

# The Impact of Remittances on Central Bank Balance Sheets and Inflation in Nepal<sup>1,2</sup>

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## Abstract

*Starting from a set of stylized central bank balance sheets, we analyze how central bank policies influence the inflationary impact of remittances. We also estimate the impact of remittances on inflation empirically, using a Vectorautoregression (VAR) framework and a quarterly data set from Nepal. We find this impact to be positive, even after controlling for inflation from India. The domestic monetary base, on the other hand, has lost significance as an independent factor for inflation in the latest 10 years of our sample period. This evidence is consistent with the "impossible trinity" hypothesis. In the conclusions we discuss policy options to accommodate large remittances inflows.*

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**Key Words:** Remittances, Inflation, Trilemma hypothesis

**JEL Classification:** E52, F24, F42, O53

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## I. INTRODUCTION

The impact of remittances on inflation and welfare is a topic of high importance for a country like Nepal, which receives remittances of over 25% relative to the GDP per year. The general impression of several observers is that the remittances in the current form are underutilized in Nepal. Primarily, this is because the lion's share of these inflows is used for the purpose of daily consumption, rather than savings, education, or investment. Thus, it does not appear to facilitate the buildup of a domestic capital stock that could help to increase domestic per capita income in the long run (see the first Appendix (A 1), which displays data from the Nepal Living Standards Survey (NLSS) 2010/2011).<sup>6</sup>

Furthermore, despite the efforts to promote the use of official channels, when sending the money back home, the share of remittances transferred via the banking system is considered to be below its potential (Pant 2011 and SAARC 2014). The second Appendix (A 2) illustrates this for the key countries from which remittances are being sent to Nepal: India clearly has the lowest share with close to 10%. The UK still has a value below 50%, and other important countries, Malaysia, Saudi Arabia, and Qatar, vary between 60% and 80%.

In this paper, we aim to shed light on these two observations by analyzing possible responses of the central bank to large remittance inflows, and by investigating the resulting impact on domestic inflation. In the first part of the paper, we analyze the hypothetical impact of remittances on stylized central bank balance sheets under different exchange rate regimes. We argue that an economy with a mostly closed capital account has difficulties in absorbing large amounts of remittance inflows, and illustrate that some responses of the central bank are more inflationary than others.

In the second part of the paper, we estimate a simple Vectorautoregression (VAR) model to illustrate the inflationary pressure that is created by large remittance inflows. We find that in the full sample, inflation in Nepal primarily responds to inflation in India.<sup>7</sup> There is also a partial effect of changes in the monetary base on inflation. However, this observation is largely driven by the early part of the sample period. In a second VAR that only includes data from the past 10 years, the significant impact of the monetary base on inflation disappears. Instead, remittances entering the country from abroad start to become a significant determinant of inflation.

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<sup>6</sup> The effect of remittances on financial development have been documented for instance by Aggarwal et al. (2006, 2011), Gupta et al. (2009), or Giuliano and Ruiz-Arranz (2013). See also Maskay, Steinkamp, and Westermann (2014) for the case of Nepal. A general overview on the impact of remittances on macro and development indicators is given in Adams (2011) and Brown et al. (2013).

<sup>7</sup> Nepal officially maintains a pegged exchange rate regime that commenced in 1960; however, since February 1993, the start of the sample period, there has not been any adjustment in the exchange rate. This finding is consistent with both the model predictions as well as empirical findings for a set of countries from Latin America in Ball et. al (2013).

These empirical findings fit to the analysis of the balance sheet data in Section 2. The central bank of Nepal, the Nepal Rastra Bank (NRB), which maintains a rigid pegged exchange rate regime with India,<sup>8</sup> continuously uses the incoming FX reserves to purchase Indian currency, which it sells to its customers. The purchase of Indian rupees corresponds to the net trade deficit with India. Therefore, the impact of remittances on inflation, while statistically significant, is only transitory.

Our findings also confirm the "impossible trinity" or "trilemma" hypothesis, according to which countries cannot - at the same time - have an open capital account, a fixed exchange rate, and independent control over monetary policy. They also support recent studies that suggest that the degree of domestic financial development, and in particular investment opportunities, matters for the amount of remittances sent via the domestic banking system (Bettin et al. 2012).

It is important to point out that the decision of migrant households to spend a large proportion of their income on daily consumption is not subject to critique. If they are the result of preferences, there is no scope for welfare improvements by policy makers trying to alter their decisions. However, the constraints under which their savings-consumption decisions are made could be distorted in favor of consumption over savings. In the conclusions, we consider various implications for welfare and policy options. For instance, we discuss the idea that a partial liberalization of foreign currency loans to non-traded goods sectors might facilitate the saving of remittances (in foreign currency) and relax credit constraints as an obstacle to economic growth.

## II. THE IMPACT OF REMITTANCES ON CENTRAL BANK BALANCE SHEETS

### 2.1 The central bank sterilizes remittance inflows

When remittance inflows are moderately large, the NRB can sterilize the impact on its balance sheet by selling other assets – for instance, domestic government bonds – or by reducing loans to the private banking system. The simplified balance sheet below illustrates the impact of an additional unit of foreign currency remittances on the balance sheet of both private and central banks.

