



**PAKISTAN**  
Strategy Support Program



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# The Pakistan Remittance Initiative and Remittance Flows to Pakistan

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# THE PAKISTAN STRATEGY SUPPORT PROGRAM (PSSP) WORKING PAPERS

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## **ABSTRACT**

This study investigates the impact of the Pakistan Remittance Initiative (PRI) on remittance flows to Pakistan. In 2009, the Government of Pakistan launched the PRI aimed at facilitating the flow of remittances sent home by non-resident Pakistanis. The PRI is comprised of multiple incentive schemes that are aimed at making remittance transfer faster, cheaper, and more convenient, and at increasing the attractiveness of formal channels of transfer relative to informal channels. I find that the PRI is associated with a significant increase in the formal remittances sent to Pakistan as well as a strong shift in the channels used for remittance transfer. Estimates suggest that while the PRI led to a significant reallocation of remittances away from the informal channel to the formal channel, it is not clear that it has increased the total amount of remittances received.

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## INTRODUCTION

In 2009, the State Bank of Pakistan (SBP), Ministry of Overseas Pakistanis, and Ministry of Finance launched the Pakistan Remittance Initiative (PRI) aimed at facilitating the flow of remittances sent home by non-resident Pakistanis. A short term goal of the PRI was to enable faster, cheaper, and more convenient flow of remittances back to Pakistan, whereas a long term aim is to create investment opportunities in Pakistan for overseas Pakistanis<sup>1</sup>. The PRI includes a set of policy measures designed to make the transfer of remittances through formal channels more attractive for remitters, financial entities, as well as beneficiaries. This study evaluates the effect of the PRI on remittance flows to Pakistan and the channel through which remittances are transferred.

Facilitating the flow of remittances is an important policy goal because remittances are the most important source of foreign exchange earnings in Pakistan. Remittances improve the balance of payments position and help reduce the dependence on external borrowing. At around 5.5 percent of GDP, these flows also increase aggregate demand in the economy. Remittances can enable growth in entrepreneurship and small businesses if it helps fill gaps in local sources of financing<sup>2</sup>. The importance of remittances for the economy has increased, as FDI to Pakistan has witnessed a dramatic decline in recent years while remittance flows have been increasing rapidly<sup>3</sup>. Notably, remittances provide a relatively reliable source of funds because they are less susceptible to economic and political conditions within Pakistan. In addition to these benefits of remittances for the overall economy of Pakistan, remittances also enhance welfare in the remittance-recipient households which are dependent on this stream of income. Remittances can help households purchase basic goods and necessities, smooth consumption, pay for education and health expenses, and fund investments and businesses<sup>4</sup>.

Encouraging the use of formal channels of transfer is important as it allows governments to monitor remittance transfers. This helps impede the flow of money that may be laundered or used to fund terrorist activities. It also provides the government information for policy planning purposes. Formal remittances may have favorable macroeconomic effects such as when banks lend against remittance deposits or sell bonds based on anticipated transfers (Martin 2006). Formal remittances may also help expand the access of the poor to the financial system if banks and credit unions that deliver remittances can attract new customers and convince them to open accounts, save and invest<sup>5</sup>.

Raw data from the SBP indicates that there has been a dramatic increase in the flow of remittances to Pakistan in the last few years. Remittances to Pakistan grew by 25.8 percent in 2011 over the previous year, making Pakistan the fifth largest remittance-recipient developing country<sup>6</sup>. Remittance flows to other South Asian countries grew by only 10.1 percent over this period. The PRI has also been recognized globally, with the International Association of Money Transfer Networks (IAMTN) awarding PRI the Money Transfer Award 2011 for the category of “Asia Pacific including South Asia”.

This recent growth in remittances to Pakistan indicates the potential role of PRI in mobilizing these remittances. This study uses data from the SBP and household survey data from the Pakistan Bureau of Statistics (PBS) to evaluate the impact of the multiple incentive schemes that comprise the PRI on remittance flows to Pakistan. It also investigates the overall effect of the PRI on remittances sent to Pakistan, the extensive margin of households receiving any remittances, and the channel of remittance transfer used. The study also assesses whether the PRI led to a net increase in the total remittances sent or has reallocated remittances that used to be sent from the informal channels to the formal channel.

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<sup>1</sup> Chapter 4 “Exchange Rate and Reserve Management” of the State Bank of Pakistan Annual Report, 2009-10, page 63.

<sup>2</sup> Access to finance is an important constraint on business creation and operations in Pakistan; only 8.6% of Pakistani firms had bank loans/lines of credit compared to 32.1% of firms in South Asia in 2007 (Enterprise Survey Report, Pakistan Country Profile 2007, World Bank, IFC).

<sup>3</sup> FDI declined by 28.7 percent during July-April 2010-11 and by 48.3% over the period of July-April 2011-12 (Economic Surveys of Pakistan, 2010-11 and 2011-12, Chapters 8).

<sup>4</sup> See, for example, Yang and Choi (2007), Yang (2008a) for its role as insurance, Cox-Edwards and Ureta (2003) for its effect on child schooling, Adams (2005) on education, health and housing, and Woodruff and Zenteno (2007), Yang and Martinez (2005), and Yang (2008b) on entrepreneurship and small business investment.

<sup>5</sup> Chapter 4 “Remittances” of the September 2011 UNDP Report “Towards Human Resilience: Sustaining MDG Progress in an Age of Economic Uncertainty”

<sup>6</sup> Chapter 8 “Trade and Payments”, Economic Survey of Pakistan, 2011-12, page 113.

The study finds that there is a positive and statistically significant increase in formal remittances associated with the passing of the PRI. After allowing for a flexible trend in formal remittance flows and adjusting for several, time-varying remittance determinants, the PRI is associated with an increase of monthly formal remittance flows around PKR 7.044 billion. This represents a 13% increase relative to the mean formal remittance amounts received prior to the PRI. This evidence suggests that the PRI met its goal of successfully increasing formal remittances. However, using the household survey data, there is no evidence to suggest that the PRI has increased the average amount of remittances received by Pakistani households. Instead, results show that the PRI is significantly associated with a meaningful reallocation of remittance transfer from *Hundi* and other informal channels into the formal, banking channel<sup>7</sup>. These estimates are consistent with the possibility that most of the increase in formal remittance flows has been a result of a shift of remittances being sent from informal to formal channels. The study concludes that while the PRI has significantly shifted the channel of remittance transfer used, it has not necessarily led to an increase in the total amount of remittances sent to Pakistan.

The rest of the paper is organized as follows. The following section describes the PRI program while the third section discusses theoretical mechanisms and past literature to motivate the research hypotheses. The fourth describes the data sources and summary statistics, while the fifth section presents the empirical strategy and results. The final section concludes and discusses implications.

## INSTITUTIONAL BACKGROUND

On August 22, 2009, the Federal Government and the SBP launched the PRI to reform the country's remittance structure to promote the flow of remittances sent home by non-resident Pakistanis<sup>8</sup>. The program was launched following a detailed assessment of the remittance system which highlighted the need for an ownership structure and a comprehensive strategy to facilitate remittances sent to Pakistan. A number of complementary incentives were put in place to facilitate faster, cheaper, and a more convenient flow of remittances. These were designed to make the transfer of remittances through formal channels more attractive for remitters, financial entities, as well as beneficiaries. Formal channels of remittance transfer include banks, money transfer organizations (MTOs) such as Western Union and MoneyGram, and post offices, while informal channels include *Hundi* or *Hawala* as well as sending money through friends or personal contacts. Ninety-one percent of the formal remittances are sent through banks, 8% through MTOs, and the remainder through post offices.

Based on meetings with SBP officials and SBP reports, the PRI is comprised of the following measures<sup>9</sup>:

- i. Enhanced outreach and networks: the PRI has significantly expanded the network of locations from where remittances can be sent as well as received by approving new authorized dealer (AD) locations in Pakistan and building arrangements across banks and financial entities<sup>10</sup>. The SBP has approved the establishment of as many as 10,000 new AD locations where beneficiaries can receive and collect remittances from. While there are strict regulations that limit the opening of new bank branches, the SBP has allowed banks to open new home remittance payment centers (HRPCs) where they can provide remittance services.

The existing network has also been enhanced as a result of the PRI encouraging Pakistani banks to establish arrangements with each other and financial entities overseas. The arrangements with financial entities overseas allow remittances to be delivered locally to beneficiaries using the vast network of Pakistani banks. As of July 2013, when the author met with PRI officials, the total number of such ar-

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<sup>7</sup> *Hundi* or *Hawala* is an alternative remittance system which operates parallel to the formal banking and financial channels, and in which money transfers take place based on communications between members of a network of hawala dealers. Often referred to as "underground banking", *Hundi* plays a role in money laundering although it is also used widely to conduct legitimate remittances around the world (Jost, 2003).

<sup>8</sup> SBP press release, August 22, 2009 "Federal Government, State Bank launch historic Pakistan Remittance Initiative" <http://www.sbp.org.pk/press/2009/PRI-22-Aug-09.pdf>.

<sup>9</sup> I thank Mr. Tanveer Akhtar, Mr. Mansoor Ali, Dr. Azizullah Khattak, Dr. Hamza Malik, Mr. Arshad Sattar, and Mr. Moinuddin at the SBP for helpful discussions about the PRI. Some of the information presented was obtained from Chapter 4 on "Exchange Rate and Reserve Management" of the Annual Reports of the Annual Performance Reviews 2010-11 and 2011-12.

<sup>10</sup> AD refers to those authorized dealers or entities authorized to deal in foreign exchange. An increase in AD locations means an increase in outlets where remittances can be received.

rangements had reached 400, up from around 100 that existed when the PRI was launched. Arrangements were also made to facilitate the transfer of remittances across banks within Pakistan to further widen the network of outlets where remittances sent through any bank could be received.

