important relationship between the remitter and relatives in the home country is protection from income shocks, which can be in both directions. For example, Yang and Choi (2007) show that agricultural families in the Philippines use remittances to compensate for income shocks, while in Amuedo-Dorantes and Pozo (2006), the family provides insurance to the remitter, with the remittances as the insurance premiums. The International Labour Organisation (2009) provides a case study for Pakistan on these issues.

Regardless of the motive to remit, the amount remitted is determined by the economic fortunes of the remitter and the recipient, among other variables. Economic growth in the host country is often used as a proxy for the remitter's economic fortunes, with higher growth leading to higher remittances. Similarly, economic growth in the home country is used as a proxy for the recipient's economic fortunes, with lower growth leading to higher remittances. Another important factor that drives remittances is the real value of remittances—which depends on the exchange rate (including black market exchange premiums) and inflation in the recipient's country—because it is the amount of real resource represented by remittances that has a direct bearing on the recipient's welfare. Many empirical studies also include factors that affect the opportunities available for use of remittances, which may include financial variables such as interest rates in the home country and proxies for political risk.

Either by design or by omission, many existing empirical studies are limited to analysing remittances using aggregate-level data to explain essentially individual behaviour, namely the motivation of the individual remitter to remit. For example, most studies focus on macroeconomic variables that affect the total amount of worker remittances and by how much—sometimes scaled in either host or home countries' GDP. This deficiency seems to reflect to a large extent the paucity of micro data on remittances.

In our empirical model, we depart from this approach in several ways. First, we try to model remittance behaviour more accurately by focusing on per capita remittances instead of aggregated remittances or the growth of remittances. As explained before, while remittance theory is often postulated at the individual remitter's level, existing cross-country studies that we are aware of focus on aggregate remittances, often scaled by the host country's GDP, as a way to control for cross-country difference. This makes it difficult to interpret the results because worker migration is often not accounted for.[6] In this study, we scale the aggregate remittance by immigrant population and study the behaviour of per capita remittances.

Second, we draw a close link between remittances and remitters' earning capacity in the belief that higher earning power leads to more remittances. Earning capacity is determined by an immigrant's human capital, which is reflected in the type of job he or she held in the home country prior to emigration. Clearly, migrant workers who have held more skilled jobs before immigration are better educated and have more human capital, and tend to have more skilled jobs with higher earnings after immigration, and will therefore remit more. Search and recruitment costs for these workers are higher than for lower skilled workers due to their job-specific skills and, hence, they tend to have more job security. This complements the traditional macroeconomic link between the host country's general economic conditions and remittances.

For Pakistani workers going overseas, information on a worker's occupation prior to emigration is collected by the Bureau of Emigration and Overseas Employment. Workers are classified into the following categories: highly skilled, highly qualified, skilled, semi-skilled, and unskilled. Based on this data, we construct a (normalised) skill index as follows with higher weights for the more skilled workers:[7]

$$SK = (1/25)(7HS + 6HQ + 5S + 4SS + 3U)/(HS + HQ + S + SS + U)$$

where *HS, HQ, S, SS,* and *U* denote the number of persons classified in the respective highly skilled, highly qualified, skilled, semi-skilled, and unskilled categories, and the skill index variable (*sk*) is used to test the hypothesis.[8] Detailed information on the construction of the skills index is provided in the data Appendix I.

Third, we regard remittances explicitly as part of an investment decision for an emigrant worker, and believe that investment opportunities in the host and home country affect remittance decisions as standard portfolio allocation theory would suggest. This emphasis comes in part from the fact that remittance data for Pakistan includes not just workers' remittances, but also employee compensation and migrants' transfers. The latter two categories have been found to be more pro-cyclical in many empirical studies; for

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[6]One exception is Cuc, *et al.* (2005), which studies remittances and migration in Moldova.

[7]The combined weight for highly skilled and highly qualified workers is 52 percent compared to 40 percent if all skills are equally weighted. So, relative to an equally weighted index, this index skews the weights of higher skilled workers by 30 percent. The relatively high weight for higher skill workers is consistent with the higher income that these workers enjoy, which reflects their higher productivity compared to lower skilled workers. Other weighting schemes can also be used and the results would be similar after adjusting for the weights.

