

Honduras: Selected Issues and Analytical Notes



HONDURAS

SELECTED ISSUES AND ANALYTICAL NOTES

November 2016

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HONDURAS

SELECTED ISSUES AND ANALYTICAL NOTES

October 14, 2016

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CONTENTS

BENCHMARKING SOCIAL SPENDING USING EFFICIENCY FRONTIERS	<u>4</u>
A. Background	<u>4</u>
B. Benchmarking Methodology	<u>5</u>
C. Empirical Results	<u>6</u>
D. Implications and Policy Recommendations	<u>9</u>
References	<u>11</u>
FIGURES	
1. Public Spending Cross-country Comparisons	<u>5</u>
2. Technical and Allocative	<u>6</u>
3. Benchmarking Education Spending	<u>7</u>
4. Benchmarking Health Spending	<u>8</u>
5. Selected Inputs and Outputs Comparisons	<u>8</u>
CORRUPTION, VIOLENCE, AND ECONOMIC GROWTH	<u>12</u>
A. Introduction	<u>12</u>
B. Theoretical Considerations	<u>12</u>
C. Recent Developments	<u>13</u>
D. Empirical Results and Model Simulations	<u>16</u>
References	
FIGURES	
1. History of Crime and Corruption in Central America	<u>13</u>
2. High Levels of Corruption Are Associated with...	<u>15</u>

MACROECONOMIC IMPACT OF LOWER OIL PRICES IN HONDURAS	19
A. Introduction	19
B. Methodology	20
C. Results	21
D. Conclusion	22
References	26

FIGURES

1. Oil Imports and Current Account Balance	19
2. Impulse Response Functions to Structural Shocks	23
3. Impulse Response Functions of Quarter-On-Quarter GDP Growth To Three Structural Shocks	24
4. Cumulative Medium-Term Effect of Oil Shocks in Central America	25

BANKING SECTOR STABILITY IN HONDURAS

A. Introduction	27
B. Structure of the Banking System	28
C. Credit Cycle	29
D. Balance Sheet Soundness Indicators	30
E. Banking Sector Stress Tests	31
F. Spillovers from International Banking Sector Stress	35
G. Conclusion	37
References	36

TABLES

1. Size and Structure of the Financial System	28
2. Banking Sector Soundness Indicator Map	29
3. Banks Sectoral Allocation of Private Credit and Credit Dollarization	30
4. Central America: Comparative Financial Soundness Indicator Map	31
5. Banks Stress Tests Results	33
6. Summary of Combination Shock Bank Stress Test Results	35
7. Spillovers from International Banking Sector Stress	35

FIGURES

1. The Global and Honduras Financial Stability Maps, 2008 and 2015 Q4	27
2. Banks Stress Test Results	33

A BALANCE SHEET APPROACH TO MACROECONOMIC VULNERABILITIES _____ 39

A. Introduction _____ 39

B. The Overview of Key Balance Sheet Developments—2013 versus 2015 _____ 39

C. Sectoral Balance Sheet Developments _____ 42

D. Sectoral Sensitivity to Nominal Exchange Rate Shocks _____ 50

E. Conclusions _____ 51

References _____ 51

TABLES

1. Summary of Balance Sheet Risks _____ 41

2. Summary of Household Balance Sheet Risks _____ 43

3. Summary of Corporate Sector Balance Sheet Risks _____ 45

4. Summary of Government Sector Risks _____ 46

5. Summary of Financial Sector Balance Sheet Risks _____ 48

6. Summary of Central Bank Balance Sheet Risks _____ 49

7. Net Loss (Gains) From a Nominal Exchange Rate Depreciation _____ 50

FIGURES

1. Structure of Liabilities, Net Financial and Net Foreign Currency Positions _____ 41

2. The Household Sector _____ 43

3. The Corporate Sector _____ 45

4. The Government Sector _____ 47

5. Financial Sector _____ 48

6. Central Bank of Honduras _____ 50

ANNEX

I. Net Inter-Sectoral Asset and Liability Positions, 2015Q3 _____ 52

BENCHMARKING SOCIAL SPENDING USING EFFICIENCY FRONTIERS¹

A. Background

1. **After a tradition of fiscal instability, Honduras is adopting a path of fiscal prudence.** In 2013, the fiscal deficit reached a historical record of 7½ percent of GDP, and public debt to GDP ratio reached 40 percent of GDP (15 percentage points increase since 2011). In January 2014, the newly elected government moved to implement an ambitious reform program, which sought to put the public finances on a sound footing. The results of the program, backed by structural revenue and spending measures, have been satisfactory thus far.² Two years after implementation, the fiscal deficit has been reduced by 6½ points of GDP, reaching 1 percent of GDP in 2015, and public debt over GDP ratio has stabilized.

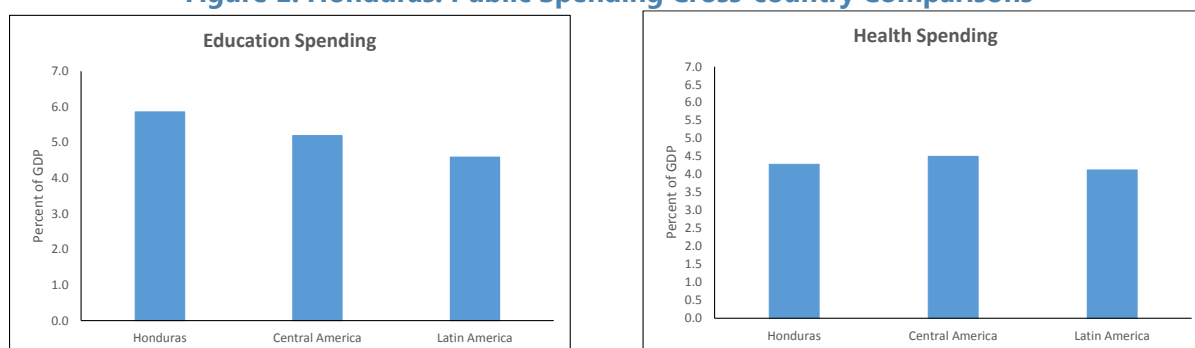
2. **The fiscal prudence plan rests on the full implementation of the recently passed fiscal responsibility law.** The law sets out ambitious fiscal targets for the medium-term. Under this new framework, and considering the limited room for increasing revenues, it is imperative to contain the spending growth without affecting the delivery of the much needed social and security services.

3. **Spending priorities on health and education could benefit from greater efficiency (Figure 1).** Despite being recently contained, public spending in education is still high. At around 6 percent of GDP, it is above the Central America and Latin America averages (5.2 and 4.6 percent of GDP respectively) and it is even higher than the OECD average (5.4 percent of GDP). This increase in public spending does not reflect better educational outcomes. Honduras ranked among the last positions in standardized tests (World Bank, 2015). In health, public spending has been relatively constant at around 4 percent of GDP. This trend conflicts with the large coverage gap on medical insurance. Only 18 percent of the population has access to medical insurance and only 5 percent in rural areas (World Bank, 2015).

4. **Improving the efficiency of social spending could help the authorities to effectively increase their delivery of public services in a cost-effective manner.** Reducing inefficiency in spending implies that the country can achieve the same output with fewer resources or achieve higher output with the same resources. In addition, improving spending efficiency helps maintain fiscal discipline and ensure the value of money spent. This note seeks to benchmark Honduras' social spending (health and education) identifying areas where there is scope to improve expenditure efficiency.

¹ Prepared by Javier Kapsoli.

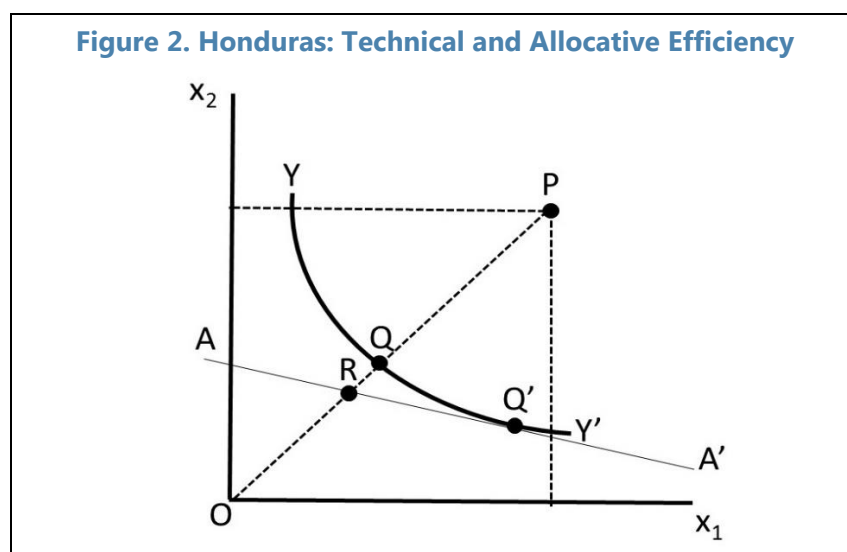
² See IMF (2015), Box 1 for details on the fiscal consolidation measures.

Figure 1. Honduras: Public Spending Cross-country Comparisons

Source: The World Bank, UNESCO, and WHO

B. Benchmarking Methodology

5. **A benchmarking exercise is based on the estimation of efficiency scores for a group of countries.** The modern literature on estimating efficiency started with Farrell's (1957) seminal paper. That paper defines two types of efficiency, technical and allocative. Figure 2 illustrate both concepts by using the familiar isoquant diagram assuming a production function with two inputs x_1 and x_2 . The YY' isoquant represents the different combinations of inputs that a fully efficient unit would use, and P is the production bundle that a sub-optimal unit uses. Note that the point Q , represents the optimal consumption of inputs for the level of output determined in P , therefore, the ratio OQ/OP would be a measure of technical efficiency meaning that the distance QP could be saved if inputs were used efficiently. The latter is a view of efficiency entirely based on the technical capacity to obtain the higher level of output with the minimum consumption of inputs. However, one can see efficiency also from a cost minimizing perspective. Let p_1 and p_2 be the prices of inputs x_1 and x_2 then the slope of line AA' would be $-p_2/p_1$ and Q' would be the optimal bundle assuming such price levels. For the production bundle P , the ratio OR/OQ would be a measure of the allocative or price efficiency. Allocative efficiency measures the amount of resources that could be saved if, input prices given, the consumption of inputs would be used to minimize the unit's total cost. In this note, because of the lack of comparable multi-country data on prices, this paper focuses entirely on the estimation of technical efficiency.



6. Technical efficiency could be estimated based on input or output oriented models. In input-oriented models, the efficiency scores are the proportional amount by which input consumption could be reduced while leaving outputs unchanged. On the other hand, efficiency scores from output-oriented models are defined as the proportional amount by which outputs could be increased while leaving inputs consumption unchanged.

7. We use data envelopment analysis (DEA) and bootstrapping to estimate the efficiency scores. DEA is a mathematical programming method that can solve the two main tasks involved in a benchmarking exercise: a) calculate the frontier based on the best performer units, and b) evaluate performances relative to such frontier. DEA is a non-parametric method where –by definition– there is no randomness in the data. This assumption makes the method extremely sensitive to the presence of outliers or noise in the data. To control by this limitation, we use bootstrapping to add a layer of randomness on the DEA, thus providing an unbiased and robust estimation of the efficiency scores.³ Bootstrapping allow us not only the estimation of bias-corrected scores but also the calculation of the confidence intervals for them.

C. Empirical Results

8. There are many inputs-outputs model specifications. For health, we use health-adjusted life expectancy (HALE) as output and public spending, private spending and the educational level of

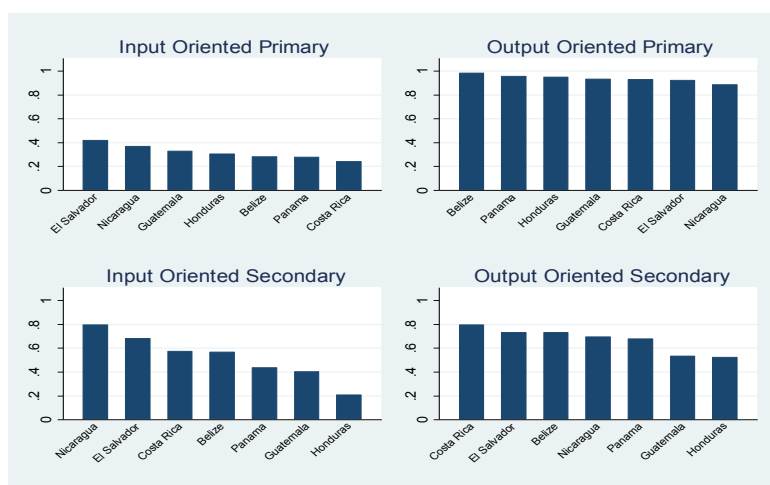
³ See Simar and Wilson (1998, 2000) for details on the methodology, and Bogetoft and Otto (2011) for details on bootstrapping and its application to DEA models.

(continued)

adults as inputs.⁴ For education, we prepare separate estimates for primary and secondary education. We use net enrollment rates as output and public spending and the teacher-pupil ratio as inputs.⁵ All spending variables are expressed in 2011 PPP US dollars. The educational level of adults is measured by the average years of schooling for population older than 15 years.

9. **Our estimated scores show sizeable room for efficiency savings gains in education and some room for efficiency savings in health.** Figures 3 and 4 summarize the main results. We are presenting the scores for Honduras relative to all Central American peers.⁶ In health, the output-oriented score for Honduras is 0.96 showing limited room for getting better outcomes by using inputs efficiently, however, the input-oriented score is 0.84 meaning that all inputs could be reduced by around 15 percent without a marked reduction in outcomes. In education, Honduras performed poorly in secondary education with an output-oriented score of 0.52 and an input-oriented score of 0.21. The results are somewhat better in primary education with scores of 0.95 for the output-oriented and 0.31 for the input-oriented, respectively. These results imply potential efficiency savings in educational inputs between 70-80 percent.

Figure 3. Honduras: Benchmarking Education Spending

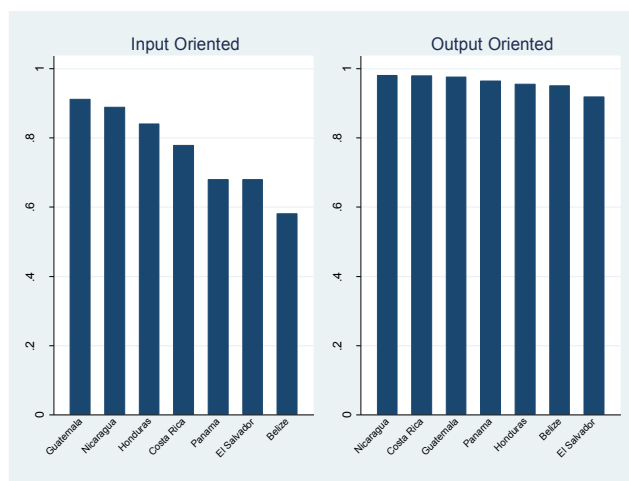


Source: Author's estimations.

⁴ HALE is estimated by the WHO and is defined as the average number of years that a person can expect to live in "full health" thus deducting years lived in disease and/or injury from the regular life expectancy.