- ii. Transaction reimbursement scheme: the PRI includes a transaction reimbursement scheme wherein the SBP reimburses banks in Pakistan the equivalent of 25 Saudi riyals (SAR) in Pakistani rupees per remittance transaction provided that the remitter and beneficiary are not charged any remittance fee. In the third quarter of 2009, when the PRI was launched, the average fee charged to remit USD 200 from Saudi Arabia to Pakistan was \$1.79 which was equivalent to SAR 20.43<sup>11</sup>.
- iii. Marketing incentive scheme for overseas entities: A performance-based scheme was developed to encourage overseas entities to enhance their marketing efforts at the remittance-originating end<sup>12</sup>. According to this scheme announced on October 19, 2009, overseas entities were reimbursed marketing expenses at the end of the year based on the remittances that they mobilized. This scheme was operational for about one year and has been discontinued.
- iv. Improvements in payment system infrastructure and access: In early 2010, banks were shifted to PRISM (RTGS) for settling inter-bank remittance transactions which has enabled banks to transfer remittances into the recipient's accounts in 24 hours. Prior to this, delivery could take up to a week. In 2012, the SBP built an application to transfer remittances to the Inter Bank Fund Transfer system (IBFT), as a result of which banks credit the amounts immediately and settle across each other at the end of the day. With a maximum time limit of 30 minutes for a transaction, IBFT allows for real time transfer of remittances.

The PRI also facilitated banks to introduce cash over the counter (COC) payments of remittances in 2009. This enables beneficiaries to receive their remittance payments over the counter even when they do not have bank accounts. Banks are also encouraged to implement a SMS notification system whereby the remitter and beneficiary receive alerts after the remittance is credited to the beneficiary's account or in the system for cash payment at the counter. The PRI is also encouraging the installation of ATMs and promoting the use of e-banking and m-banking.

- v. Home remittance cells: In addition to reimbursing banks for remittance transactions, the PRI convinced banks that remittances are a separate viable business stream even when banks do not charge remittance fees. They encouraged banks to set up internal departments, called home remittance cells, that oversee remittance transactions and develop complementary banking services for beneficiaries. An example of a new financial product that banks have started offering includes remittance-funded debit cards which can be used at ATMs and are tax-free<sup>13</sup>. According to a PRI official, one of the five large banks of Pakistan reportedly generates 17,000 new bank accounts in a quarter as a result of beneficiaries coming into collect their remittances.
- vi. Non-resident Pakistani accounts: The PRI also pushed for banks to open accounts with non-resident Pakistanis when they come in to send money to Pakistan. Started in 2011, these non-resident Pakistani (NRP) accounts can be used to invest in Pakistan Investment Bonds (PIBs), treasury bills, or other national savings schemes and therefore tie in with a long term aim of the PRI to create investment opportunities in Pakistan for overseas Pakistanis. Examples include Motherland accounts by Habib Bank Limited (HBL) and *Hubbul watani* accounts at JS bank.
- vii. Complaints handling and feedback mechanism: A 24/7 call center was established in 2009 to handle inquiries and complaints related to remittance services from overseas Pakistanis and their families.

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<sup>11</sup> Remittance fee data obtained from the *Remittance Prices Worldwide* database of the World Bank, maintained at <https://remittance-prices.worldbank.org/en> and accessed on June 12, 2014.

<sup>12</sup> <http://www.sbp.org.pk/epd/2009/FEC6.htm>, "Facilitation of Home Remittances" October 19, 2009. FE Circular No. 06.

<sup>13</sup> United Bank Limited (UBL) launched the Pardes card in 2011. More recently, Bank Al Falah and Muslim Commercial Bank (MCB) have launched similar debit cards.

- viii. Monetary penalty on delay in remittance: In order to protect beneficiaries from unwarranted delays in receipt of remittance funds, the PRI has established a penalty amount on the involved bank to be paid to the beneficiary. The penalty is tied to the number of days the remittance is delayed. This scheme is not operational yet and will be introduced later.

## THEORETICAL MECHANISMS AND PAST LITERATURE

This section discusses the theoretical mechanisms through which PRI measures might affect remittances and provides an overview of findings from related studies. These are used to develop the research hypotheses tested for later in this study.

According to the World Bank's *Remittance Prices Worldwide* project, remittance fees usually entail up to three different costs: an exchange rate margin which is a cost resulting from the fact that the firm applies a rate that is different from the interbank one, a fee charged of the sender which typically varies with the amount being sent, and a fee charged of the receiver picking up the remittance. Under the transaction reimbursement scheme of the PRI, the SBP reimburses banks per remittance transaction made provided that the remitter and beneficiary are not charged any remittance fee. This has incentivized several banks to eliminate the remittance transaction fee charged and thereby adopt what the SBP calls the "free-send model". This is expected to lower the monetary cost of sending remittances to Pakistan through the formal, bank channel.

In the third quarter of 2009 when the PRI was launched, the average fee charged to remit USD 200 from the UAE was \$3.72 and \$16.20 from the U.S.<sup>14</sup>. These fees are not trivial compared to the median remittance transaction amount of \$200<sup>15</sup>. The elimination of remittance transaction fees charged by banks can, therefore, lead to a significant substitution of remittance flows from informal to formal channels. By decreasing the transaction costs associated with sending remittances, the PRI can also free up resources that can potentially be sent back as additional remittances. In case a fee was previously being charged to the beneficiary, the elimination of the fee leaves the beneficiary with a larger net remittance amount as well.

In line with these theoretical expectations, several past studies have found that remittances respond significantly to variation in remittance transfer fees. Hanson (2010) finds that formal remittances are negatively correlated with service charges such that a 10% increase in service fees is associated with a 1.5% reduction in transfers. Gibson, McKenzie, and Rohorua (2008) use survey hypotheticals to conclude that remittances respond significantly to fee reductions while Freund and Spatafroa (2008) employ cross-country regressions to show that fees are negatively correlated with remittance flows at the country level. Aycinena, Martinez, and Yang (2010) use randomly assigned discounts on remittance fees for El Salvadorean migrants to Washington D.C. to show that fee reductions of \$1 increase remittance flows by \$25 per month. They find that the fee reduction leads to an increase in frequency of remittance-sending. The authors find no evidence to suggest that this increase in remittances sent was just shifting from alternative channels, or that this was due to intertemporal substitution of funds that would have been sent later.

Since one of the main components of PRI is the elimination of the remittance transfer fee, this paper is closely related to these studies investigating the effect of fee reductions on remittance flows. Unlike the Hanson, and Freund and Spatafroa papers, this study utilizes time-variation that results from a sharp policy change rather than cross-sectional variation in fees charged. Compared to the Aycinena, Martinez, and Yang experiment, this study is able to investigate the longer term effect of an actual policy change that affects the fee charged.

There is an additional channel through which a reduction in remittance fees can increase remittances based on a behavioral model of procrastination that assumes that migrants are present-biased and over optimistic about their ability to accumulate funds prior to remitting (Aycinena, Martinez, and Yang, 2010). If migrants plan to send remittances at a certain frequency after accumulating a certain amount but end up spending the funds before sending them, they will remit lower amounts than intended. Lowering the remittance fees, which are usually a fixed cost, can increase the frequency of sending remittances. The PRI also significantly expanded the network of locations from where remittances can be sent which can potentially increase the frequency of sending remittances as well. Both of

<sup>14</sup> Remittance fee data covering the exchange rate margin and fee estimates obtained from the *Remittance Prices Worldwide* database of the World Bank, maintained at <https://remittanceprices.worldbank.org/en> and accessed on June 12, 2014.

<sup>15</sup> Based on conversations with SBP officials. There is no way to independently verify this in the survey data since that only includes information on total remittances received in the past year and does not collect information on the number and size of individual or typical transfers.

these effects of the PRI should reduce the chance for spending the funds out of temptation before the next remittance transfer and can thereby increase the total amount remitted.

The other PRI measures described above make remittance transfers faster and more convenient through a reduction in delivery time, cash-over-the-counter collection, and increase in authorized dealer locations, for example. These measures should reduce the non-monetary cost of sending formal remittances to Pakistan. This should encourage a shift towards using formal channels instead of informal channels for remittance transfers.

Related papers that study the recent remittance growth in Pakistan include Amjad et. al's 2012 and 2013 working papers. These studies document the large increase in formal remittance flows to Pakistan over the past decade – from \$1 billion in FY 2001 to \$12 billion in FY 2011 – and discuss potential factors behind it. The authors discuss that a shift of remittances from informal channels to formal channels has likely contributed towards the increase in formal remittances flowing to Pakistan. They show that there has been an increase in the number of migrants abroad and a rise in their skill levels which can partly, but not fully, explain the increase in remittances. The authors also discuss the possibility that the recent rise in formal flows is due to illegally obtained gains being increasingly transferred back to Pakistan as remittances. Since the source of formal remittances is not questioned by the Government of Pakistan, formal remittances represent an easy opportunity for people to thus “whiten” their “black money”. While there is no data to quantify this effect, the authors conclude that it is not likely to be the dominant mechanism.

The 2013 study also uses the Pakistan Panel Household Survey to investigate the determinants of choice of remittance transfer channel used. It finds that while younger migrants and urban households are more likely to use banking channels over informal ones, the migrants who use formal versus informal channels are not systematically different in terms of socioeconomic characteristics overall. This study utilizes the repeated cross sections of household survey data from the PBS to document the changing trends in the use of these channels and to isolate the effect attributable to the PRI. While these two past studies investigate the general rise in formal remittances in recent years, they do not attempt to quantify the impact of the PRI, as done here. This study also goes beyond evaluating the effect of the PRI on formal remittance flows by investigating the effect of the PRI on the channel of remittance transfer used and the average remittance amounts received by households.

