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Smooth Operator: Remittances and Fiscal Shocks

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Smooth Operator: Remittances and Fiscal Shocks

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Abstract

With 250 million migrants globally, remittances are one of the major sources of income in many developing countries. While there is abundant evidence that remittances facilitate consumption smoothing in receiving countries, the literature has not considered whether this effect varies with the fiscal stance and during fiscal shocks. Therefore, we investigate the impact of remittances on the stability of household consumption, using both cross-country and household-level datasets. Our focus is on whether the consumption-smoothing effect changes with fiscal policy phases and whether remittances and government support are substitutes or complements in stabilizing household consumption. We find that remittances help smooth consumption, and hence improve welfare, more during fiscal consolidation episodes, while this impact is insignificant during fiscal expansions. The results also indicate that the effect is more pronounced in countries with greater reliance on remittances.

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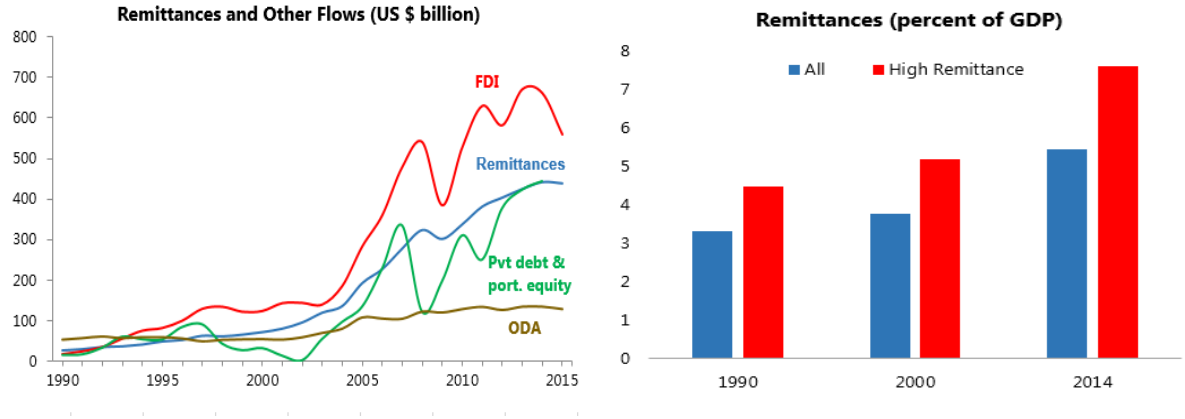
Contents **Page**

I. INTRODUCTION

Cross-border migration is a global phenomenon, with migrants accounting for over 3 percent of the world's population.[1] There are more than 250 million migrants globally, and workers' remittances—the money migrants send home to their families staying behind—amount to over US$500 billion a year. This represents one of the most important sources of income for households in many developing countries (Figure 1). In 2015, some 84 countries received migrant remittances equivalent to at least 1 percent of GDP, and 19 countries received 10 percent or more.[2] Compared to other types of private capital flows and foreign development assistance, international inflows of workers' remittances are far more significant in magnitude and cyclical stability, and thereby tend to have a greater developmental impact by raising welfare, reducing poverty, facilitating financial development, and improving educational and health opportunities and outcomes (Adams and Page, 2005; Jongwanich, 2007; Giuliano and Ruiz-Arranz, 2009).

Figure 1. Migrant Remittances Across the World, 1990-2015



Source: IMF, World Bank, Authors' calculations.

Remittances facilitate consumption smoothing, but the literature has not considered whether this effect varies with fiscal shocks. A significant body of research has focused on the response of household consumption to income fluctuations, concluding that people prefer a stable path of consumption and make decisions accordingly with regards to choices of labor and production, and borrowing and saving instruments (Townsend, 1994; Morduch, 1995; Fafchamps and Lund, 2003; Chetty and Looney, 2006). In this context, Kose, Prasad and Terrones (2009) define consumption smoothing as delinking fluctuations in idiosyncratic component of consumption from that of income to maintain a steady pace of household consumption over time. Many empirical studies have shown that the money migrants send home is used effectively as a risk-sharing arrangement to smooth consumption in developing countries (Ratha, 2003;

[1] In this paper, we focus on cross-border flows of migration, excluding internal migrants within a country.

[2] We define migrant remittances as the inflows of personal transfers included in the secondary income account. If one considers compensation of employees also as part of remittances, the number of countries with workers' remittances greater than 1 and 10 percent of GDP would be 136 and 48, respectively. Section III provides a detailed discussion of the data and definition of remittances.

Chami, Hakura, and Montiel, 2009; Bugamelli and Paterno, 2009; Combes and Ebeke, 2011). While there is a large literature on the contribution of migrant remittances to economic well-being and human development, this paper is, to the best of our knowledge, the first attempt to investigate whether remittances help smooth household consumption during fiscal shocks and whether this behavior varies with the fiscal policy stance (i.e., during contractionary and expansionary phases).

This paper analyzes the consumption-smoothing effect of migrant remittances, using cross-country and household-level panel data. Remittances can affect macro-financial developments through a spectrum of channels, including growth dynamics and inflation, consumption risk-sharing, exchange rate valuation and asset prices, tax revenues, and incidence of poverty and income distribution. In particular, migrant remittances can play an important role in delinking household consumption from output shocks and hence improving the extent of consumption smoothing. This effect is critical to the design of economic policies, especially in countries where remittances constitute a significant source of household income. Accordingly, in this paper, we provide a cross-country analysis of the consumption-smoothing effects of remittances, using fixed effects and dynamic panel models for a broad panel of 149 countries over the period from 1990 to 2014. To complement the empirical analysis utilizing cross-country macroeconomic data, we also exploit a panel dataset of household survey data collected from Mexico in 2002, 2005-06 and 2009-12 and investigate whether migrant remittances alter the consumption pattern of recipient households and whether such an effect on household consumption varies with the access to social assistance transfers.

We confirm that remittances help smooth household consumption and find that this effect is significantly greater during fiscal consolidation episodes. The cross-country empirical analysis indicates that workers' remittances help smooth household consumption (even after controlling for the standard channels of risk-sharing such as trade and financial openness). This consumption-smoothing effect is significantly greater during fiscal consolidation episodes, as remittances function as a cushion against shocks, especially in high-remittance countries. On the other hand, focusing on episodes of fiscal expansion, we find that remittances have no impact on delinking changes in consumption from those in income, even for the sample of high-remittance countries. Furthermore, a sample of large fiscal shocks indicate that remittances have a greater role in consumption smoothing during periods of significant fiscal adjustment. Likewise, utilizing household-level data from Mexico, we find that remittances contribute to higher consumption, even after controlling for a plethora of household characteristics, and remittances and social assistance transfers provided by the government are substitutes.

Fiscal policy should consider the impact of migrant remittances on household consumption, especially during large fiscal adjustments. Our empirical results provide evidence underscoring the importance of remittances in stabilizing household consumption during periods of (large) fiscal adjustments, especially in countries with greater reliance on remittances. For high-remittance countries, this finding suggests that fiscal consolidation may not necessarily have an immediate adverse effect on household consumption if the pace and composition of fiscal adjustment take into account household characteristics and put in place measures designed to protect the most vulnerable segments of society. In this context, social assistance programs (such as targeted conditional cash transfers) can be used to raise household

consumption among the poorest households as well as to incentivize improvements in health and education. The household-level empirical analysis indicates that workers' remittances play a more significant role in supporting consumption in those Mexican households that do not receive financial support or social assistance from the government.

The rest of the paper proceeds as follows. Section II places our contribution into the existing literature on consumption smoothing and risk sharing. Section III is composed of two sections. The first section provides an empirical model and discusses the findings for a cross-country analysis and the second section is composed of a country case study for Mexico. Finally, section IV concludes and provides suggestions for future research.

II. OVERVIEW OF THE LITERATURE

There is a large and growing literature on consumption smoothing and risk sharing at the macro level as well as on household level dynamics. The literature is mainly at the macroeconomic level and studies the channels through which capital flows could be used to finance consumption during economic slowdowns. Kose, Prasad and Terrones (2009), for example, find that financial openness improves consumption smoothing, and hence conclude that they help enhance welfare via reducing fluctuations in consumption. Building on this model, De and others (2016) find that workers' remittances are more stable than all other types of financial flows and that they help smooth household consumption over the business cycle. Furthermore, remittances are found to provide important insurance for households against negative macroeconomic shocks. Using a cross-country panel, Yang (2008) and Mohapatra and others (2012) show that the increase in migrant remittances in the aftermath of natural disasters acts as a safety net for households with family members working abroad, especially in poorer countries with greater dependence on remittance flows. Similarly, Combes and Ebeke (2010) consider a wide variety of macroeconomic shocks and conclude that workers' remittances act as a hedge against various types of macroeconomic instability including natural disasters, agricultural shocks, discretionary fiscal policy, systemic banking crises and exchange rate instability, dampening the effects of these sources of household consumption instability in developing countries.[3]

Empirical studies tend to focus on the capacity of remittances to reduce macroeconomic volatility. Output volatility could be shared across countries though financial and capital flows as long as these flows are not fully synchronized, Consistent with the relative stability of migrant remittances compared to other types of capital flows, a plethora of studies have shown that remittances tend to reduce output growth volatility in recipient countries (IMF, 2005; World Bank, 2006; Chami and others 2008, 2009; Craigwell, Jackman and Moore, 2010; Bugamelli and Paterno, 2011; Ajide, Raheem and Adeniyi, 2015). There is also evidence that the stabilizing effect of remittances diminishes as inflows increase as a share of GDP (Chami, Hakura, and Montiel, 2009), and the negative effect of remittances on the labor supply of remittance-dependent households may outweigh its insurance role in stabilizing consumption (Chami and others, 2008). The stabilizing effect may also depend on the extent of comovement between the business cycles of

[3] Ebeke and Combes (2013) also explore whether workers' remittances help mitigate the impact of natural disasters on growth volatility and find that remittances aggravate the destabilizing effect of natural disasters in countries receiving large remittances as a share of GDP (greater than 17 percent of GDP).

migrants' home and host countries, as noted by Gupta, Patillio and Wagh (2009) and Durdu and Sayan (2010). To the extent that remittances are procyclical with the migrants' home country's business cycle, remittances tend to have an amplifying effect, while to the extent remittances are countercyclical, remittances can act as automatic stabilizers. At the same time, Barajas and others (2012) show that migrant remittances can significantly increase the synchronization of business cycle between remittance-recipient countries and the rest of the world.

However, fewer studies have considered the impact of migrant remittances on consumption volatility. The consumption smoothing impact of cross-border capital flows has been widely discussed in the literature, highlighting their role as instruments to finance consumption during economic downturns. Similarly, given the size and relative stability over the business cycle, remittances lower the dependence of consumption on fluctuations in domestic output, and hence, make it more stable and enhance welfare. For example, Combes and Ebeke (2010) estimate the impact of remittances on consumption volatility for a large cross-sectional panel of developing countries and find evidence that remittances significantly reduce household consumption instability. De and others (2016), adopting an alternative empirical approach, follow the standard approach in the risk sharing literature to consider the impact of workers' remittances on the co-movement between domestic consumption and output and conclude that remittances help to lower the correlation between household consumption and output growth, particularly for countries that receive a larger amount of remittances. However, the literature is not conclusive on this point. Craigwell, Jackman and Moore (2010) and Jidoud (2015) obtain results indicating that workers' remittances do not have a role in consumption smoothing.