[8]Our skill index only measures skills acquired before emigration and does not take into account skills acquired through formal or on-the-job training in the host country.

example, Chami, *et al.* (2008) notes that "employee compensation and migrants' transfers are procyclical on average, a finding that is more consistent with the behaviour of private capital flows than remittances as compensatory income transfers." Similar findings are also noted in Frankel (2009). Anecdotes from Pakistan officials and friends also suggest that a significant part of the change in remittances from the Gulf region (for example, Dubai) is associated with changes in the real estate investment of Pakistanis in both Dubai and in Pakistan. We therefore model the investment aspect of remittances with such variables as returns on investment in the host and home countries and exchange rates, among other variables. We construct an investment return variable for both the host and home countries that tracks the return of a hypothetical portfolio with 80 percent in deposits (considered risk-free) and the remaining in equities:[9]

$$ir = 0.8R^* + 0.2Re$$

where R^* is the deposit rate, and Re is calculated as the return on the stock market index (I_t), i.e., $Re = 100* \left(\frac{I_t}{I_{t-1}} - 1 \right)$.

(b) Estimation Results

The estimation is based on a panel of 15 countries with bilateral remittance flows to Pakistan, using data from 1997 to 2008.[10,11] Sources of the dataset and explanatory notes can be found in Appendix I and a summary plot of the main variables by country is given in Appendix II. The panel approach helps to overcome empirical challenges such as small sample size. Our regression model is based on average remittances per worker (r_1, in US dollars) and four sets of explanatory variables:

- Job skill index (sk)
- Investment return (ir, ir_{pak})
- Proxy for recipients' economic conditions in Pakistan
- Proxy for real value of remittance

As a good proxy for a recipient's economic conditions in Pakistan, we use output of major agricultural crops (mc_{rpak}). Another variable—total agricultural output—yields similar results. Both are shown to be better indicators, in terms of statistical significance, than GDP-related variables such as real GDP. Given that Pakistan has a relatively large

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[9]This portfolio basket is consistent with a relatively risk-averse investor, which we would surmise to be representative of the average migrant given their income and wealth level. Interpretation of the empirical results would need to take into account the composition of the benchmark portfolio. The results for different weights vary somewhat but all are statistically significant.

[10]The countries are Bahrain, Germany, Greece, Italy, Japan, Kuwait, Oman, Qatar, Saudi Arabia, Spain, Sweden, Switzerland, the UAE, the UK, and the US. The estimation results that we obtain are an average of the bilateral remittance flows between these countries and Pakistan. In practice, bilateral remittance flows are more important to some countries than to others; consequently, the behaviour of aggregate remittances is a weighted average of the individual relationships.

[11]While the informal *hundi* system is another important channel for remittance flows into Pakistan, the constraints on data availability mean that remittances through the *hundi* system were not included in this study. However, there is evidence that the increase in remittances through the formal channel is in part the result of crackdowns on illegal fund transfers, and the increased outreach of Pakistani banks that have arrangements with overseas entities [State Bank of Pakistan (2010)].

agricultural sector that employs the majority of the workforce and that many immigrant workers have families or relatives in the rural areas, this result is not surprising. Both the nominal exchange rate (*e*) and the real effective exchange rate (*reer*) are used to adjust for fluctuations in the real value of remittances. The estimated equation reads:

$$r_1 = \alpha + \beta_1 sk + \beta_2 reer + \beta_3 ir + \beta_4 e + \beta_5 ir_{pak} + \beta_6 mc_{rpak}$$

The model is estimated using several techniques. First, it is estimated as a pooled model, and the estimation is then carried out allowing fixed and random effects for country-specific intercepts. These models are re-estimated using a Bayesian approach, with broadly similar results. For the Bayesian estimation, the maximum likelihood ratios appear not to favour the fixed-effects model under a non-hierarchical prior. Instead, the ratios seem to slightly favour the random coefficient model over the pooled model and fixed-effects model under a hierarchical prior, but the maximum likelihood ratios are rather close.[12] Therefore, the Bayesian results reveal some model uncertainty. Nevertheless, the coefficients are broadly similar even under the Bayesian estimation.

With limited data points, no short-term dynamics are attempted; instead, we focus on the long-term relationship, given that many variables are strongly trended. The potential endogeneity issue cannot be addressed directly due to the limitations of the dataset, and would require some form of system estimation. The results are shown in Tables 2 and 3.