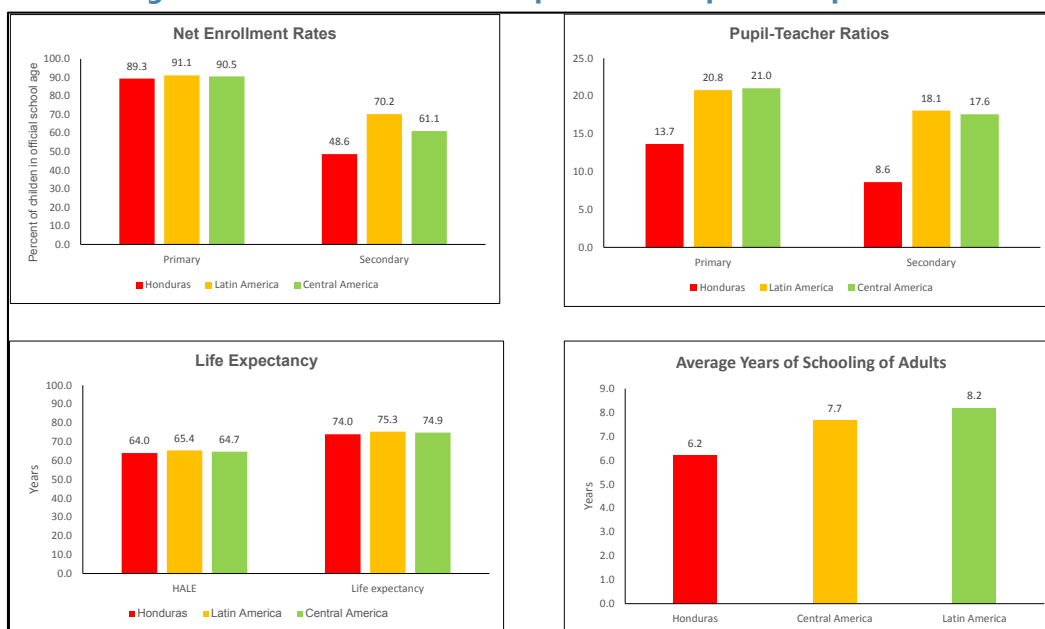
⁵ Net enrollment rates reflects only students enrolled relative to the corresponding school age excluding repeaters. In the education case, a common critique is that enrollment rates do not measure educational achievements. We use this variable and not the outcome of standardized tests (such as PISA, TIMMS, or PIRLS) because of the tests' limited coverage for low-income countries.

⁶ Detailed point estimates and confidence intervals are available upon request.

Figure 4. Honduras: Benchmarking Health Spending

Source: Author's estimations.

10. The results of the benchmarking exercise seem consistent with the main observed facts and trends. Figure 5 shows some basic comparisons. We can see that Honduras (and Latin America in general) has a large enrollment gap in secondary education. This seems consistent with the current changes in the demography of the region. This gap would entail the need for allotting more resources to secondary education. Additionally, pupil-teacher ratios in Honduras are very low relative to its peers. This points out to an overfunded educational system.

Figure 5. Honduras: Selected Inputs and Outputs Comparisons

Sources: The World Bank; WHO; UNESCO; and Barro-Lee database.

D. Implications and Policy Recommendations

11. **There is a significant room to improve public health and education spending efficiency with potentially large fiscal savings.** From an input-oriented point of view, Honduras performs poorly in education and health spending efficiency. From an output-oriented point of view, health spending efficiency appears to be in line with regional comparators while there is room to improve efficiency in secondary education.
12. **In health and education spending, the priority is to tackle the disconnection between compensation benefits and labor productivity.** The wage bill is 80 percent of the education budget and 60 percent of the health one, therefore, it is not possible to achieve savings without significant reforms in the compensation schemes.
13. **In education, the priority should be reforming the teachers' *estatuto* and the implementation of the quality evaluations stated in the law.** Currently the PACSE implementation has been limited only to its compensation provisions but the agreement includes also some provisions regarding the introduction of performance evaluation and a merit-based carrier. The most pervasive component of the teachers' *estatuto* is the link between wages and allowances to the minimum wage. This needs to be revised aiming at linking compensations to performance and the achievement of students in international evaluations.
14. **Spending in education needs to improve efficiency to adjust to the unavoidable demographical transition and to close the coverage gaps.** Pupil-teacher ratios indicate overstaffing. Honduras has a sizeable coverage gap in secondary education while the bulk of the spending in education is at the primary level (Figures 6 and 7). At least part of these coverage gaps is explained by the relatively small instructional time effectively received by students⁷. Over the coming years, Honduras needs to adjust its public policies to face the population aging. This would entail moving resources from primary to secondary education. The results of this paper show that this process can be done through efficiency gains/savings therefore preventing dramatic short-term adjustments.
15. **In the health sector, besides reforming the wage bill, other administrative measures could be implemented.** The health sector has six of the eight compensation frameworks currently existing in Honduras. Some of them have not been questioned because of their limited size but are introducing deep inequalities in the public sector compensation framework.⁸ These frameworks should be revised in light of the need to expand coverage stated in the law of social protection.

⁷ On average, the effective time of instructional time is 64 percent of total teachers' time but for schools in the bottom quintile of the distribution this number is only 37 percent. In practice, this means that students in top quintile schools receive 96 days more school days compared with students in the bottom quintile schools (Burns and Luque, 2014)

⁸ For example, because of the application of the pharmaceutical-chemists' *estatuto* they earn the same wage as a doctor and two times a dentist's wage (Banco Interamericano de Desarrollo, 2014).

Additionally, as the provision of health care services is a goods-intensive activity, administrative measures could be implemented to exploit economies of scale stemming from the size of the public sector as a purchaser.

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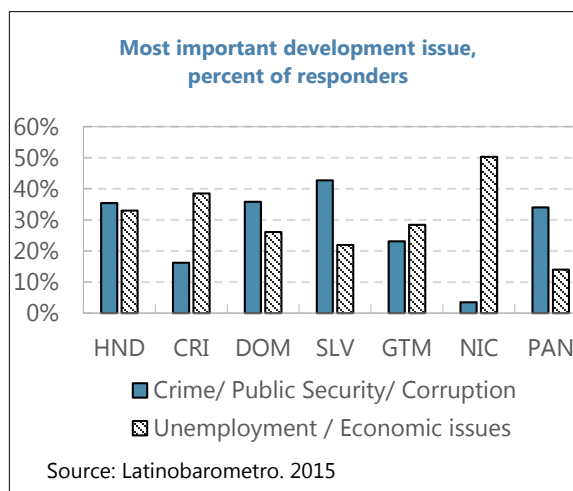
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CORRUPTION, VIOLENCE, AND ECONOMIC GROWTH¹

A. Introduction

1. **Crime and corruption have been identified as the biggest challenges to economic prosperity in the world, and in Central America in particular.**

The World Bank (2016) considers corruption a major impediment to its 2030 goal of eradicating extreme poverty in the world. In Central America, crime and corruption are viewed as the most important issues for country development, according to the *Latinobarometro* 2015 survey. The World Bank survey of Central American firms found similar results when asking about impediments to productivity and growth (World Bank (2011)).² The same paper estimates at almost 10 percent of GDP per year the total costs of crime in Honduras, including health costs,



public and private security costs, administration of justice as well as material costs. The costs of crime and corruption tend to be higher for poorer individuals due to their inability to protect themselves, leading to higher inequality (Lagarde (2015)). Since 65 percent of population in Honduras lives in poverty, the question of reducing instances of crime and corruption is of utmost importance.

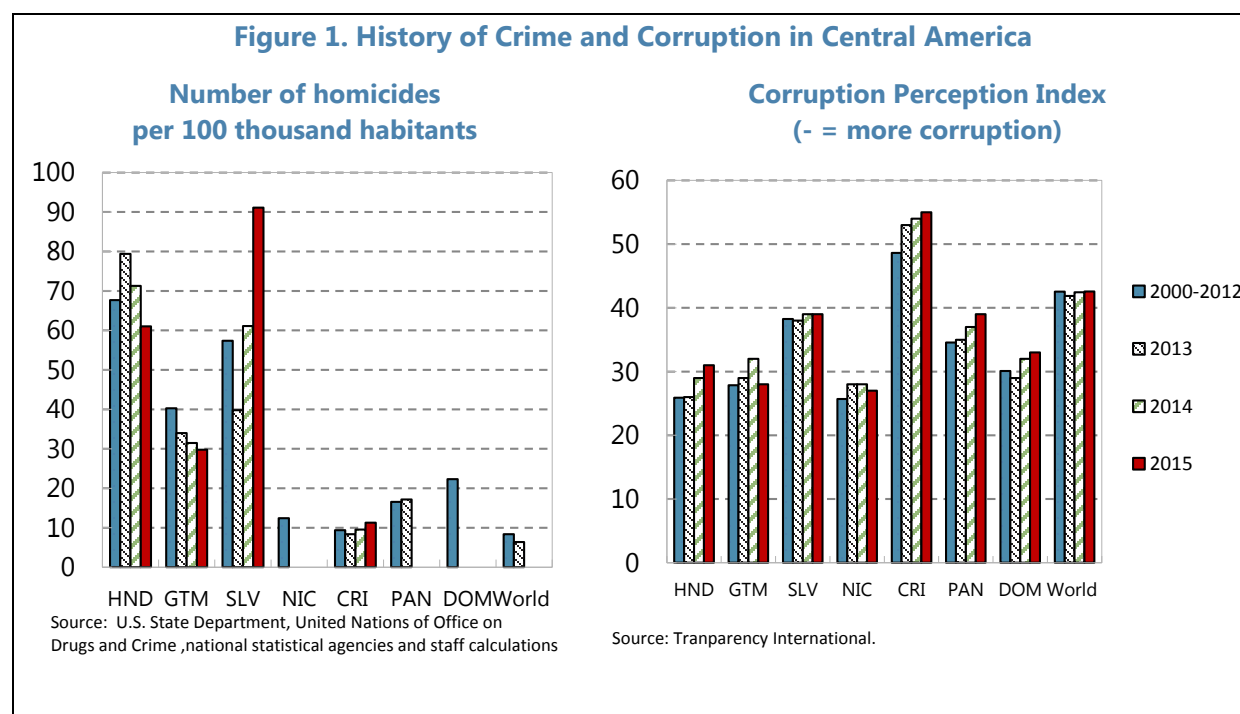
B. Theoretical Considerations

2. **Corruption and crime are hard to measure.** First, definitions of crime and corruption differ both across countries and across time, complicating cross-country comparisons. Something that is considered crime in one country is not necessarily illegal in another. Second, data on crime is inaccurate and crime is often under-reported. To minimize these measurement errors, this paper focuses on homicide rates—compiled by the United Nations Office on Drugs and Crime (UNODC)—as the most consistent and accurate measures of crime across countries. As for corruption, it is even harder to define and measure than general crime. The most commonly used measure of corruption is the Corruptions Perceptions Index (CPI) published by Transparency International. It is a composite index of 13 different series from 12 different organizations. It assesses the perceived level of corruption in countries on a scale from 0 (very corrupt) to 100 (very clean). The CPI in 2015 covers 168 countries, including all Central American countries.

¹ Prepared by Dmitry Plotnikov.

² For Costa Rica only corruption enters the top five constraints reflecting lower crime rates than in the rest of the region.

3. **The effects of crime and corruption on growth are likely nonlinear.** While the link between growth and corruption might seem obviously negative, empirically it is not as clear. The effect of corruption on growth seems to be similar to that of inflation on growth: high levels of corruption are clearly associated with worse economic performance, while this link disappears for lower levels of corruption (Powell et al. (2010)). A similar logic holds for crime and violence rates. Honduras, however, clearly falls into the region where both corruption and crime are high enough to affect growth negatively (World Bank (2011)). Both crime and corruption produce similar outcomes for economic activity. Indeed, corrupt officials hinder economic activity by creating artificial barriers for productive individuals to extract rent, while criminals can directly extract share of aggregate output by theft, robbery, murder, etc. To protect themselves from crime, productive individuals have to divert resources from productive activity by spending them on security, or on bribes in case of corruption. Importantly, both crime and corruption are increasingly difficult to eradicate when their level decreases.



C. Recent Developments

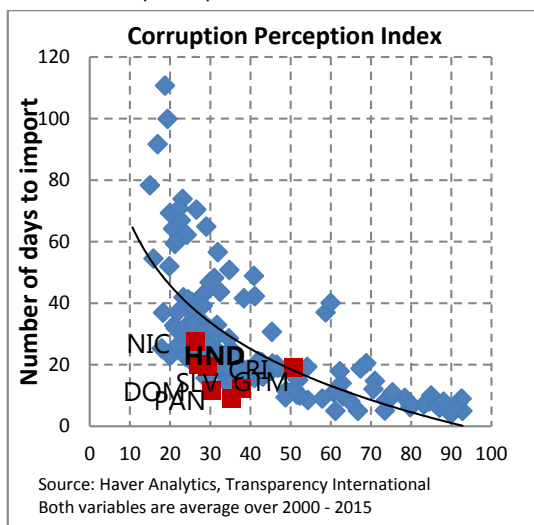
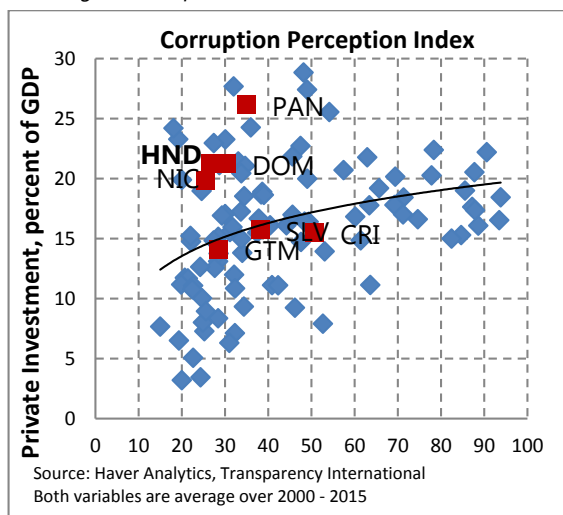
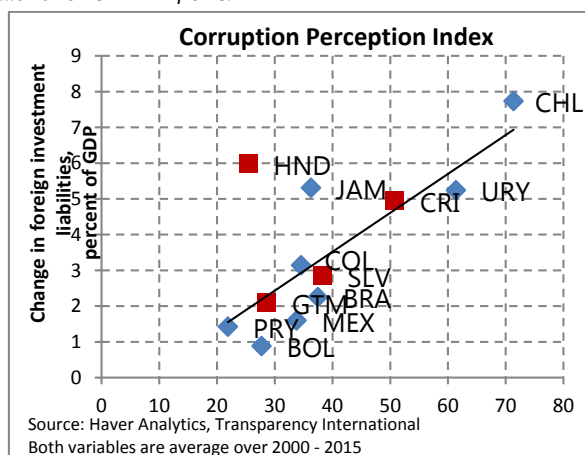
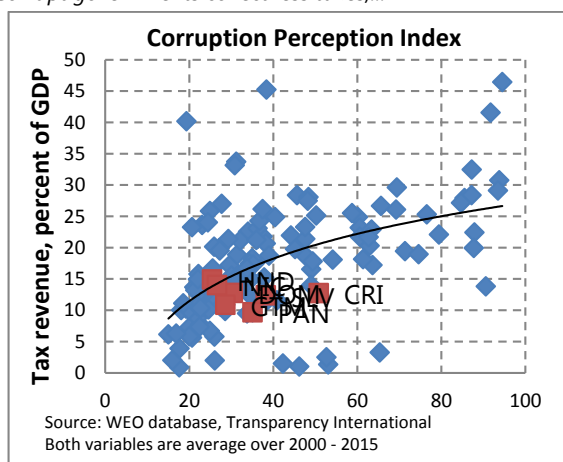
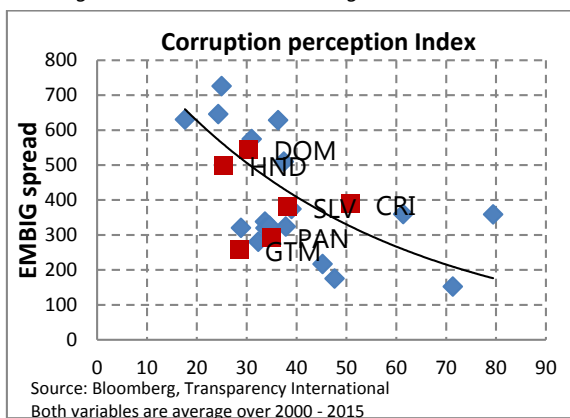
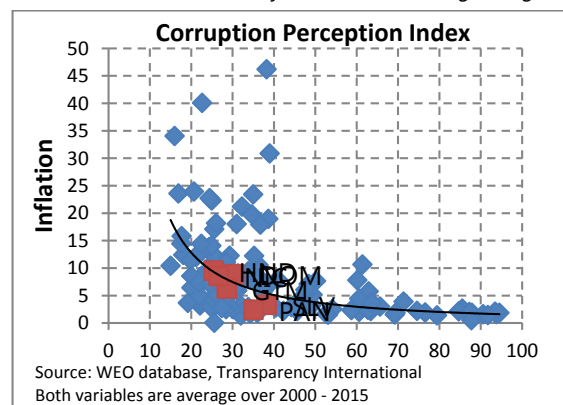
4. **Corruption and crime in Honduras have been consistently very high, with some positive developments in recent years.** Honduras remains one of the most violent countries in the region and the world. It also hosts the most violent city in the world, San Pedro Sula, which registered 187 homicides per 100 thousand inhabitants in 2013. According to SEPOL, the homicide rate declined by more than 30 percent since its peak in 2011 from more than 90 to less than 60 homicides per 100 thousand inhabitants in 2015. For 2016 this number is projected to be less than 50. Similarly, the perceived corruption index increased from the average of 25 in the years prior to

2012, to 31 in 2015, marking a slight decline in corruption and improving Honduras' standing in the rankings by 21 positions—from 133th in 2013 to 112th in 2015 (Figure 1).