Remittances may promote consumption stability following negative macroeconomic shocks by providing a means for households to maintain their consumption. Yang and Choi (2007), using household level data for the Philippines, find that remittances sent by overseas migrants serve as insurance for households following rainfall shocks. Remittances enable remittance-receiving households to maintain their consumption following rainfall shocks, whereas households without migrants are forced to reduce their consumption. Similarly, Mohapatra, Joseph, and Ratha (2012), using household-survey data, show that remittance-receiving households in Bangladesh are able to maintain higher consumption following natural disasters, while remittance-receiving households in Ethiopia rely more on cash reserves than the sale of productive assets during food crises. The results suggest that remittances enable households to invest in more resilient infrastructure to mitigate ex-ante the impact of natural disasters, thereby helping to smooth consumption following natural disasters. Similarly, Calero, Bedi and Sparrow (2008) find that remittance-receiving households in Ecuador are able to maintain their spending on private education when faced with economic shocks. These results are consistent with an ex-post insurance role for remittances in smoothing household consumption. Remittances may also play an ex-ante insurance role for consumption.

Remittances are also found to facilitate consumption smoothing by strengthening financial inclusion. Aga and Martinez-Peria (2014) show that remittance-receiving households are more likely to open a bank account, suggesting an important role for migrant remittances in strengthening financial inclusion for poor households, while Guiliano and Ruiz-Arranz (2009) present evidence that remittances help overcome liquidity constraints and provide an alternative source of financing for investment. Carlson and others (2015), using household level data for

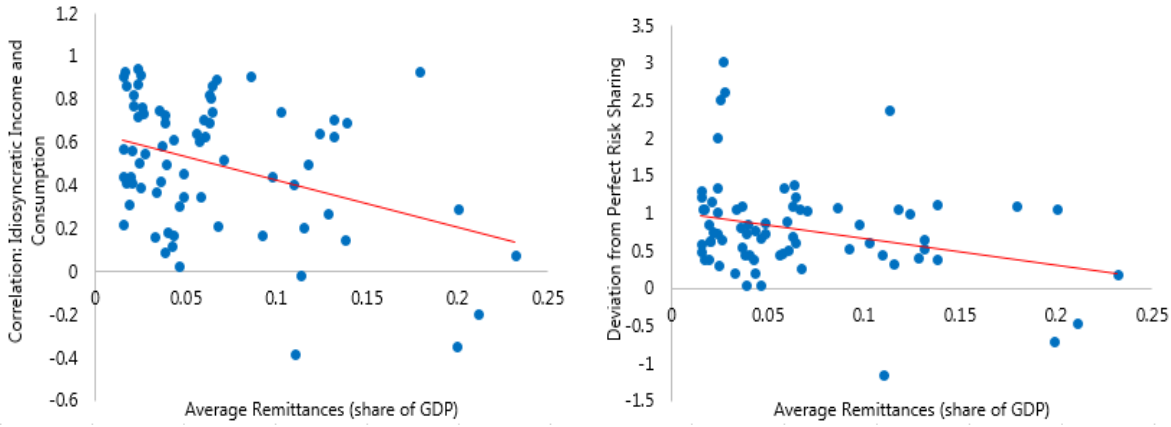
Nigeria, find that households with some financial access are better able to smooth consumption than those without. Taken together, these results suggest that by facilitating households' financial inclusion, remittances may facilitate consumption smoothing. Indeed, Combes and Ebeke (2010) and Jidoud (2015) find an enhanced role for remittances in stabilizing consumption in countries with lower levels of financial development, while Giuliano and Ruiz-Arranz (2009) show that remittances boost growth in countries with less developed financial systems.

The literature has not considered whether fiscal policy influences the consumption smoothing effect of remittances. At the macroeconomic level, the literature is divided on the response of household consumption to fiscal policy changes. While some studies (utilizing a vector autoregressive (VAR) framework to identify government spending shocks) tend to find that an increase in government spending also raises consumption (e.g. Blanchard and Perotti, 2002; Mountford and Uhlig, 2009; Perotti, 2008; Galí, López-Salido and Vallés, 2007), other studies (using the narrative approach to identify government spending shocks) typically conclude that an increase in government spending lowers household consumption (Ramey and Shapiro, 1998; Edelberg, Eicehnbaurm, and Fisher, 1999; Burnside, Eichenbaum, and Fisher, 2004). Using household level data for the United States, Giavazzi and McMahon (2012) find significant heterogeneity in households' responses to positive government spending shocks. Households with lower income respond to an increase in government spending by reducing consumption and raising hours worked as the wealth effect dominants as households realize they will eventually have to pay for higher government spending, consistent with predictions of intertemporal models, whereas households with higher income tend to increase household consumption. Therefore, these results suggest that fiscal policy may have an impact on the consumption-smoothing impact of workers' remittances on the private sector.

III. Empirical Analysis

The paper utilizes two complementary approaches to identify whether remittances improve risk-sharing opportunities and consumption smoothing. Remittances can affect macro-financial developments through a spectrum of channels, including growth dynamics and inflation, consumption risk-sharing, exchange rate valuation and asset prices, tax revenues, and incidence of poverty and income distribution. In this paper, we focus on the role of workers' remittances in delinking household consumption from output shocks and thereby determining the extent of consumption smoothing. As shown in Figure 2, migrant remittances appear to lower the degree of correlation between household consumption and output growth in the receiving country. Accordingly, this paper analyzes the consumption-smoothing effect of migrant remittances across time and during fiscal shocks, using both cross-country and household-level panel data. First, the impact of workers' remittances on consumption smoothing is assessed using static and dynamic panel models for a broad panel of 149 countries over the period 1990-2014. The consumption smoothing impact of remittances is further investigated and contrasted during periods of fiscal consolidation, expansion, and shocks. Second, to confirm the results obtained using macroeconomic data, the paper exploits household survey data from Mexico to estimate a reduced-form model of the role of migrant remittances in determining households' ability to maintain a stable level of consumption over time.

Figure 2. Remittances, Volatility and Deviation from Perfect Risk Sharing



Note: The left chart plots correlation between idiosyncratic income fluctuations, $\Delta\tilde{y}_{it}$, and consumption, $\Delta\tilde{c}_{it}$, in high remittance countries. The right chart provides a similar plot for the correlation coefficient β_1 obtained via running the regression: $\Delta\tilde{c}_{it} = \beta_0 + \gamma R_{it} + \beta_1\Delta\tilde{y}_{it} + \varepsilon_{it}$ separately for each country, measuring the correlation between idiosyncratic changes in income and consumption. Risk sharing is assumed to be perfect if the correlation is equal to zero.

Source: Authors' calculations.

A. Cross-Country Analysis

To develop our baseline model, we start with replicating the empirical specification widely used in earlier studies. We investigate the impact of remittances on the co-movements between output and consumption with a standard econometric model that defines idiosyncratic household consumption growth in Equation (1) and idiosyncratic output growth in Equation (2):

$$\Delta\tilde{c}_{it} = \Delta c_{it} - \Delta\bar{c}_t \quad (1)$$
$$\Delta\tilde{y}_{it} = \Delta y_{it} - \Delta\bar{y}_t \quad (2)$$

where Δc_{it} and Δy_{it} are household consumption growth and per capita output growth, respectively, in country i at time t. Similarly, $\Delta\bar{c}_t$ and $\Delta\bar{y}_t$ denote the global household consumption growth and global GDP per capita growth at time t, respectively. We include the main variable of interest, migrant remittances as a share of GDP (R_{it}) received by country i at time t, and study the extent to which remittances delink household consumption from output growth. Adopting the specification described De and others (2016), we analyze the consumption smoothing impact of remittances in the following form:

$$\Delta\tilde{c}_{it} = \beta_0 + \gamma R_{it} + \beta_1\Delta\tilde{y}_{it} + \beta_2 R_{it}\Delta\tilde{y}_{it} + \gamma\boldsymbol{X}_{it} + \beta_3\boldsymbol{X}_{it}\Delta\tilde{y}_{it} + \lambda_t + \alpha_i + \varepsilon_{it} \quad (3)$$

in which $\boldsymbol{X}_{it}$ represent control variables (including trade and financial openness), the interaction term ($R_{it}\Delta\tilde{y}_{it}$) measuring the extent of consumption smoothing facilitated by remittances, and λ_t,

α_i and ε_{it} denote time and country fixed effects and the error term, respectively.[4] To account for possible heteroskedasticity, robust standard errors are clustered at the country level.

A negative coefficient β_2 on the interaction term denotes the consumption smoothing effect of remittances. Absent interaction terms, i.e. $\beta_2 = \beta_3 = 0$, β_1 captures the unconditional correlation between idiosyncratic movements in output and consumption. However, if we believe that remittances help facilitate consumption risk-sharing, a higher level of migrant remittances would lead to a lower overall degree of correlation between consumption and output growth, that is β_2 should be negative. We use the ratio of remittances to GDP as a proxy for reliance on remittance flows rather than level of remittances or growth in remittances as we are addressing the question if countries with higher dependence on remittances enjoy more stable consumption patterns. Other control variables, $\boldsymbol{X}_{it}$, and channels of consumption risk-sharing such as financial openness and trade openness, are also considered. As suggested by Kose, Prasad and Terrones (2009), output fluctuations are shared by foreign countries through purchases of cross-border assets, and the degree of international risk sharing depends on the extent of globalization measured by trade and financial openness. A robust negative and statistically significant β_2 in the presence of the control variables would mean that the consumption smoothing effect of remittances is beyond the traditional risk sharing channels presented in the literature (i.e., through capital account and trade openness channels).

As a second step, we investigate the consumption smoothing impact of remittances during fiscal shocks and different fiscal stances. To study the substitutability or complementarity of fiscal policy and remittances on consumption smoothing, we divide the sample according to the fiscal policy stance (i.e., consolidation or expansion) in a given year. Equation (3) is then estimated separately for periods of fiscal expansions and contractions. Contrasting the estimation results enables us investigate the welfare-enhancing effect of remittances during different fiscal episodes. A more negative and statistically significant β_2 during fiscal consolidation (expansion) would imply that remittances are more effective during fiscal austerity (expansion). Hence, we can assess whether fiscal policy enhances (weakens) the stability of private consumption over time, and whether fiscal policy could act as a complement (substitute) for remittance inflows. Similarly, a more negative coefficient during fiscal shocks would imply that remittances enhance the stability of consumption more during bigger fiscal adjustments. We further explore if these relationships are different for high-remittance countries, that is, if consumption smoothing impact of remittances are greater in countries that rely heavily on such financial inflows.

We measure fiscal shocks as a change of at least 1.5 percentage points of GDP in the cyclically adjusted primary budget balance in either direction. There are various approaches utilized in the literature to identify fiscal policy shocks. The narrative action-based approach—developed by Romer and Romer (2010) and expanded by Devries, Guajardo, Leigh, and Pescatori (2011)—has become a popular choice in isolating fiscal episodes according to actual policy decisions by examining historical documents, such as national budget laws, budget speeches,

[4] Hadzi-Vaskov (2006) uses a similar regression to identify the role of remittances in international risk-sharing.

and central bank reports. Although the narrative action-based approach identifies fiscal episodes without being influenced by the economic cycle, it largely relies on judgment calls and, more importantly, the necessary information is not available for most developing and low-income countries.[5] Accordingly, we follow Alesina and Ardagna (1998, 2010) and measure fiscal shocks as a change of at least 1.5 percentage points of GDP in the cyclically adjusted primary budget balance in either direction.[6] The cyclically adjusted primary budget balance as a share of potential GDP filters out changes in revenues and expenditures that occur automatically with cyclical changes in economic conditions.[7] These fluctuations are filtered out with the intention of leaving only discretionary changes in the fiscal position that are deliberate choices of policymakers. We divide the sample into the episodes of fiscal consolidation and fiscal expansion, in which the cyclically adjusted primary balance improves and deteriorates, respectively, from one year to another.