<table style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2" style="border: none; padding: 5px;">Private Bank</th> </tr> <tr> <td style="border: 1px solid black; width: 50%; padding: 5px;">C B<sub>N</sub> ↑</td> <td style="border: 1px solid black; width: 50%; padding: 5px;">D<sub>DC</sub> ↑</td> </tr> </table>	Private Bank		C B <sub>N</sub> ↑	D <sub>DC</sub> ↑	<table style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2" style="border: none; padding: 5px;">Central Bank</th> </tr> <tr> <td style="border: 1px solid black; width: 50%; padding: 5px;">FX<sub>US</sub> ↑ FX<sub>IND</sub> B<sub>N</sub> ↓</td> <td style="border: 1px solid black; width: 50%; padding: 5px;">M<sub>N</sub> ↑↓</td> </tr> </table>	Central Bank		FX <sub>US</sub> ↑ FX <sub>IND</sub> B <sub>N</sub> ↓	M <sub>N</sub> ↑↓
Private Bank									
C B <sub>N</sub> ↑	D <sub>DC</sub> ↑								
Central Bank									
FX <sub>US</sub> ↑ FX <sub>IND</sub> B <sub>N</sub> ↓	M <sub>N</sub> ↑↓								

Where C = credit to firms, D<sub>DC</sub> = domestic currency deposits, B<sub>N</sub> = domestic government bonds, FX<sub>US</sub> = Reserves of the central bank in convertible currency, FX<sub>IND</sub> = Reserves in non-convertible currency, and M<sub>N</sub> = Money in circulation in Nepal.

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<sup>8</sup> The last change in the pegged exchange rate with Indian currency occurred on April 13, 1993; it has remained rigid since then.

In the first instance, the incoming remittances raise the deposits of the private bank. Within 15 days, the deposits are required (by NRB directive) to be converted to domestic currency, which raises the foreign exchange holdings of the central bank as well as the money in circulation.

However, in the next step, the central bank sells domestic government bonds to the private bank and thus mops up the newly created liquidity. The money in circulation, as well as the length of the central bank balance sheet, remains unchanged. The only thing that has changed for the central bank is the composition of its assets. Also, the private banks balance sheet has expanded.

In this scenario, the domestic price level and the equilibrium exchange rate with respect to India remain unchanged. The central bank balance sheet can be viewed as less prone to crisis, as it has increased its holdings of convertible reserve assets.

### 2.2 *Non-sterilized remittances with a flexible exchange rate*

A sterilization of remittances as described above cannot be sustained indefinitely by the central bank, as eventually it will run out of domestic government bonds or other assets to sell. At this point, further remittance inflows will increase the length of the central bank balance sheet, as illustrated below:

Private Bank		Central Bank	
$C \uparrow$	$D_{DC} \uparrow$	$FX_{US} \uparrow$	$M_N \uparrow$
$B_N$		$FX_{IND}$	
		$B_N$	

These non-sterilized inflows have the drawback of causing inflation in Nepal, as the currency in circulation goes up.<sup>9</sup> In principle, the resulting inflation could lead to a depreciation of the exchange rate. However, as traded goods prices are fixed internationally and non-traded goods prices increase, most countries experience an appreciation of the exchange rate following large remittance inflows (e.g., Mandelmann 2013).

### 2.3 *Non-sterilized remittances with a fixed exchange rate*

The third case, which is reflective of the current policy stance in Nepal, is a scenario in which the central bank does not sterilize remittances inflow, but at the same time fixes the exchange rate to another country (India). In this case, we need to distinguish between a transitory and a long-term equilibrium impact of remittance inflows.

The transitory impact is initially similar to the case of a flexible exchange rate. Both private and central bank balance sheets increase, and the price level in Nepal,  $P_N$ , increases.

<sup>9</sup> As a positive side-effect, the involuntary monetary expansion could increase the credit availability provided by the private banks for households and firms.

Private Bank	
C ↑↓ B <sub>N</sub>	D <sub>DC</sub> ↑↓

Central Bank (Nepal)	
FX <sub>US</sub> ↑↓ FX <sub>IND</sub> ↑ B <sub>N</sub>	M <sub>N</sub> ↑

Central bank (India)	
FX <sub>US</sub> ↑	M <sub>IND</sub> ↑

However, unlike under flexible exchange rates, the exchange rate cannot appreciate. The NRB prevents the appreciation by selling its convertible FX reserves and purchases non-convertible FX assets from India, such as cash in Indian rupees. As a consequence, the Reserve Bank of India (RBI) becomes involved. It provides the Indian currency and buys FX<sub>US</sub> assets from the NRB. This way, the pressure on the exchange rate to appreciate is reduced.

By providing rupees, the length of the balance sheet of the RBI also increases, as well as the prices in India, albeit to a much smaller extent in relative terms, as India is a much larger country.

A new, long-term equilibrium is reached, when the NRB uses the Indian currency to satisfy the domestic excess demand for non-convertible currency. The Nepalese private and central bank's balance sheets shrink in this process. Theoretically, this shrinkage could be up to the point of their initial length.

#### 2.4 A financially open economy

An alternative policy would be to liberalize the capital market. To some extent, this is already in existence in Nepal. Foreign currency deposits gradually have been liberalized (see Maskay, Steinkamp and Westermann 2014) and currently account for about 5% of the liabilities of the aggregate commercial banking system. However, substantial limits still apply. In particular, remittances entering the country through official channels need to be converted to domestic currency within the first 15 days as per NRB directive. The highly transitory nature of these deposits and regulations on the asset side prevent lending in foreign currency to domestic firms. Currently, banks are allowed to lend in foreign currency only to traded goods sector firms with special authorization of the NRB and for the purpose of financing imported goods. The total amount of such loans make up less than 1% of the aggregate bank balance sheet.

