Chapter 5

HOUSEHOLD SECTOR DYNAMICS AND MONETARY POLICY IN THE PHILIPPINES

By

Tatum Blaise Pua Tan

1. Background

The growing importance of household sector financial dynamics and its implication on financial and economic stability, as witnessed in the recent global financial crisis, has spurred substantial interest among policymakers, regulators, and economists. The same is true for the Philippines. In the recent decade, an expanding suite of statistics has been compiled and generated on the household sector, especially for the Central Bank. Most of these statistics offer insights on household indebtedness and financial behavior. Rightfully so, it is estimated that the household sector comprises about a quarter of the banking system’s total loans in 2016. The sector’s borrowings surged in the past seven years from Php746.2 billion in 2010 to reach Php1,829.6 billion by end-2016. Moreover, credit activity in the household sector is closely tied to real asset prices, particularly those of residential real estate properties, which serve as collateral in borrowing from formal lending intuitions. As such, credit not only affects household consumption directly as a supplementary source of funds but also indirectly, via housing prices.

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2. The BSP compiles the following household sector statistics: HH Consumer loans (started in 2009), the Consumer Finance Survey (CFS, maiden issue released in 2012- reference year is 2009 and 2014), the Flow of Funds (2008 SNA, starting 2000), Consumer Expectations Survey (started in 2004), the National Baseline Survey on Financial Inclusion (2014), and Year-end Reports of BSP Financial Inclusion Initiatives (starting 2011).

3. End-2017 data are still unavailable as of the time of the study. Source: Standardized Report Forms and author’s calculation.


5. Includes household loans from other depository corporations (ODCs) (i.e., Universal/Commercial Banks (UKBs), Thrift Banks (TBs), Rural and Cooperative Banks (RBs), Non-stock Savings and Loan Associations (NSSLAs), and Non-bank with Quasi-Banking functions (NBQBs)). Household indebtedness in this study adopts the definition in the 2008 System of National Accounts (SNA). Household debt is used interchangeably with household credit. Source: Standardized Report Forms and author’s calculation.
In the Philippines, the households’ ownership of residence is considered their biggest asset, posing significant implications on its net worth (Figure 1). As a form of collateral, an increase in housing prices augments the value of the households’ real assets and its net worth, leading to improved prospects in terms of loan availment and terms of credit. Similarly, the upturn in housing prices encourages more housing construction and real estate investments in anticipation of further increase in house prices. On the demand side, this translates to a significant boost in the net worth of 75.5% of Filipino households who are homeowners. The subsequent wealth effect stimulates more consumption and investment activities. On the supply side, this induces more residential building constructions by the real estate and construction industries. As housing prices increase, exceeding construction costs, new housing constructions will continue to generate profits, fueling more residential construction (Goodhart and Hofmann, 2008).

In view of the foregoing, the motivation for this research is twofold. First, the study aims to analyze the multi-directional relationship between household sector credit, house prices, and monetary policy transmission mechanism in the Philippines (Figure 2). Specifically, the paper attempts to shed light on the multidimensional link between house prices and the household sector’s debt dynamics to the country’s monetary policy settings, as potential sources of shock. A theoretical assessment of these variables suggests a reciprocal causation between house prices, credit, and policy rates. Second, while there have been significant developments in the compilation of household sector statistics, the body of research employing contemporary macroeconomic

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7. Net worth is measured as non-financial and financial assets less financial liabilities.
8. Based on the 2014 CFS (BSP, 2014a), which has a sample size of 18,000 households encompassing all regions in the country, except Leyte province and Autonomous Region in Muslim Mindanao (ARMM).
empirical models which integrate household sector aggregates (e.g., house prices and household indebtedness) remains limited. Thus, this study hopes to set the groundwork for future research works that would take into account said household sector variables using more sophisticated empirical economic models (i.e., Dynamic Stochastic General Equilibrium (DSGE) model, multi-equation model).

As a small open economy that has adopted an inflation targeting framework, Bjørnland and Jacobsen’s (2010) research on Sweden, Norway, and United Kingdom offers a sound starting point for this research on the effect of house prices on the monetary transmission mechanism in the Philippines. Bjørnland and Jacobsen (2010) use a structural vector autoregressive (SVAR) model to analyze the effects of monetary policy and housing price shocks to inflation and interest rates. Extending their model, Robstad (2014) incorporates household credit in Norway in the specification to analyze the impact of monetary policy shocks using Bayesian structural VAR (BVAR) models. Robstad (2014) broadens the analysis of a monetary policy shock to household-related variables by employing three different specifications: a Cholesky identification, a SVAR as in Bjørnland and Jacobsen (2010), and a SVAR sign restrictions following Uhlig (2005).