Data Sources

We put together a comprehensive dataset of annual observations on a broad set of countries over the period 1990-2014.[8] Real and nominal GDP, real and nominal household consumption, and population statistics are drawn from the United Nations' National Accounts Main Aggregates Database, while the global per capita GDP series is taken from the World Bank's World Development Indicator Database. Trade openness (defined as the sum of exports and imports in GDP) and *de jure* financial openness (defined as a country's degree of capital account openness) come, respectively, from the World Bank's World Development Indicator Database and the Chinn-Ito (2006) Index dataset.

We define workers' remittances as inflows of in-cash or in-kind current transfers between resident and nonresident households. The data on migrant remittances are drawn from the IMF's Balance of Payments Statistics based on the Balance of Payments Manual 6 (BPM6). Personal transfers, included in the secondary income account, is defined as all current transfers in cash or in kind made or received by resident households to or from nonresident households. While some studies and databases (including the World Bank) calculate workers' remittances as the sum of inflows of personal transfers and compensation of employees (gross earnings of workers residing abroad less than a year, included in the primary income account), we exclude

[5] Afonso and Jalles (2014) reviews the discussion on alternative approaches to identify fiscal policy episodes.

[6] The empirical results presented in this paper remain robust to alternative fiscal shocks thresholds, such as a change in the cyclically adjusted primary budget balance of 0.5, 1 and 2 percentage points of GDP.

[7] We estimate potential GDP for each country by applying the Hodrick-Prescott (HP) filter to decompose real GDP into trend and cyclical components (Hodrick and Prescott, 1997). The HP filter removes low frequency variations and smoothes the GDP series to its stochastic trend, depending on the weight assigned to the linear time trend. If there is no noise, the series is fully informative and the weight—λ—should be equal to zero. While a λ of 100 is typically the choice for annual data in the literature, Baxter and King (1999) argue that a value of 10 is more reasonable, and Ravn and Uhlig (2002) recommend 6.25 for estimations using annual data. After experimenting with a range of smoothing parameters, we find marginal computational differences in the analysis and adopt a λ of 6.25. It should be noted that the Hodrick-Prescott filter is also susceptible to the end-point problem—the trend follows actual GDP more closely at the beginning and end of the estimation period than in the middle. We deal with the end-point problem by extending the series through 2020, using projections.

[8] The list of countries is available in Appendix Table 9.

compensation of employees in our study. The reason is that compensation of employees tends to exhibit a different pattern of macroeconomic behavior compared with personal transfers. Chami and others (2008) argue that compensation of employees is a form of earned income and not a transfer between residents and non-residents of different countries. Therefore, the behavior of these series is different over time and particularly during shocks, and there is little economic reasoning to include compensation of employees as part of workers' remittances.

There are no major differences in idiosyncratic fluctuations in income and consumption in high-remittance countries compared to the full sample. The dataset used in this paper includes 69 countries with a high degree of dependence on workers' remittances (defined as more than the median level (1.5 percent of GDP) during the period from 1990 to 2014. Tables 1 and 2 provide summary statistics of the main variables in the full sample and high-remittance countries, respectively, and show that the key variables have similar distributions in both sets. The only major difference is in trade openness which is included as a control variable and indicates that high-remittance countries have relatively lower degree of trade openness.

Table 1. Summary Statistics (Full Sample)

	Number of Observations	Mean	Standard Deviation	Min	Max
Idiosyncratic consumption growth	2,209	0.02	0.06	-0.28	0.31
Idiosyncratic output growth	2,209	0.01	0.04	-0.18	0.17
Remittances/GDP	2,209	0.04	0.06	0.00	0.49
Financial Openness	2,084	0.49	0.35	0.00	1.00
Trade Openness	2,115	0.81	0.40	0.15	3.74

Table 2. Summary Statistics (High Remittance Countries)

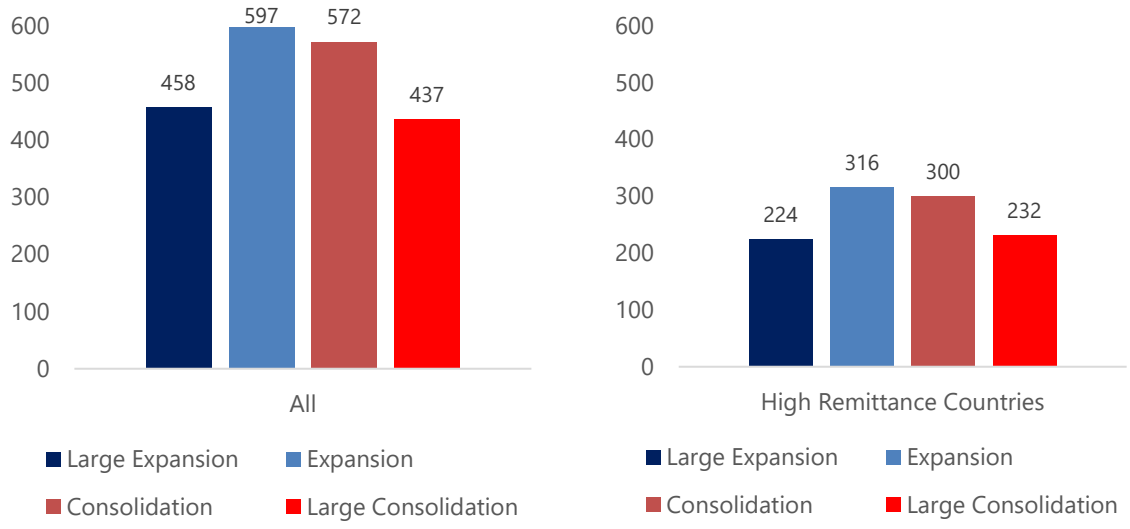
	Number of Observations	Mean	Standard Deviation	Min	Max
Idiosyncratic consumption growth	1,169	0.02	0.06	-0.28	0.30
Idiosyncratic output growth	1,169	0.01	0.04	-0.18	0.16
Remittances/GDP	1,169	0.07	0.06	0.00	0.49
Financial Openness	1,117	0.44	0.32	0.00	1.00
Trade Openness	1,111	0.78	0.31	0.15	2.11

Source: Authors' calculations

We identify fiscal episodes based on changes in the cyclically adjusted primary budget balance scaled by potential GDP. The narrative action-based approach is more appropriate in assessing fiscal episodes without being influenced by the economic cycle, but it is not feasible for most developing and low-income countries. Therefore, in this paper, we rely on the cyclically adjusted primary budget balance as a share of potential GDP to identify a country's fiscal policy stance in a given year. For these calculations, we use data on general government revenue, general government total expenditures, and interest payments, which are obtained from the IMF's Public Finances in Modern History Database and various country reports published by the IMF. Following the above-mentioned identification approach, we identify a total of 1009

episodes of fiscal consolidation (437 of which are categorized as fiscal shocks), and a total of 1055 episodes of fiscal expansion (458 of which are categorized as fiscal shocks). The distribution pattern is similar for high remittance countries: these countries experienced 532 episodes of fiscal consolidation and 540 instances of fiscal expansion of which 232 and 224 cases are categorized as fiscal shocks, respectively (Figure 3).

Figure 3. Distribution of Fiscal Episodes



Source: Authors' calculations based on the IMF Public Finances in Modern History Database and country reports.

Empirical Results

In line with the literature, the correlation of output and consumption is on average lower in countries that receive higher remittances. The fixed-effect estimation results for the period 1990-2014 are presented in Appendix Table 1. The estimated β_2 coefficient is negative and statistically significant for the full sample, as well as a sub-sample of high-remittance countries. These empirical findings are robust to the inclusion of control variables (trade and financial openness), and indicate that workers' remittances help smooth household consumption beyond the standard channels of risk-sharing. In our opinion, this reflects consumption smoothing through intertemporal savings and better access to liquidity and financial services facilitated in part by migrant remittances, especially during periods of economic difficulty.

The consumption-smoothing effect of remittances is magnified especially during fiscal consolidation episodes. Appendix Table 2 reports results for the periods of fiscal consolidation. A comparison of β_2 coefficients in Appendix Table 1 and 2 implies that workers' remittances are more effective in smoothing household consumption during fiscal consolidation episodes. In other words, during a period of fiscal austerity (which tends to be correlated with lower output, lower social transfers, and lower household consumption), migrant remittances function as a cushion to smooth household consumption and hence increase welfare. Our analysis further detects that the consumption-smoothing impact of workers' remittances during fiscal consolidation episodes is even greater in high-remittance countries. A comparison of β_2

coefficients in columns 1-4 compared with those in columns 5-8 of Appendix Table 2 supports the view that the impact is bigger in countries that receive higher remittance inflows.[9] During the consolidation periods, workers' remittances help households compensate for the loss in consumption due to lower social transfers, and through intertemporal savings or consuming higher proportion of remittances. Furthermore, since financial systems tend to be more developed in remittance-recipient economies as shown in the literature, households in these countries benefit more from greater access to finance, savings and credit instruments to smooth consumption against income shocks.

On the other hand, workers' remittances do not appear to smooth household consumption during periods of fiscal expansion. Focusing on episodes of fiscal expansion, we find that remittances have no impact on delinking changes in consumption from those in income, and this observation holds even for the sample of high-remittance countries (which tend to benefit more from welfare-enhancing effects of migrant remittances). As presented in Appendix Table 3, the consumption smoothing coefficient, β_2, is not statistically significant or robust across different specifications. Therefore, we support the view that remittances do not help smooth consumption during periods of fiscal expansion even in high-remittance countries.

Remittances tend to have a significant role in stabilizing household consumption during large fiscal shocks. Focusing on large fiscal shocks, we obtained similar results indicating that workers' remittances have a greater role in consumption smoothing during periods of large fiscal adjustments (see Appendix Table 4).[10] Figure 4 provides a summary view of our main findings and plots the β_2 coefficient for the baseline regressions presented in columns 1 and 5 of Appendix Tables 1-4. It visualizes the consumption-smoothing impact of remittances for the full sample of countries, as well as separately for high-remittance countries, during different phases of the fiscal policy stance categorized as fiscal consolidations, fiscal expansions, and large fiscal shocks.[11] We also further decompose large fiscal shocks into contractionary and expansionary episodes to identify the consumption-smoothing role of workers' remittances, especially during large fiscal adjustments. Although this effect is highly significant during periods of fiscal consolidation, we find that remittances do not have a significant role in smoothing household consumption during periods of fiscal expansion.

The estimated smoothing effect of workers' remittances on household consumption is substantial, especially in high-remittance countries. Taking the baseline coefficient β_2 for the regression with the full sample (-2.56) and multiplying that by the median level of remittances-to-GDP ratio in high-remittance countries (4.9 percent) implies that the correlation between

[9] Differences in the coefficients for the full sample and fiscal consolidation episodes are statistically significant, which is also the case for the subsample of high-remittance countries.

[10] The consumption-smoothing impact of remittances is asymmetric for periods of fiscal shock. It is amplified during the contractionary periods, i.e., when cyclically adjusted primary balance is contracted compared with those periods expanded by more than 1.5 percent of GDP. These results are available upon request.

[11] We apply the Chow (1960) test whether the difference between the coefficients in two separate regressions is statistically significant and find that the consumption-smoothing impact of remittances for high-remittance countries *versus* other countries during periods of fiscal consolidation and for high-remittance countries during fiscal shocks compared with periods of no fiscal shocks are statistically different.