In summary, the PRI is expected to lower both the monetary and non-monetary costs of sending formal remittances to Pakistan. As such, it should lead to a shift towards greater use of formal channels instead of informal channels for remittance transfers. As discussed above, the PRI could also potentially increase the total amount remitted by allowing some of the fee reduction to be passed on as remittances. The PRI could also increase remittances sent back if the policies implemented increase the frequency with which the remitter transfers money thereby reducing the likelihood that the remitter spends the funds before sending them. The two main hypotheses that emerge are whether the PRI is associated with a shift from informal channels to formal channels for remittance transfers and whether the PRI increased the formal and total remittances flowing to Pakistan.

## DATA

This study analyzes the impact of the PRI on remittances using two sources of data: official remittance data from the Statistics Department of the SBP, and remittance information from the Household Integrated Economic Survey (HIES) conducted with the Pakistan Social and Living Standards Measurement Survey (PSLM) by the PBS. The SBP remittance data includes monthly remittance amounts sent to Pakistan by each remittance-sending country or region. The SBP data only includes remittances sent through formal channels which includes banks, money transfer organizations, and post offices. Figure 1 uses the SBP data to document the substantial increase in formal remittances sent to Pakistan between fiscal years 2000 and 2012. Nominal remittances sent through formal channels used to be around 1 USD billion in FY 2000 and have grown to 13 USD billion in FY 2012.

**Figure 1: Formal Remittance Flows to Pakistan During Fiscal Years 2000-2012 – SBP Data**

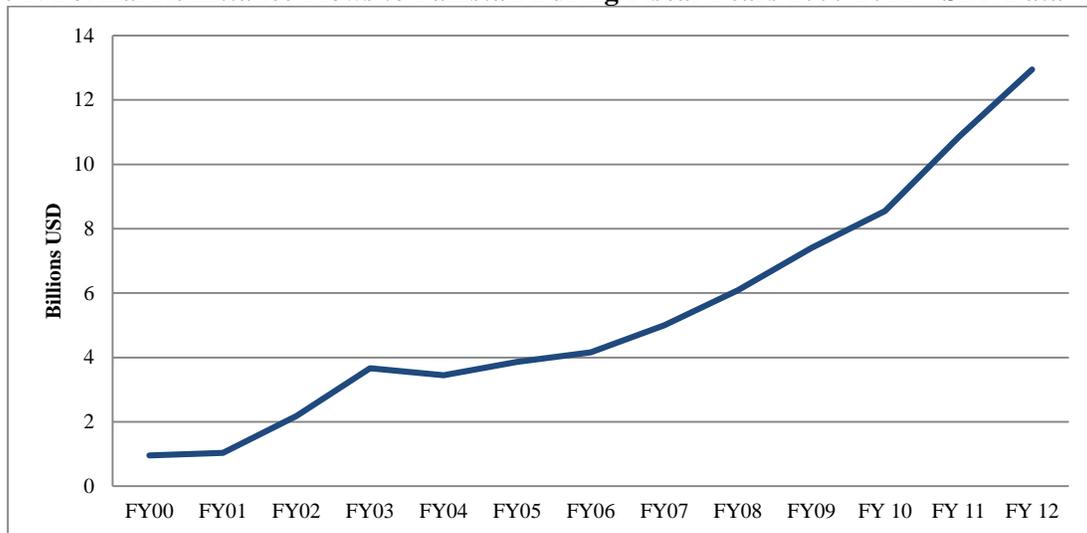


Table 1 shows the breakdown of the source country/region for these formal remittances sent to Pakistan for the fiscal year 2011. Saudi Arabia is the largest remittance-sending country which accounts for almost a quarter of all formal remittances followed by the U.A.E, the U.S., and the U.K. These top four sending countries account for 72% of the formal remittances received. Other notable remittance-sending countries include other Gulf countries (Bahrain, Oman, Kuwait, and Qatar), Canada and European countries.

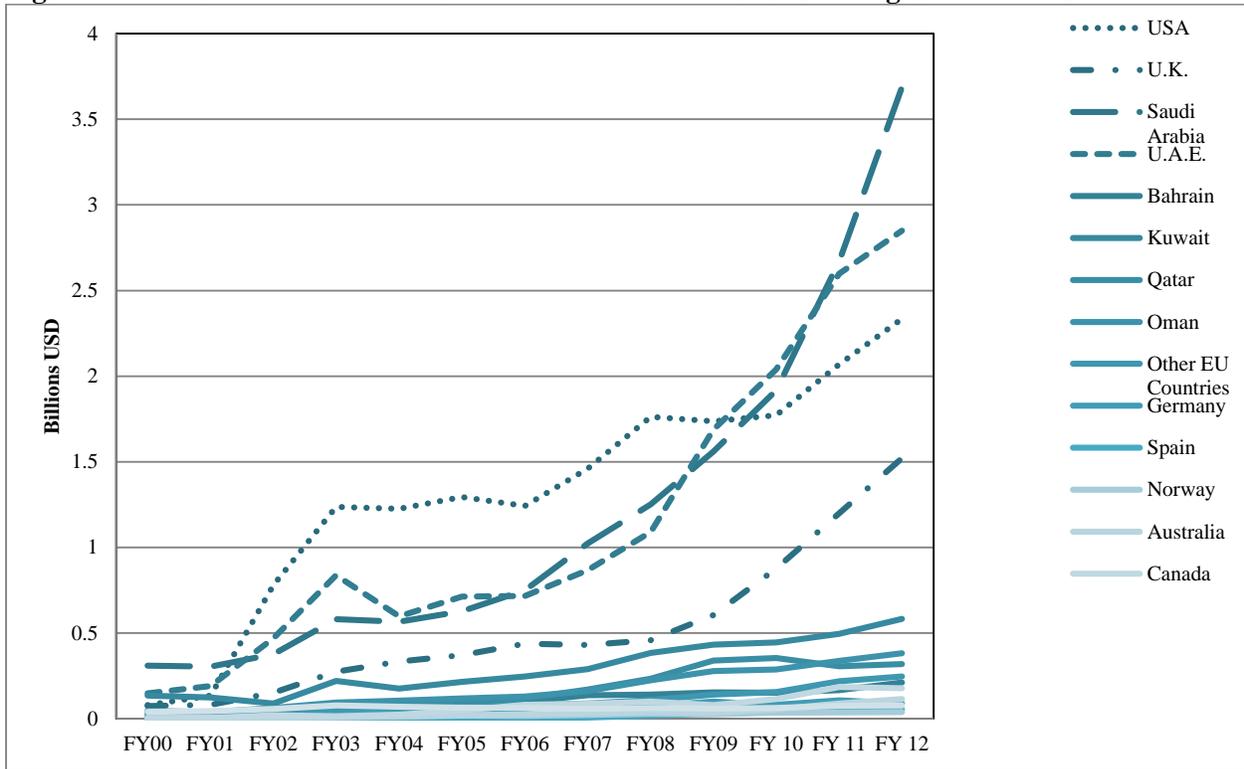
**Table 1: Formal Remittances Received from Different Countries/Regions (USD Millions)**

	Total	Percent
Saudi Arabia	2,670	22.52%
U.A.E.	2,598	21.91%
USA	2,069	17.45%
Other countries	1,315	11.09%
U.K.	1,200	10.12%
Kuwait	495	4.18%
Oman	338	2.85%
Qatar	306	2.58%
Other European countries	226	1.91%
Canada	184	1.56%
Bahrain	167	1.41%
Germany	106	0.90%
Australia	89	0.75%
Spain	53	0.45%
Norway	36	0.31%

Source: Author's calculations from the SBP data on formal remittances received in fiscal year 2011.

Figure 2 shows the pattern of formal remittance flows between fiscal years 2000 and 2012 separately by source country/region. The largest growth in remittance flows has also occurred in the countries that send most of the remittances i.e. Saudi Arabia, the U.A.E., the U.S., and the U.K. followed by the other Gulf countries and other European countries.

**Figure 2: Formal Remittance Flows from Different Remittance-Sending Countries – SBP Data**



While this data can be used to analyze the effect of the PRI on formal remittances, this analysis is supplemented by using household survey data from the HIES/PSLM survey rounds of 2005-2006, 2007-2008, and 2010-2011. The HIES/PSLM surveys collect detailed data on employment, income, consumption, and social indicators for rural and urban households from all four provinces of Pakistan. It contains information on the total amount of foreign remittances received in the past year, the country the remittances came from, as well as the channel used to transfer the remittances. Respondents can choose between three methods of remittance transfer including *bank*, *Hundi*, and *other channel*. Since the PRI was passed in August 2009, the survey rounds of 2005-2006 and 2007-2008 provide information from years prior to the PRI, while the 2010-2011 survey provides information from the period after the PRI. The HIES/PSLM data is used to analyze the effect of PRI on remittance amounts received by Pakistani households, the extensive margin of whether households receive any remittances, and the remittance transfer channel used. Later, this is used to assess whether and how much the PRI re-allocated remittances away from informal channels to formal channels.

Table 2 shows summary statistics on remittances received by Pakistani households across the 2005-2006, 2007-2008, and 2010-2011 rounds of the HIES/PSLM. Five percent of households report receiving any remittances from outside the country in the past year, and conditional on receiving any remittances, the mean inflation-adjusted amount received is Rs. 216,000 approximately<sup>16</sup>. The inflation-adjusted measures are expressed in 2011 Pakistani rupees.