If Nepal would decide to further liberalize FX deposits and FX lending – for instance, to non-traded goods sectors, the private banking system would help the NRB to sterilize FX inflows from remittances. The balance sheet analysis below shows a situation in which a bank is allowed to take FX deposits and give FX loans. Remittance inflows would increase the length of the private banks' balance sheet, but not the balance sheet of the central bank.

Private Bank	
C C <sub>FX</sub> ↑ B <sub>N</sub>	D <sub>DC</sub> D <sub>FX</sub> ↑

Central Bank	
FX <sub>US</sub> FX <sub>IND</sub> B <sub>N</sub>	M <sub>N</sub>

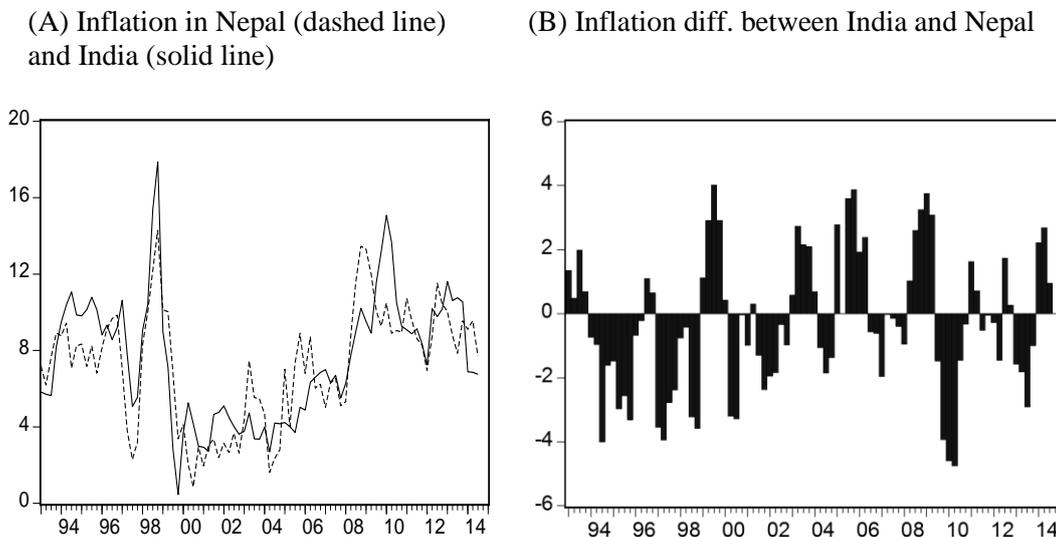
### III. EMPIRICS: THE LINK BETWEEN INFLATION, REMITTANCES AND THE EXCHANGE RATE

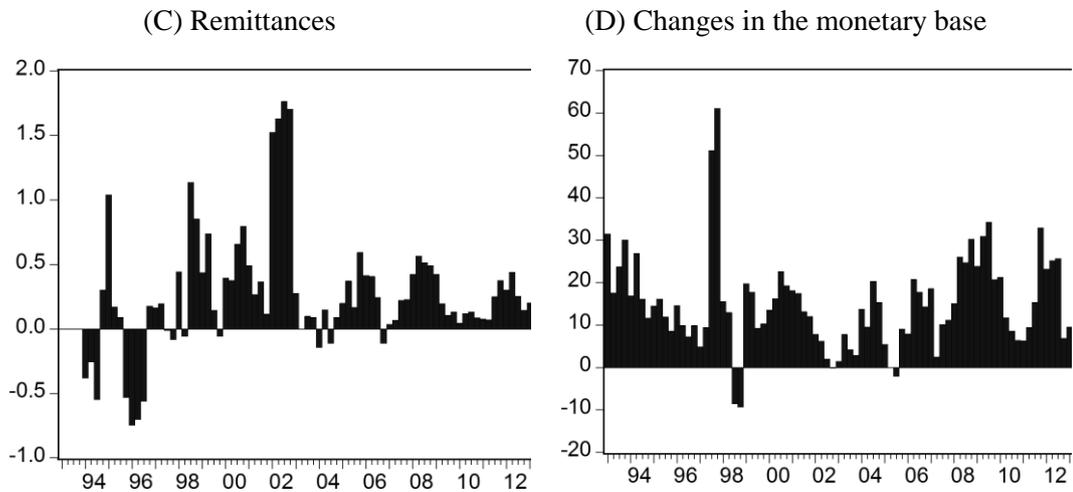
The section above illustrated that remittances can have inflationary consequences for the domestic economy, in particular when inflows are non-sterilized and the exchange rate is flexible. While Nepal maintains a rigid pegged exchange rate vis-à-vis India, there still could be an inflationary impact, as for a transitory period remittance inflows increase the monetary base. In this section, we perform an empirical analysis in which we investigate whether an increase in remittances indeed creates inflationary pressure in Nepal.

For several developing countries, earlier research also has documented that large remittance inflows lead to a real appreciation of the currency (e.g., Ball, Lopez and Reyes 2013). The motivation is that non-tradable goods prices increase, while traded goods prices largely are unaffected.

Figure 1 illustrates the key variables. In Figure 1(A), we first see that inflation rates in Nepal largely are determined by the Indian inflation rate, due to the fixed performance of the pegged exchange rate system. However, there are also some transitory differences in the inflation rates that are displayed in Figure 1(B). These inflation differentials might be influenced by remittances, displayed in Figure 1(C), and changes in the monetary base, displayed in Figure 1(D).