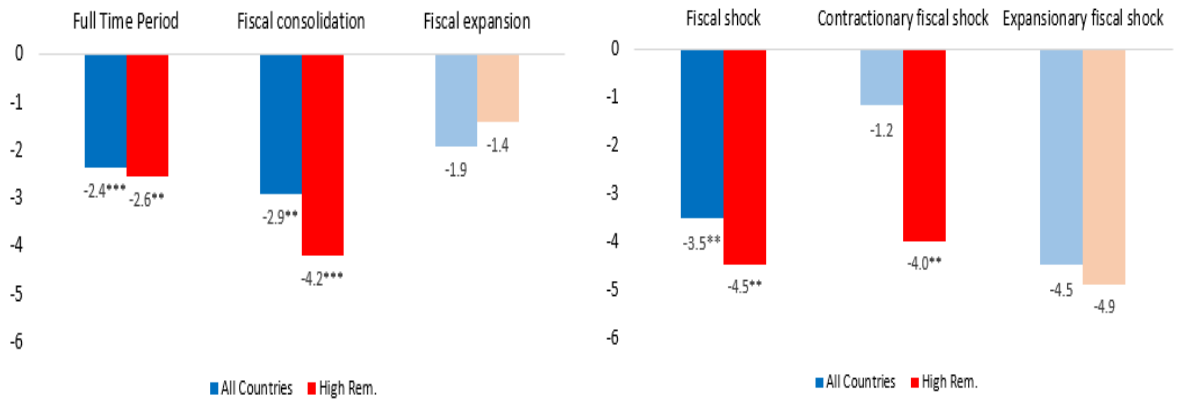
country-specific consumption and output is lower by 0.13, that is down from 0.87 to 0.74. The estimated impact is even greater for periods of fiscal consolidation and fiscal shocks, with the overall mitigating effect on the correlation in a high-remittance country evaluated at 0.21 and 0.22, respectively. In other words, these calculations imply that the correlation between income and consumption during fiscal consolidation and fiscal shock periods declines from around 1.0 to almost 0.80.

We use a dynamic panel data estimation method to check the robustness of our findings against potential endogeneity and reverse causality. While workers' remittances influence fluctuations in consumption, we do not dismiss the possibility of reverse causality and therefore utilize the system Generalized Method of Moments (GMM) technique proposed by Arellano and Bover (1995) and Blundell and Bond (1998) to address potential endogeneity of the explanatory variables. The system GMM approach involves constructing two sets of equations, one with first differences of the endogenous and pre-determined variables instrumented by suitable lags of their own levels, and one with the levels of the endogenous and pre-determined variables instrumented with suitable lags of their own first differences. A further issue is that the use of large number of instruments significantly weakens the Hansen *J*-test of over-identifying restrictions, and so the detection of over-identification is hardest when it is most needed. Conversely, however, restricting the instrument set too much results in a loss of information that leads to imprecisely estimated coefficients.

The system GMM estimations require a delicate balance between maximizing the information extracted from the data and guarding against over-identification. To this end, we use three-year averages help smooth out short-run fluctuations, and reduce the number of time periods so that the number of countries is more than the number of time periods in all regressions (including those for various subsamples). We also follow the strategy suggested by Roodman (2009) to deal with the problem of weak and excessively numerous instruments, and validate the system GMM identification assumptions by applying a second-order serial correlation test for the residuals and the Hansen *J*-test for overidentifying restrictions. The system GMM results, presented in Appendix Tables 5-8, confirm that migrant remittances help smooth household consumption and that this effect is more pronounced during episodes of fiscal consolidation and large fiscal shocks, especially in countries with greater dependence on remittance flows.

The consumption-smoothing impact of migrant remittances generally holds regardless of regional or income categories. Appendix Figure 1 presents the baseline β_2 coefficient for each regional category, while Appendix Figure 2 reports the baseline β_2 coefficient according to the income grouping of countries. They express that the main findings are in line with the full sample: that remittances support stabilize consumption more significantly during fiscal consolidation and fiscal shocks and that the impact is much greater for high remittance recipients. There is some heterogeneity across the regions though in that the relationship fails to hold in Africa and is more significant for the remittance recipients in Latin America and Caribbean, and in Asia. Emerging economies and, to a greater extent, countries with lower income levels also tend to benefit more from remittances in stabilizing their consumption.

Figure 4. Consumption Smoothing Impact of Remittances



Note: The bar chart shows the consumption smoothing impact of remittances (β_2) estimated by Equation (3). The symbols *, **, and *** suggest statistical significance at 10, 5, and 1 percent levels, respectively. "High Rem." Refers to high remittance countries, those with remittance inflows greater than the median 1.5 percent of GDP during the 1990-2014 period.

Source: Authors' calculations.

B. Household-Level Analysis

Mexico is an interesting choice for our household level analysis given the high degree of emigration and reliance on migrant remittances. According to the United National Development Program (UNDP), about 10 percent of Mexico's population lives outside of Mexico, with almost all (about 98 percent) of Mexican migrants residing in the United States (Figure 5). These migrants send vast sums of remittances to Mexico, amounting to around US$25 billion (or over 2 percent of GDP) annually and providing an important source of financing for the Mexican economy.[12] Using a panel of three waves of a survey covering 8,440 households over the period 2002-2012, we test the impact of migrant remittances on household consumption and analyze whether workers' remittances and government support are substitutes or complements in influencing consumption at the household level. The baseline model is:

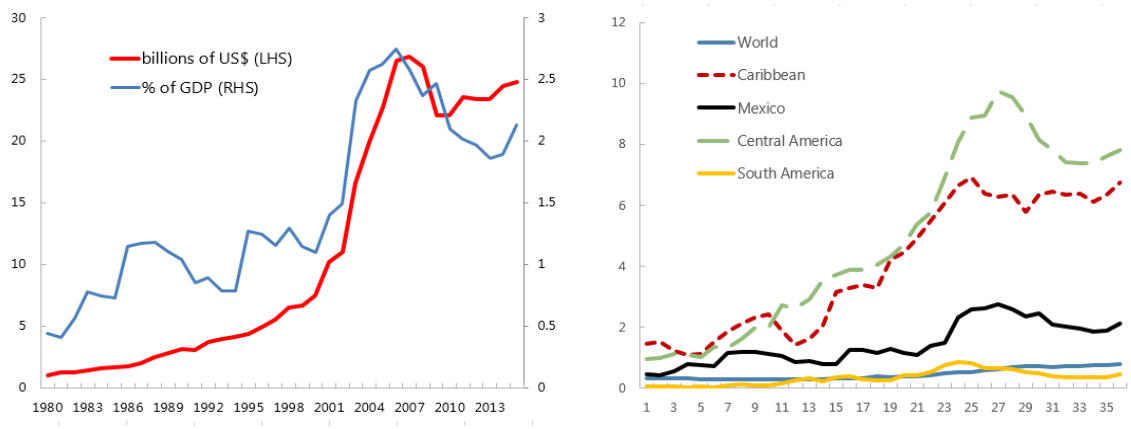
$$C_{ijt} = \alpha + \beta_1 R_{ijt} + \beta_2 GOV_{ijt} + \beta_5 \boldsymbol{X}_{ijt} + \mu_{it} + \theta_{jt} + \varepsilon_{it}, \quad (4)$$

where C_{ijt} is log per capita consumption for household i in location j at period t. $R_{ijt}$is a binary indicator of whether household i in location j at period t reports receiving migrant remittances, while GOV_{ijt}, is a similar binary indicator denoting whether household i in location j at period t reports receiving social assistance transfers from the government. μ_{it} are household-time fixed effects, while θ_{jt} are location–time fixed effects, and $\boldsymbol{X}_{ijt}$ is a vector of control variables, including household size, average years of education of adult household members, age of the household

[12] The global financial crisis hit remittances to Mexico particularly hard given the concentration of its migrants in the United States: the epicenter of the crisis, and the concentration of the recession in industries, in which Mexico's migrants are typically employed like construction (Beaton and others, 2017). Consequently, workers' remittances declined from the pre-crisis peak of 2.7 percent of GDP to 2.1 percent of GDP in 2015.

head, and household net financial worth.[13] To study the substitutability or complementarity of fiscal policy and remittances on consumption, we divide the sample according to households that do and do not receive remittances and those that do and do not receive support from the government. An alternative approach is to include interaction terms in Equation (4) to assess the extent to which remittances and government spending separately delink consumption from income. However, this would require interacting these variables with an indicator that captures whether households have experienced a negative income shock in the absence of suitable time series data on household income, and interacting two dummy variables would become empirically difficult.

Figure 5. Migrant Remittances in Mexico, 1980-2015



Source: IMF; UNDP; World Bank; Authors' calculations.

Data Sources

We conduct the household-level empirical analysis using panel data from the Mexican Family Life Survey (MxFLS).[14] The MxFLS is a longitudinal panel survey representative of the Mexican population at the national, urban, rural, and regional levels conducted jointly by the Centro de Investigación y Docencia Económica (Center for Research and Teaching in Economics, CIDE) and the Universidad Iberoamericana in Mexico City (UIA). The survey is multi-thematic, covering information on a wide range of socioeconomic and demographic indicators at the individual, household and community level. Detailed information on households' consumption and economic well-being as well as migration and government subsidies or aid is included. The survey has been conducted three times: in 2002, over 2005-2006 and over 2009-2012. It tracks the same households over time to observe changes in individual households' characteristics. The first survey collected information on a sample of 35,000 individuals from 8,440 households in 150

[13] Household income is not included directly given concerns about measurement error in income data from household surveys. Household wealth, which tends to be more accurately reported, is included instead. The results are robust to the inclusion of household income.

[14] Rubalcava and Teruel (2006, 2008, 2013) provide detailed information on the MxFLS database, which is the first survey in Mexico with longitudinal design.

communities. Of the households initially surveyed, 7332 households responded to the survey in all three survey rounds, which forms the balanced data set we use in this paper.

The MxFLS includes detailed information on the migration patterns of Mexican individuals and households. Most importantly, it includes detailed information on the migration of Mexicans to the United States (which is the main destination of Mexico's emigrants). The survey also includes detailed information on individuals' and households' receipt of monetary transfers (and from whom). This detailed dataset combining information on migration and receipt of monetary transfers can be used to infer whether a household receives remittances as well as the magnitude of the remittances received. Following Ambrosius (2015), we classify households as remittance-receiving if at least one household member received monetary transfers from a family member living in the United States during the last year. By this classification, on average over the three survey rounds around, 6 percent of households received remittances. The estimates for the share of remittance-receiving households are very similar to those based on the Encuesta Nacional de Ingreso y Gasto de los Hogares (ENIGH), a biannual household survey carried out by the Mexican Statistics Institute, INEGI).[15]

The MxFLS database also provides detailed information on the types of government subsidies or aid received by individuals and households. The survey provides information at the level of individual on government subsidies or social assistance programs. These programs are covered consistently across the survey years, except for instances when there were changes in government support programs, in these cases, the survey questionnaire was updated to either remove or add new programs.[16] We classify a household as receiving government social assistance if any individual adult household member reports receiving social assistance through any of the government programs included in the survey and refer to these households as households receiving government support.[17]

A greater proportion of Mexican households receive government support than migrant remittances. As presented in Table 3, on average across the three survey rounds about 9 percent of households indicated receiving government support under one of the social assistance programs, compared to an average of about 6 percent of households reporting receiving remittances. Of the households receiving remittances, about 70 percent reported not receiving government support, while of the households receiving government support about 90 percent reported not receiving remittances. There is therefore very little overlap between households receiving remittances and households receiving government support, only about 1 percent of households on average report receiving both remittances and government support. This suggests that remittances and government support may be substitutes.