<sup>16</sup> During 2011, one USD was approximately 87 Pakistani rupees.

**Table 2: Summary Statistics of Remittance Receipt in HIES/PSLM**

All rounds	Mean	Std Dev	N
Remittance amount	7,500	40,860	47,252
Inflation-adjusted remittance amount	11,210	62,306	47,266
Remittance amount   receiving remittances	144,540	111,230	2,528
Inflation-adjusted remittance amount   receiving remittances	216,088	174,841	2,528
Indicator received remittances	0.05	0.23	47,279

Notes: Author's calculations from the HIES/PSLM panel data including the 2005-2006, 2007-2008 and 2010-2011 rounds. This table shows mean amounts of foreign remittances received, proportion of households receiving any remittances and mean amounts of remittances received conditional on receiving any. The inflation-adjusted measures are amounts that have been converted to 2011 Pakistani rupees to make them comparable across different rounds. All summary statistics are estimated using sample weights and all rounds.

Trends in remittance receipt across the different survey rounds are documented in Table 3. The proportion of households reporting that they receive foreign remittances fluctuates slightly across the rounds but stays around 5 percent. Mean inflation-adjusted remittances were roughly Rs. 230,000, Rs. 250,000, and Rs. 175,000 in the 2005-2006, the 2007-2008, and 2010-2011 rounds, respectively. The raw data suggest that there has been a decrease in the mean, inflation-adjusted remittance amount received in the last round.

**Table 3: Summary Statistics of Remittance Receipt by Survey Round**

2005-2006 round	Mean	Std Dev	N
Remittance amount	5,960	33,357	15,449
Inflation-adjusted remittance amount	12,063	67,518	15,452
Remittance amount   receiving remittances	113,307	94,863	849
Inflation-adjusted remittance amount   receiving remittances	229,366	192,029	849
Indicator received remittances	0.06	0.228	15,452
<b>2007-2008 round</b>			
Remittance amount	7,012	40,216	15,475
Inflation-adjusted remittance amount	12,210	70,046	15,486
Remittance amount   receiving remittances	142,420	116,526	821
Inflation-adjusted remittance amount   receiving remittances	248,119	203,007	821
Indicator received remittances	0.05	0.219	15,486
<b>2010-2011 round</b>			
Remittance amount	9,430	47,336	16,328
Inflation-adjusted remittance amount	9,430	47,336	16,328
Remittance amount   receiving remittances	175,291	112,202	858
Inflation-adjusted remittance amount   receiving remittances	175,291	112,202	858
Indicator received remittances	0.06	0.227	16,341

Notes: Author's calculations from the HIES/PSLM panel data. This table shows mean amounts of foreign remittances received, proportion of households receiving any remittances and mean amounts of remittances received conditional on receiving any. The inflation-adjusted measures are amounts that have been converted to 2011 Pakistani rupees to make them comparable across different rounds. These statistics are shown separately by survey round. All summary statistics are estimated using sample weights.

Table 4 uses data from all of the survey rounds to show the summary statistics on remittance receipt separately by the transfer channel used. Half of all remittances are received through banking channels, a quarter through *Hundi*, and the rest through other channels. The average remittance amounts sent through each channel are roughly similar – the average inflation-adjusted amount received through a bank is Rs. 229,000 compared to Rs. 216,000 from *Hundi*.

While banks are clearly a formal channel, the “other channel” option can include remittances sent through the informal channels of friends and acquaintances and through *Hundi* (if respondents are not willing to admit to receiving money through *Hundi*). Remittances through “other channel” could potentially also include transfers through MTOs and post offices which are formal channels. However, it seems plausible that remittances received through MTOs do not make up a large fraction of remittances reported received through the “other channel”, because remittances through MTOs only make up 8% of the formal remittances received and because respondents likely consider MTOs as similar to banks because of the financial services they provide.

**Table 4: Summary Statistics of Remittance Receipt by Channel in HIES/PSLM**

All rounds	Mean	Std Dev	N
Indicator received remittances from bank	0.51	0.50	2,595
Indicator received remittances through <i>Hundi</i>	0.23	0.42	2,595
Indicator received remittances through other channels	0.28	0.45	2,595
Remittance amount   receiving remittances from bank	158,086	115,695	1,156
Remittance amount   receiving remittances from <i>Hundi</i>	139,011	103,241	790
Remittance amount   receiving remittances from other channels	133,750	113,323	658
Inflation-adjusted remittance amount   receiving remittances from bank	228,510	178,987	1,165
Inflation-adjusted remittance amount   receiving remittances from <i>Hundi</i>	216,016	170,158	794
Inflation-adjusted remittance amount   receiving remittances from other channels	208,681	186,635	663

Notes: Author's calculations from the HIES/PSLM panel data including the 2005-2006, 2007-2008 and 2010-2011 rounds. This table shows the fraction of households reporting receiving remittances through different types of channels and the mean remittance amounts received conditional on receiving remittances through each channel. The inflation-adjusted measures are amounts that have been converted to 2011 Pakistani rupees to make them comparable across different rounds. All summary statistics are estimated using sample weights and all rounds.

Table 5 presents the information on remittance receipt by channel separately for each round. This raw data shows an increase in the use of banks and a decrease in the use of *Hundi* and other channels to transfer remittances between 2007-2008 (the last pre-PRI round) and 2010-2011 (the post-PRI round). The share of households receiving remittances from *Hundi* falls from around 27% in the 2007-2008 rounds to 17% in 2010-2011. Between 2007-2008 and 2010-2011, the share of households receiving remittances from banks increases from 41% to 62%, while the share of households receiving remittances from other channels falls from 35% to 23%. Mirroring the trend observed for average remittance amounts in Table 3, we see that there is a decline in the average remittance amounts received by households from each channel between 2007-2008 and 2010-2011.

**Table 5: Summary Statistics of Remittance Receipt by Channel by Round**

2005-2006 round	Mean	Std Dev	N
Indicator received remittances from bank	0.50	0.50	882
Indicator received remittances through <i>Hundi</i>	0.24	0.42	882
Indicator received remittances through other channels	0.27	0.45	882
Remittance amount   receiving remittances from bank	122,828	96,645	374
Remittance amount   receiving remittances from <i>Hundi</i>	110,388	98,087	297
Remittance amount   receiving remittances from other channels	107,198	88,646	204
Inflation-adjusted remittance amount   receiving remittances from bank	246,929	196,046	376
Inflation-adjusted remittance amount   receiving remittances from <i>Hundi</i>	223,229	198,582	298
Inflation-adjusted remittance amount   receiving remittances from other channels	217,001	179,446	204
<b>2007-2008 round</b>			
Indicator received remittances from bank	0.41	0.49	842
Indicator received remittances through <i>Hundi</i>	0.27	0.45	842
Indicator received remittances through other channels	0.35	0.48	842
Remittance amount   receiving remittances from bank	162,952	124,347	297
Remittance amount   receiving remittances from <i>Hundi</i>	134,918	102,323	301
Remittance amount   receiving remittances from other channels	138,746	129,048	259
Inflation-adjusted remittance amount   receiving remittances from bank	280,125	217,627	304
Inflation-adjusted remittance amount   receiving remittances from <i>Hundi</i>	232,657	178,918	304
Inflation-adjusted remittance amount   receiving remittances from other channels	238,173	225,050	264
<b>2010-2011 round</b>			
Indicator received remittances from bank	0.62	0.49	871
Indicator received remittances through <i>Hundi</i>	0.17	0.38	871
Indicator received remittances through other channels	0.23	0.42	871
Remittance amount   receiving remittances from bank	182,422	117,215	485
Remittance amount   receiving remittances from <i>Hundi</i>	182,462	96,927	192
Remittance amount   receiving remittances from other channels	157,555	109,706	195
Inflation-adjusted remittance amount   receiving remittances from bank	182,422	117,215	485
Inflation-adjusted remittance amount   receiving remittances from <i>Hundi</i>	182,462	96,927	192
Inflation-adjusted remittance amount   receiving remittances from other channels	157,554	109,706	195

Notes: Author's calculations from the HIES/PSLM panel data. This table shows the fraction of households reporting receiving remittances through different types of channels and the mean remittance amounts received conditional on receiving remittances through each channel. The inflation-adjusted measures are amounts that have been converted to 2011 Pakistani rupees to make them comparable across different rounds. These statistics are shown separately by survey round. All summary statistics are estimated using sample weights.

## EMPIRICAL STRATEGY AND RESULTS

This section describes how this study uses remittance data from the SBP and the HIES/PSLM to test whether the PRI led to an increase in the remittances being sent to Pakistan and presents results. Since the PRI was passed in August 2009, a few months into FY 2010, FY 2010 is the potential break point in remittance receipt. Using SBP data from fiscal years 2004-2012, the estimation strategy will compare remittance receipt in the pre-treatment periods up

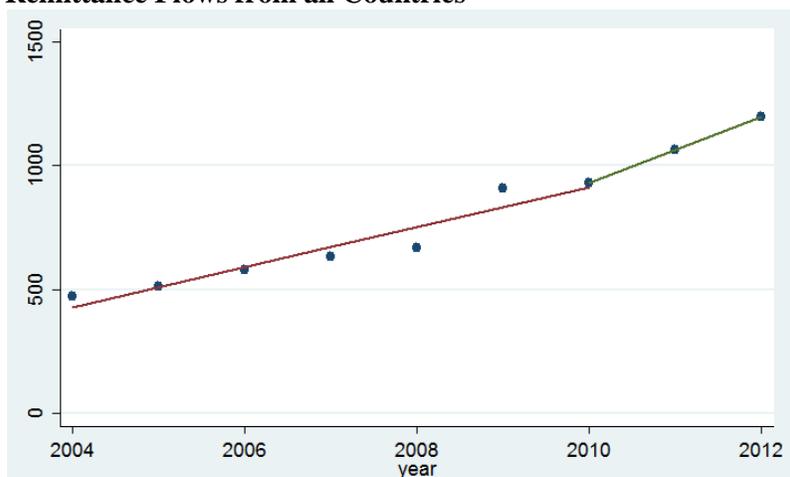
until FY 2010 to remittance receipt after FY 2010<sup>17</sup>. In the HIES/PSLM data, this study will analogously compare remittance behavior in the pre-PRI surveys of 2005-2006 and 2007-2008 to the post-PRI survey of 2010-2011.