Our analysis yields the following main results:

- The skill level of emigrants appears to be highly significant in explaining the level of remittances when using the OLS approach, although less so when using the Bayesian approach. Indeed with the inclusion of the skill variable, host country GDP is no longer significant, suggesting that the skill variable is a superior indicator of earning capacity and driver of remittances.
- The investment return in both the host country and Pakistan is highly significant, and has the expected signs (under both the OLS approach and most Bayesian models), indicating that remitters respond to variations in investment opportunities both in the host country and in Pakistan.
- Remittances are also affected both by the nominal and real effective exchange rates, suggesting that remitters adjust for nominal and real exchange rate fluctuations when deciding on the dollar amount of remittances. This is in line with previous studies.[13]
- The results also confirm that changes in domestic economic fortunes—proxied by the output of major agricultural crops—are significant in explaining remittance behaviour. Somewhat surprisingly, we find that better agricultural harvests are related to higher remittances and transfers, i.e., they are pro-cyclical.[14] This result is consistent with other studies as noted earlier, since our

[12]Given the uncertainty on the distribution of the coefficients, even the small log marginal likelihood of the non-hierarchical model cannot be used as direct evidence of low model support.

[13]The real effective exchange rate is less significant under Bayesian estimation, but nominal exchange rates are significant in most Bayesian estimations.

[14]The average correlation of per-capita remittances and agricultural GDP is around 0.6 and 0.8, respectively, for the two definitions of agricultural GDP.

data on remittances includes migrant transfers, which together tend to behave more like private capital flows. As other studies have shown, remittance-only data often has a small negative correlation with real GDP [see Chami, *et al.* (2008)], which could be true for Pakistan, but which we could not verify because of data constraints. One should also bear in mind that, since our results are from a single equation estimation, other variables—such as exchange rates (real and nominal), which tend to fluctuate along with the real economy—may have already picked up some of the intended effects on remittances.

Table 2

Regression Results—OLS Approach

R1 = α + β₁SK + β₂reer + β₃IR + β₄E + β₅IR_PAK + β₆MC_RPAK
(See notation below)

(i) Coefficients (standard errors)

	Pooled Model		Fixed Effects		Random Effects	
α	−73.724	(11.239)	−76.119	(11.252)	−91.189	(7.299)
SK	−0.480	(2.856)	5.885	(2.395)	5.182	(2.339)
reer	1.550	(0.865)	3.379	(0.856)	4.039	(0.709)
IR	−0.071	(0.016)	−0.045	(0.010)	−0.044	(0.010)
E	0.411	(0.035)	1.871	(0.739)	0.436	(0.093)
IR_PAK	0.404	(0.193)	5.386	(0.614)	6.139	(0.463)
MC_RPAK	5.742	(0.788)	0.305	(0.113)	0.339	(0.112)
SER	1.3025		0.660		0.670	
R²	0.5615		0.865		0.606	
Adjusted R²	0.5463		0.848		0.593	
Durbin-Watson stat			1.164		1.099	
F-statistic (p-value)			51.112	(0.000)	44.406	(0.000)

(ii) Error Component

	S. D.	Variance	Share of Total
Cross-section Random	0.936	0.668	
Idiosyncratic Random	0.660	0.332	

(iii) Tests of Fixed and Random Effects
Redundant Fixed Effects Tests

Effects Test	Statistic	d.f.	Prob.
Cross-section F	25.64	−14.159	0.000
Cross-section Chi-square	212.59	14	0.000

Hausman Random Effect Tests 1/

Variable	Fixed	Random	Var. (Diff.)	Prob.
SK	5.885	5.182	0.266	(0.173)
LOG(REER)	3.379	4.039	0.230	(0.169)
IR	−0.045	−0.044	0.000	(0.465)
LOG(E)	1.871	0.436	0.537	(0.050)
LOG(MC_RPAK)	5.386	6.139	0.163	(0.062)
LOG(IR_PAK)	0.305	0.339	0.000	(0.031)

*Cross-section test variance is invalid. Hausman statistic is set to zero.