5. **Corruption is likely to affect growth indirectly by hindering investment and discouraging tax compliance.** Regarding the private sector, corruption is likely to increase cost of investment through red tape, larger “iceberg” costs when importing intermediate goods for production, and increased uncertainty for firms. As for the public sector, widespread corruption dramatically reduces the efficiency of government spending, and revenue collection falls as distrust in the government leads to tax evasion.

6. **The major factor behind high levels of crime and corruption in Honduras is drug trafficking.** According to the 2016 U.S. State Department International Narcotics Control Strategy Report, 90 percent of the cocaine trafficked to the United States in the first half of 2015 passed through Central America, although the total volume declined by 40 percent that year. UNODC (2012) estimates the total value of cocaine that passed through Honduras in 2010 to be 13 percent of Honduran GDP, almost $\frac{2}{3}$ of the total spending on crime prevention of the entire region in the same year. Given the size of the value of drug trade, pervasive poverty in Honduras, relatively low education level and widespread availability of firearms, it is not surprising that the country suffers from high levels of youth violence, gang membership and involvement of police in crime.

7. **The recent decline in violence appears to be a result of a significant reform effort.** Since 2013, the government has increased both quantity and quality of the police force. Regarding quantity, in 2013 the number of police officers in Honduras was smaller than in other countries in the region with much smaller homicide rates, e.g., Nicaragua. To address this issue, the government plans to train 2,000 officers a year for the next 3–4 years, with 850 officers graduating this summer. On the quality side, the government embarked on a comprehensive reform to improve police education. First, in the last 3 years average of schooling improved from 6 years to a bachelor degree. Second, the mandatory number of months in the police academy has increased from three to eleven. The average salary of a police officer has increased accordingly: from US\$300 to US\$500 per month. The government continues the depuration process of the police and in 2016 already has purged over 100 police officers including 2 directors and 27 commissionaires among other lower ranked officers. The most recent investigations in the police management—for example, the Bertha Caceres case—involves officers that have been already removed during the depuration process.

Figure 2. High Levels of Corruption Are Associated with...*...increased red tape for private sector...**...resulting in lower private domestic investment...**...and lower FDI inflows.**Corrupt governments collect less taxes...**...have higher international borrowing costs**...and, as a result, have to rely more often on seigniorage*

8. **The authorities have introduced measures to fight corruption.** The authorities have secured the help of an Organization of American States (OAS) support mission against corruption and impunity (MACCIH) as part of its response to the unveiling of the embezzlement episode at the Honduran Social Security Institute (IHSS), which occurred during the previous administration. MACCIH formally started operations on April 20, 2016. While not as strong as its sister institution in Guatemala, International Commission against Impunity in Guatemala (CICIG), MACCIH still represents a strong effort in the fight against corruption. The main weakness of MACCIH relative to CICIG is its inability to open a criminal investigation against anyone no matter their office without an approval of the Honduran public prosecutor, who can potentially block the proceeding due to threats from criminals or being corrupt him- or herself. The first cases MACCIH will investigate include the recent murder of the environmental and human rights activist Bertha Caceres, as well as the assassinations of the anti-drug czar Aristides Gonzalez in 2009 and of other heads of the police department.

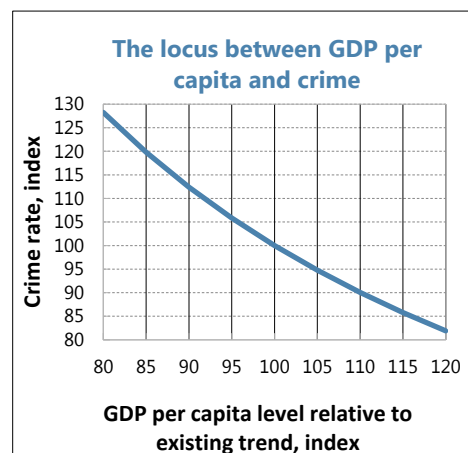
9. **It is crucial to reinforce the fight against corruption and crime with growth-enhancing reforms to break the vicious cycle of high crime and low growth.** On the one hand, since perceptions of high crime tend to be persistent, the reduction in crime and corruption has to be continuous and long lasting before the positive effect on growth starts to materialize. On the other hand, increasing economic growth by itself is expected to significantly reduce crime over the medium term.

D. Empirical Results and Model Simulations

10. **As a first step to measure the relationship between growth and crime, staff constructed a linear regression model.** Accordingly, a one percent increase in the medium-term growth is associated with one-point decline in the number of homicides per 100,000 habitants per year. However, this estimate is likely to be overestimated and in general does not capture the causal effect of higher growth on crime. This is due to reverse causality in the regression– in data high crime is associated with low growth and vice versa.

11. **Staff constructed a structural general equilibrium model to better understand the interaction between of crime and growth.** The model is based on the Diamond-Mortensen-Pissaridies labor search framework with the following three differences. First, an individual can decide to become “a criminal”, instead of searching for a job, resulting in an endogenous crime rate. Second, a firm matched with a worker spends part of its profits on “security”. This expense minimizes probability of being a victim of “criminals”. If a firm becomes a victim of crime, its profits become income of the criminals this period. The necessity of security costs endogenously affects wages lowering them as workers share part of the security cost. The security cost can be interpreted as actual security cost in books, as well as bribes firm needs to pay in order to function. Third, existing criminals “steal” profit of a share of firms that are affected by crime but with some probability, which is a parameter of the model, get caught, go to “jail” and then, after being released, return to unemployment. The model is calibrated to Honduras data.

12. **The calibrated model has qualitatively similar medium-term effects as the linear regression.** The main advantage of the model is that it lets examine the effect of exogenous variables on the relationship between endogenous crime and endogenous growth. For brevity, this paragraph presents simulations where both crime and growth are driven by labor productivity. The estimated effect is presented on the right: for instance, a one percent increase in the medium-term growth leads to a one-percent decline in the number of homicides per 100,000 habitants per year. The intuition is as follows. As growth increases, the choice of being a criminal becomes less lucrative relative to the option of looking for a formal job. The number of criminals decreases together with the security costs incurred by firms in crime prevention. This, as a share of the resources saved, goes to workers, and the value of having a job increase thereby further discouraging new criminal recruits. And although existing criminals also receive higher income from higher growth, the enhanced profitability of the firm outweighs this effect. Higher firm profits in turn encourage more firms to enter the market, thereby expanding employment. The effect is nonlinear: as income increases, the corresponding effect on crime decreases.



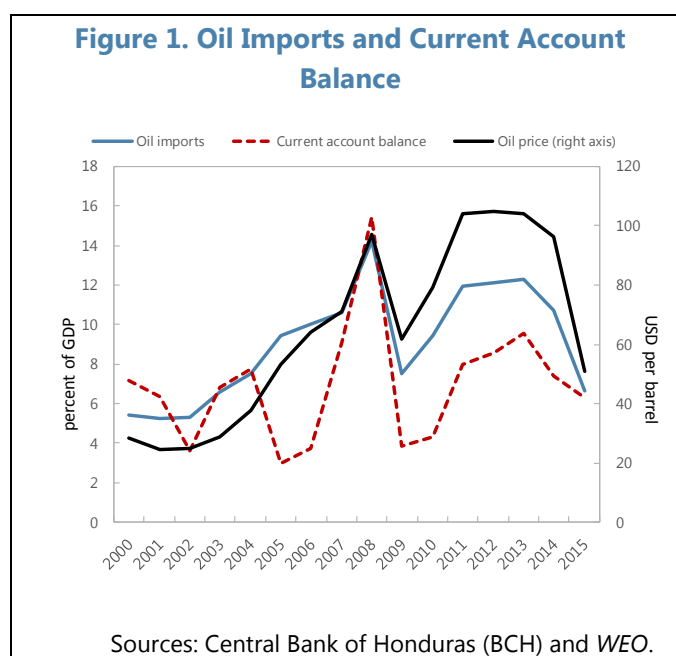
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MACROECONOMIC IMPACT OF LOWER OIL PRICES IN HONDURAS¹

A. Introduction

1. **As an oil importer, Honduras is highly sensitive to changes in international oil prices.** Fluctuations in oil prices affect most major macroeconomic variables in Honduras: prices, growth, current account and fiscal deficit.² The dramatic drop in world oil prices since 2014 saw oil imports fall from slightly more than 11 percent of GDP in 2013 to about 6 percent of GDP in 2015 (Figure 1). The effect of oil prices on consumption is also non-negligible—oil-related categories account for about 7 percent of the CPI's consumption basket.³ The price of oil can also affect fiscal variables through the operating results of state-owned enterprise (ENEE), which is responsible for transmission, distribution and $\frac{2}{3}$ of total generation (more than a half of which is thermal).⁴



2. **Following the sharp oil price decline in 2014, the Honduran economy has improved significantly in 2015.** While the volume of oil imports grew in line with real growth, the value of oil imports almost halved as oil price declined. The resulting real income effect supported real growth, which accelerated to 3.6 percent in 2015 from 3.1 percent in 2014—and helped fiscal consolidation. At the same time, headline inflation dropped from 5.8 percent in 2014 to 2.4 percent in 2015. While

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² In the sample fiscal variables are sensitive to oil price changes due to the state-owned enterprise responsible for transmission, distribution and $\frac{2}{3}$ of total generation; more than a half of which is generated using thermal energy.

³ The overall significance is of course larger, as oil is used to produce other consumption goods.

⁴ ENEE's overall balance ("balance economico") excluding transfers averaged -0.7 percent of GDP over 2010–15.

these developments were supported by various factors, including improved domestic policies, a more favorable external outlook, and improved confidence, this paper aims to isolate the effect of oil price movements on economic performance.

B. Methodology

3. **The methodology captures the idea that oil price swings may respond to various forces.** To understand the effect of oil prices on growth, it is first necessary to identify the underlying forces driving oil price movements. Prices, including those of commodities, move in response to both demand and supply shocks, and the 2014–2016 drop in world oil prices has indeed been related to a combination of different shocks (see for instance, Arezki and Blanchard, 2014). Disentangling these effects is necessary if the aim is to obtain meaningful estimates of the effect of developments in the world crude oil market on growth. For example, a drop in oil prices will have a different effect on growth if it is due to weak global demand—which would also entail lower demand for Honduras’ exports—than if it relates to a sudden increase in world oil supply.

4. **To disentangle structural drivers of oil price changes, we first estimate a structural VAR of the world crude oil market.** The simple approach to identifying the underlying (or *structural*) reasons for oil price movements we follow the approach that was first proposed by Kilian (2009). The framework is based on a structural VAR model on monthly data for the percent change in global crude oil production ($\Delta prod_t$), global demand for industrial commodities as measured by a detrended index of real economic activity (rea_t), and the percent change in the real price of oil (Δrpo_t). If \mathbf{z}_t denotes the vector of variables of interest, $\mathbf{z}_t = (\Delta prod_t, rea_t, \Delta rpo_t)'$, then the proposed structural VAR representation is

$$\mathbf{A}_0 \mathbf{z}_t = \boldsymbol{\alpha} + \sum_{i=1}^T \mathbf{A}_i \mathbf{z}_{t-i} + \boldsymbol{\varepsilon}_t \quad (1)$$

where $\boldsymbol{\varepsilon}_t$ is a vector of uncorrelated structural shocks, and \mathbf{A}_0 is a lower-triangular matrix, i.e.

$$\mathbf{A}_0 = \begin{bmatrix} a_{11} & 0 & 0 \\ a_{21} & a_{22} & 0 \\ a_{31} & a_{32} & a_{33} \end{bmatrix}.$$

The exclusion restrictions imposed on \mathbf{A}_0 imply that world crude oil supply does not respond contemporaneously to global demand shocks or to any demand shock that is specific to the oil market. Global demand, in turn, may respond to contemporaneous innovations in the supply of oil, but not to those specific to the oil market. The real oil price may respond on impact to all three forces. Directly observable reduced-form residuals, $\mathbf{A}_0^{-1} \boldsymbol{\varepsilon}_t$, yield the series of structural innovations thanks to the restrictions imposed. Global demand innovations will correspond to those changes in global demand that cannot be explained by past observations and the contemporaneous shock to oil supply. Oil-specific demand shocks are changes in the real oil price not explained by past data and contemporaneous shocks to oil supply and global demand. These latter shocks would capture, for example, shocks to precautionary demand for oil.

5. **Given the structural innovations that explain oil price movements, the effect of these shocks on economic growth is estimated.** Following Kilian (2009) we estimate, for each structural shock separately, a linear regression model on quarterly data where quarter-on-quarter GDP growth (Δy_t) is the dependent variable and contemporary and lagged values of the shock are the explanatory variables. More specifically, we estimate:

$$\Delta y_t = \alpha_j + \sum_{i=0}^8 \varphi_{ji} \hat{\zeta}_{jt-i} + u_{jt}, \quad (2)$$

where $j = 1, 2, 3$ corresponds to each of the three structural shocks, and $\hat{\zeta}_{jt-i}$ is the average of the estimated monthly innovations of structural shock j within quarter $t - i$.

6. **The methodology has several advantages.** The most important is that it distinguishes among the different drivers—supply and demand effects—of oil prices that have different implications for growth. Also, since Honduras is a small economy, it is sensible to treat shocks affecting the world crude oil market as exogenous. As a result, the coefficient φ_{ji} simply corresponds to the impulse-response coefficient at horizon i .

7. **The longest available data span is used to estimate the oil price effect.** The first step is to model the world crude oil market using monthly data, covering over 30 years, from 1984:1 to 2015:12 of world oil production, a detrended monthly index of economic activity, which is based on representative single voyage freight rates,⁵ and monthly average spot oil price, which is available in the International Financial Statistics database, deflated with U.S. CPI. The second step of the procedure uses the longest quarterly GDP series up to the end of 2015 available in Haver Analytics.

C. Results

8. **The estimates for the model of the world crude oil market are intuitive and consistent with previous estimates.** An increase in oil production is usually protracted with partial reversal within a half a year (Figure 2, top left). This is because an unexpected reduction in oil production in one part of the world usually leads to an increase in production elsewhere (Killian, 2009). The unexpected increase in oil production leads to a protracted decrease in the oil price, again with partial reversal (Figure 2, bottom left). Upon aggregate demand innovations, oil production accommodates (Figure 2, center top), and oil prices increase somewhat (Figure 2, center bottom). A precautionary oil-specific demand shock leads to a decline in oil production and, as a result, to a surge of the oil price (Figure 2, bottom right). Also interestingly, the shock also increases real activity in the short-run (Figure 2, center right), a feature consistent with precautionary shocks to oil demand being related to expected increases in real economic activity.

9. **The estimates show that the Honduran economy is sensitive to oil supply shocks as well as aggregate demand shocks, but does not react to oil-specific demand shocks** (Figure 3). Lower oil prices due to unexpectedly higher oil supply impact Honduras the most with the largest

⁵ The monthly index of economic activity is provided by Lutz Kilian at www-personal.umich.edu/~lkilian/paperlinks.html.

boost to GDP in the second quarter after the shock. Even though a positive aggregate demand shock leads to an increase in the oil price, the effect of higher external demand for Honduras exports more than offsets the negative increase in the oil price increase. On the other hand, given that a precautionary oil demand shock leads to a significant oil price increase, the short-run increase in real activity is just enough to offset the negative impact of higher oil prices resulting in insignificant effect on GDP.