Average household expenditure is higher for remittance receiving households than those who receive government support. Total household spending on goods and services on an annualized basis is calculated as the sum of all expenditure items included in the survey. In the

[15] Estimates from the ENIGH suggest that about 5 percent of households received remittances in 2014 (Beaton and others, 2017)

[16] Appendix Table 10 provides a list of all the programs covered in each round of household survey.

[17] The MxFLS dataset classifies those aged 15 and older as adults.

MxFLS, the length of the period over which consumption patterns are measured varies by goods, ranging from the past 7 days to the past 12 months. We annualize the consumption figure for each good and sum over all goods to get a measure of annualized consumption in a given survey round. Household net worth is calculated as the total value of all reported household assets including the reported value of housing. Average household expenditure for remittance receiving households is also, on average, higher than that for households that do not receive either remittances or government support. Households that receive government support have, on average, the lowest household expenditure, while households that receive government support and migrant remittances tend to spend more than households with only government support. However, their expenditure remains below that of households receiving only remittances.

Table 3. Mexican Households: Income Sources and Expenditure Shares

	2002	2005-06	2009-12
Total Remittances Receiving Households	508	435	394
(in percent of total households)	6.9	5.9	5.4
Remittance Receiving Households (no Government Support)	346	407	321
(in percent of total households)	4.7	5.6	4.4
Total Government Support Receiving Households	1002	303	692
(in percent of total households)	13.7	4.1	9.4
Government Support Receiving Households (no Remittances)	908	274	619
(in percent of total households)	12.4	3.7	8.4
Remittance and Government Support Receiving Households	94	29	73
(in percent of total households)	1.3	0.4	1.0
Average Household Expenditure (in thousands of pesos)			
Remittance Receiving Households	60.6	68.0	62.7
Government Support Receiving Households	34.2	46.4	55.9
Remittance and Government Support Receiving Households	44.6	51.8	50.3
Household does not Receive Remittances or Government Support	61.7	60.0	62.2

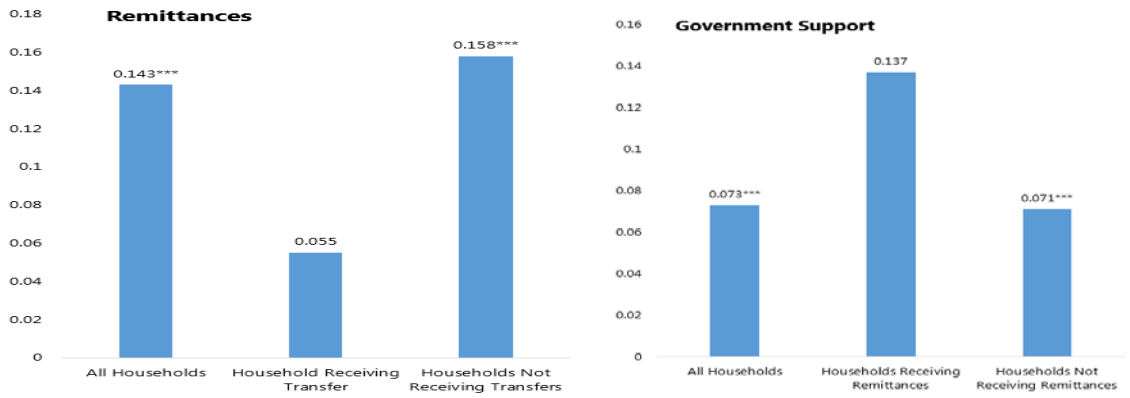
Source: MxFLS; Authors' calculations.

The basic socio-demographic characteristics of households are broadly consistent across remittance and government-support receiving households. Both types of households have a mean household size of around 5 members, which has remained stable across the survey rounds. Households that receive remittances tend to have a larger share of adult household members with secondary or higher education. The average age of the household head is also generally consistent across household groups, although for the third survey wave in particular is higher for those households receiving government support. This may be associated with the inclusion of the 70 y más program in the last survey round.

Empirical Results

Workers' remittances and government social assistance programs raise consumption at the household level in Mexico. The results of the benchmark specification are reported in Table 4 (as well as in Figure 6). We first estimate a version of the baseline model without remittances or government support. The results of this regression confirm the appropriateness of our control variables. The level of consumption is higher for household with more members, those that are more educated and have a higher net worth. Households with older household heads tend to consume less. We then separately add remittances and government social support to the model. The results suggest that both remittances and government support increase the level of household consumption, both effects are statistically significant whether both types of income support are included separately or together in the baseline model.

Figure 6. Effect of Remittances and Government Support on Consumption



Source: Authors' calculation.

We find that workers' remittances and social assistance transfers provided by the Mexican government are substitutes. Table 5 reports the results for the same exercise as in Table 4, but for different groupings of households. The results in columns (1) and (2) for households with and without government support imply that remittances play a more significant role in supporting consumption of those households which do not receive government support. For these households, migrant remittances have a positive and significant effect on household consumption whereas remittances do not have a significant effect on consumption in households with government support. This finding suggests that workers' remittances and government support can be substitutes, which is in line with evidence from our cross-country panel analysis. That is, remittances have no impact on delinking change in consumption from those in income during periods of fiscal expansion, which at the household level can most closely affect household through changes in the transfers they receive. When households receive no government transfers, remittances can help to support their consumption by consuming a higher share of their remittances. The results in columns (3) and (4) provide further evidence that remittances and government support can be substitutes. For households that do not receive remittances, government support has a positive and significant effect on household consumption, while for households with remittances the effect of government support on household consumption is insignificant.

Table 4. Determinants of Household Consumption in Mexico

	(1)	(2)	(3)	(4)
Remittances Receiving Household		0.150***		0.143***
		(0.026)		(0.027)
Government Support Receiving Household			0.074***	0.073***
			(0.021)	(0.021)
Number of Household Members	0.071***	0.071***	0.063***	0.063***
	(0.006)	(0.006)	(0.006)	(0.006)
Household Members with Secondary or Higher	0.001***	0.001***	0.001***	0.001***
Education (in percent)	(0.000)	(0.000)	(0.000)	(0.000)
Age of Household Head	-0.004**	-0.004**	-0.004**	-0.004**
	(0.002)	(0.002)	(0.002)	(0.002)
Household Assets (Ln)	0.066***	0.066***	0.065***	0.065***
	(0.004)	(0.004)	(0.004)	(0.004)
Constant	8.579***	8.565***	8.634***	8.630***
	(0.189)	(0.189)	(0.324)	(0.324)
Observations	19,443	19,274	18,143	18,079
Number of households	7,289	7,273	7,228	7,221
Adjusted R-squared	0.113	0.116	0.108	0.109

Note: Robust standard errors are reported in parentheses. The dependent variable is log per capita household consumption. The estimates are based on equation (4).

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

Table 5. Determinants of Household Consumption in Mexico: The Role of Government Support and Remittances

	(1) Households without Government Support	(2) Households with Government Support	(3) Households without Remittances	(4) Households with Remittances
Remittances Receiving Household	0.158***	0.055		
	(0.031)	(0.119)		
Government Support Receiving Household			0.071***	0.137
			(0.023)	(0.146)
Number of Household Members	0.068***	0.069**	0.068***	-0.023
	(0.007)	(0.030)	(0.007)	(0.038)
Household Members with Secondary or	0.002***	-0.001	0.001***	0.004
Higher Education (in percent)	(0.000)	(0.003)	(0.000)	(0.004)
Age of Household Head	-0.004**	-0.024	-0.004**	-0.022*
	(0.002)	(0.016)	(0.002)	(0.011)
Household Assets (Ln)	0.063***	0.042*	0.063***	0.058*
	(0.005)	(0.023)	(0.005)	(0.030)
Constant	8.671***	11.070***	8.767***	11.352***
	(0.318)	(0.846)	(0.326)	(0.842)
Observations	16,210	1,869	16,895	1,184
Number of folio	7,110	1,509	7,139	1,013
Adjusted R-squared	0.108	0.153	0.108	0.214

Note: Robust standard errors are reported in parentheses. The dependent variable is log per capita household consumption. The estimates are based on equation (4).

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

IV. CONCLUSION

With 250 million migrants globally, workers' remittances are one of the major sources of income for households in many developing countries. There is a significant body of research focusing on the impact of migrant remittances at the macroeconomic level as well as on household behavior in recipient countries. While there is abundant evidence that remittances facilitate consumption smoothing, the literature has not considered whether this effect varies with the fiscal policy stance and during fiscal shocks. This paper is, to the best of our knowledge, the first attempt to investigate whether workers' remittances help smooth household consumption during fiscal shocks and whether this behavior varies according to the fiscal policy stance (i.e. during contractionary and expansionary phases).

Migrant remittances are found to smooth household consumption, with a significantly greater effect during periods of fiscal consolidation. We provide a cross-country analysis of the consumption-smoothing effects of remittances, using a broad panel of 149 countries over the period from 1990 to 2014. The cross-country empirical analysis indicates that workers' remittances help smooth household consumption (even after controlling for the standard channels of risk-sharing such as trade and financial openness). This consumption-smoothing effect is significantly greater during fiscal consolidation episodes, as migrant remittances function as a cushion against shocks, especially in high-remittance countries. We also find evidence indicating that migrant remittances play a greater role in smoothing household consumption during periods of large fiscal adjustment. On the other hand, focusing on episodes of fiscal expansion, we find no significant impact of workers' remittances on delinking changes in household consumption from those in income, even for the sample of high-remittance countries.

We also explore the impact of remittances on household consumption at the micro level, using household surveys from Mexico. To supplement the cross-country empirical analysis, we take advantage of a panel dataset of household surveys from Mexico collected in 2002, 2005-06 and 2009-12 and investigate whether migrant remittances alter the consumption pattern of recipient households at the micro level and whether such an effect on household consumption varies with the access to social assistance transfers. This household-level analysis shows that migrant remittances contribute to higher consumption, even after controlling for a plethora of household characteristics (such as education and net financial worth). Furthermore, we focus on different groupings of households and find that migrant remittances have a positive and significant effect on consumption in household that do not receive government assistance whereas remittances do not have a significant effect on consumption in households with government support. In line with the evidence from our cross-country analysis, this finding suggests that workers' remittances and social assistance transfers provided by the government can be substitutes.

Policymakers should take into account the impact of migrant remittances on household consumption in designing fiscal adjustments. Our empirical results provide evidence that underscores the importance of workers' remittances in stabilizing household consumption during periods of (large) fiscal adjustments, especially in countries with greater reliance on remittances. For high-remittance countries, this finding suggests that fiscal consolidation episodes may not necessarily have an immediate adverse effect on household consumption as long as the pace

and composition of fiscal adjustment take into account household characteristics and put in place measures designed to protect the most vulnerable segments of the society. In this context, social assistance programs (such as targeted cash transfers) can be used effectively to raise household consumption among the poorest households as well as to incentivize particular outcomes in health and education. The analysis based on household-level data from Mexico indicates that workers' remittances play a more significant role in supporting consumption in those households that do not receive financial support or social assistance from the government.