R1 = per capita remittances (in US$)
SK = constructed skill index of immigrants
reer = real effective exchange rate
IR = return on investment (constructed)
E = exchange rate (currency per US$)
MC_RPAK = major agricultural crop of Pakistan

Table 3

Regression Results—Bayesian Approach

$R1 = \alpha + \beta_1 SK + \beta_2 reer + \beta_3 IR + \beta_4 E + \beta_5 IR\_PAK + \beta_6 MC\_RPAK$
(See notation below)

(i) Coefficients (Standard errors), followed by nse

	Fixed Effects			Random Effects			Pooled Model			Random Coefficients		
α				−0.382	(0.817)	0.0082	−0.450	(1.00)	0.0100	−0.1856	(0.993)	0.0057
SK	0.037	(0.954)	0.0095	0.018	(0.967)	0.0097	−0.266	(0.955)	0.0096	0.5882	(0.985)	0.0057
reer	−0.699	(0.605)	0.0061	−0.501	(0.714)	0.0071	−0.545	(0.632)	0.0063	−1.0793	(0.616)	0.0036
IR	−0.055	(0.013)	0.0001	−0.056	(0.019)	0.0002	−0.070	(0.017)	0.0002	−0.0457	(0.184)	0.0011
E	0.493	(0.101)	0.0010	0.468	(0.129)	0.0013	0.394	(0.037)	0.0004	0.5643	(0.771)	0.0045
IR_PAK	0.496	(0.155)	0.0016	0.494	(0.214)	0.0021	0.537	(0.208)	0.0021	0.25	(0.244)	0.0014
MC_RPAK	0.751	(0.223)	0.0022	0.706	(0.271)	0.0027	0.715	(0.243)	0.0024	0.8358	(0.331)	0.0019
$1/\sigma^2$	1.1645	(0.130)	0.0013	0.746	(0.283	0.0028	0.624	(0.066)	0.0007	4.2532	(0.554)	0.0032
Log of Marginal Likelihood	−940.9			−332.3			−401.8			−290.3		

IV. CONCLUSIONS

Remittances have become a major source of inflows for Pakistan in recent years, and there are no signs of a reversal. In this paper, we use a new approach to explain the strong flow of remittances to Pakistan. The results are encouraging as they show that the skill level of immigrants, investment returns in the host country and in Pakistan, exchange rates (real and nominal), and Pakistan's economic conditions all play a significant role in explaining remittances.

These results help explain why remittances to Pakistan appear more resilient than those to other countries in the region. In the period 2009-2011, following the global crisis of 2008, the average annual growth of remittances to Pakistan was 2 percentage points higher than in the three years preceding the crisis (2006-08). Bangladesh, Nepal, and India, on the other hand, witnessed a drop in average annual remittance growth between 17 and 23 percent. Sri Lanka was able match Pakistan's performance and witnessed an increase in average remittance growth from 14 to 21 percent. Sri Lanka, Bangladesh, and Pakistan have all experienced a surge in labour migration since 2005, while migration from Nepal has remained stable. GCC countries are the main source of remittances for all these countries. It thus seems that the increase in remittances to Pakistan can be explained only in part by an increase in worker migration and the economic boom in the GCC countries in the years prior to the crisis. The increase in the share of higher skilled workers in Pakistan's labour migration explains part of this discrepancy.

In the long run, the question whether Pakistan will be able to sustain the recent increase in remittances depends on whether the rise in labour migration is to continue and, more importantly, if the composition of the migrating workforce continues to tilt in favour of higher skilled workers. Obviously, any positive impact of the continued export of higher skilled labour should be carefully weighed against the potential cost of this 'brain drain'.

APPENDIX I

DATA SOURCES AND EXPLANATORY NOTES

Data on remittances, interest rates, and stock market indices was collected from Haver Analytics. Major agricultural crop and agricultural output data for Pakistan is also from Haver Analytics, sourced from the Pakistan Federal Bureau of Statistics. Data on the real effective exchange rate and nominal exchange rate is from the IMF's International Financial Statistics database.

Data for the skill index (SK) was collected from the annual "Statement showing the number of workers proceeded abroad for employment registered by Bureau of Emigration and Overseas Employment, broad categories of workers",[15] which classifies immigrant workers as highly skilled, skilled, semi-skilled, and unskilled.[16]

The migration data that we have used covers all migration to the Middle East, but for destinations other than the Middle East, only labour migration is covered. There is therefore some under-coverage of migrants who are eventually employed in the host country although they did not initially migrate to find employment. Nevertheless, given that the bulk of migration is for employment purposes, this under-coverage of migration to non-Middle East destinations is ameliorated as the skill set of people who migrate could be considered broadly the same for the same destination. It should also be noted that there may be some underreporting in our data of highly skilled workers, who do not necessarily emigrate through the Bureau of Emigration [Gilani (2011)].