10. **In the short-run, the sharp oil price decline in 2015 represented—on net—a positive impulse for the Honduran economy.** In particular, real output growth rose to 3.6 percent in 2015, from 3.1 in 2014. According to April 2016 WEO, the decline in oil price decline in 2015 was mostly due to oil supply. In this case, the estimated effect of a 30 percent oil price decline such as the one observed in the second half of 2015 leads to approximately 0.7 q/q increase in 2015Q3 and 1.2 q/q increase in 2015Q4 based on the size of implied structural shocks. Therefore, overall growth rate that would have prevailed in 2015 is 3.1 percent instead of 3.6 percent.

11. **In the medium-term, the cumulative positive effect on growth in Honduras is expected to be around 2.5 percent.** Around $\frac{3}{4}$ of this increase is expected to come through private consumption and the rest through other components of GDP.⁶ The fiscal balance is expected to improve as the financial situation of the state electricity company improves due to the cost reduction of electricity generation.

12. **Relative to its Central American neighbors, Honduras shows average sensitivity to oil shocks.** (Figure 4). This is likely due to a higher share of thermal generation in Honduras in the past (as in Nicaragua and unlike Costa Rica) and large public presence in the electricity sector (unlike El Salvador).

D. Conclusion

13. **The positive effect of lower oil prices on Honduras may be dampened by weaker global demand.** While Honduras benefits from a surge in global crude oil production, it is also very sensitive to world aggregate demand. Hence an appropriate assessment of the effect of oil price changes on Honduras growth performance requires closely monitoring the supply-demand mix in the crude oil market.

14. **While Honduras appears to be sensitive to oil supply and aggregate demand movements, the sensitivity is likely to decline in the future.** First, Honduras has been gradually moving away from fossil fuels as the main source of electricity production. In 2009 nearly $\frac{2}{3}$ of the installed capacity was thermal, while the rest came from renewable sources. As of March 2016, almost $\frac{2}{3}$ of electricity was produced using renewable sources such as water, solar, wind and biomass. Second, the tariff reform proposed and partially implemented by electricity sector

⁶ This effect is slightly larger than what could be approximately rationalized using a simple Keynesian consumption function that only accounts for first-round effects. The estimated effect on GDP is equal to share of consumption in GDP times the marginal propensity to consume times the share of disposable income that goes to transportation times the percent change in oil price. This implies $0.74 \times 0.9 \times 0.07 \times 30 = 1.4$ percent reduction in q/q growth.

regulator (CREE) aims at reducing subsidies and make tariffs adjust with oil prices leading to reduction in sensitivity of the fiscal position.

Figure 2. Impulse Response Functions to Structural Shocks

(in months, seventy percent confidence)

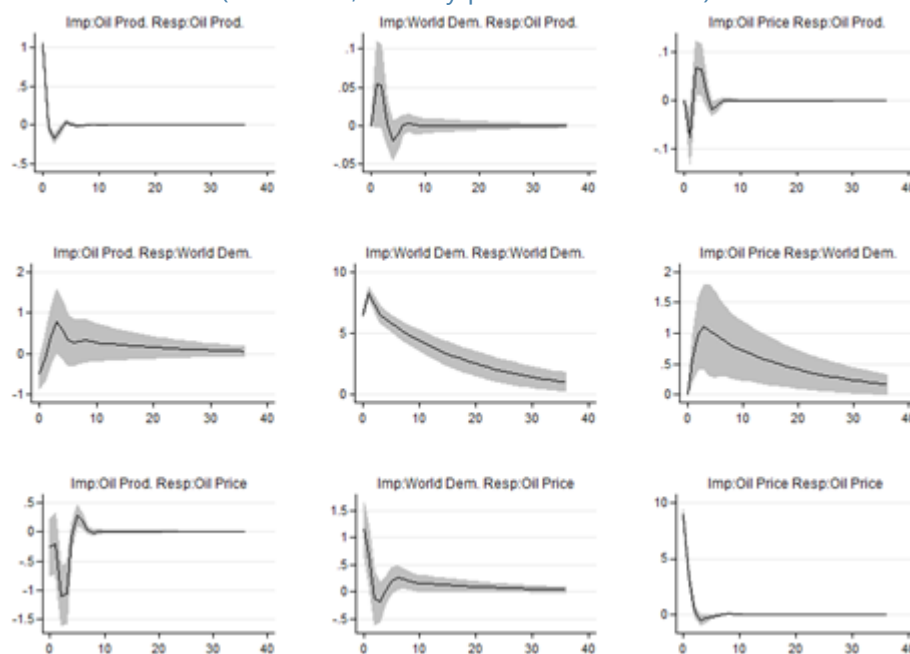


Figure 3. Impulse Response Functions of Quarter-On-Quarter GDP Growth To Three Structural Shocks.

(In quarters, seventy percent confidence.)

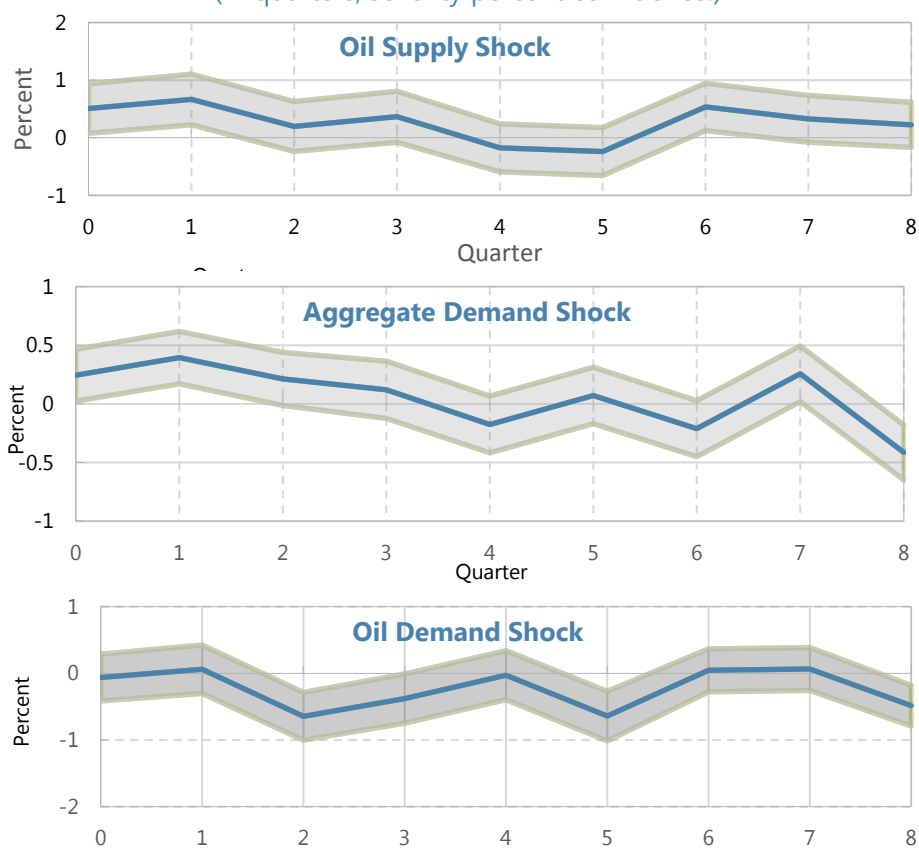
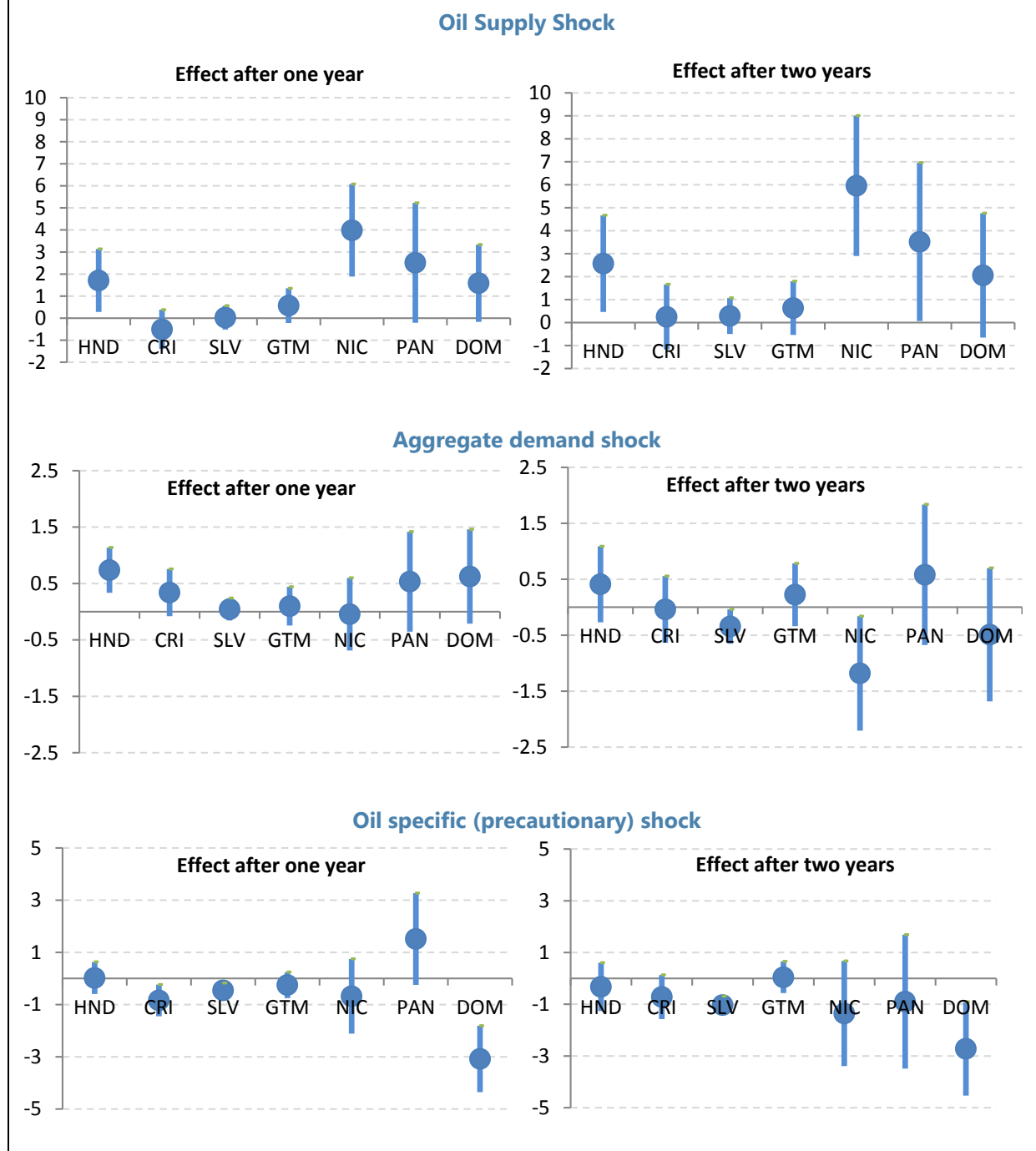


Figure 4. Cumulative Medium-Term Effect of Oil Shocks in Central America
(One s.d. shock with one s.e. Band)



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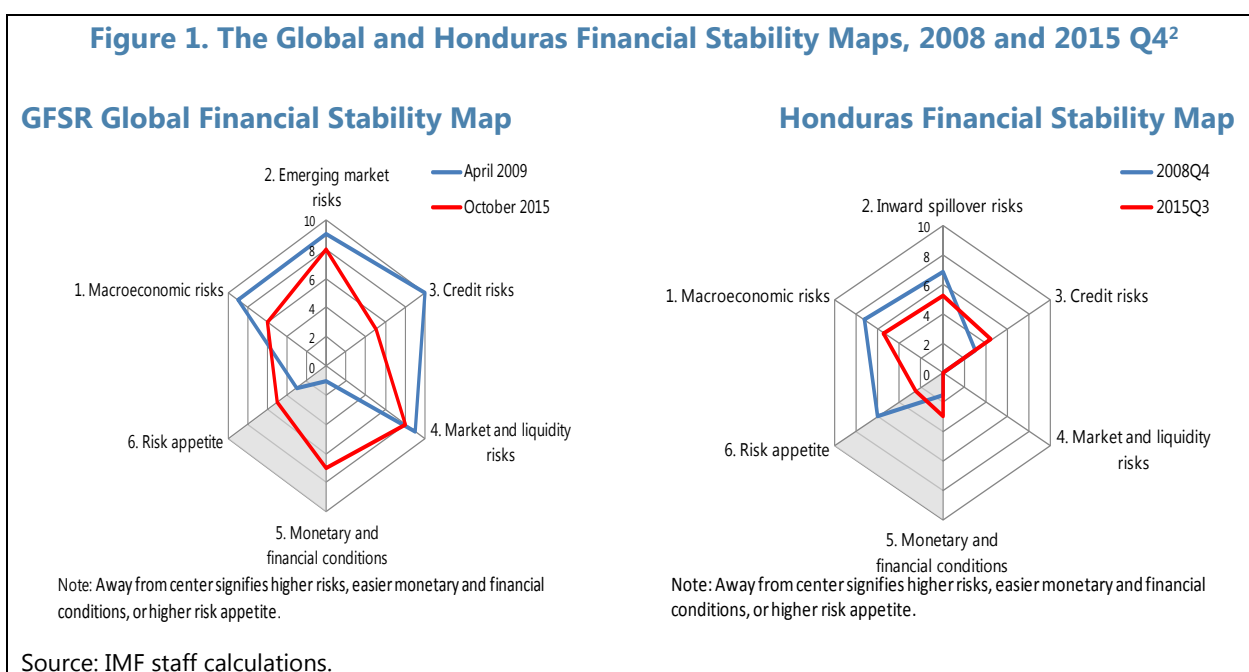
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BANKING SECTOR STABILITY IN HONDURAS¹

A. Introduction

1. **Financial stability indicators point to relatively low vulnerabilities in the Honduran banking system, but challenges remain.** Supported by the 2014 economic reform program, macroeconomic risks have subsided from the levels seen at the time of the last FSAP (which coincided with the nadir of the global financial crisis (GFC)), in line with a decline in inward spillover risks and the risk appetite for Honduran assets (Figure 1). In contrast, market and liquidity risks have remained at levels seen during the GFC. FSI indicators suggest that the financial system remains stable and well capitalized with relatively low NPLs and ample liquidity. Now that global financial stability indicators have stabilized, it provides a good opportunity to once again examine the resilience of the banking system using similar tail risk scenario shocks as those calibrated during the 2007/08 FSAP 2008.



2. **This paper outlines the structure of the financial system and assesses its soundness and resilience to shocks.** To achieve these objectives, we use the financial sector indicators heat map, the Cihak (2012) stress testing model and the Bank Contagion Module. Our results show that against the background of falling risks and improving macroeconomic conditions credit growth to GDP is well below credit boom thresholds and with low balance sheet risks and high balance sheet buffers, the

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² See the April 2010 Global Financial Stability Report (GFSR), especially Annex 1.1, for a methodology underlying the Financial Stability Map.

overall vulnerability rating for the banking sector is medium. Risks from international inward spillovers also appear to be low.

B. Structure of the Banking System

3. **The Honduran financial system continues to be dominated by the banking sector.** In 2015, measured by assets the banking sector represented about 78 percent of total assets of the financial sector, compared with 57 percent in 2000 (Table 1). Most banks are part of economic holding companies, which typically include other financial services as insurance and non-financial companies.