While the PRI was passed in August 2009, it is a comprehensive program that entails several policies that are being developed on an ongoing basis. As such, evaluation of the program will mostly capture the effect of the subset of policies that were implemented earlier. Most of the PRI policies described above were put in effect soon after its announcement in 2009 including the transaction reimbursement scheme which eliminates the fee charged for remittance transfers, the marketing scheme, cash over the counter payment, and the call center. The RTGS system which enabled remittance transfer within a day was operational in early 2010. However, estimates here will likely not capture the effects of the launch of NRP accounts and remittance-funded debit cards in 2011, and the switch to IBFT which enabled transfers within 30 minutes occurred in 2012. Finally, it is important to note that the data and empirical strategy here will only provide estimates of short term effects of these PRI policies.

## Analysis using SBP data

To motivate the preferred identification strategy before describing the details regarding its implementation, it helps to visually demonstrate the trends in formal remittance receipt using the raw, unadjusted SBP data. Figure 3 shows total formal remittances received from all countries between fiscal years 2004 and 2012. The dots in the figure show the yearly formal remittance totals measured in 2011 inflation-adjusted Pakistani rupees (millions). The figure also overlays separate linear trends on two sections of the data, allowing for a potentially different trend after fiscal year 2010. Figure 3 shows that the two linear trends fit the data points reasonably well, and that formal remittances have been rising steadily throughout this period. While the slope of the linear trend after FY 2010 seems slightly steeper, there is no evidence for a clear, sizable break in the trend in formal remittance receipt post-PRI in this unadjusted data.

**Figure 3: Formal Remittance Flows from all Countries**

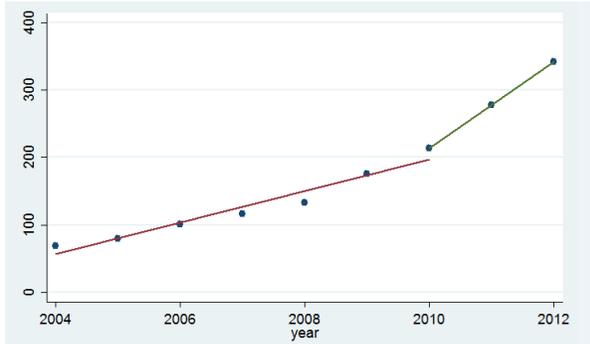


Notes: Author's calculations from SBP data. The data points are yearly totals of formal remittances sent to Pakistan between FY2004-FY2012. Remittance amounts are measured in inflation-adjusted 2011 Pakistani rupees (millions). Separate linear trends are overlaid on two sections of the data, one to the left of fiscal year 2010 and one to the right.

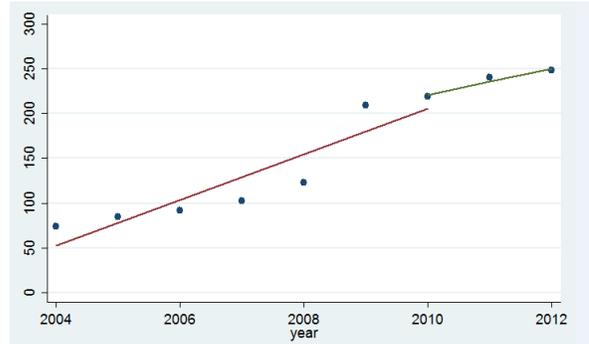
Also shown in figures 4-7 are analogous figures for trends in unadjusted, formal remittances from the main remittance-sending countries of Saudi Arabia, the U.A.E, the U.S., and the U.K. The linear trends fit the actual data points for Saudi Arabia well and demonstrate a clear steepening in remittance flows post-PRI, as does the data for the U.K. The figures for the U.S. shows a slightly increasing trend, while there is a slightly declining trend post-PRI for the U.A.E.

<sup>17</sup> Since the first round of usable HIES/PSLM data is the 2005-2006 survey, while the latest round comes from the 2010-2011 survey, this study uses SBP data for the fiscal years 2004-2012 in the analysis to ensure that the estimates are based on a similar time frame.

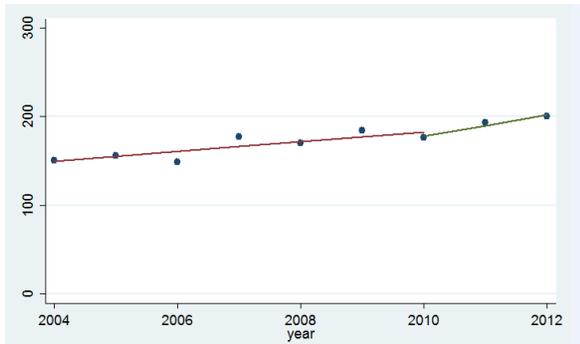
**Figure 4: Formal Remittance Flows from Saudi Arabia**



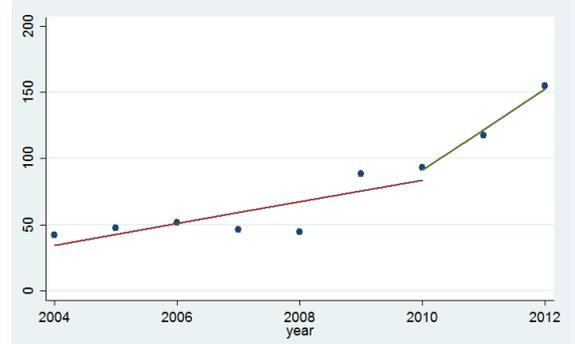
**Figure 6: Formal Remittance flows from U.A.E.**



**Figure 5: Formal Remittance Flows from the U.S.**



**Figure 7: Formal Remittance Flows from the U.K.**



Notes: Author's calculations from SBP data. The data points are yearly totals of formal remittances sent to Pakistan from the respective country, between FY2004-FY2012. Remittance amounts are measured in inflation-adjusted 2011 Pakistani rupees (millions). Separate linear trends are overlaid on two sections of the data, one to the left of fiscal year 2010 and one to the right.

While the visual depiction of the raw data suggests that there has been some steepening in the trend of formal remittances received post-PRI, this will be tested formally in a regression framework next. Given that there is data on monthly formal remittance flows for several years prior to the implementation of the PRI, it can be used to estimate the trends in remittance receipt in the absence of the PRI. The predicted remittance receipt in the treated period after FY 2010 will then be compared with actual remittance receipt in this period to infer the effect of PRI. If there is a statistically significant break in the trend of remittances flowing to Pakistan after FY 2010 relative to the projected trend, it can be assumed that the difference is likely attributable to the PRI. This study will bolster the plausibility of this required identification assumption by controlling for important, time-varying covariates described below.

The main challenge in estimating the effect of the PRI is that it is a nationwide policy that was implemented at the same time everywhere. As such, the estimated effects of the PRI can confound other economic phenomena that varied between the pre-PRI periods and post-PRI periods. One potential concern is that there was a severe global recession in the later years being analyzed, and this has greater overlap with the post-PRI period. The overlap is not perfect, however. For example, the recession in the U.S. started in late 2007 prior to the implementation of the PRI, while other countries were affected a little later. Since one might be concerned that worsening economic conditions are correlated with the post-PRI period, it is important to control for time-varying economic factors such as unemployment rates and exchange rates.

Table 6 shows the estimates of the effect of the PRI on formal remittances received using the SBP data. Unlike the linear trends imposed in figures 3-7, all of the regression specifications in Table 6 control for a more flexible, quadratic trend in remittances. The *Post-PRI* indicator variable is equal to 1 for fiscal years 2011 and on and equal to 0 otherwise. The coefficient on *Post-PRI* identifies the difference between formal remittances received in

the pre-PRI period and post-PRI periods after projecting a quadratic trend in remittances (based on the trend estimated from the pre-PRI period observations) and adjusting for any controls included in the regression. This estimated difference is attributable to the PRI conditional on the assumption that there are no omitted determinants of remittances to Pakistan that are correlated with the timing of the implementation of the PRI. Column 2 adds covariates for Eid dates, because remittances to Pakistan spike around the religious holidays, as well as indicators for calendar month to control for the seasonality of remittances. As discussed above, it is also important to control for the economic determinants of remittance transfers, so columns 3 and 4 sequentially add controls for the exchange rates and unemployment rates in the remittance-sending countries. While the coefficients on these covariates are not reported in the tables in the interest of space, the coefficients have the expected signs. For example, the coefficients on Eid indicators and the unemployment rate were positive and negative, respectively.<sup>18</sup>

**Table 6: PRI and Formal Remittance Flows**

	(1)	(2)	(3)	(4)
Post-PRI	5,819** (4,094)	1,782** (3,241)	3,711** (3,564)	7,045** (3,238)
Number of observations	106	106	106	106
Quadratic trend	Yes	Yes	Yes	Yes
Eid and month controls	No	Yes	Yes	Yes
Exchange rate controls	No	No	Yes	Yes
Unemployment controls	No	No	No	Yes

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: Author's calculations from SBP data. The dependent variable is total formal remittance flows to Pakistan. Remittances are measured in 2011 inflation-adjusted Pakistani rupees (millions). Remittances are measured at the monthly level and the regression sample includes data for fiscal years 2004-2012. The different columns show regression results after adjusting for various sets of controls. Eid controls include indicator variables for a sixty-day period around Eid-al-Fitr and Eid-al-Adha each. Month controls include indicator variables for each calendar month. Exchange rate controls include a quadratic term in the average, yearly exchange rate of the remittance-sending country. Unemployment controls include a quadratic term in the average, yearly unemployment rate of the remittance-sending country. Standard errors are robust.