**Figure 1: Inflation, Remittances and Monetary Base Changes in Nepal**





Data sources: See the third Appendix (A 3).

Before analyzing the effect of remittances on inflation in a formal regression analysis, we first investigate the stationarity properties of our variables, provided in the fourth appendix (A 4), which reports unit root tests according to several definitions. The Augmented Dickey Fuller (ADF) test rejects the Null of the series' having a unit root for all variables at least at the 5% level of significance. We also apply the Dickey Fuller GLS test which has been shown to be more powerful than the conventional ADF-test (see e.g. Cheung & Lai 1995). Again, we reject the null of non-stationarity for all variables at the 1% level of significance. As a crosscheck, we also test the Null of stationarity using a KPSS test. At the conventional levels of significance we do not have to reject the Null for any of the variables.

In a simple, four-variable vectorautoregressive analysis that includes inflation in Nepal, inflation in India, remittances and changes in the monetary base, we estimate whether inflation in Nepal responds to the quarterly inflows of remittances. As the time series are stationary in first differences, we can estimate the following system of equations without the risk of a spurious regression:

$$Y_t = C + \sum_{0p=0}^P \varphi_p Y_{t-p} + e_t \quad \dots\dots\dots (1)$$

with  $Y$  being a vector of endogenous variables  $Y = (\text{inflation Nepal, inflation India, } \Delta\text{remittances, } \Delta\text{monetary base})$  at time  $t$ ,  $C$  representing a vector of equation-specific constants, and  $e$  being a vector of residuals.  $\varphi$  contains the estimated coefficients. We choose lag length,  $P$ , according to the Akaike Information Criterion and subject to the requirement of leaving no significant autocorrelation in the residuals.

The impulse response pattern displayed in Figures 2 and 3 are computed from the estimated VAR coefficients.<sup>10</sup> They show the reaction derived as generalized impulse

<sup>10</sup> For completeness, the coefficient estimates are given in the fifth Appendix (A 5).

response functions; in other words, the graph displays a reaction to a system-shock to one variable, taking the contemporaneous correlation with the other variable into account. This approach has the advantage that the impulse response patterns are independent of the ordering in the VAR. A potential disadvantage is the fact that each shock may not be identified precisely. However, the contemporaneous correlation is quite low, and an alternative approach, for instance a Cholesky decomposition, would yield similar results.

*The full sample (1993:1 to 2014:1)*

Figure 2 shows the impulse response functions in the full sample period from 1993:1 to 2014:1. In the first graph, Figure 2(A), we see the reaction of an unanticipated change in inflation in India on the inflation rate in Nepal. It is statistically significant and positive for about five to six quarters. It shows the importance of the Indian economy, as well as the policy of the central bank of Nepal. By fixing the exchange rate, Nepal effectively imports the inflation rate from India, as visible in Figure 1(A).

However and as seen in Figure 2(B), changes to the monetary base over the longer term have not been ineffective entirely. Thus, despite its close link to India, Nepal has managed to reserve some control over inflation. After a shock in the monetary base, there is (with a delay of about two to three quarters) a positive response of inflation that is statistically significant, although of course transitory and insignificant in the longer term. While this observation violates the so-called “trilemma” hypothesis, according to which economies cannot have a fixed exchange rate and (to some extent) an open capital account and independent monetary policy at the same time, this finding is not unreasonable, given Nepal's considerable capital controls, which are still in place.

Remittances, on the other hand and reflected in the final panel of Figure 2(C), only have a very short-lived, but positive impact on inflation when considering the full sample period. The reaction is statistically significant in the first quarter only. Thereafter, remittances do not appear to contribute to explaining the path of inflation in Nepal.

*The last 10 years (2004:1 to 2014:1)*

There are several good reasons to perform a sample split and also to consider the most recent period in Nepal separately. First, looking at Figure 1, there are several large observations, such as 1997 in the monetary base, 1998 in inflation rates, and 2001 in remittances. Although these observations are not outliers in a statistical sense, they still may dominate the overall findings. The variance of all variables has been substantially smaller in the later period. Also, one cannot fully rule out the possibility that these observations from early data recording reflect data mistakes rather than larger underlying economic movements.

Second, there are historical reasons for such a sample split. The insurgency that occurred in Nepal and accelerated in the early 2000s has contributed to an economic downturn and a substantial increase in remittances. While remittances were negligible in the 1990s, they have grown to be an increasingly important element of national income from about 2003/4 onwards. In this period of large remittance inflows – considering the central bank

balance sheet analysis above – one might expect a different reaction of inflation rates, as large sums of inflows cannot be sterilized easily by the central bank.

In Figure 3(A), we can see that India, just as in the whole sample, plays a key role in determining inflation rates in Nepal. The magnitude and time pattern are quite similar to Figure 2, with the possible exception that there seems to be a short delay before the shocks are transmitted.