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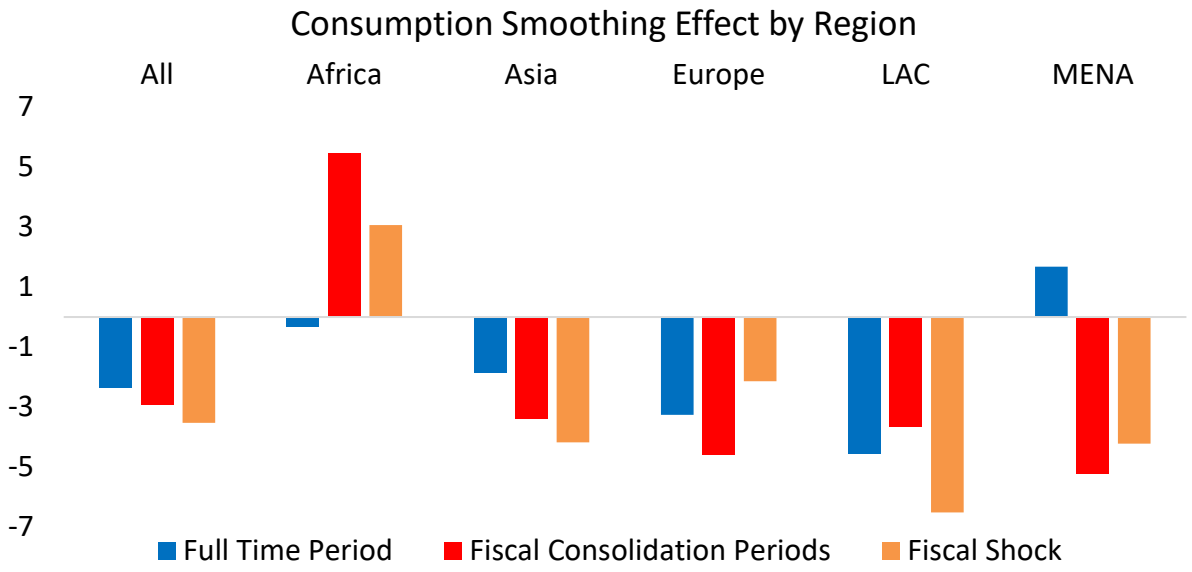
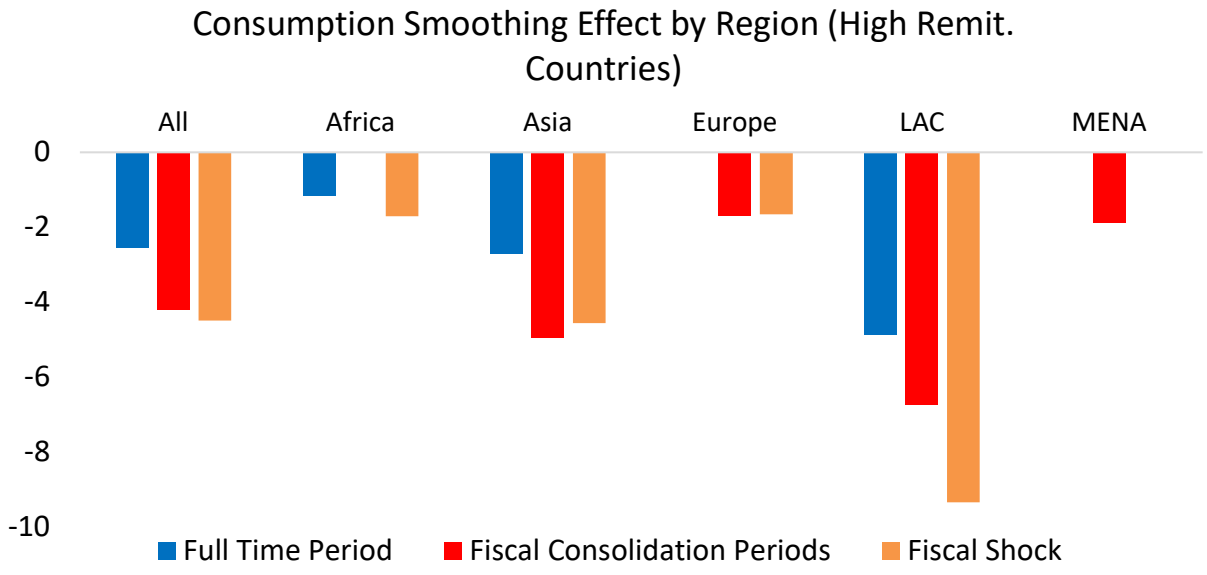
Appendix Figure 1: Consumption Smoothing Impact of Remittances by Region

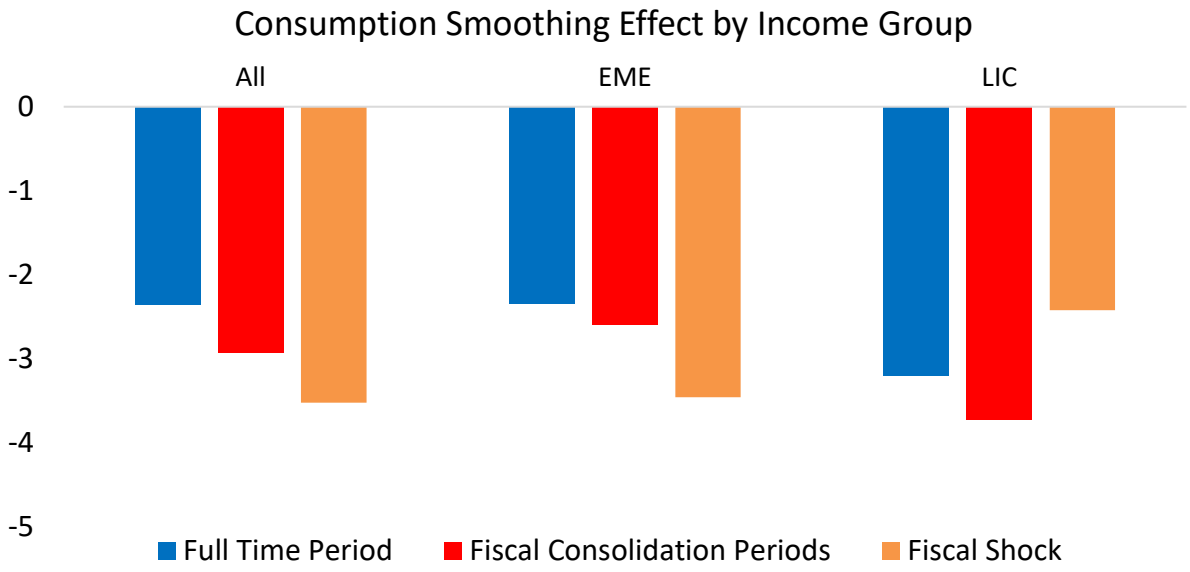


Note: The bar chart shows the consumption smoothing impact of remittances (β_2) estimated by Equation (3) for each regional category and by fiscal stance.

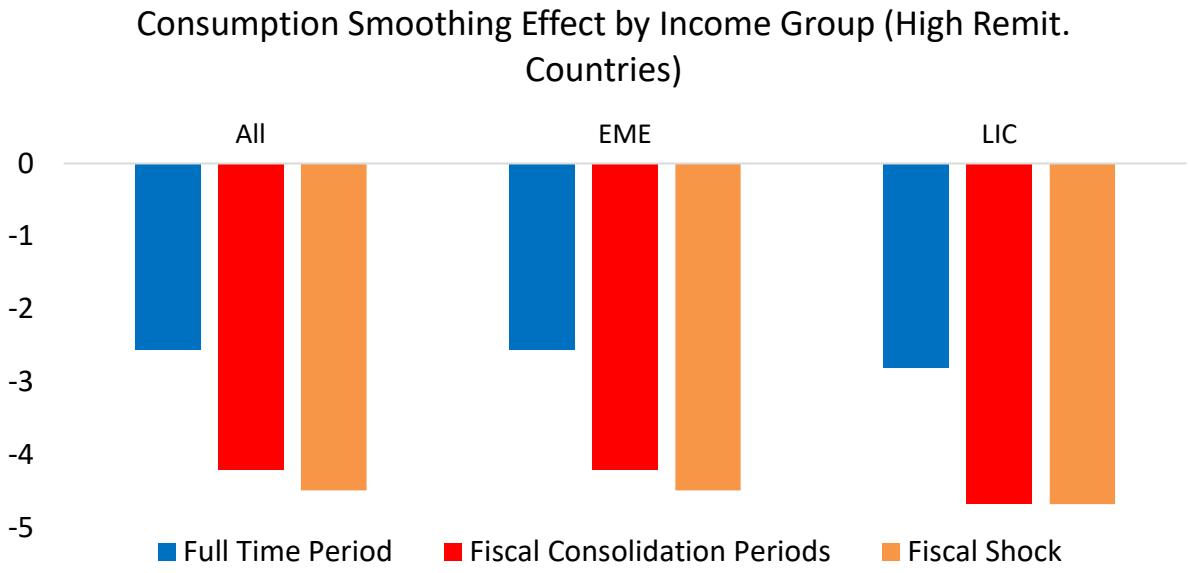


Note: The bar chart shows the consumption smoothing impact of remittances (β_2) in high remittance countries estimated by Equation (3) for each regional category and by fiscal stance. High remittance countries are those with remittance inflows greater than the median 1.5 percent of GDP during the 1990-2014 period.

Appendix Figure 2: Consumption Smoothing Impact of Remittances by Income Group



Note: The bar chart shows the consumption smoothing impact of remittances (β_2) estimated by Equation (3) for each income grouping and by fiscal stance. EME refers to emerging markets and LIC stands for low income countries.



Note: The bar chart shows the consumption smoothing impact of remittances (β_2) in high remittance countries estimated by Equation (3) for each regional category and by fiscal stance. High remittance countries are those with remittance inflows greater than the median 1.5 percent of GDP during the 1990-2014 period. EME refers to emerging markets and LIC stands for low income countries.

Appendix Table 1: Full Sample Period

1990 - 2014	All	All	All	All	High_R	High_R	High_R	High_R
Δy	0.847***	0.874***	1.143***	1.184***	0.869***	0.838***	1.150***	1.300***
	[0.058]	[0.091]	[0.108]	[0.129]	[0.101]	[0.118]	[0.178]	[0.173]
R	0.090*	0.077	0.057	0.040	0.096*	0.067	0.044	0.009
	[0.048]	[0.050]	[0.054]	[0.055]	[0.050]	[0.055]	[0.058]	[0.063]
R * Δy	**-2.361*** **	**-2.177** **	**-2.222** **	**-2.080** **	**-2.558** **	**-1.632***	**-1.849***	**-0.990**
	[0.827]	**[0.869]**	**[0.926]**	**[0.930]**	**[0.990]**	**[0.957]**	**[1.029]**	**[1.056]**
Fin. Openness		0.009		0.007		-0.002		0.001
		[0.008]		[0.008]		[0.009]		[0.010]
Fin. Openness * Δy		-0.065		-0.057		-0.148		-0.303*
		[0.131]		[0.141]		[0.210]		[0.178]
Trade Openness			0.023	0.021			0.045**	0.035**
			[0.014]	[0.013]			[0.019]	[0.016]
Trade Openness * Δy			-0.388***	-0.398**			-0.479**	-0.575***
			[0.121]	[0.159]			[0.223]	[0.195]
Constant	-0.001	-0.006	-0.017	-0.019	-0.010	-0.010	-0.040**	-0.031*
	[0.006]	[0.007]	[0.014]	[0.013]	[0.010]	[0.011]	[0.018]	[0.016]
Observations	2,209	2,084	2,115	2,003	1,169	1,117	1,111	1,072
R-squared	0.205	0.205	0.213	0.217	0.198	0.188	0.212	0.217
Number of Countries	149	139	144	135	69	65	66	63

Note: Robust standard errors are reported in brackets. The dependent variable is the idiosyncratic growth in consumption. The estimates are based on equation (3) including country and time fixed effects. A negative β_2 indicates that remittances help smooth consumption by delinking correlation between country-specific growth in consumption and output. High_R refers to the sample of high-remittance countries, those with remittance inflows greater than the median 1.5 percent of GDP during the 1990-2014 period. R denotes remittances as percent of GDP, Δy is the country-specific output growth, "Fin. Openness" is the normalized index of financial openness obtained from Chinn-Ito (2006), and "Trade Openness" is defined as the sum of exports and imports in GDP derived from the World Bank's World Development Indicator Database. *, **, and *** denote statistical significance at 10, 5, and 1 percent levels, respectively.