Table 6 shows that, even after accounting for a quadratic trend in formal remittance flows, there is a positive and statistically significant increase in formal remittances associated with the passing of the PRI. The size of the estimated effect varies depending on the controls included, but all of the estimates are statistically and economically significant. Controlling for the unemployment rate in the remittance-sending countries in column 4 makes the estimated effect of the PRI larger relative to the effect in column 3. This is in line with what one would expect, since many remittance-sending countries were experiencing economic downturns in the post-PRI period which would lower the amount of remittances received from these countries and lead to downward bias in the estimated effect of the PRI<sup>19</sup>.

Taking the coefficient in the fourth column with the full list of controls as the preferred estimate, the PRI is significantly associated with an increase in monthly formal remittances of PKR 7.044 billion. Compared to the mean amount of monthly remittances received prior to the implementation of the PRI – PKR 55.1 billion – the PRI is associated with a 13% increase in formal remittance flows to Pakistan. This is an 11% increase relative to the mean monthly remittance received over the entire regression sample.

Table 7 uses the same empirical strategy and set of regression specifications to analyze the effect of the PRI on log formal remittance flows instead of remittances in levels. While these estimates are imprecise and generally

<sup>18</sup> A complete set of results is available from the author upon request.

<sup>19</sup> Economic downturns likely depress the remitter's earnings capacity which is an important determinant of the remittances he/she sends back home.

lack statistical significance compared to those in Table 6, they also suggest positive effects of the PRI on formal remittances sent to Pakistan. The preferred estimates in column 4 suggest that the passing of the PRI is associated with an 8% increase in formal remittances, and this estimate is statistically significant at the 10% level.

**Table 7: PRI and Log Formal Remittance Flows**

	(1)	(2)	(3)	(4)
Post-PRI	0.063 (0.055)	0.007 (0.042)	0.038 (0.048)	0.078* (0.045)
Number of observations	106	106	106	106
Quadratic trend	Yes	Yes	Yes	Yes
Eid and month controls	No	Yes	Yes	Yes
Exchange rate controls	No	No	Yes	Yes
Unemployment controls	No	No	No	Yes

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: Author's calculations from SBP data. The dependent variable is log total formal remittance flows to Pakistan. Remittances are measured in 2011 inflation-adjusted Pakistani rupees (millions). Remittances are measured at the monthly level and the regression sample includes data for fiscal years 2004-2012. The different columns show regression results after adjusting for various sets of controls. Eid controls include indicator variables for a sixty-day period around Eid-al-Fitr and Eid-al-Adha each. Month controls include indicator variables for each calendar month. Exchange rate controls include a quadratic term in the average, yearly exchange rate of the remittance-sending country. Unemployment controls include a quadratic term in the average, yearly unemployment rate of the remittance-sending country. Standard errors are robust.

Overall, the analysis using SBP data shows that there is a positive and statistically significant increase in formal remittances associated with the passing of PRI. The increase of monthly formal remittance flows around PKR 7.044 billion is both statistically and economically significant and exists after allowing for a flexible trend in formal remittance flows and adjusting for several, time-varying remittance determinants. This evidence suggests that the collection of policies introduced as part of the PRI met its goal of successfully increasing formal remittances.

## Analysis using HIES/PSLM data

As a complement to the analysis using SBP data, this study also investigated the relationship between the PRI and remittance flows using the HIES/PSLM household survey data. The HIES/PSLM data provides remittance data from the household survey rounds of 2005-2006, 2007-2008, and 2010-2011. While this provides fewer data points to estimate and project a trend in remittance flows relative to the SBP data, the HIES/PSLM data contains information on total remittances received by households and the transfer channel used. While the SBP evidence indicates that the PRI successfully increased formal remittances, there is no way to use that data to determine whether this also amounts to an increase in net remittances or reflects a reallocation of remittances that used to be sent through informal channels to formal channels. Using the HIES/PSLM data will allow an investigation into the effect of the PRI on remittance amounts received by households, the extensive margin of whether households receive remittances, and the channel of transfer used.

While the SBP and HIES/PSLM data can analyze different questions, it is important to note that the data sources measure remittances quite differently, and one would not necessarily expect similar estimates using these datasets. Since the SBP information on remittances comes from administrative data, it accurately captures all remittances received through formal channels. The self-reported remittance information in the HIES/PSLM, however, is most likely measured with error due to issues related to recall and respondents' willingness to share. As discussed below, there is evidence for significant seasonality of reported remittances based on survey month and Eid indicators in the HIES/PSLM data even though the survey asks for remittances received in the past year. This is suggestive of significant measurement error in the HIES/PSLM data. Furthermore, past studies, including Amjad et. al (2013), have pointed out that formal remittances to Pakistan likely include non-remittance amounts that have been sent as a way to "whiten black money" generated in Pakistan. Since the Government of Pakistan does not tax or question the source of formal remittances sent to Pakistan, illegally gotten gains could be transferred abroad and sent back to Pakistan as formal remittances to legalize them. While there is no way of knowing what fraction of formal remittances

are actually illegal earnings generated in Pakistan and transferred back. It seems reasonable to expect that formal remittance receipts in the SBP data will likely be larger than those obtained from household survey data due to this phenomenon<sup>20</sup>.

In order to evaluate the effect of the PRI on remittances in the HIES/PSLM data, this study exploits the repeated cross sections of the HIES/PSLM surveys and uses an identification strategy similar to that used for the SBP analysis. The 2005-06 and 2007-08 rounds of the data will serve as the pre-PRI or pre-treatment periods, and the 2010-2011 round will be the post-PRI or treated period. Similar to the SBP analysis, household remittance receipt in these pre-PRI rounds to the post-PRI round of 2010-11 will be compared to infer the effect of PRI. Tests will then be conducted to see whether there is an identifiable break in the trend of remittances flowing to Pakistani households after 2009 after accounting for a trend in remittance flows and conditioning on a set of remittance determinants.

Table 8 shows the results estimating the effect of the PRI on inflation-adjusted remittance amounts received by a household using the strategy just described. All specifications control for a linear yearly trend in remittances, and the *Post-PRI* variable is an indicator for the post-PRI round of 2010-2011<sup>21</sup>. Columns 2 and 3 sequentially add covariates for Eid dates and indicators for survey months, respectively<sup>22</sup>. The coefficient on *Post-PRI* identifies whether the passing of the PRI is associated with a significant break in remittances received by Pakistani households conditional on the covariates.

The estimates in Table 8 show that there is a positive but statistically insignificant trend in remittance flows over this time period. After accounting for this trend, the passing of the PRI is associated with a negative but statistically insignificant effect on remittances received by Pakistani households across all specifications. While the results are imprecise, the fact that all the post-PRI coefficients in Table 8 are negative and modest suggests that there is not much support for the hypothesis that the PRI increased total average remittances received by households.

**Table 8: PRI and Remittance Amounts Received by Household**

Remittances (inflation-adjusted PKR)			
Post-PRI	-3,075 (2,384)	-2,823 (2,655)	-4,568 (3,224)
Linear trend	73.62 (460)	31.64 (499)	408.01 (649)
Mean of dependent variable	11,817		
Number of observations	47,266	47,266	47,266
Eid controls	No	Yes	Yes
Survey month controls	No	No	Yes

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: Author's calculations from HIES/PSLM data. The dependent variable is total foreign remittances received by a household measured in inflation-adjusted 2011 Pakistani rupees. The different columns show regression results after adjusting for various sets of controls. Eid controls include indicator variables for a sixty-day period around Eid-al-Fitr and Eid-al-Adha each. Survey month controls include indicator variables for each month as well as an indicator for whether survey month information is missing. All estimates are run at the household-level and use sample weights. Standard errors are robust.

<sup>20</sup> This is in line with what has been documented for other developing countries. Clemens and McKenzie (2014) show that the growth in remittances, as measured in macro data, for several countries greatly exceeds that in the micro data. They estimate that as much as 80% of the growth in remittances received by developing countries between 1990 and 2010 reflects measurement error.

<sup>21</sup> The 2010-2011 survey was fielded between July 2010 and July 2011. Unlike the SBP analysis, it is not feasible to include a quadratic trend in remittances because of the fewer periods of data available.

<sup>22</sup> Even though the survey asks about total remittances received in the past year, the remittance data exhibit marked seasonality related to the survey month and its proximity to the Eid holidays. This seasonality suggests the presence of recall bias where respondents are likely to report receiving higher remittances if they were received recently.

The same identification strategy can be used to analyze whether the PRI has a significant effect on the extensive margin of whether a household receives any remittances. Table 9 shows that, after controlling for a linear trend, the PRI is significantly, positively related to the receipt of foreign remittances in two of the three specifications. The preferred estimate in column 3 suggests that the passage of the PRI is associated with a statistically insignificant 1.4 percentage point increase in the probability that Pakistani households receive remittances which represents a 25% increase relative to the mean fraction of households reporting receiving any remittances<sup>23</sup>. The evidence in Table 9 overall suggests that PRI might have been associated with an increase in remittance receipt on the extensive margin, although the effect is not statistically distinguishable from zero in the preferred specification.