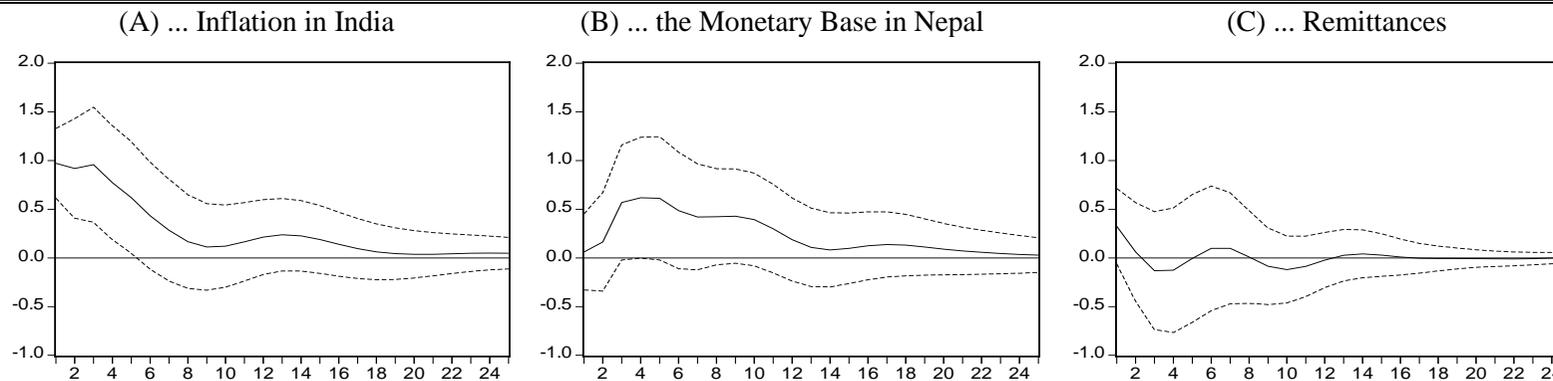
Figure 3(B), on the other hand, illustrates that the impact of the monetary base has changed in the later period. While the impact was positive and significant before, it now has no clear sign direction, and is statistically insignificant over the full 25 quarter period which was simulated.

Instead, as documented in Figure 3(C), the response to remittances has become much more pronounced, and is positive and significant over a similar time interval of two to seven quarters, comparable to the Indian inflation rate.

These impulse response patterns, although derived from a very simple VAR model, are quite interesting, as they are consistent with the discussion of remittances and central banks' balance sheets above. While initially, small remittance inflows during the 1990s and early 2000s were manageable from the central banks point of view, in the sense that the central bank was able to sterilize its impact on inflation, the remittance inflows have become a driving factor for inflation.

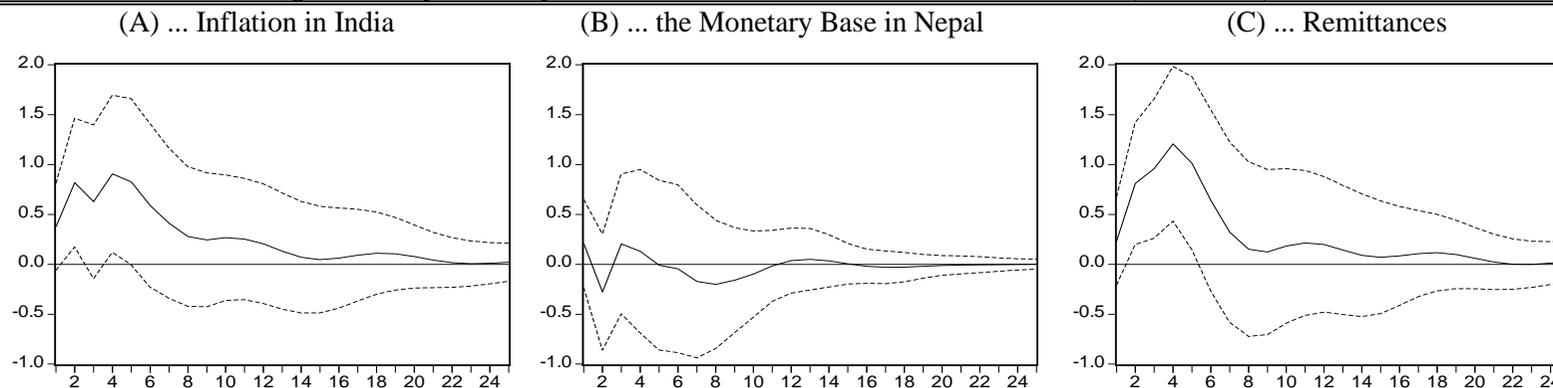
What appears to happen is that the remittances create inflationary pressure in Nepal, but thereafter, the central bank policy of stabilizing the exchange rate ensures that this effect is transitory, and thus, prevents a longer-term impact. The NRB steers against this inflationary pressure by selling U.S. assets and purchasing Indian currency, as will be documented in the following section. In the process, it has lost the ability to exert an independent control over domestic inflation.

**Figure 2: Impulse Response Pattern of the Inflation in Nepal to a Shock in... (Full Sample)**



Notes: Own calculations. For data sources see Appendix 1.

**Figure 3: Impulse Response Pattern of the Inflation to a Shock in... (after 2003)**



Notes: Own calculations. For data sources, see Appendix 1.