Appendix Table 2: Fiscal Consolidation

1990 - 2014	All	All	All	All	High_R	High_R	High_R	High_R
Δy	0.860***	0.828***	0.988***	1.009***	1.001***	0.878***	0.827***	1.000***
	[0.089]	[0.137]	[0.146]	[0.166]	[0.164]	[0.215]	[0.299]	[0.315]
R	0.190**	0.220***	0.142	0.179*	0.192**	0.206**	0.137	0.162
	[0.082]	[0.083]	[0.095]	[0.096]	[0.094]	[0.092]	[0.106]	[0.106]
R * Δy	**-2.926****	**-3.639*****	**-3.171****	**-3.946*****	**-4.206*****	**-4.066*****	**-4.550*****	**-4.181*****
	[1.234]	**[1.193]**	**[1.216]**	**[1.178]**	**[1.388]**	**[1.301]**	**[1.340]**	**[1.147]**
Fin. Openness		0.030**		0.031**		0.017		0.026**
		[0.012]		[0.012]		[0.014]		[0.013]
Fin. Openness * Δy		0.182		-0.027		0.107		-0.448
		[0.194]		[0.193]		[0.375]		[0.314]
Trade Openness			0.004	-0.000			0.001	-0.007
			[0.015]	[0.014]			[0.018]	[0.018]
Trade Openness * Δy			-0.168	-0.089			0.176	0.112
			[0.149]	[0.215]			[0.385]	[0.394]
Constant	-0.000	-0.018	-0.002	-0.017	-0.004	-0.016	-0.000	-0.010
	[0.008]	[0.011]	[0.013]	[0.014]	[0.013]	[0.015]	[0.014]	[0.015]
Observations	1,009	954	964	915	532	508	504	486
R-squared	0.246	0.271	0.247	0.279	0.232	0.220	0.245	0.247
Number of Countries	145	136	139	131	69	65	66	63

Note: Robust standard errors are reported in brackets. The dependent variable is the idiosyncratic growth in consumption. The sample is restricted to the periods of fiscal consolidation defined as narrowing of the cyclically adjusted primary budget balance. The estimates are based on equation (3) including country and time fixed effects. A negative β_2 indicates that remittances help smooth consumption by delinking correlation between country-specific growth in consumption and output. High_R refers to the sample of high-remittance countries, those with remittance inflows greater than the median 1.5 percent of GDP during the 1990-2014 period. R denotes remittances as percent of GDP, Δy is the country-specific output growth, "Fin. Openness" is the normalized index of financial openness obtained from Chinn-Ito (2006), and "Trade Openness" is defined as the sum of exports and imports in GDP derived from the World Bank's World Development Indicator Database. *, **, and *** denote statistical significance at 10, 5, and 1 percent levels, respectively.

Appendix Table 3: Fiscal Expansion

1990 - 2014	All	All	All	All	High_R	High_R	High_R	High_R
Δy	0.846***	0.959***	1.072***	1.071***	0.754***	0.927***	1.105***	1.227***
	[0.075]	[0.112]	[0.178]	[0.196]	[0.123]	[0.150]	[0.250]	[0.226]
R	-0.015	-0.006	-0.031	-0.014	-0.021	-0.022	-0.069	-0.058
	[0.083]	[0.081]	[0.085]	[0.082]	[0.097]	[0.092]	[0.097]	[0.092]
R * Δy	**-1.917**	**-1.331**	**-1.504**	**-1.165**	**-1.392**	**-0.283**	**-0.089**	**0.480**
	[1.240]	**[1.202]**	**[1.167]**	**[1.138]**	**[1.578]**	**[1.462]**	**[1.382]**	**[1.327]**
Fin. Openness		0.012		0.005		-0.009		-0.015
		[0.015]		[0.015]		[0.019]		[0.019]
Fin. Openness * Δy		-0.358**		-0.202		-0.559**		-0.412**
		[0.175]		[0.171]		[0.218]		[0.198]
Trade Openness			0.035	0.033			0.060**	0.050**
			[0.021]	[0.022]			[0.023]	[0.023]
Trade Openness * Δy			-0.320	-0.251			-0.596**	-0.552**
			[0.208]	[0.243]			[0.286]	[0.242]
Constant	-0.006	-0.013	-0.030	-0.031	-0.012	-0.009	-0.051*	-0.038
	[0.009]	[0.013]	[0.023]	[0.025]	[0.017]	[0.021]	[0.030]	[0.030]
Observations	1,055	1,007	1,015	969	540	522	519	503
R-squared	0.218	0.209	0.223	0.215	0.232	0.234	0.250	0.256
Number of Countries	146	137	142	134	69	65	66	63

Note: Robust standard errors are reported in brackets. The dependent variable is the idiosyncratic growth in consumption. The sample is restricted to the periods of fiscal expansion defined as widening of the cyclically adjusted primary budget balance. The estimates are based on equation (3) including country and time fixed effects. A negative β_2 indicates that remittances help smooth consumption by delinking correlation between country-specific growth in consumption and output. High_R refers to the sample of high-remittance countries, those with remittance inflows greater than the median 1.5 percent of GDP during the 1990-2014 period. R denotes remittances as percent of GDP, Δy is the country-specific output growth, "Fin. Openness" is the normalized index of financial openness obtained from Chinn-Ito (2006), and "Trade Openness" is defined as the sum of exports and imports in GDP derived from the World Bank's World Development Indicator Database. *, **, and *** denote statistical significance at 10, 5, and 1 percent levels, respectively.

Appendix Table 4: Fiscal Shock

1990 - 2014	All	All	All	All	High_R	High_R	High_R	High_R
Δy	0.895***	1.015***	1.229***	1.290***	1.024***	1.113***	1.351***	1.446***
	[0.102]	[0.143]	[0.243]	[0.241]	[0.152]	[0.183]	[0.290]	[0.272]
R	0.034	0.061	-0.002	0.027	-0.025	0.005	-0.087	-0.057
	[0.080]	[0.073]	[0.078]	[0.071]	[0.094]	[0.078]	[0.091]	[0.077]
R * Δy	**-3.521****	**-3.837****	**-3.299***	**-3.765****	**-4.484****	**-3.886****	**-3.031**	**-2.656**
	[1.731]	**[1.659]**	**[1.675]**	**[1.636]**	**[1.992]**	**[1.814]**	**[1.892]**	**[1.777]**
Fin. Openness		0.038**		0.033**		0.015		0.016
		[0.017]		[0.016]		[0.019]		[0.021]
Fin. Openness * Δy		-0.231		-0.206		-0.418		-0.587
		[0.213]		[0.250]		[0.361]		[0.416]
Trade Openness			0.034	0.032			0.068***	0.052**
			[0.023]	[0.022]			[0.022]	[0.021]
Trade Openness * Δy			-0.456	-0.375			-0.635**	-0.508
			[0.314]	[0.359]			[0.291]	[0.337]
Constant	0.009	-0.013	-0.027	-0.045**	0.024	0.011	-0.043**	-0.042*
	[0.010]	[0.012]	[0.021]	[0.022]	[0.017]	[0.020]	[0.021]	[0.022]
Observations	895	834	844	791	456	426	426	404
R-squared	0.229	0.242	0.234	0.255	0.287	0.269	0.297	0.300
Number of Countries	144	134	138	129	69	65	65	62

Note: Robust standard errors are reported in brackets. The dependent variable is the idiosyncratic growth in consumption. The sample is restricted to the periods of fiscal shocks defined as change of at least 1.5 percentage points of GDP in the cyclically adjusted primary budget balance in either direction. The estimates are based on equation (3) including country and time fixed effects. A negative β_2 indicates that remittances help smooth consumption by delinking correlation between country-specific growth in consumption and output. High_R refers to the sample of high-remittance countries, those with remittance inflows greater than the median 1.5 percent of GDP during the 1990-2014 period. R denotes remittances as percent of GDP, Δy is the country-specific output growth, "Fin. Openness" is the normalized index of financial openness obtained from Chinn-Ito (2006), and "Trade Openness" is defined as the sum of exports and imports in GDP derived from the World Bank's World Development Indicator Database. *, **, and *** denote statistical significance at 10, 5, and 1 percent levels, respectively.

Appendix Table 5: Full Sample Period

1990 - 2014	All	All	All	All	High_R	High_R	High_R	High_R
Δy	0.899***	0.976***	0.786**	0.990**	0.757**	0.876***	1.191***	1.312***
	(4.453)	(3.932)	(2.412)	(2.242)	(2.401)	(5.471)	(3.407)	(3.177)
R	0.060	0.029	0.054	0.153	0.041	0.085	0.089	0.233
	(1.249)	(0.623)	(1.506)	(0.986)	(0.454)	(0.842)	(1.262)	(1.136)
R * Δy	**-1.992***	**-2.976***	**-2.059**	**-3.555**	**-1.480**	**-2.307**	**-3.711*****	**-4.883***
	(-1.714)	**(-1.702)**	**(-1.171)**	**(-1.534)**	**(-0.945)**	**(-1.236)**	**(-2.874)**	**(-1.803)**
Fin. Openness		-0.006		0.001		-0.008		-0.004
		(-1.235)		(0.051)		(-1.042)		(-0.257)
Fin. Openness * Δy		-0.155		-0.086		-0.119		0.322
		(-0.334)		(-0.184)		(-0.327)		(0.559)
Trade Openness			0.005	0.013			0.015**	0.041
			(1.015)	(0.468)			(2.131)	(1.314)
Trade Openness * Δy			0.067	-0.056			-0.111	-0.417
			(0.180)	(-0.155)			(-0.376)	(-1.433)
Constant	0.006	-0.001	-0.000	-0.028	0.003	0.005	-0.013*	-0.036**
	(1.144)	(-0.151)	(-0.063)	(-1.201)	(0.541)	(0.558)	(-1.727)	(-2.115)
Observations	812	767	780	740	420	401	401	387
Number of Countries	148	138	143	134	69	65	66	63
AR2	0.915	0.918	0.999	0.966	0.297	0.266	0.146	0.146
Hansen	0.254	0.538	0.322	0.0442	0.511	0.141	0.351	0.114
Instruments	71	57	57	57	71	57	57	57

Note: Z-statistics are reported in parentheses. The dependent variable is the idiosyncratic growth in consumption. The estimates are based on equation (3) including country and time fixed effects. A negative β_2 indicates that remittances help smooth consumption by delinking correlation between country-specific growth in consumption and output. High_R refers to the sample of high-remittance countries, those with remittance inflows greater than the median 1.5 percent of GDP during the 1990-2014 period. R denotes remittances as percent of GDP, Δy is the country-specific output growth, "Fin. Openness" is the normalized index of financial openness obtained from Chinn-Ito (2006), and "Trade Openness" is defined as the sum of exports and imports in GDP derived from the World Bank's World Development Indicator Database. *, **, and *** denote statistical significance at 10, 5, and 1 percent levels, respectively.