Table 1. Size and Structure of the Financial System
(In millions of Lempiras unless otherwise indicated)

	Dec. 2000				Dec. 2008				Dec. 2014				Dec. 2015			
	Number	Total assets	In percent of:		Number	Total assets	In percent of:		Number	Total assets	In percent of:		Number	Total assets	In percent of:	
			Total Assets	GDP			Total Assets	GDP			Total Assets	GDP			Total Assets	GDP
Commercial banks	21	60,379	77.1	56.6	17	213,486	78.5	81.4	17	393,763	77.3	96.1	15	432,178	77.5	97.0
Domestic	19	58,967	75.3	55.3	8	124,945	45.9	47.6	8	237,799	46.7	58.1	6	250,809	45.0	56.3
Foreign	2	1,412	1.8	1.3	9	88,541	32.5	33.7	9	155,964	30.6	38.1	9	181,370	32.5	40.7
Foreign Branches	1	6	0.0	0.0	2	469	0.2	0.2	2	335	0.1	0.1	1	320	0.1	0.1
Assets of Two Largest Banks	2	18,585	23.7	17.4	2	63,850	23.5	24.3	2	140,790	27.6	34.4	2	163,054	29.2	36.6
Assets of Six Largest Banks	6	40,364	51.5	37.8	6	164,729	60.5	62.8	6	312,069	61.3	76.2	6	357,442	64.1	80.3
Institutional Investors	18	12,442	15.9	11.7	17	53,589	19.7	20.4	18	106,932	21.0	26.1	18	116,037	20.8	26.1
Insurance Companies	12	3,068	3.9	2.9	11	7,979	2.9	3.0	12	12,477	2.4	3.0	11	13,401	2.4	3.0
Pension Funds	6	9,375	12.0	8.8	6	45,610	16.8	17.4	6	94,455	18.5	23.1	7	102,636	18.4	23.0
Private	1	14	0.0	0.0	1	59	0.0	0.0	1	384	0.1	0.1	2	552	0.1	0.1
Public 1/	5	9,360	12.0	8.8	5	45,551	16.7	17.4	5	94,071	18.5	23.0	5	102,084	18.3	22.9
Other Nonbank	12	1,148	1.5	1.1	11	4,984	1.8	1.9	10	8,614	1.7	2.1	10	9,572	1.7	2.1
Financial Companies	12	1,148	1.5	1.1	11	4,984	1.8	1.9	10	8,614	1.7	2.1	10	9,572	1.7	2.1
Total Financial System	55	78,309	100.0	73.4	45	272,060	100	103.7	45	509,309	100.00	124.3	43	557,788	100.00	125.3

Source: National Banking and Insurance Commission (CNBS).

1/No information on INPREUNAN is available for 2000.

4. **Although foreign participation in the banking system has increased since 2000, domestic banks remain dominant.** As of December 2015, the banking sector comprised 15 privately owned banks, 9 of which were foreign owned banks compared with 2 (out of a total of 21 banks) in 2000. Domestic banks, however, with 58 percent of the banking sector assets (56 percent of GDP) in 2015, remain dominant. Together, the domestic and foreign owned banks represented about 97 percent of GDP in 2015, compared with 79 percent in 2008 and 57 percent in 2000.

5. **The banking sector has become more concentrated over time.** In 2015, two banks controlled 29.2 percent of the banking sector assets and 39 percent of deposits. By contrast in 2008, two banks controlled 24 percent of banking sector assets. This process has been driven by a series of merges and acquisitions, as banks consolidate to reduce cost and improve efficiencies.

C. Credit Cycle

6. **Recent private sector credit growth has been well below credit boom metrics.** In particular, the annual change in credit to GDP ratio has been much less than 5 percentage points—the threshold that indicates excessive credit growth (Table 2). In addition, the annual percentage change in the credit to GDP ratio has also been below the stress threshold of 10 percent, with a Z score of less than 1.5 standard deviations (std).³

Table 2. Banking Sector Soundness Indicator Map											
Honduras	2013Q4	2014Q1	2014Q2	2014Q3	2014Q4	2015Q1	2015Q2	2015Q3	2015Q4	2016Q1	2016Q2
Overall Financial Sector Rating	M	M	M	M	M	M	M	M	M	M	M
Credit cycle	M	L	L	L	L	L	L	L	L	L	L
Change in credit / GDP ratio (pp, annual)	3.4	2.8	2.2	1.6	1.0	0.9	0.9	0.9	0.1	0.5	0.8
Growth of credit / GDP (% annual)	6.7	5.4	4.1	2.9	1.8	1.7	1.7	1.6	0.2	0.9	1.5
Credit-to-GDP gap (st. dev)	1.3	0.9	0.4	-0.1	-0.8	-1.5	-1.7	-1.8	-2.1	-1.6	-1.3
Balance Sheet Soundness	M	M	M	M	M	M	M	M	M	M	M
Balance Sheet Structural Risk	M	M	M	M	M	M	M	M	M	M	M
Deposit-to-loan ratio	94.8	95.9	95.0	93.8	96.2	98.8	99.0	97.5	97.3	98.2	98.0
FX liabilities % (of total liabilities)	37.2	37.0	36.9	37.1	38.0	36.2	36.5	36.4	36.1	36.0	35.3
FX loans % (of total loans)	32.9	34.2	34.0	33.5	34.0	34.9	33.6	32.9	32.5	32.9	31.4
Balance Sheet Buffers	L	L	L	L	L	L	L	L	L	L	L
Leverage	L	L	L	L	L	L	L	L	L	L	L
Leverage ratio (%)	9.1	8.9	9.4	9.3	9.2	9.0	8.8	8.9	8.7	8.7	8.6
Profitability	L	L	L	L	L	L	L	L	L	L	L
ROA	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.4	1.2	1.3
ROE	14.5	13.8	13.4	13.3	13.4	12.5	13.1	13.5	14.6	11.8	13.5
Asset quality	L	M	L	M	L	L	L	L	L	M	M
NPL ratio	3.4	3.6	3.7	4.0	3.3	3.4	3.4	3.7	3.1	3.7	3.6
NPL ratio change (% annual)	3.2	9.2	-0.7	7.7	-3.6	-7.7	-10.0	-7.4	-6.6	10.9	6.9
Memo items:	2013Q4	2014Q1	2014Q2	2014Q3	2014Q4	2015Q1	2015Q2	2015Q3	2015Q4	2016Q1	2016Q2
Credit-to-GDP (%)	54.3	54.6	54.8	55.0	55.3	55.5	55.7	55.9	55.4	56.0	56.5
Credit-to-GDP gap (%; HP filter)	1.3	1.2	1.1	0.9	0.8	0.6	0.5	0.3	-0.6	-0.3	-0.2
Credit growth (%; annual)	11.2	11.0	10.9	10.8	10.7	10.6	10.6	10.5	10.4	9.8	10.3
CAR (in %)	14.5	14.2	14.9	14.5	14.6	14.5	14.0	14.1	14.0	13.9	13.7

Source: CNBS.

7. **That said, the current allocation of private sector credit could foster banking sector vulnerabilities.** While the sectoral allocation of the loan portfolio at end 2015 appears to be diversified, with about 60 percent of loans comprising consumption, retail, real estate and corporate sectors, the loans-portfolio exposure to foreign currency risk remains high. Loans to the commercial and housing sectors to unhedged borrowers are about 46 percent and 80 percent of the total foreign currency lending to each sector respectively (Table 3). These unhedged borrowers have the potential to increase the vulnerability of the financial sector to foreign exchange rate risks, and require sustained efforts from the bank supervisory body to mitigate this risk. In addition, increased loans to the household sector could be a risky strategy given the longstanding anemic record of

³ See Dell'Ariccia and others "Policies for Macroeconomic Stability: How to Deal with Credit Booms," IMF SDN/12/06, for a methodology describing the computation of these thresholds.

employment creation in Honduras. At the same time, credit to manufacturing and agriculture, two key foreign exchange earning sectors have been virtually stagnant.

Table 3. Banks Sectoral Allocation of Private Credit and Credit Dollarization
(In percent of total credit)

	2010	2011	2012	2013	2014	2015
Credit allocation						
Agriculture and related sectors	4.7	4.9	4.4	4.7	5.0	5.9
Commerce	12.7	13.0	14.4	14.3	14.3	13.6
Construction and real estate	34.2	32.9	30.8	28.9	27.1	24.6
Industry	13.6	12.3	11.7	11.9	11.1	11.1
Consumption	16.5	18.3	20.5	21.9	21.0	21.3
Other	18.3	18.6	18.2	18.0	21.3	23.5
Credit dollarization						
<i>Credit in foreign currency in percent of total</i>	<i>28.3</i>	<i>30.1</i>	<i>31.2</i>	<i>33.5</i>	<i>34.7</i>	<i>33.2</i>
By sector:						
Commerce	37.8	39.9	42.5	45.9	46.8	46.0
Housing	11.0	12.3	9.8	8.9	8.2	6.9
Consumption	10.1	10.1	9.2	8.5	10.5	9.1
<i>Proportion of FX debtors that are non FX generators</i>	<i>48.4</i>	<i>46.1</i>	<i>52.4</i>	<i>49.2</i>	<i>46.9</i>	<i>49.1</i>
Of which:						
Commerce	47.4	45.6	51.2	47.5	44.8	46.4
Housing	81.5	73.1	74.1	79.3	79.9	82.3
Consumption & Credit cards	32.7	28.4	52.8	56.1	58.9	82.4

Source: CNBS

D. Balance Sheet Soundness Indicators

8. **Structural risks to banks balance sheets appear to be moderate.** In particular, liquidity appears to be adequate with the total deposits to loan ratio being less than 100, broadly in line with the rest of its peers in Central America. And total liquid assets, covering 44 percent of short-term liabilities.

9. **Financial dollarization remains moderate compared with some of its peers in Latin America.** Foreign currency liabilities represent about 37 percent of total liabilities, while the share of foreign-currency denominated loans is about 33 percent of total loans. However, El Salvador is 100 percent dollarized, while Costa Rica is broadly in line with what obtains in Honduras. Importantly, dollarization indicators have recently begun to show a gradual reduction.

10. **Balance sheet buffers in the banking sector appear to be sufficient, with a low vulnerability rating.** As of December 2015, bank capital was well above regulatory requirements, low non-performing loans representing about 3.7 percent of total loans and 17.5 percent of the banking system's capital.⁴ That said, Honduras as at end-December 2015, had the highest level of NPLs among its peers in Central America (Table 4). Honduran banks, however, are profitable, with an

⁴ NPLs net of provisions to capital was -5.4 percent as at end-December 2015.

average return on equity (ROE) of almost 15 percent and an average return on assets (ROA) of 1.4 percent. At the same time, the debt to capital ratio (leverage ratio) was low at 10 percent.

Table 4. Central America: Comparative Financial Soundness Indicator Map

	Costa Rica	Dominican Republic	El Salvador	Guatemala	Honduras	Panama	Nicaragua
Overall Financial Sector Rating	M	M	M	M	M	M	M
Credit cycle	M	L	L	L	L	H	L
Change in credit / GDP ratio (pp, annual)	3.4	0.9	0.9	1.3	0.9	7.7	2.1
Growth of credit / GDP (% annual)	5.3	3.4	2.2	4.2	1.5	8.3	6.5
Credit-to-GDP gap (st. dev)	-0.6	-0.2	-1.4	-1.1	-0.9	0.1	-2.0
Balance Sheet Soundness	M	M	M	M	M	L	M
Balance Sheet Structural Risk	M	M	H	M	M	L	M
Deposit-to-loan ratio	95.3	83.1	92.5	124.1	97.3	105.2	111.5
FX liabilities % (of total liabilities)	33.5	30.0	100.0	30.8	36.1	n.a.	83.0
FX loans % (of total loans)	37.2	24.2	100.0	39.5	32.5	n.a.	100.0
Balance Sheet Buffers	L	L	L	L	L	L	L
Leverage	L	L	L	M	L	L	L
Leverage ratio (%)	9.7	9.1	13.9	6.9	10.4	10.0	13.3
Profitability	L	L	L	L	L	L	L
ROA	1.1	2.3	1.1	1.7	2.0	1.4	2.2
ROE	7.7	20.0	7.8	18.6	18.5	14.1	20.4
Asset quality	M	L	L	L	L	L	L
NPL ratio	1.7	1.5	2.3	1.3	3.0	1.2	2.7
NPL ratio change (% annual)	7.2	-31.8	-2.3	4.6	-7.0	-11.2	-1.8

Reflects data as at 2015Q4. For the Dominican Republic the data is for 2014Q4, while Nicaragua is 2015Q2

Sources: Individual country authorities; and IMF staff calculations.

E. Banking Sector Stress Tests

11. **To undertake a more forward looking assessment of banking sector soundness, we perform stress tests, using bank-by-bank data.**⁵ Using the Cihak model (2012), we conducted stress tests (STs) to measure credit, market and liquidity risks on the banking sector (including sensitivity to single-factor shocks) based on end-2015 data. This framework can simulate the static impact that tail risk scenario shocks to a number of variables will cause on the levels of capitalization and profitability of the banking sector.

12. **The stress tests of the Honduras' banking sector assessed key shocks stemming from market, liquidity and credit risks, as well as a combination shock.** On market risks, we analyzed the impact of a 10 percent depreciation of the Lempira against the US dollar on the net open foreign exchange position, while assuming that NPLs increase by 50 percent and provisioning by 25 percent.⁶ Liquidity risk, is based on a scenario stemming, for example, from a slowdown in the inflow of remittances to Honduras. The scenario considered in this paper is based on the level of deposit withdrawals obtained during 2000–08 (similar as in the FSAP), averaging 20 percent of deposits in one month. On interest rate, we simulated a 3.3 percentage points increase (similar to the one-year cumulative change during December 2008 to December 2009) in the nominal policy interest rate. On credit risks, we measure the impact on CAR from tail risk events. Under this heading, we

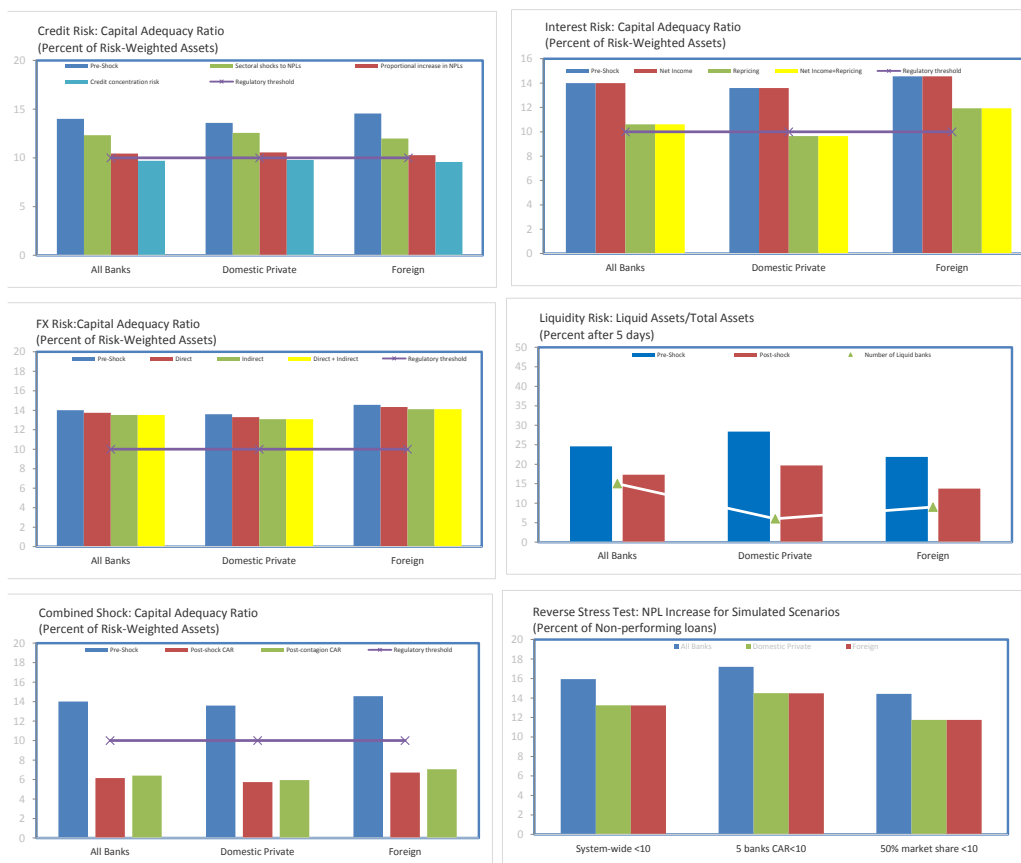
⁵ The stress tests reported in this paper were subsequently used for the preparation of the 2016 Honduras Financial Sector Stability Review.