The skill index is a weighted index of the share of different skill workers. The weights assigned are relatively skewed towards higher skills to reflect the relative difference in income earning capacity. The ratio of highest to lowest skills is around 1.75 (7/4), which can be considered in line with relative income differentials. The index is constructed as follows:

$$SK = (1/25)*(7*HS+6*HQ+5*S+4*SS+3*U)/(HS+HQ+S+SS+U), \text{ where}$$

HS = highly skilled
HQ = highly qualified
S = skilled
SS = semi-skilled
U = unskilled

The per capita remittance (r_1) is calculated as follows: r_1 = remittance / estimated immigrant stock (IS)

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[15]*Source*: Bureau of Emigration and Overseas Employment. Ministry of Labour, Employment and Overseas Pakistanis.

[16]The Bureau of Emigration classifies workers into five categories depending on their occupation: highly qualified (engineers, doctors, accountants, computer programmers, pharmacists), highly skilled (nurses, teachers, managers, stenographers, designers, craftsman), skilled (welders, storekeepers, clerk/typists, foremen, carpenters, cooks, plumbers, electricians, steel-fixers, painters, technicians, mechanics, cable jointers, drivers, operators, tailors, surveyors, fitters, goldsmiths, salesmen, photographers, artists, masons), semi-skilled (blacksmiths, waiters, riggers), and unskilled (labourers, agriculturists).

The immigrant stock series (IS) is estimated using the following transition equation:

$IS(t) = IS(t-1) + EMI(t)$, where

EMI(t) is migration out of Pakistan. The immigrant stock IS in 2004 is based on estimates from the Pakistani authorities [Pakistan (2006)] and the immigrant stock for other years is estimated using flow data from the Pakistan Bureau of Overseas Employment. Per capita remittance is then calculated by scaling the total remittances with the estimated immigrant stock.
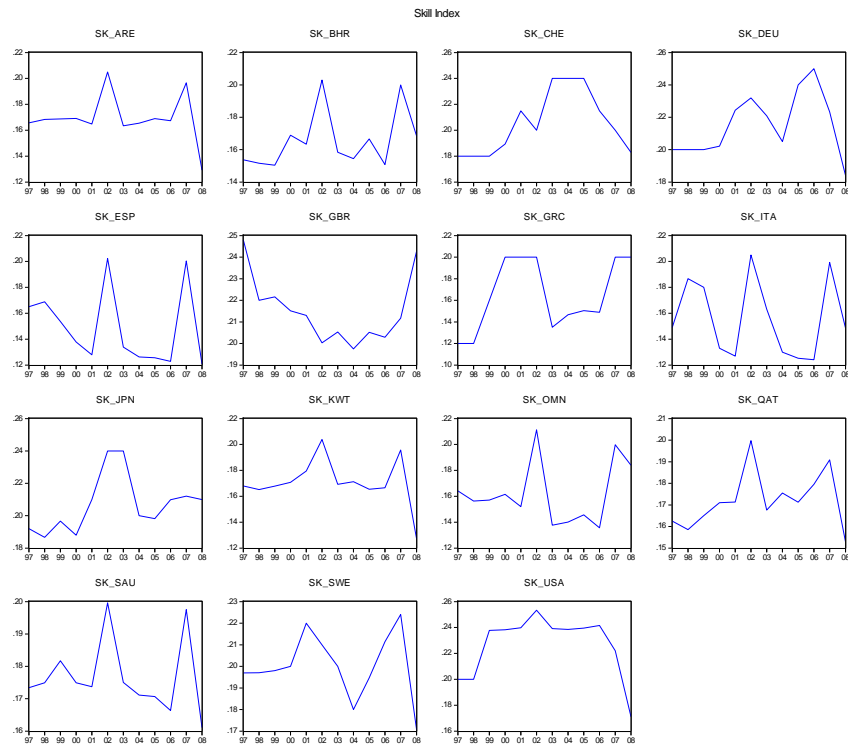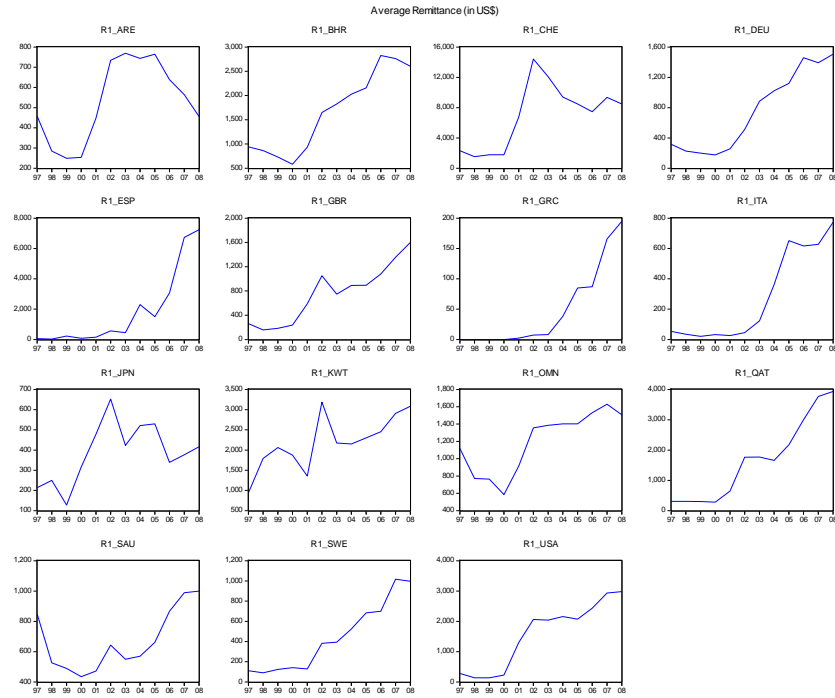
Investor return (r) series are estimated using the weighted average of key deposits rates (80 percent weight) and changes in the main index of the stock market (20 percent weight) for the countries in the sample.