#### IV. EXCHANGE RATE POLICY IN NEPAL

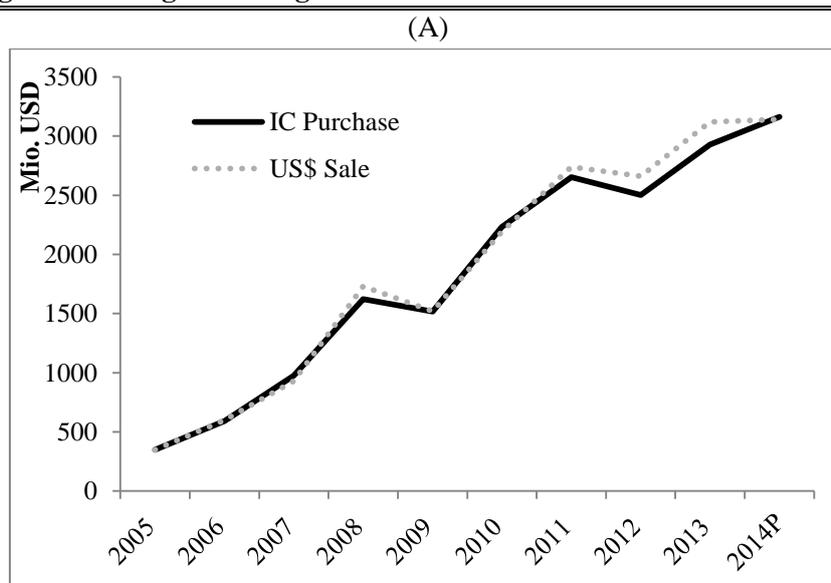
In this section, we investigate whether the policy response to remittance inflows in Nepal is indeed reminiscent of the simplified balance sheet analysis of a central bank with an only partially liberalized capital account and fixed exchange rate in section (2.3).

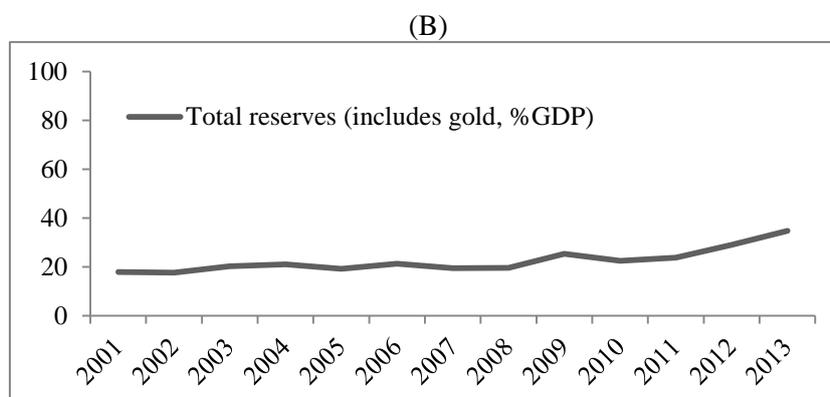
As a first step, consider Figure 4, which displays an increasing trend of Indian currency (IC) purchases, as well as U.S. monetary sales of the NRB. This upward trend resembles the upward trend of remittances flowing into the country and the effort of the NRB to neutralize the impact of the inflows on inflation and the exchange rate. The IC purchased by the NRB is provided to customers (indirectly via the banking system) who want to exchange Nepalese rupees for Indian rupees. As the NRB provides this IC to the markets, the NRB's total balance sheet stays fairly constant (displays only a moderate increase).

As a consequence of a steady flow of U.S. monetary sales and IC purchases, the total reserve holding of the NRB, relative to the GDP, stayed fairly constant as well, despite a continuous inflow of remittances, recently reaching an annual share of over 25% of the GDP. Considering these large inflows, a cumulative increase of the NRB's reserves from 20% to about 30% of the GDP, as displayed in Figure 4(B), seems quite low.

What happened with the Indian currency that the NRB had provided to its customers? The pattern of U.S. dollar sales (nearly identical to the NRB's IC purchases) is very similar to the net imports of Nepal from India. Both have the same time trend, magnitude, and even cyclical pattern. Cumulatively, the U.S. dollar sales have been 15.84bn, while the net trade deficit of Nepal with India has been 15.98bn U.S. dollars. Expressed as a percentage of the GDP, this is 11.83% annually (a number that has started at 4% in 2005, and reached 17% in 2013).

**Figure 4: Foreign Exchange Market Interventions and Reserve Holdings**






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Data sources: See data appendix.

## V. CONCLUDING REMARKS

Is the inflow of remittances underutilized? The patterns documented above fit to the initial survey evidence from the NLSS 2010/2011, which indicates that most of remittances are used for daily consumption. Households appear primarily to use this income to purchase goods and services in India.

If this observation results from preferences for international goods, there would be no scope for an economic policy discussion. The first welfare theorem would imply that these decisions are indeed efficient. However, if this spending pattern is driven by a highly-regulated domestic financial market, such as regulations on foreign currency holding and lending (discussed in Maskay et al. 2014) or by inflation expectations in the domestic economy, rather than original preferences for Indian goods, remittances could indeed be underutilized in several dimensions:

- First, an additional dollar entering Nepal can be thought of as Keynesian stimulus to the economy. While the direct impact leads to additional consumption in Nepal, a large part of the Keynesian multiplier is directed to India. There are only little “second round effects,” in which this consumption leads to another increase of income for someone else, further consumption, etc.
- Second, the incoming remittances are leading to little capacity extension. In the standard Keynesian model, an additional dollar would be used partly for consumption, but partly also for investment purposes. This investment creates an additional long-term effect by building up a capital stock. Such a capital stock is not being built up by private households in Nepal, partly because they need to be worried that inflation will eliminate much of their capital gains.
- Finally, and most importantly, the current regulatory arrangements on foreign currency holdings prevent a buildup of private household wealth in the domestic banking system. If foreign currency accounts for the remitters, and if domestic lending