⁶ All shocks, except for the liquidity and interest rate shocks, are calibrated as two standard deviations over the mean for the period 1997–2015.

considered two scenarios: (i) a 9 percentage point deterioration in loan quality, leading to a uniform increase in the non-performing loans (proportional to existing loans). This increase in NPLs is consistent with three times the current level of NPLs, and represents about two-thirds of the NPL increase following Hurricane Mitch 1998; and (ii) default of the three largest borrowers for each bank. This shock measures a proportional increase in NPLs to large borrowers—to measure the impact on the CAR of the default of the three largest borrowers of each bank. The combination shock scenario is based on the aforementioned, liquidity, FX, interest rate, and credit risks. In this tail risk scenario, we assessed the impact on solvency and liquidity of the NPL ratio rising to eleven percent (consistent with the trigger to assess credit risk) combined with 10 percent depreciation of the Lempira and 5-day successive withdrawals of 7.4 percent of deposits.⁷ Finally, we also considered a reverse test to determine what would have to be the NPL level increase for (i) the system-wide CAR to fall below the regulatory minimum threshold; (ii) at least 7 banks (about half of the total system) to fall below the regulatory CAR; and (iii) banks constituting 50 percent of total market share to decline below the minimum regulatory threshold.

⁷ In the liquidity shock deposits withdrawal assumptions are as follows: Demand deposits in domestic currency 15 percent per day; demand deposits in foreign currency, 10 percent per day. For time deposits, in domestic currency 3.5 percent per day. Time deposits in foreign currency are assumed to be 1 percent per day. Together, these withdrawals average 7.4 percent of total deposits per day.

Figure 2. Banks Stress Test Results



Source: IMF staff estimates

Note: The credit risk shock 10 percent increase in NPLs of performing loans and 50 percent provisioning rate. The interest rate shock assumes a 2.3 percentage point increase nominal interest rate increase. The FX shock assumes a 6 percent depreciation of the FX rate, leading to 50 percent FX loans becoming NPLs, and a 50 percent provisioning rate. The liquidity shock assumes a 20 percent fall in deposits over 5 days.

Table 5. Banks Stress Tests Results

	Domestic		
	All Banks	Private	Foreign
Baseline			
Non performing loans (NPLs (gross)/ total loans)	3.0	4.1	1.7
Capital adequacy ratio (CAR) (Percent)	14.0	13.6	14.6
Credit Risks Stress Tests			
<i>1. Proportional increase in NPLs</i>			
NPLs (gross)/ total loans	11.8	12.8	10.5
Post-shock CAR (Percent)	10.4	10.6	10.3
<i>2. Sectoral shocks to NPLs</i>			
NPLs (gross)/ total loans	6.9	7.4	6.4
Post-shock CAR (Percent)	12.3	12.6	12.0
<i>3. Credit concentration risk</i>			
NPLs (gross)/ total loans	10.1	11.1	8.9
Post-shock CAR (Percent)	9.7	9.8	9.6
<i>4. NPL Threshold that puts the system level CAR below minimum</i>			
NPLs (gross)/ total loans	15.9	17.2	14.4
Post-shock CAR (Percent)	9.5	9.3	9.7
<i>5. NPL Threshold based on seven banks with CAR below the Regulatory Minimum</i>			
NPLs (gross)/ total loans	13.2	14.5	11.7
Post-shock CAR (Percent)	10.5	10.3	10.8
<i>6. NPL threshold based on the banks that represent 50 percent of banking sector assets</i>			
NPLs (gross)/ total loans	13.2	14.5	11.8
Post-shock CAR (Percent)	10.3	10.1	10.6
Interest Rate Risk Stress Test			
<i>1. Net interest income impact</i>			
Post-shock CAR (Percent)	14.0	13.6	14.6
CAR change (Pct Point)	0.0	0.0	0.0
<i>2. Repricing impact</i>			
Post-shock CAR (Percent)	10.6	9.6	11.9
Fx Stress Tests			
<i>1. Direct Foreign Exchange Risk</i>			
Post-shock CAR (Percent)	13.7	13.3	14.3
<i>2. Indirect Foreign Exchange Risk</i>			
Post-shock CAR (Percent)	13.5	13.1	14.1
Liquidity Stress Test (# of liquid banks after 5 days)			
Simple liquidity test (run on all banks, fire-sale of assets)	15	6	9

Source: Fund staff calculations.

Note. A 10 percentage point increase in NPLs proportional to existing NPLs and performing loans. There is assumed 50 percent provisioning rate; and a 100 percent impact on RWA.

13. **The Honduran banking system appears to be broadly resilient to market, liquidity and interest rate shocks.** On market risks, our results, suggest that the shock to exchange rate leaves both the net open position in foreign currency and the system's CAR within the required thresholds (Figure 2 and Table 5). The overall impact of the interest rate hike is likely to be a 3.5 percentage points (pp) fall in CAR to 11 percent. This result emerges as the banks only hold long term government securities. The largest impact of the interest rate movements occurred with the domestic banks, given that they hold 67 percent of the banking sector's total holding of government securities. Our shock to liquidity, suggested that the banking system can comfortably accommodate a 7.4 percent per day withdrawal of deposits for up to five days.

14. **The banking system also appears to be able to withstand most credit shocks, except for the tail-risk scenarios.** On credit risks, our results suggest that under the uniform NPL increase, the system's CAR would fall by 3.6 percentage points, but remain above the CAR regulatory threshold of 10 percent (Table 5). However, about seven banks fall below the CAR regulatory threshold. When the three largest borrowers (credit concentration risks) of each bank default, the system's capital would fall to 9.7 percent, which is below the regulatory threshold. In addition, the CAR of about 11 banks, under this scenario, falls below the regulatory minimum. The results of the combined shock show that banks' capital is also highly vulnerable to multiple shocks (Table 6). The system's CAR would fall to 6.4 percent with all but four banks undercapitalized representing a capital shortfall equivalent to 2 percent of GDP. Further, the system's liquid asset ratio would fall to 17 percent (below the pre-shock ratio of 25.6 percent), and one bank would suffer liquidity shortage.

F. Spillovers from International Banking Sector Stress

15. **Inward spillovers to Honduras from international banking stress are among the smallest in the CAPTAC-DR region.** The impact on foreign credit availability in Honduras of a severe stress scenario in asset values of BIS reporting banks, presented in the text figure and the table below, is not very large.⁸ As of October 2015, the most sizeable impact on claims on Honduran borrowers would stem from shocks in the selected European countries as a group. Spillovers from a 10 percent shock to assets originating in the selected European countries would reduce credit in Honduras by 1.7 percent of GDP.



Note: In Panama, the loss of credit includes credit by banks in the off-shore center with minimal links to the domestic economy.

⁸ For methodological details see Cerutti, Eugenio, Stijn Claessens, and Patrick McGuire, 2012, "Systemic Risks in Global Banking: What can Available Data Tell Us and What More Dare Are Needed?" BIS Working Paper 376, Bank for International Settlements. Banks exposures and spillover estimates were provided by Camelia Minoiu and Paola Ganum (RES).

Table 6. Summary of Combination Shock Bank Stress Test Results

	All Banks		Domestic Banks	Foreign Banks
	Indicator	Ratings 1/		
Summary of Results				
<i>Solvency</i>				
Pre-shock CAR	14.0	2	13.6	14.6
Impact of (percentage points of the original RWA)	-7.8		-7.9	-7.8
Increase in provisioning	-0.4	2	-0.1	-1.0
Increase in NPLs	-3.5	2	-3.3	-3.8
Increase in interest rates	-3.4		-3.9	-2.6
Exchange rate change (+ depreciation, - appreciation)	-0.5	2	-0.5	-0.4
Post-shock CAR	6.2	4	5.7	6.7
<i>Liquidity</i>				
Liquid assets/total assets				
Pre-shock	24.6	2	28.4	21.9
Post-shock	17.3	3	19.7	13.8
Liquid assets/short-term liabilities				
Pre-shock	69.5	1.1	74.1	62.6
Post-shock	56.1	1.8	62.6	46.0
Overall Rating				
Pre-Shock Rating		2		
Post Shock Rating		3		

Source: IMF staff calculations

1/ 1=Low risk, 2=increased risk, 3=High risk, 4=Very high risk.

Table 7. Spillovers from International Banking Sector Stress

(Exposures as of October 2015)

Creditor banking system	Magnitude of Shock to Creditor Banks' Exposures 1/	Impact on Credit Availability (% GDP) 2/	
		Total Impact	Impact through Panama
USA	10	-1.30	-0.10
Canada	10	-0.09	-0.09
USA and Canada	10	-1.39	-0.19
UK	10	-0.09	-0.09
Germany	10	-0.31	-0.11
France	10	-0.54	-0.04
Spain	10	-0.03	-0.03
Italy	10	-0.02	-0.02
Greece	10	-0.01	-0.01
GIP 3/	10	-0.01	-0.01
Switzerland	10	-0.02	-0.02
Netherlands	10	-0.72	-0.02
Japan	10	-0.32	-0.32
Selected European countries 4/	10	-1.73	-0.33

Source: Research Department Macro-Financial Division Bank Contagion Module based on

1/ Percent of on-balance sheet claims (all borrowing sectors) that default.

2/ Reduction in foreign banks' credit due to the impact of the shock on their balance sheet, assuming uniform deleveraging across domestic and external claims. All simulations are based on 2015Q3 data.

3/ Greece, Ireland, and Portugal.

4/ Greece, Ireland, Portugal, Italy, Spain, France, Germany, Netherlands, and the UK.

16. **At the same time, reflecting strong trading and banking sector links, Honduras' largest single country source of inward spillovers is the United States.** In particular, a 10 percent shock to creditor banks in the United States would result in loss of a 1.3 percent of GDP fall in credit availability in Honduras. This result is in line with that of its peers in the region.

G. Conclusion

17. **Financial stability indicators points to relatively low vulnerabilities in the Honduran banking system, but challenges remain.** Supported by the 2014 economic reform program, macroeconomic risks have subsided from the levels seen during the nadir of the global financial crisis (GFC), in line with a decline in inward spillover risks and the risk appetite for Honduran assets (Figure 1). These developments are in keeping with global developments. FSI indicators suggest that the financial system remain stable and well capitalized with relatively low NPLs and ample liquidity.

18. **The banking sector is broadly resilient to market, and liquidity shocks, but susceptible to some credit shocks, and a combination shock.** Stress tests conducted by staff—confirm the banking sector's relative strength in managing market and liquidity risks. Specifically, the system can tolerate shocks such as, deposit withdrawals, and a large Lempira depreciation, suggesting that, liquidity, and foreign exchange risks are contained. That said, the system does not appear to have sufficient capital to absorb shocks when confronted with tail-risk scenarios—a credit concentration shock, or a combination shock. In both scenarios, the banking system's CAR fell below the minimum CAR regulatory threshold.

References

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A BALANCE SHEET APPROACH TO MACROECONOMIC VULNERABILITIES¹

A. Introduction

1. **In response to rising macroeconomic vulnerabilities during 2011–13, starting in 2014, the Honduran government implemented a macroeconomic adjustment package.** The primary aim of this adjustment package was to reduce macroeconomic imbalances, promote inclusive economic growth, and improve domestic security. This adjustment package was targeted to be implemented over a three-year period, starting in 2014. On the fiscal side, the program aimed to restore discipline and contain public debt growth. Overall, the authorities are targeting an adjustment in the combined public sector primary balance of about of 6½ percent of GDP over 2014–17, with about 2 percentage points of this adjustment taking place in 2014. The fiscal policy measures, while building upon the tax measures adopted in 2013, were focused on reducing spending, improving tax administration, and lowering the deficit of the state-owned electricity company. On monetary policy, the authorities undertook measures to keep inflation in check and help strengthen the external position.

2. **To assess the success of the stabilization program in reducing macroeconomic vulnerabilities, this paper used the balance sheet analysis framework.** The balance sheet matrices can be used to assess mismatches in the size, structure, tenure and currency denomination of each sector's financial assets and liabilities. According to Lima and others (2006), these vulnerabilities can be gleaned from a series of indicators. The net financial position, i.e., financial assets minus financial liabilities. A large negative net position can point to solvency problems, especially if a sector's real assets are insufficient to match its open financial position. High leverage—i.e., a large share of debt in total liabilities (i.e., of debt plus equity)—reinforces vulnerability. The net foreign currency position (foreign currency assets minus foreign currency liabilities). A sector with a large negative (positive) foreign currency position is vulnerable to an exchange rate depreciation (appreciation). Most foreign currency assets/liabilities in Honduras are denominated in US dollars. Net short-term position, defined as short-term assets minus short-term liabilities: a large negative short-term position indicates vulnerability to interest rate increases and to rollover risk.

B. The Overview of Key Balance Sheet Developments—2013 versus 2015

3. **Since 2013Q4, the authorities have been successful in reducing some macroeconomic vulnerabilities (Table 1 and Figure 1).** In particular:

- *The net short-term foreign currency position (liquidity) has improved since 2013.* This has increased the economy's resilience to short-term external shocks. In particular, in 2015Q3 net liquid foreign currency assets rose to 6.5 percent of GDP (US\$1.65 billion), about 2.9

¹ Prepared by Garth P. Nicholls with assistance from Giovanni Ugazio in estimating the BSA matrices.

percentage points more than the level in 2013Q4. The 4 percentage points of GDP increase in the central bank's foreign liquidity position was the main driver of this improvement. At the same time, the level of net international reserves to short-term debt rose to 828 percent in 2015, from 694 percent in 2013.

- *The economy's capital structure has also improved.* The ratio of net external debt to the stock of net foreign direct investment has declined to 59 percent in 2015, from 65.8 percent in 2013. This was supported by a steady inflow of FDI, along with an improvement in the net foreign asset position of the central bank. In the case of the private sector, foreign direct investment remains at about 60 percent of total liabilities.

4. **That said, some balance sheet weaknesses remain (Table 1 and Figure 1).** In particular:

- *The currency mismatch indicators have deteriorated, albeit, slightly since 2013.* First, the non-FDI net foreign currency deficit position (NFC) expanded and this has increased the economy's vulnerability to exchange rate risks. Since 2013, the non-FDI NFC deficit position rose by about 1.1 percentage points to 8.7 percent in 2015, reflecting increased foreign borrowing by both the corporate and government sectors, along with a fall in household and financial sector NFC surplus positions. Second, with FDI included, the net foreign currency deficit (NFC) position of Honduras widened to 65 percent of GDP in 2015, from 61 percent of GDP in 2013. And third, hard currency denominated external debt net of external assets denominated in hard currency relative to GDP has increased relative to 2013.
- *Most indicators of external solvency point to a continued deterioration, albeit, slightly during 2013 to 2015.* For example, the net external deficit to GDP has widened to 66 percent of GDP in 2015, from 61 percent in 2013. At the same time, although the present value (PV) of external debt has remained broadly stable at 30 percent of GDP, the PV of external debt to exports has risen to 67 percent from 62 percent in 2013.

5. **Overall, these developments provide some comfort that Honduras' present external position has stabilized somewhat, but weaknesses persist at the sectoral level.** The public and corporate sectors are exposed to exchange rate risks due to currency mismatches. The currency mismatch in the corporate sector can translate into credit risk to banks in the event of a sharp exchange rate depreciation. In addition, growing household indebtedness in the context of weak employment and income growth can also expose the banking system to significant credit risks. These and other balance sheet weaknesses represent likely contingent liabilities to the public sector that could potentially raise the already sizeable public debt burden.