**Table 9: PRI and Extensive Margin of Remittance Receipt**

	(1)	(2)	(3)
Post-PRI	0.013*	0.017**	0.014
	(0.008)	(0.009)	(0.010)
Linear trend	-0.002	-0.003*	-0.002
	(0.002)	(0.002)	(0.002)
Mean of dependent variable	0.055		
Number of observations	47,279	47,279	47,279
Eid controls	No	Yes	Yes
Survey month controls	No	No	Yes

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: Author's calculations from HIES/PSLM data. The dependent variable is an indicator variable for whether the household reported receiving any foreign remittances in the past year. The different columns show regression results after adjusting for various sets of controls. Eid controls include indicator variables for a sixty-day period around Eid-al-Fitr and Eid-al-Adha each. Survey month controls include indicator variables for each month as well as an indicator for whether survey month information is missing. All estimates are run at the household-level and use sample weights. Standard errors are robust.

Next the study turns to investigate the effect of the PRI on the channels of remittance transfer used. Since channel of remittance transfer is only reported for households that report receiving any remittances, one can additionally control for remittance origin-country fixed effects which are added as the fourth column specification in Table 10<sup>24</sup>. This is potentially important because migrants to different countries have different norms and networks that they use for sending remittances back home, and controlling for origin-country fixed effects allows one to account for this.

Table 10 shows that the PRI has significantly shifted the channels of remittance transfer used from non-bank channels towards bank channels. Panel A shows that the PRI is associated with a significant, 39 percentage point increase in the probability of using banks as the channel of transfer. Relative to the fraction of households using banks for remittance transfer in the household survey, this amounts to a 85% increase in the use of banks. Furthermore, panel A shows that the trend for using banks had actually been negative, and that the PRI caused a sharp break in the trend of channel used. Panel B shows that the PRI is associated with lower usage of *Hundi* for sending remittances. Two of the four coefficients are statistically significant, and all of them are negative and modest relative to the mean proportion of households reportedly using *Hundi*. Panel C shows that the PRI is also associated with a statistically significant decline in the use of other channels for remittance transfer. The coefficient in column 4 suggests that the use of other channels has declined by 34 percentage points. One might have worried that the decline in reported use of *Hundi* might not be real and may just reflect people's decreasing willingness to admit to using *Hundi*. The fact that the

<sup>23</sup> This coefficient is also within sampling variation of the post-PRI coefficients in the first two columns.

<sup>24</sup> The HIES/PSLM data does not collect information on household members who are migrants living abroad. The only questions asked are about the country of remittance-origin if a household reports receiving foreign remittances. For this reason, it is not possible to determine the country from which a household may potentially receive remittances or control for its characteristics, unless the household reports receiving remittances in the past year.

negative effects of the PRI are seen both on *Hundi* and other channels is reassuring for this reason, because people should not have the same qualms with reporting the use of other channels.

**Table 10: PRI and Remittance Channels**

Panel A: Remittances through bank	(1)	(2)	(3)	(4)
Post-PRI	0.370*** (0.078)	0.391*** (0.086)	0.373*** (0.101)	0.389*** (0.102)
Linear trend	-0.042*** (0.015)	-0.045*** (0.016)	-0.034* (0.021)	-0.031 (0.021)
Mean of dependent variable	0.454			
Number of observations	2,595	2,595	2,595	2,595
<hr/>				
Panel B: Remittances through <i>Hundi</i>				
Post-PRI	-0.181*** (0.062)	-0.184*** (0.069)	-0.108 (0.081)	-0.114 (0.083)
Linear trend	0.019* (0.012)	0.020 (0.013)	0.002 (0.016)	-0.002 (0.017)
Mean of dependent variable	0.306			
Number of observations	2,595	2,595	2,595	2,595
<hr/>				
Panel C: Remittances through other channels				
Post-PRI	-0.280*** (0.072)	-0.257*** (0.080)	-0.334*** (0.094)	-0.338*** (0.096)
Linear trend	0.039*** (0.014)	0.035** (0.015)	0.048** (0.019)	0.045** (0.020)
Mean of dependent variable	0.256			
Number of observations	2,595	2,595	2,595	2,595
Eid controls	No	Yes	Yes	Yes
Survey month controls	No	No	Yes	Yes
Origin-country controls	No	No	No	Yes

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: Author's calculations from HIES/PSLM data. The dependent variables in panels A, B and C are indicator variables for whether the household received foreign remittances through a bank, through *Hundi*, and another channel, respectively. The estimation sample includes households that report receiving foreign remittances in the past year. The different columns show regression results after adjusting for various sets of controls. Eid controls include indicator variables for a sixty-day period around Eid-al-Fitr and Eid-al-Adha each. Survey month controls include indicator variables for each month as well as an indicator for whether survey month information is missing. Origin-country controls include indicator variables for the countries from which remittances are received. All estimates are run at the household-level and use sample weights. Standard errors are robust.

Table 11 considers the relationship between the PRI and remittance amount received conditional on receiving remittances. Table 8 showed results of the relationship between the PRI and unconditional remittance amounts which included zero remittances for roughly 95% of the households that do not receive any remittances. Table 11 uses the same identification strategy as Table 8 but limits the sample to households that report receiving remittances. The estimates from this analysis are likely subject to endogeneity due to sample selection, and this must be kept in mind when interpreting these results.<sup>25</sup> Since this analysis is restricted to households that report receiving remittances, and the data collects information on remittance origin country for all such households, it is possible to control for a richer set of covariates. Column 4 adds origin country fixed effects which will control for any time-invariant attributes of

<sup>25</sup> Households that have migrants abroad that send remittances are plausibly a select sample of all households, and this sample selection can introduce bias in the regression estimates

remitters from these various countries. Columns 5 and 6 additionally control for the exchange rate with the origin country and the unemployment rate in the origin country, respectively.

**Table 11: PRI and Remittance Amounts Conditional on Remittance Receipt**

	(1)	(2)	(3)
Post-PRI	-104,988*** (30,481)	-124,582*** (34,990)	-139,945*** (40,574)
Linear trend	8,631 (5,830)	11,897* (6,496)	16,210** (8,067)
Eid controls	No	Yes	Yes
Survey month controls	No	No	Yes
Origin-country controls	No	No	Yes
	(4)	(5)	(6)
Post-PRI	-136,218*** (39,024)	-161,926*** (55,858)	-182,520*** (59,651)
Linear trend	18,003** (7,856)	21,141* (11,136)	23,134** (11,666)
Mean of dependent variable	219,723		
Eid controls	Yes	Yes	Yes
Survey month controls	Yes	Yes	Yes
Origin-country controls	Yes	Yes	Yes
Exchange rate controls	No	Yes	Yes
Unemployment controls	No	No	Yes

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: Author's calculations from HIES/PSLM data. The dependent variable is amount of inflation-adjusted remittances received (PKR) conditional on a household receiving foreign remittances. The different column numbers show regression results adjusting for various sets of controls. Eid controls include indicator variables for a sixty-day period around Eid-al-Fitr and Eid-al-Adha each. Survey month controls include indicator variables for each month as well as an indicator for whether survey month information is missing. Origin-country controls include indicator variables for the countries from which remittances are received. Exchange rate controls include a quadratic term in the average, yearly exchange rate of the remittance-sending country. Unemployment controls include a quadratic term in the average, yearly unemployment rate of the remittance-sending country. All estimates are run at the household-level and use sample weights. Standard errors are robust.

Table 11 shows that the PRI is associated with a significant decline in mean remittance amounts conditional on households receiving any remittances. These effects are consistently negative and large across all of the specifications. Notice that the coefficient on Post-PRI actually becomes larger and more negative once controlled for unemployment. Based on this, it does not seem like omitted variable bias due to worsening economic conditions is driving the negative coefficients found. While these results suggest that the PRI might have been associated with a decline in average remittances received by households, this cannot be taken as conclusive evidence due to the endogeneity concerns described earlier.

In summary, the analysis using the HIES/PSLM household survey data indicates that there is no evidence to suggest that the PRI has increased the average amount of remittances received by Pakistani households. If anything, it may have been associated with a decrease in unconditional and conditional average remittances received. The results suggest that the PRI may have been associated with an increase in remittance receipt on the extensive margin, although this result lacks statistical significance in the preferred specification. Finally, the HIES/PSLM data show that the PRI is significantly associated with a sizable reallocation of remittance transfer from *Hundi* and other channels into the formal, banking channel.

## Is the Increase in Formal Remittance Flows a Reallocation Effect?

One limitation of the SBP data is that it does not include remittances flowing to Pakistan through informal channels. This makes it hard to determine whether the documented increase in formal remittances post-PRI reflects a net increase in total remittances received or a reallocation of remittances that were being sent through informal channels to formal channels. The HIES/PSLM household survey data suggests that average remittance amounts received by households may have fallen since the implementation of the PRI, although the unconditional estimates are imprecise and not statistically significant. It is possible for both these findings of rising formal remittances and possibly falling average household remittances to be consistent if informal remittances have fallen by more than the increase in formal remittances. It is also important to note that it is possible for total remittances to have increased even if the average remittance amount received by households has fallen as a result of the PRI if there is an expansion in the number of households receiving remittances<sup>26</sup>. Unfortunately, the evidence in Table 9 does not shed much light on whether the PRI has increased household remittance receipt on the extensive margin. While there is no evidence of a significant increase in the likelihood of a household reporting receiving remittances in the preferred specification, the coefficient is not a precisely estimated zero that would suggest no change on the extensive margin either.