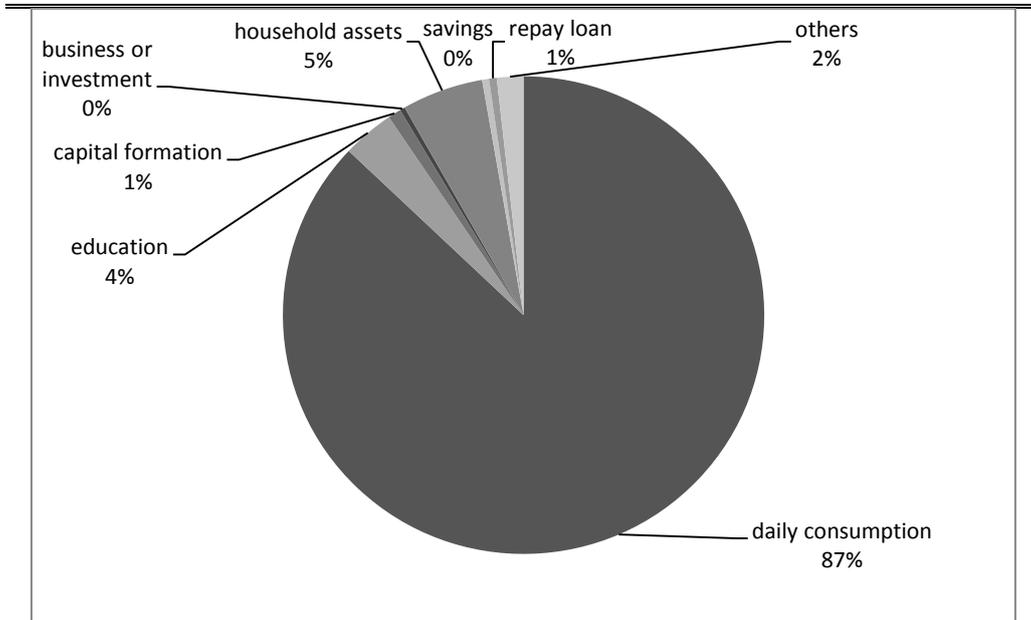
to non-traded sectors in foreign currency was liberalized further, this could both finance investment and dampen the inflationary impact of remittances. It would allow for capacity extension and a higher long-term growth path. A potential drawback of such a policy might be that it comes at the expense of a higher risk of currency crisis that other developing economies have experienced (Tornell and Westermann 2005, and Tornell, Westermann and Martinez 2003). However, household deposits, unlike international portfolio flows, are rather unlikely to experience sharp reversals.

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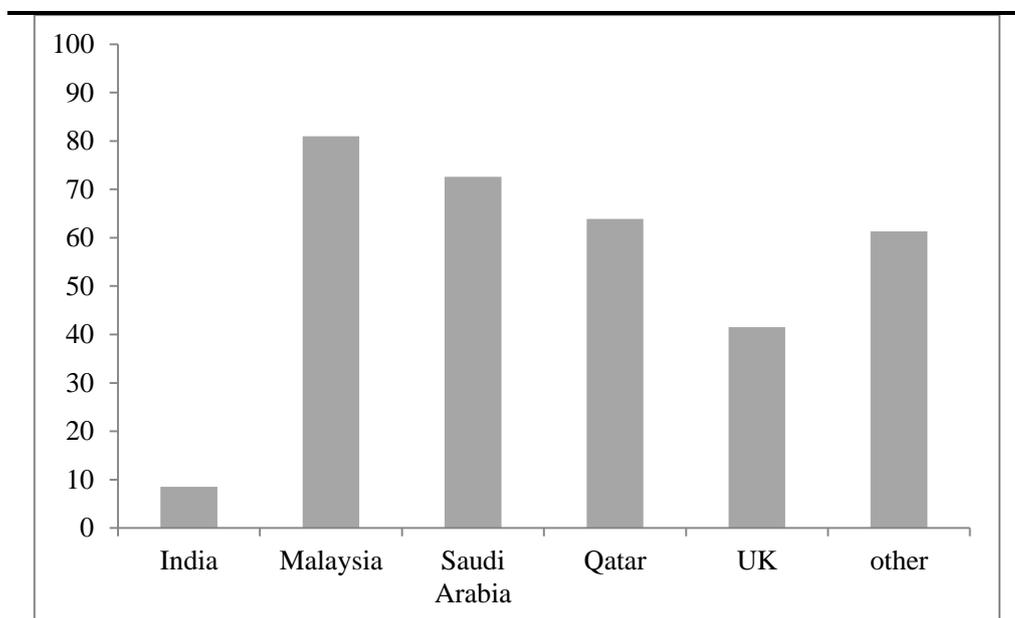
**APPENDIX**

**A 1: Households' "most important use of remittances"**



Data source: NLSS III, 2010/2011.

**A 2: Share of remittances transferred via financial institutions**



Data source: NLSS III, 2010/2011.