Table 1. Summary of Balance Sheet Risks

	2013	2015
Maturity Mismatch:		
Foreign exchange liquidity relative to GDP	3.6	6.5
Net International Reserves to short-term external debt	694.0	828.0
Currency Mismatch:		
Net Foreign currency balance relative to GDP	-60.6	-64.5
Net Foreign currency balance (excluding FDI) relative to GDP	-7.7	-8.7
Net hard currency denominated external debt minus external assets denominated in hard currency relative to	32.3	34.0
Capital Structure Mismatch:		
Net hard currency denominated external debt relative to net stock of FDI 1/	65.8	63.9
Solvency (liabilities vs assets)		
Net external financial position to GDP	-60.9	-64.9
External debt to external assets 2/	52.1	52.1
External debt to GDP	34.6	36.6
External debt to exports of goods and services	75.1	81.9
PV of external debt	29.8	31.1
PV of external debt in percent of exports	61.6	69.6
Memo		
Net stock of FDI	-52.9	-55.7

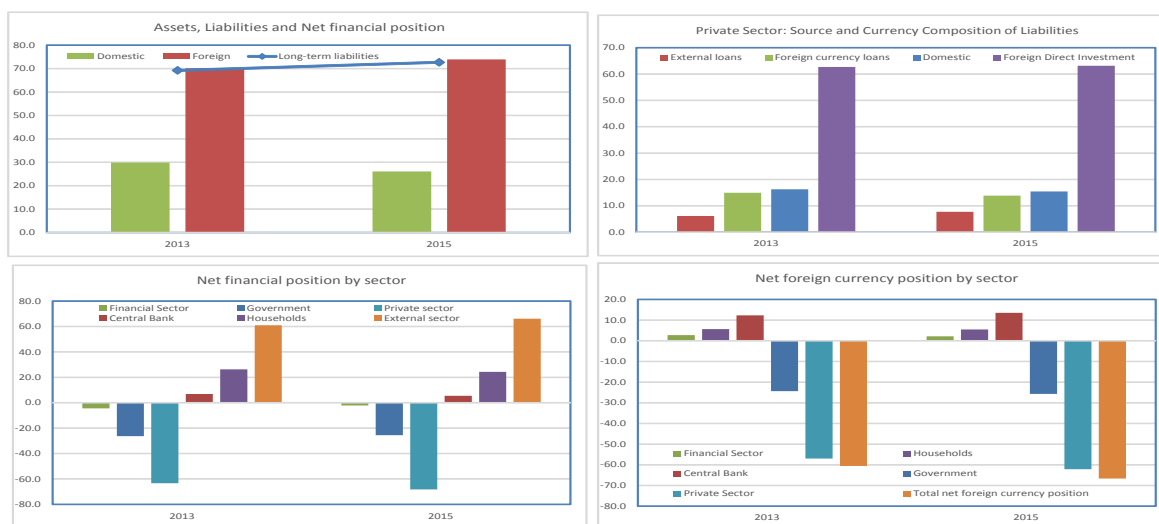
Source: IMF staff calculations.

1/Net external debt (external debt minus external assets) relative to net stock of FDI

2/ Stock of external debt relative to external financial assets.

3/ Stock of external debt relative to external financial assets plus the discounted value of the non-interest external account

Figure 1. Structure of Liabilities, Net Financial and Net Foreign Currency Positions



Source: IMF staff calculations.

C. Sectoral Balance Sheet Developments

Household Sector

6. **The household sector's balance sheet has weakened, amid an increase in household indebtedness.** Since 2013, household indebtedness rose by 1 percentage point of GDP to 19 percent of GDP (22.8 percent of household income), broadly in line with the average for Central America.² In 2015, household debt for housing and consumption amounted to 8.4 and 10.6 percent of GDP respectively, and are partly denominated in foreign and local currency. As a result of the rise in household indebtedness, the household sector's net financial position has declined by 1.7 percentage points since 2013 (Table 5 and Figure 6). This movement in the net financial position is due primarily to a decline in the household's net position with the financial sector.

Composition of Household Debt

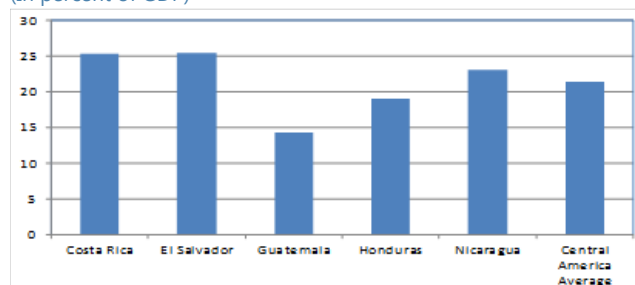
(In percent of GDP)

	2011	2012	2013	2014	2015
Total	15.2	16.7	18.0	18.3	19.0
Consumption	6.7	8.1	9.2	9.9	10.6
Credit Card	3.6	4.2	4.8	5.4	4.7
Other Consumption	3.1	3.9	4.4	4.5	5.9
Housing	8.5	8.6	8.8	8.4	8.4

Source: Central Bank of Honduras, Financial Stability report, 2015

Household Debt in Selected Central America Countries, 2015

(In percent of GDP)



7. **Household indebtedness has grown amid the authorities' pursuit of financial deepening and inclusion.** This financial development strategy has focused on increasing access, prudential standards, education and consumer protection. This strategy has permitted increased access to the financial system by the previously unbanked, but also appears to have led to an increase in household debt.

8. **The household sector's net foreign currency position has also deteriorated, somewhat, since 2013.** This deterioration has been driven by a fall in foreign currency deposits as a share of GDP, which fell more than the share of foreign currency loans. While the portion of household debt denominated in foreign currency has fallen, the share of un-hedged household debt has risen. In 2015, about 16 percent of total household debt was denominated in foreign currency, having declined from about 17.4 percent of total debt in 2013. At the same time, the portion of the foreign currency borrowing by the un-hedged households has increased to 82 percent in 2015 from 79 percent in 2013.

² In 2015 household debt represented about 35 percent of the financial sector's outstanding credit to the private sector.

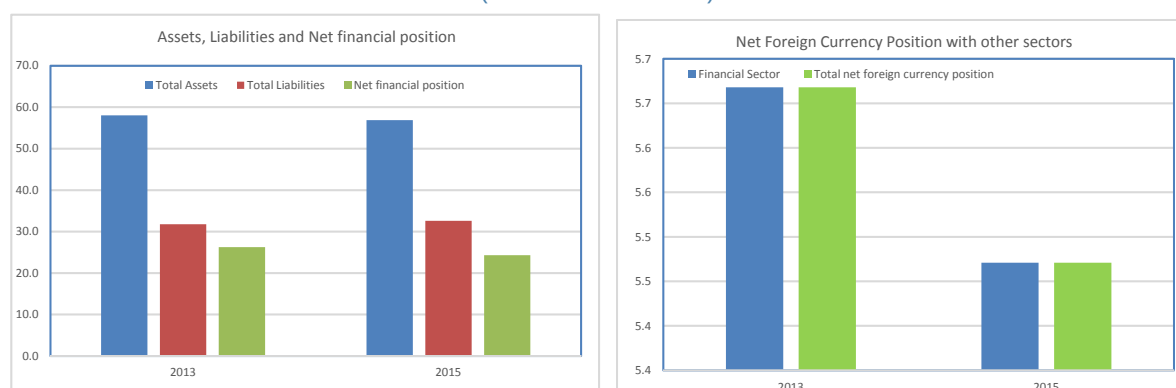
Table 2. Summary of Household Balance Sheet Risks

	2013	2015
Currency Mismatch:		
Foreign currency loans to foreign currency deposits (percer	38.9	39.7
Net foreign currency position (in percent of GDP)	5.7	5.3
Unhedged foreign currency borrowing by households 1/	79	82
Solvency (assets vs liabilities):		
Household debt to household income	21.6	22.8
Household debt to GDP	18.0	19
Liabilities to total assets (percent)	54.8	57.5
Net financial position to GDP	26.3	24.4
Memo:		
Non-performing housing debt/2	3.5	5.0
Non-performing credit card debt/2	3.6	3.5

Source: IMF staff calculations

1/Proportion of FX debtors that do not generate foreign exchange

2/In percent of GDP

Figure 2. The Household Sector
(In Percent of GDP)

Source: IMF staff calculations.

9. **In recent years, the level of nonperforming household debt has begun to rise.** In 2015, the level of total non-performing loans to households was 4 percent of the total lending to households (same as in 2013) compared with 3.6 percent in 2012. The key drivers in the rise of non-performing loans to households, has been a deterioration in the quality of loans for credit cards and housing. In the case of housing loans, NPLs rose to 5 percent of the total housing loans from 3.9 percent in 2013. At the same time, NPLs for credit cards rose to 4 percent, compared with 3.6 percent in 2013.

10. **Going forward the authorities would need to balance the goal of financial deepening and inclusion with the requirements of financial stability.** Key priorities under this heading would include, strengthening existing credit standards and credit reporting to ensure

that these are best practice, improving the sharing of credit information among credit rating bureaus, increasing financial literacy programs, and strengthening regulatory oversight. These measures would help to protect the banking system from vulnerabilities that may arise from sectoral weaknesses, and help to support a sustainable pace of credit expansion.

Corporate Sector

11. **FDI developments continue to be the key driver of the corporate sector's total net foreign currency deficit position.**

In 2015, the corporate sector's total net foreign currency deficit position widened by 5.0 percentage points of GDP to 62.1 percent, largely driven by the rise in the stock of FDI. Higher FDI has also caused a wider net financial deficit position for Honduras. This steady rise in the stock of FDI is explained by renewed private sector confidence in the macroeconomic outlook for Honduras. In particular, FDI has flowed into a number of capital and

Private sector-- Composition of the Net Foreign Currency position (As a share of total private sector foreign obligations)		
	2015	2013
Foreign Direct Investment	74.4	74.9
Foreign loans	25.6	25.1
External loans	9.2	7.3
Foreign currency loans from local	16.4	17.8
Source: IMF staff calculations		

infrastructure projects including the upgrading the energy production capacity with a switch to renewables. These investments were financed with long-term capital—equity and help to contain the potential risk to contagion.

12. **Indeed, increased FDI inflows has also helped to improve the corporate sector's capital structure.**

In 2015, the level of the corporate sector's stock of net external debt to the stock of net FDI has fallen to 36 percent from 45 percent in 2013. Additionally, the stock of domestic currency debt to the stock of domestic currency assets has also fallen to 150 percent from 169 percent in 2013. Therefore, from an overall perspective the corporate sector has reduced its reliance on debt thereby improving its capital structure.

13. That said, the corporate sector's non-FDI balance sheet has become more vulnerable since 2013, albeit slightly. Total corporate debt rose to 33 percent of GDP from 31 percent in 2013, as the stock of external corporate debt increased by 1.9 percentage points to 7.3 percent of GDP.³ The higher foreign currency debt stock has in turn caused the corporate non-FDI net foreign currency deficit position to widen to 5.7 percent of GDP in 2015, from about 4.1 percent in 2013, raising contagion risks. This wider non-FDI net foreign currency deficit position has in turn increased the corporate sector's exposure to foreign currency risks. A shock to the risk preferences of nonresident investors, which leads them to reduce holdings of Honduran assets, could be a key channel of transmission of global shocks to Honduras.

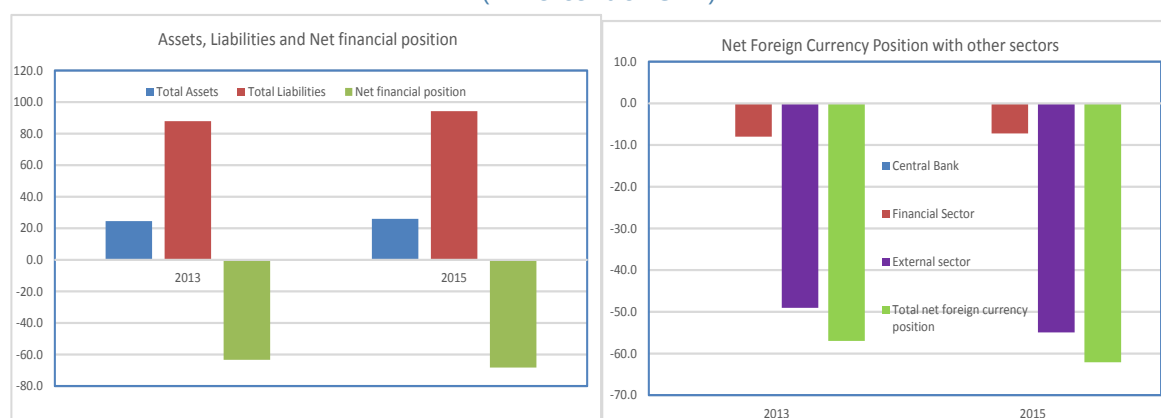
³ It is unclear, if these foreign currency debt obligations are hedged.

Table 3. Summary of Corporate Sector Balance Sheet Risks

	2013	2015
Maturity Mismatch (in percent of GDP)		
Liquidity gap	-7.2	-7.9
Currency mismatch (in percent)		
Net foreign currency position (in percent of GDP)	-57.0	-62.0
GDP)	-4.1	-6.3
Foreign currency debt to foreign currency assets	111.1	116
Capital structure mismatch:		
Hard currency external debt relative to net stock of FDI	45.4	36
Domestic currency debt to Domestic currency assets	168.9	150
Solvency (liabilities in percent of assets)		
Liabilities to total assets	357.2	359.0
Net financial position in percent of GDP	-63.3	-68.2

Source: IMF staff calculations

1/Hard currency external debt to net foreign direct investment.

Figure 3. The Corporate Sector
(In Percent of GDP)

Source: IMF staff calculations.

The Government Sector

14. **The government sector balance sheet is stronger than in 2013, amid fiscal restraint and institutional reforms to fiscal policy.** On the positive side the liquidity gap has fallen since 2013, a direct result of better cash-flow management. In addition, the ratio of domestic currency debt relative to domestic assets has fallen to 106 percent from 120 percent in 2013. The debt to tax revenue, along with the present value indicators also suggests that the government's solvency standing has improved, albeit slightly (see Table 4). In addition, the government sector currency deficit has narrowed, albeit marginally, since 2013 to 23.9 percent in 2015, despite increased foreign currency borrowing—mainly from the multilateral agencies that has supported

its 2014 economic reform program. Other currency mismatch indicators, such as the foreign currency debt to foreign currency assets of the government sector also point to an improvement relative to 2013. Overall, these achievements were sufficient to improve investor perception of sovereign risk and eventually led to the upgrade of Honduras' sovereign country rating in the first half of 2016 by Moody's and S&P rating agencies.

15. That said, a relatively high stock of mostly long-term external debt, keeps the government's exposure to exchange rate risk high, but appears to contain rollover risks.

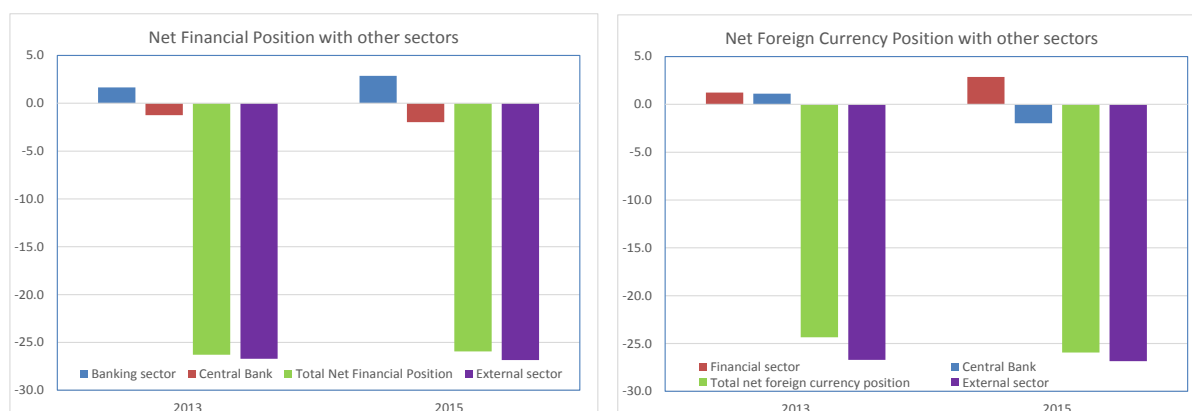
For example, although, the share of foreign currency debt to foreign assets of the government sector has fallen since 2013 by about 71 percentage points, the ratio is still high at 740 percent in 2015, maintaining a high exposure to exchange rate risk (Table 4). Indeed, even after taking into account the foreign assets of the central bank, the government's foreign currency debt to foreign assets remained high at 112 percent of foreign assets, just 9 percentage point lower than that obtained in 2013. That said, with over 80 percent of the external debt being long-term, exposure to rollover risk appears to be contained. In addition, during 2015, the authorities successfully reprofiled about US\$400 million in domestic debt, extending the average maturity of domestic debt from 3.3 to 4.3 years.