Unfortunately, it is not feasible to use the HIES/PSLM survey data to compute national estimates of total, formal, and informal remittances received and analyze those over time. The pre-PRI household survey datasets of 2005-2006 and 2007-2008 are representative at the provincial level, while the post-PRI household survey dataset of 2010-2011 is representative at the district level; which can be used to compute indicators at the district level. Given their different sample frames, one cannot use the household survey datasets to test whether the PRI was associated with an increase in total remittances<sup>27</sup>.

Given these data limitations, it is not possible to directly test whether the increase in formal remittances translated into an increase in total remittances received. Therefore, this study uses the reported rates of use of different remittance transfer channels in the household survey to conduct a back-of-the-envelope calculation to estimate how the flow of formal and informal remittances might have changed.

Based on the HIES/PSLM data, 27.5% of remittance-recipient households reported receiving remittances through *Hundi* in 2007-2008 immediately before the passing of the PRI (Table 9). The analysis in Table 10 shows that the PRI reduces the use of *Hundi* by 11.4 percentage points. One could use this reduction in the use of the *Hundi* channel to get a rough estimate of the amount of informal remittances that have started coming through formal channels. This assumes, conservatively, that households receiving remittances through a non-*Hundi* channel, i.e. through bank and “other channel”, are receiving remittances through a formal channel<sup>28</sup>. Since 27.5% of households report receiving remittances through *Hundi*, and the average remittance amount received through different channels is similar, one can assume that 27.5% of total remittances are received through *Hundi*, and the remainder come through formal channels. By re-allocating 11% of the households from *Hundi* to formal channels, the PRI could, therefore, have shifted about PKR 8.36 billion per month that used to be sent through *Hundi* into formal channels<sup>29</sup>.

Note that the PKR 8.36 billion reallocation of informal remittances to formal remittances is close to the estimated PKR 7.044 billion that the PRI has increased the monthly formal remittance flows by. These estimates seem

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<sup>26</sup> Households which recently start receiving remittances will be getting smaller amounts, on average, compared to households that have had remitting members established and working abroad for longer. The expansion of households receiving remittances, therefore, can be expected to lower the average remittance amount.

<sup>27</sup> See Amjad et. al (2012) for additional discussion on how the sampling frame of the household survey data, in conjunction with the non-uniform distribution of remittance-recipient households across Pakistan, means the household survey data cannot be used to estimate the total amount of remittances received nationally.

<sup>28</sup> Although the PRI had a stronger effect on increasing (reducing) remittance transfer through the bank channel (the “other channel”), This study does not use the effect on the use of the bank channel or the “other channel” to estimate the shift of remittances from informal to formal channels, since some of the shift from the “other channel” to banks may not entail a switch from informal to formal channels. As discussed before, the “other channel” is most likely comprised of transfers through informal channels such as friends and acquaintances, and *Hundi* but can include some remittances sent through formal channels such as MTOs and the post office. Therefore, the estimate of reduction in use of *Hundi* channel is used, since that is unambiguously an informal channel. This will likely lead to an underestimate of the shift of remittances from informal to formal channels, since most households reporting using the “other channel” are likely to be receiving remittances through informal channels as indicated by the limited use of MTOs and post offices for remittance transfers overall.

<sup>29</sup> Since the average monthly formal remittance flow to Pakistan was PKR 55.1 billion per month prior to PRI, the estimated average monthly total remittance flow to Pakistan would be approximately PKR 76 billion. Shifting 11% of the total remittance flow from *Hundi* to formal channels would therefore shift PKR 8.36 billion from *Hundi* to formal remittances.



consistent with the possibility that most of the significant increase in formal remittance flows attributed to the PRI has come about as a result of a shift of remittances being sent from informal channels to formal channels. This evidence suggests that while the PRI has significantly shifted money that used to be sent to Pakistan through informal channels into formal channels, it has not necessarily led to a significant increase in the total amount of remittances being sent to Pakistan.

## CONCLUSIONS AND POLICY IMPLICATIONS

This paper finds that the PRI is associated with a significant increase in formal remittance flows to Pakistan. Monthly formal remittance flows to Pakistan increase by PKR 7.044 billion or 13% relative to the mean amount received prior to the PRI. Using the household survey data, there is no indication that the PRI has increased the average amount of total remittances received by Pakistan households. There is strong evidence that the PRI has led to a significant shift in the channels used for remittance transfer with a decrease in the use of *Hundi* and other channels along with an increase in the use of formal, bank channels. These estimates are used to conduct back-of-the-envelope calculations to infer how much of the increase in formal remittance flows might be due to a reallocation of funds that used to be sent through informal channels to formal channels. The estimates are consistent with most of the increase in formal remittances attributable to the PRI being a result of shifts of remittances from informal channels to formal channels. In conclusion, the results indicate that the PRI has been successful in shifting remittances from informal channels to formal channels but has not necessarily led to an increase in the total amount of remittances being sent to Pakistan.

These findings provide valuable information on the short term effectiveness of the PRI. Given the multiple schemes that the PRI is comprised of, the program offers a unique opportunity to investigate which constraints to formal remittance flows had been binding and how the relaxation of these constraints has increased remittances. While the PRI has been successful at meeting its short term goal of shifting remittances from informal channels to formal channels, future work should explore the policy tools that can be leveraged to increase total remittances and how remittances can be better utilized to create investment and growth in Pakistan which is a long term goal of the PRI.

## REFERENCES

- Adams, Jr., Richard H, 2005, "Remittances, Household Expenditure and Investment in Guatemala.", World Bank Policy Research Working Paper No. 3532.
- Amjad, Rashid, Ghulam Mohammad Arif, and Muhammad Irfan, 2012, "Explaining the Ten-fold Increase in Remittances to Pakistan 2001-2012", IGC Working Paper 12/0391.
- Amjad, Rashid, Muhammad Irfan, and Ghulam Mohammad Arif, 2013, "How to Increase Formal Inflows of Remittances: An Analysis of the Remittance Market in Pakistan", IGC Working Paper.
- Aycinena, Diego, Claudia Martinez A. and Dean Yang, 2010, "The Impact of Remittance Fees on Remittance Flows: Evidence from a Field Experiment among Salvadoran Migrants", Working Paper.
- Clemens, Michael A., and David McKenzie, 2014, "Why don't remittances appear to affect growth?", *World Bank Policy Research Working Paper* 6856.
- Cox-Edwards, Alexandra and Manuelita Ureta, 2003, "International Migration, Remittances, and Schooling: Evidence from El Salvador", *Journal of Development Economics*, Vol. 72, pp.429-461.
- Freund, Caroline, and Nikola Spatafora, 2008, "Remittances, Transaction Costs, and Informality", *Journal of Development Economics*, 86(2):356-66.
- Gibson, John, David McKenzie, and Hala Rohorua, 2006, "How Cost Elastic are Remittances? Evidence from Tongan Migrants in New Zealand", *Pacific Economic Bulletin*, 21(1):112-28.
- Hanson, Gordon H. 2010, "International Migration and the Developing World", *Handbook of Development Economics*, Volume 5, Chapter 66.
- Jost, Patrick M., and Harjit Singh Sandhu, 2003, "The hawala alternative remittance system and its role in money laundering", Interpol.
- Martin, P.L., 2006, "The trade, migration, and development nexus", *Migration, Trade, and Development*, p.11.
- Ministry of Finance, Government of Pakistan, Economic Surveys of Pakistan, 2010-11.
- Ministry of Finance, Government of Pakistan, Economic Survey of Pakistan, 2011-12.
- State Bank of Pakistan, Chapter 4 "Exchange Rate and Reserve Management" of the State Bank of Pakistan Annual Report, 2009-10.
- State Bank of Pakistan, Chapter 4 on "Exchange Rate and Reserve Management" of the Annual Reports of the Annual Performance Reviews 2010-11.
- State Bank of Pakistan, Chapter 4 on "Exchange Rate and Reserve Management" of the Annual Reports of the Annual Performance Reviews 2011-12.
- State Bank of Pakistan, Chapter 8 on "Trade and Payments" of the Annual Report 2011 of the State Bank of Pakistan.
- State Bank of Pakistan, Press Release, August 22, 2009 "Federal Government, State Bank launch historic Pakistan Remittance Initiative", <http://www.sbp.org.pk/press/2009/PRI-22-Aug-09.pdf>.
- State Bank of Pakistan, Press Release, <http://www.sbp.org.pk/epd/2009/FEC6.htm>, "Facilitation of Home Remittances", October 19, 2009. FE Circular No. 06.
- United Nations Development Programme, Chapter 4 on "Remittances" of report "Towards Human Resilience: Sustaining MDG Progress in an Age of Economic Uncertainty", September 2011.

Woodruff, Christopher, and Rene Zenteno, 2007, “Migrant Networks and Microenterprises in Mexico”, *Journal of Development Economics*, 82(2):509-528.

World Bank, IFC, Enterprise Survey Report, Pakistan Country Profile 2007.

Yang, Dean, 2008a, “Coping with Disaster: The Impact of Hurricanes on International Financial Flows, 1970-2002”, B.E. *Journal of Economic Analysis and Policy*: Vol. 8, No. 1 (Advances), Article13.

Yang, Dean, 2008b, “International Migration, Remittances, and Household Investment: Evidence from Philippine Migrants’ Exchange Rate Shocks”, *Economic Journal*, Vol. 118, pp. 591-630.

Yang, Dean and Claudia Martinez A., 2005, “Remittances and Poverty in Migrants’ Home Areas: Evidence from the Philippines”, in Caglar Ozden and Maurice Schiff, eds., *International Migration, Remittances, and the Brain Drain*, World Bank.

Yang, Dean and HwaJung Choi, 2007, “Are Remittances Insurance? Evidence from Rainfall Shocks in the Philippines”, *World Bank Economic Review*, 21(2):219-248.

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