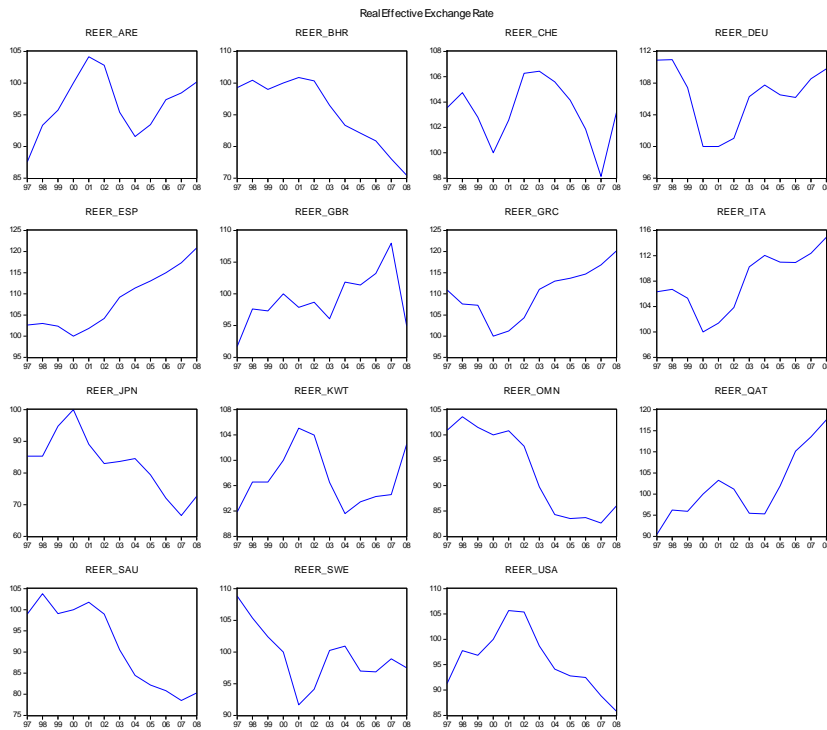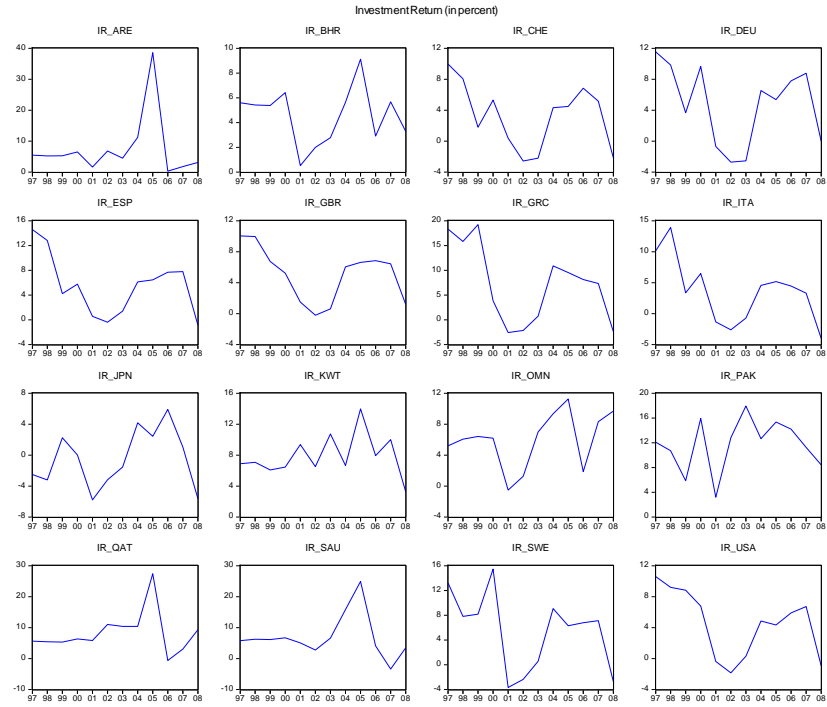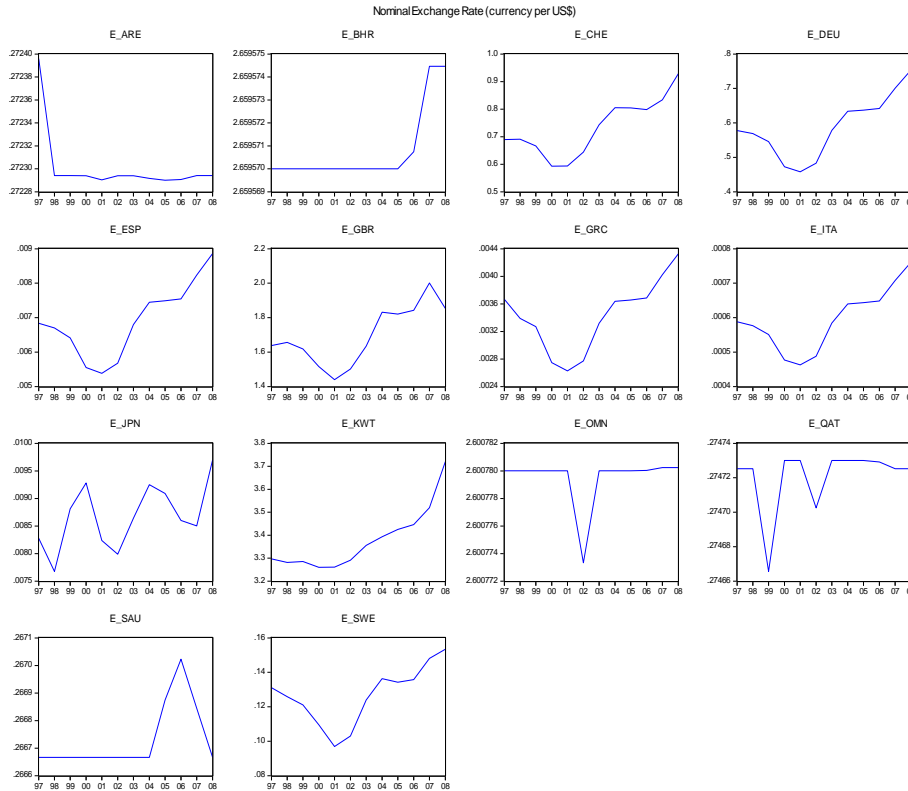
APPENDIX II

OVERVIEW OF REGRESSION VARIABLES

In the following charts, the abbreviations used for country names are:

ARE	UAE
BHR	Bahrain
CHE	Switzerland
DEU	Germany
ESP	Spain
GBR	UK
GRC	Greece
ITA	Italy
JPN	Japan
KWT	Kuwait
OMN	Oman
PAK	Pakistan
QAT	Qatar
SAU	Saudi Arabia
SWE	Sweden

Average Remittance (in US$)

Skill Index

Kock and Sun

Investment Return (in percent)

Real Effective Exchange Rate

Nominal Exchange Rate (currency per US$)

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