Appendix Table 6: Fiscal Consolidation

1990 - 2014	All	All	All	All	High_R	High_R	High_R	High_R
Δy	0.853***	1.133***	1.152***	1.113**	1.204***	1.045***	0.568	0.949**
	(4.130)	(5.288)	(3.199)	(2.321)	(4.083)	(4.183)	(1.078)	(2.006)
R	0.106	0.133*	0.152*	0.145	0.193*	0.203**	0.210*	0.053
	(1.407)	(1.692)	(1.942)	(0.994)	(1.876)	(1.999)	(1.812)	(0.618)
R * Δy	**-2.947***	**-3.849*****	**-3.608****	**-3.784***	**-5.650*****	**-4.741***	**-5.254***	**-2.612**
	(-1.798)	**(-2.633)**	**(-2.360)**	**(-1.870)**	**(-2.732)**	**(-1.908)**	**(-1.941)**	**(-1.487)**
Fin. Openness		-0.001		-0.004		-0.007		-0.002
		(-0.188)		(-0.219)		(-0.658)		(-0.140)
Fin. Openness * Δy		-0.318		-0.326		-0.016		-0.444
		(-0.991)		(-0.771)		(-0.047)		(-1.000)
Trade Openness			0.012**	0.014			-0.002	0.041
			(2.243)	(0.560)			(-0.150)	(1.168)
Trade Openness * Δy			-0.157	0.048			0.754	0.181
			(-0.340)	(0.111)			(1.271)	(0.381)
Constant	-0.013*	0.002	-0.016**	-0.013	-0.006	-0.008	-0.011	-0.045*
	(-1.806)	(0.226)	(-2.411)	(-0.472)	(-0.577)	(-1.039)	(-0.933)	(-1.665)
Observations	366	348	348	332	189	181	178	172
Number of Countries	140	131	135	127	67	63	64	61
AR2	0.578	0.621	0.498	0.547	0.148	0.106	0.133	0.187
Hansen	0.0839	0.140	0.231	0.447	0.640	0.255	0.531	0.278
Instruments	89	117	117	127	71	57	57	57

Note: Z-statistics are reported in parentheses. The dependent variable is the idiosyncratic growth in consumption. The sample is restricted to the periods of fiscal consolidation defined as narrowing of the cyclically adjusted primary budget balance. The estimates are based on equation (3) including country and time fixed effects. A negative β_2 indicates that remittances help smooth consumption by delinking correlation between country-specific growth in consumption and output. High_R refers to the sample of high-remittance countries, those with remittance inflows greater than the median 1.5 percent of GDP during the 1990-2014 period. R denotes remittances as percent of GDP, Δy is the country-specific output growth, "Fin. Openness" is the normalized index of financial openness obtained from Chinn-Ito (2006), and "Trade Openness" is defined as the sum of exports and imports in GDP derived from the World Bank's World Development Indicator Database. *, **, and *** denote statistical significance at 10, 5, and 1 percent levels, respectively.

Appendix Table 7: Fiscal Expansion

1990 - 2014	All	All	All	All	High_R	High_R	High_R	High_R
Δy	0.820***	0.791***	1.064***	1.268***	0.693**	0.875***	1.039***	1.165***
	(4.621)	(3.341)	(3.893)	(6.569)	(2.409)	(3.763)	(2.716)	(3.674)
R	0.030	0.011	0.045	0.038	0.021	0.008	0.045	0.206
	(0.569)	(0.170)	(0.829)	(0.702)	(0.308)	(0.117)	(0.689)	(1.626)
R * Δy	**-1.407**	**-0.924**	**-1.764**	**-2.129**	**-0.125**	**-0.489**	**-1.897**	**-4.075**
	(-0.941)	**(-0.459)**	**(-1.249)**	**(-1.322)**	**(-0.076)**	**(-0.226)**	**(-0.912)**	**(-1.510)**
Fin. Openness		-0.002		-0.005		-0.002		-0.029
		(-0.283)		(-0.489)		(-0.176)		(-1.079)
Fin. Openness * Δy		-0.129		-0.285		-0.523		0.631
		(-0.442)		(-0.755)		(-1.226)		(0.795)
Trade Openness			0.008	0.015			0.017***	-0.001
			(1.100)	(1.397)			(2.940)	(-0.021)
Trade Openness * Δy			-0.189	-0.273			-0.252	-0.712*
			(-0.574)	(-0.748)			(-0.942)	(-1.648)
Constant	0.007	0.009	-0.022**	-0.024**	0.006	0.012	-0.025***	-0.008
	(1.278)	(1.288)	(-2.404)	(-2.034)	(0.774)	(1.547)	(-2.738)	(-0.291)
Observations	401	384	390	373	204	198	199	193
Number of Countries	141	132	136	127	68	64	65	61
AR2	0.738	0.675	0.901	0.703	0.0484	0.0916	0.0933	0.210
Hansen	0.189	0.192	0.220	0.233	0.343	0.245	0.235	0.239
Instruments	89	117	117	127	71	57	57	57

Note: Z-statistics are reported in parentheses. The dependent variable is the idiosyncratic growth in consumption. The sample is restricted to the periods of fiscal expansion defined as widening of the cyclically adjusted primary budget balance. The estimates are based on equation (3) including country and time fixed effects. A negative β_2 indicates that remittances help smooth consumption by delinking correlation between country-specific growth in consumption and output. High_R refers to the sample of high-remittance countries, those with remittance inflows greater than the median 1.5 percent of GDP during the 1990-2014 period. R denotes remittances as percent of GDP, Δy is the country-specific output growth, "Fin. Openness" is the normalized index of financial openness obtained from Chinn-Ito (2006), and "Trade Openness" is defined as the sum of exports and imports in GDP derived from the World Bank's World Development Indicator Database. *, **, and *** denote statistical significance at 10, 5, and 1 percent levels, respectively.

Appendix Table 8: Fiscal Shock

1990 - 2014	All	All	All	All	High_R	High_R	High_R	High_R
Δy	1.074***	1.117***	1.333***	1.229***	1.258***	1.351***	1.274*	0.537
	(5.230)	(6.155)	(3.554)	(4.366)	(3.805)	(3.358)	(1.957)	(0.379)
R	0.239**	0.177*	0.234**	0.239**	0.363**	0.297**	0.212**	0.070
	(2.300)	(1.683)	(2.102)	(2.030)	(2.205)	(2.368)	(2.121)	(0.564)
R * Δy	**-4.205***	**-3.418****	**-3.436**	**-4.877****	**-6.769***	**-5.360***	**-3.057**	**-0.825**
	(-1.686)	**(-1.987)**	**(-1.353)**	**(-2.169)**	**(-1.697)**	**(-1.808)**	**(-1.271)**	**(-0.327)**
Fin. Openness		-0.009		-0.001		-0.023		-0.026
		(-0.942)		(-0.027)		(-1.467)		(-0.574)
Fin. Openness * Δy		-0.337		-0.625		-0.303		0.083
		(-1.011)		(-1.429)		(-0.458)		(0.062)
Trade Openness			0.016	0.007			0.076***	0.044
			(1.334)	(0.177)			(3.989)	(0.849)
Trade Openness * Δy			-0.503	0.117			-0.824	0.095
			(-1.472)	(0.327)			(-1.070)	(0.082)
Constant	-0.033*	0.005	-0.014	-0.020	-0.038	0.000	-0.074**	-0.048
	(-1.877)	(0.458)	(-1.034)	(-0.547)	(-1.123)	(.)	(-2.013)	(-0.682)
Observations	174	164	159	151	75	70	64	61
Number of Countries	91	85	86	81	41	38	37	35
AR2	0.387	0.399	0.362	0.410	0.376	0.375	0.814	0.381
Hansen	0.442	0.541	0.390	0.257	0.290	0.277	0.356	0.991
Instruments	71	57	57	57	29	37	37	57

Note: Z-statistics are reported in parentheses. The dependent variable is the idiosyncratic growth in consumption. The sample is restricted to the periods of fiscal shocks defined as change of at least 1.5 percentage points of GDP in the cyclically adjusted primary budget balance in either direction. The estimates are based on equation (3) including country and time fixed effects. A negative β_2 indicates that remittances help smooth consumption by delinking correlation between country-specific growth in consumption and output. High_R refers to the sample of high-remittance countries, those with remittance inflows greater than the median 1.5 percent of GDP during the 1990-2014 period. R denotes remittances as percent of GDP, Δy is the country-specific output growth, "Fin. Openness" is the normalized index of financial openness obtained from Chinn-Ito (2006), and "Trade Openness" is defined as the sum of exports and imports in GDP derived from the World Bank's World Development Indicator Database. *, **, and *** denote statistical significance at 10, 5, and 1 percent levels, respectively.

Appendix Table 9: List of Countries

(High remittance countries are distinguished by *)

Afghanistan
Albania*
Algeria
Antigua and Barbuda
Argentina
Armenia*
Austria
Azerbaijan*
Bangladesh*
Barbados
Belarus
Belgium
Belize*
Benin*
Bhutan
Bolivia*
Bosnia and Herzegovina*
Botswana
Brazil
Bulgaria*
Burkina Faso*
Burundi*
Cambodia*
Cameroon
Cape Verde*
Chad
China
Colombia*
Comoros*
Congo, Republic of
Costa Rica
Croatia
Cyprus
Czech Republic
Côte d'Ivoire
Djibouti
Dominica*
Dominican Republic*
Ecuador*
Egypt*
El Salvador*
Estonia
Ethiopia
FYR Macedonia*
Fiji*
France
Gabon
Gambia, The*
Georgia*
Germany
Ghana
Greece
Grenada*
Guatemala*
Guinea
Guinea-Bissau*
Guyana*
Haiti*
Honduras*
Hungary
Iceland
India*
Indonesia
Iraq
Ireland
Italy
Jamaica*
Japan
Kazakhstan
Kenya*
Kiribati*
Korea
Kosovo*
Kyrgyz Republic*
Lao P.D.R.
Latvia
Lebanon*
Liberia*
Libya
Lithuania
Luxembourg
Macao SAR, China
Madagascar*
Malawi
Mali*
Malta
Marshall Islands*

Appendix Table 9: List of Countries

(High remittance countries are distinguished by *)

Mauritania
Mexico*
Micronesia, Fed. States of *
Moldova*
Mongolia*
Montenegro, Rep. of*
Morocco*
Mozambique
Myanmar
Namibia
Nepal*
Netherlands
New Zealand
Nicaragua*
Niger
Norway
Oman
Pakistan*
Palau
Panama
Papua New Guinea
Paraguay*
Peru
Philippines*
Poland
Portugal
Qatar
Russia
Rwanda
Samoa*
Senegal*
Serbia*
Seychelles
Sierra Leone*
Slovak Republic
Slovenia
Solomon Islands*
Spain
Sri Lanka*
St. Kitts and Nevis
St. Vincent and the Grenadines*
Suriname
Sweden
Switzerland
Syria*
Tajikistan*
Tanzania
Thailand
Togo*
Tonga*
Trinidad and Tobago
Tunisia*
Turkey
Tuvalu*
Uganda*
Ukraine*
United Kingdom
Uruguay
Vanuatu*
Venezuela
Yemen*
Zambia

Appendix Table 10: Subsidies or Government Aid Programs in MxFLS

	2002	2005-06	2009-12
Oportunidades (earlier Progresa) 1/	Yes	Yes	Yes
PROCAMPO	Yes	Yes	Yes
VivAh (programa Ahorro y Subsidio a la Vivienda Progresiva)	Yes	Yes	Yes
Crédito a la Palabra	Yes	Yes	No
Programa de Coinversión Social	Yes	Yes	Yes
Programa de Empleo Temporal	Yes	Yes	Yes
Programa Alianza para el Campo	Yes	Yes	Yes
Fondo de Apoyo para la Micro, Pequeña y Mediana Empresa	Yes	Yes	No
Fondo Nacional de Apoyo para las Empresas de Solidaridad	Yes	Yes	Yes
70 y más	No	No	Yes
Apoyo alimentario	No	No	Yes
Opciones productivas	No	No	Yes
Other	Yes	Yes	Yes

1/Included in the survey, but results not published.