Table 4. Summary of Government Sector Risks

	2013	2015
Maturity Mismatch (in percent of GDP)		
Liquidity gap (incl. The BCH)	13.0	17.4
Currency mismatch (in percent)		
Net foreign currency position	-24.3	-23.9
Foreign currency debt to fx assets	811.1	740
Foreign currency debt to fx assets (incl. BCH NFA)	121.8	112
Domestic currency debt to Domestic currency assets	119.7	107
Solvency (liabilities in percent of assets)		
Net financial position to GDP	-26.3	-24.6
Total public sector debt to GDP	45.7	47.3
Total liabilities to total assets	297.7	283.1
Total public sector debt to tax revenues	304.1	261.6
PV of public sector debt	38.0	35.0
PV of public sector debt to revenue ratio (in percent)	175.0	118.9

Source: IMF staff calculations

Figure 4. The Government Sector
(In percent of GDP)



Source: IMF staff calculations.

16. **Overall, while some progress has been made in reducing government sector balance sheet risks, vulnerabilities remain.** Against this backdrop, further consolidation is warranted to create additional macroeconomic buffers and room to maneuver. With lower debt, the government would have more room for pursuing countercyclical fiscal policies in the event of economic downturns.

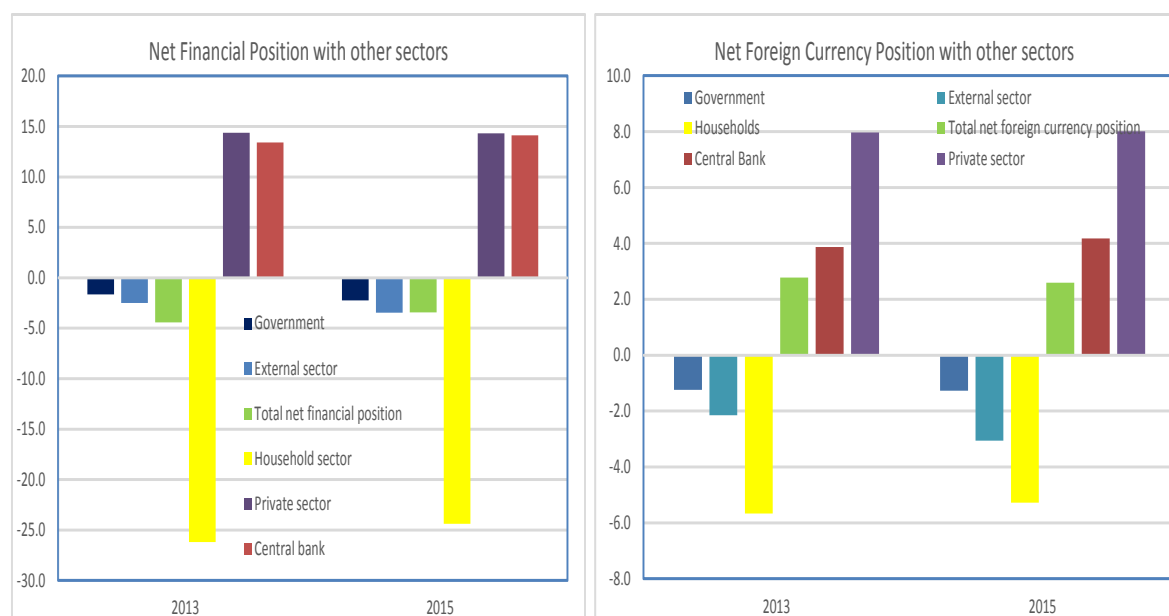
The Financial Sector

17. **The aggregate balance sheet of the financial sector has strengthened since 2013, and does not appear to contain any major vulnerabilities.** Gross financial assets have grown faster than GDP, increasing to about 85 percent of GDP in 2015 from 80 percent in 2013, and the net financial position of the sector has strengthened (Table 5 and Figure 5). In terms of sectoral exposures, at end-2015, the financial sector's balance sheet shows a slightly smaller overall net deficit position with other sectors. In particular, it has reduced its net deficit position with households, reflecting an increase in the stock of domestic currency loans. The financial sector has also increased its surplus holdings of central bank bills (Letras), as the central bank mopped up excess liquidity from increased foreign capital inflows during this period. That said, its net deficit position with the government and the external sector has increased since 2013, albeit marginally. Finally, the financial sector's capital structure has also improved. In particular, deposits to capital ratio has fallen to 566 percent from 580 percent in 2013 as the banking system has increased its level of capital. The higher capital means that the banking system is depending more on equity rather than debt financing since 2013. As such, this increased its equity buffer that can help to cushion the sector when its confronted with a shock.

Table 5. Summary of Financial Sector Balance Sheet Risks

	2013	2015
Maturity Mismatch:		
Foreign liquidity	-2.3	-3.5
Currency Mismatch:		
Net foreign currency position (in percent of	2.8	2.6
Foreign currency deposits to foreign currency lo	88.4	87.3
Capital Structure Mismatch:		
Deposits to capital ratio	580.2	566
Solvency (assets vs liabilities):		
Liabilities to total assets	104.8	103.6
Net financial position(in percent of GDP)	-4.4	-3.4

Source: IMF staff calculations

Figure 5. Financial Sector
(In Percent of GDP)

Source: IMF staff calculations.

18. **The financial sector continues to have an overall net positive foreign currency position—their dollar assets exceeded dollar liabilities.** The banks' balance sheets, therefore, are not likely to be directly affected by a sharp lempira devaluations. Their exposure to exchange rate risk is indirect, owing to the banks' exposure to the leveraged corporate and household sectors. The financial sector has a large positive foreign currency position with the BCH and the corporate and household sectors. However, to the extent that some of these claims against the corporate and household sectors are unhedged, it represents a key source of vulnerability, and hence potential credit risks.

The Central Bank

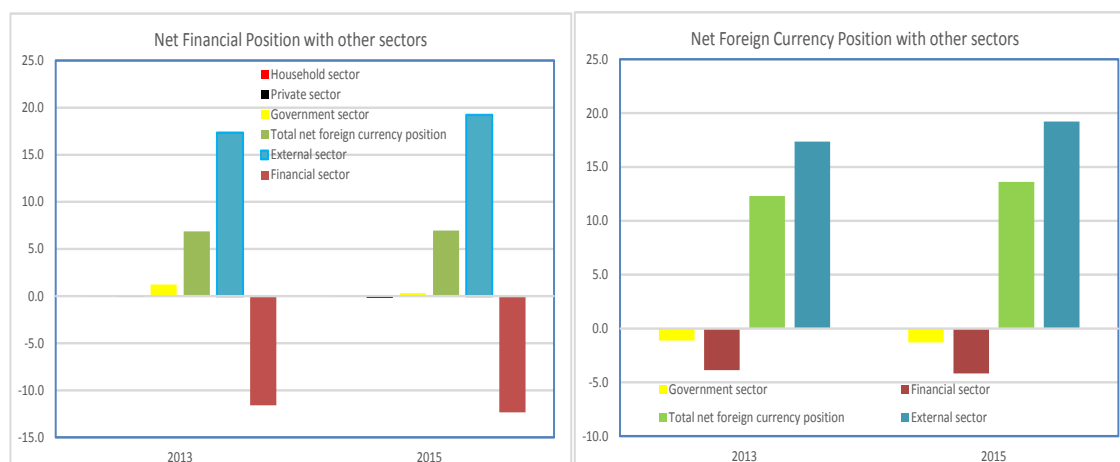
19. **The balance sheet of the central bank is stronger than at end-2013.** Although, the central bank's net financial balance remained at 6.9 percent of GDP in 2015 –the same level as obtained in 2013, its net liquidity and foreign currency positions are much stronger than in 2013. This improvement reflects the improved policies under the economic reform program, compared with the previous policy framework. Under the previous policy framework, the central bank had been generating losses on its monetary absorption operations (quasi-fiscal deficit), but these losses were being covered by zero interest government bonds, which perpetuated the central bank's capital short-fall. And while a central bank can always issue liabilities to cover previous losses, there is a limit to such actions, if the central bank is to maintain its policy settings at appropriate levels to achieve optimal inflation outcomes (Adler et al, 2012). Under the 2014 economic reform program, the authorities launched a plan to recapitalize the BCH overtime. The program also prescribed monetary targets for the central bank, a ceiling on net domestic assets and a floor on net international reserves. To support these targets, the central bank increased its issuance of bills to mop up liquidity inflows. As a result, the central bank's net position with the financial sector deteriorated as they held most of the central bank paper used to mop up excess liquidity. At the same time, at end-2015, the net foreign currency position of the BCH rose to 18.3 percent of GDP from 12.3 percent in 2013 (Table 6 and Figure 6). As a result, external buffers have strengthened, improving the economy's resilience to external shocks.

Table 6. Summary of Central Bank Balance Sheet Risks

	Change:		
	2013 to 2015	2015	2013
Central Bank	0.1	1.4	1.2
Government	0.0	-2.4	-2.4
Financial Sector	0.0	0.3	0.3
Households	0.0	0.5	0.6
Private Corporations	-0.5	-6.2	-5.7
Net of FDI	-0.2	-0.6	-0.5
Total	-0.4	-6.4	-6.1
Total (net of FDI)	-0.1	-0.9	-0.8

Source: IMF staff calculations

Figure 6. Central Bank of Honduras
(In Percent of GDP)



Source: IMF staff calculations.

D. Sectoral Sensitivity to Nominal Exchange Rate Shocks

20. **A wider total net foreign currency deficit position since 2013, has increased the economy's vulnerability to exchange rate risks.** The corporate and government sectors are most vulnerable, as their net foreign currency deficit positions are the largest. A 10 percent depreciation of the lempira against the US dollar, assuming unhedged assets, in both 2013 and 2015 increases the net foreign currency deficit position between the two periods by 0.4 percentage points of GDP (Table 7). This result obtains as the calculated gain to the central bank from the depreciation of the lempira is insufficient to compensate for losses incurred by the deficit sectors (government and corporate sectors). Importantly, the increased exposure to exchange rate risks is maintained even after the results are adjusted for foreign direct investment.

Table 7. Net Loss (Gains) From a Nominal Exchange Rate Depreciation
(In Percent of GDP)

	Change: 2013 to 2015	2015	2013
Central Bank	0.1	1.4	1.2
Government	0.0	-2.4	-2.4
Financial Sector	0.0	0.3	0.3
Households	0.0	0.5	0.6
Private Corporations	-0.5	-6.2	-5.7
Net of FDI	-0.2	-0.6	-0.5
Total	-0.4	-6.4	-6.1
Total (net of FDI)	-0.1	-0.9	-0.8

Source: IMF staff calculations

E. Conclusions

21. **The 2014 economic reform program has helped to mitigate some macro risks, but key vulnerabilities remain.** In particular, the net short-term foreign currency position (liquidity) has improved since 2013, increasing the economy's resilience to short-term shocks. In line with this, the level of net international reserves to short-term debt has risen to 828 percent in 2015, from 694 percent in 2013. At the same time, the ratio of net external debt to the stock of net foreign direct investment has declined to 59 percent in 2015, from 65.8 percent in 2013. These improvements were due primarily to a steady inflow of FDI, along with an improved net foreign asset position of the central bank. In the case of the private sector, foreign direct investment remains at about 60 percent of total liabilities. At the same time, the economy's exposure to foreign exchange rate risk has also risen with an increase in the net foreign currency deficit position of the government and corporate sectors since 2013. The financial sector is also indirectly exposed to exchange rate risks through its links with the corporate and household sectors. That said, the overall solvency risks/ default risks have risen, somewhat, with the present value of external debt slightly higher than in 2013. At the sectoral level, the rise in household indebtedness, along with a rise of nonperforming loans to households is an emerging vulnerability that could pose credit risk problems going forward for the banking system.

22. **Overall, these insights provide some comfort that Honduras' present external position has stabilized, somewhat, but weaknesses persist at the sectoral level.** In particular, the wider net foreign currency deficit position of the public and corporate sectors means that they are more exposed to exchange rate risks due to currency mismatches. The currency mismatch in the corporate sector can translate into credit risk to banks in the event of a sharp exchange rate depreciation. In addition, growing household indebtedness in the context of weak employment and income growth can expose the banking system to significant credit risks. While overall financial position remains positive, the level of nonperforming household debt is increasing again, after falling from its peak during the global financial crisis. The regulatory authorities would need to monitor carefully the evolving situation in respect of total household debt. These and other balance sheet weaknesses represent likely contingent liabilities to the public sector that could potentially raise the already sizeable public debt burden.

23. **Against this backdrop, it would appear that additional measures are needed to further reduce macroeconomic vulnerabilities by:**

- Building additional fiscal buffers and maintaining the fiscal discipline shown during the stabilization program.
- Promoting the development of domestic money and capital markets to allow the financial sector to diversify their portfolio and also permit the government to shift away from the heavy reliance on foreign currency borrowing;
- Strengthening the regulatory and supervisory framework on foreign currency borrowing and lending for un-hedged borrowers.

- Increasing prudential measures and enhance financial literacy programs to tackle elevated household indebtedness

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Annex I. Net Inter-Sectoral Asset and Liability Positions

Table A1. Honduras: Net Inter-Sectoral Asset and Liability Positions, 2015Q3
(In percent of GDP)

	Holder of the Liability (Creditor)						
	Government	Central Bank	Financial Sector	Private sector	Households	External Sector	Total
Government							
<i>Total</i>		0.3	-2.3	0.0	0.0	26.8	25.2
<i>In domestic currency</i>		1.6	-0.6	0.0	0.0	0.0	1.0
<i>In foreign currency</i>		-1.3	-1.3	0.0	0.0	26.8	24.3
Central Bank							
<i>Total</i>	-0.3		12.5	0.2	0.0	-19.5	-7.0
<i>In domestic currency</i>	-1.6		8.3	0.1	0.0	0.0	6.7
<i>In foreign currency</i>	1.3		4.2	0.1	0.0	-19.5	-13.8
Financial Sector							
<i>Total</i>	2.4	-12.5		-14.5	24.7	3.5	3.1
<i>In domestic currency</i>	0.6	-8.3		-6.4	19.4	0.4	5.7
<i>In foreign currency</i>	1.3	-4.2		-8.1	5.3	3.1	-2.6
Private sector							
<i>Total</i>	0.0	-0.2	14.5		0.0	54.9	69.1
<i>In domestic currency</i>	0.0	-0.1	6.4		0.0	0.0	6.3
<i>In foreign currency</i>	0.0	-0.1	8.1		0.0	54.9	62.8
Households							
<i>Total</i>	0.0	0.0	-24.7	0.0		0.0	-24.7
<i>In domestic currency</i>	0.0	0.0	-19.4	0.0		0.0	-19.4
<i>In foreign currency</i>	0.0	0.0	-5.3	0.0		0.0	-5.3
External							
<i>Total</i>	-26.8	19.5	-3.5	-54.9	0.0		-65.7
<i>In domestic currency</i>	0.0	0.0	-0.4	0.0	0.0		-0.4
<i>In foreign currency</i>	-26.8	19.5	-3.1	-54.9	0.0		-65.3
Total							
<i>Total</i>	-25.1	7.0	-3.1	-69.1	24.7	65.7	
<i>In domestic currency</i>	-1.0	-6.7	-5.7	-6.3	19.4	0.4	
<i>In foreign currency</i>	-24.3	13.8	2.6	-62.8	5.3	65.3	

Source: IMF staff calculations.