**A 3: Variable definitions and data sources**

Variable	Description	Source
Remittances	Personal remittances received	Nepal Rastra Bank, Quarterly Bulletin April 2014 (Table 77) & July 2012 (Table 64)
GDP	Nominal GDP	Government of Nepal (Central Bureau of Statistics), Table 2 “Gross Domestic Product”
Net Imports from India	Net Imports = Imports of goods and services from India minus Exports of goods and services to India	International Monetary Fund, Directions of Trade Statistics
Official Reserve Assets	Official Reserve Assets of Nepal (incl. gold)	International Monetary Fund, International Financial Statistics, concept code: RAFA
Inflation	Percentage change in consumer prices	International Monetary Fund, International Financial Statistics
Monetary Base	Sum of circulating currency and central bank money	International Monetary Fund, Central Bank Survey
Nepal Rastra Bank (NRB) Total Assets	Total gross assets of Nepal Rastra Bank	International Monetary Fund, Central Bank Survey, concept code: FAAG
IC Purchases	Purchases of Indian Currency by the NRB	NRB Quarterly Economic Bulletin, 2004-2014
USD Sales	Sales of USD by the NRB	NRB Quarterly Economic Bulletin, 2004-2014
Total Reserves (convertible, inconvertible)	Total Reserves of the NRB either as total or split into convertible and non-convertible reserve assets	NRB Quarterly Economic Bulletin, 2004-2014

**A 4: Stationarity Properties**

TEST	H <sub>0</sub>	TEST STATISTICS				
		Inflation Nepal	Inflation India	Inflation Differential	ΔMonetary Base	ΔRemittances
Fisher type ADF (t-stat.)	Series has a unit root	-3.430**	-3.293**	-5.704***	-5.540***	-4.639***
DF GLS (t-stat.)	Series has a unit root	-3.441***	-3.109***	-4.367***	-3.465***	-3.005***
KPPS (LM-stat.)	Series is stationary	0.324	0.243	0.192	0.167	0.161

*Notes: \*, \*\*, and \*\*\* denotes statistical significance at the 10%, 5% and 1%, respectively. Probability values in parentheses. Numbers of lags up to the third order were chosen using the Akaike Information Criterion. For the Kwiatkowski-Phillips-Schmidt-Shin test statistic (KPSS) we use automatic Newey-West bandwidth selection.*

**A 5: Vectorautoregression Estimates**

	Sample: 2004Q1 - 2014Q1				Sample: 1995Q1 - 2014Q1			
	Inflation Nepal	Inflation India	$\Delta$ Monetary Base	$\Delta$ Remittances	Inflation Nepal	Inflation India	$\Delta$ Monetary Base	$\Delta$ Remittances
Inflation	0.3833	0.0076	-0.3416	0.0260	0.7563	0.0150	-0.3151	0.0055
Nepal(t-1)	(0.185)	(0.136)	(0.783)	(0.018)	(0.137)	(0.130)	(0.680)	(0.026)
Inflation	-0.1014	-0.007	-0.5742	-0.0334	0.1023	0.1589	-1.0612	-0.0199
Nepal(t-2)	(0.197)	(0.145)	(0.836)	(0.020)	(0.171)	(0.161)	(0.846)	(0.033)
Inflation	-0.145	0.2745	2.6549	0.0002	-0.3240	-0.026	2.5854	0.0106
Nepal(t-3)	(0.174)	(0.128)	(0.737)	(0.017)	(0.138)	(0.131)	(0.686)	(0.027)
Inflation	0.4692	1.0092	0.5875	0.0246	0.1507	0.8643	-0.3004	-0.0486
India(t-1)	(0.271)	(0.199)	(1.149)	(0.027)	(0.155)	(0.146)	(0.768)	(0.030)
Inflation	-0.3764	-0.4822	-1.8287	-0.0205	0.0036	-0.2116	1.3156	0.0806
India(t-2)	(0.337)	(0.248)	(1.427)	(0.034)	(0.199)	(0.188)	(0.986)	(0.038)
Inflation	0.4075	0.1210	0.6565	0.0092	0.0987	-0.0177	-1.5949	-0.059
India(t-3)	(0.228)	(0.167)	(0.965)	(0.023)	(0.146)	(0.138)	(0.723)	(0.028)
$\Delta$ Monetary	-0.0691	-0.0676	0.3325	-0.0022	0.0100	0.0201	0.6079	0.0050
Base(t-1)	(0.036)	(0.026)	(0.152)	(0.003)	(0.023)	(0.021)	(0.114)	(0.004)
$\Delta$ Monetary	0.1042	0.1277	0.3127	0.0023	0.0452	0.0217	-0.1040	-0.0064
Base(t-2)	(0.043)	(0.031)	(0.183)	(0.004)	(0.027)	(0.026)	(0.136)	(0.005)
$\Delta$ Monetary	-0.0353	-0.0362	-0.3193	-0.006	-0.0083	0.0509	-0.0853	0.0079
Base(t-3)	(0.041)	(0.030)	(0.176)	(0.004)	(0.024)	(0.023)	(0.122)	(0.004)
$\Delta$ Monetary	4.5427	0.9991	20.199	0.4572	-0.6367	-0.0152	0.9349	0.7335
Base(t-1)	(1.850)	(1.360)	(7.822)	(0.188)	(0.600)	(0.567)	(2.969)	(0.117)
$\Delta$ Monetary	2.7360	0.8088	6.1403	0.2566	0.0598	-0.9104	3.5396	-0.0805
Base(t-2)	(2.064)	(1.518)	(8.730)	(0.210)	(0.728)	(0.687)	(3.598)	(0.142)
$\Delta$ Monetary	1.0507	-0.2480	-8.4794	-0.1754	0.5526	0.5375	-3.8839	-0.1476
Base(t-3)	(2.041)	(1.501)	(8.631)	(0.208)	(0.592)	(0.559)	(2.928)	(0.115)

Notes: Table shows the results of estimating the VAR-model given in equation 1. Standard errors in parentheses.