**Figure 2:**
Monetary Policy Transmission Mechanism in the Philippines

![Monetary Policy Transmission Mechanism in the Philippines](image)

*Aggregate Demand consists consumption, investment and net external demand. Consumption and investment include those of both the private and the public sectors.


Building on the aforementioned literature, this study employs a SVAR model with sign restrictions to examine the multidimensional impact of an expansionary monetary policy shock (A in Figure 2), a housing price boom (E in Figure 2), and a positive credit supply shock (C in Figure 2). Using monthly data from 2010:M1 to 2017:M5, the study finds three key conclusions. First, the muted link between household credit and policy rates in the country, with household credit from banks responding variably to changes in policy rates over time. In the expansionary monetary policy shock, household debt’s positive reaction is transitory despite the sustained decline in policy rates, while borrowing activity continues to expand amid rising policy rates in the credit supply shock. This
is attributed in part to the alternative funding sources available to the sector not captured in the study. Second, the research finds a reciprocal connection between household debt and housing prices. In both the credit supply and housing price shocks, the impulse response functions (IRFs) of the two variables show broadly parallel and coinciding trends. Third, monetary variables can influence real aggregates. A negative monetary policy shock spurs consumption in the short-run, while a rise in housing prices boosts household consumption through the price-induced wealth effect and better access to credit. Furthermore, household consumption moves in tandem with credit in all the simulations.

The household credit’s robust expansion and its significance to housing prices and household consumption in the country merit an assessment of the households’ current state of indebtedness. As of 2017:Q2, the Philippines’ household debt to GDP ratio stood at 12.8%. This is comfortably below the 60% threshold specified by Lombardi, Mohanty, and Shim (2017), at which household debt becomes a drag to consumption. This is also much lower than the 80% threshold set by Cecchetti, Mohanty, and Zampolli (2011), wherein household debt becomes a strain on economic growth. Moreover, with financial assets amounting to more than thrice of its financial liabilities as of end-2016, the sector is well-cushioned against potential adverse changes in macroeconomic conditions. Notwithstanding the sector’s resilient position, regular assessment is crucial to avert overleveraging and becoming counterproductive to the economy in the long-run. Hence, current efforts towards financial inclusiveness should be combined with closer and wider monitoring of household borrowings to include non-bank institutions, particularly shadow banking activities. In addition, the roll out of the first package of the Tax Reform for Acceleration and Inclusion (TRAIN) will have significant ramifications—considering the Filipino households’ marginal propensity to consume (discussed in the next section)—on the households’ income, expenditure, and indebtedness.

The paper is organized as follows: Section 2 provides a comprehensive discussion on the household sector in the Philippines; Section 3 discusses the relevant literature; Section 4 tackles the research design of the paper; Section 5 presents and analyzes the results; and Section 6 concludes and offers recommendations.

2. Stylized Facts on the Philippine Household Sector

2.1 Economic Behavior

As a consumption-driven economy, the household final consumption expenditure (HFCE) accounts for more than 60% and 70% of the country’s Gross National Income (GNI) and Gross

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10. It may be noted that some of these financial providers do not necessarily track the movement of the policy rates (e.g., socialized housing facilities, money lenders). According to the CFS (BSP, 2014a), a significant percentage of households borrow from government financial institutions, especially for housing loans—predominantly through the National Housing Authority (NHA) and Pag-ibig, which offer socialized housing. Households with no access to formal lending channels resort to money lenders who adopt a “5/6” loan arrangement, which translates to a daily interest rate of 20 percent (Mitra, 2009).

11. Includes household loans from ODCs. Source: Standardized Report Forms and author’s calculation.

12. Based on household sector’s asset holdings and debt incurrence with the ODCs.

13. TRAIN encompasses lower personal income taxes but higher excise taxes on petroleum and petroleum products, automobiles, and sugar-sweetened beverages, among others. However, the authorities expect the potential impact of said tax reforms on inflation to be transitory.
Domestic Product (GDP) on average over the years 2000-2016, respectively.\(^{14}\) Growth in consumption is robust, averaging 9.3% in the same period. While this could be a boon for the economy, an article in the 2016 BSP Annual Report found that the Filipino household’s marginal propensity to consume (MPC) was 0.99 on average between the years 2010-2015, an almost one-to-one ratio between income and spending.\(^{15}\) This implies that every additional peso income is spent almost entirely on consumption.

Delving deeper, an analysis of the Filipino households’ MPC across income class shows that households in the higher income brackets have higher marginal propensity to save (MPS).\(^{16}\) This is expected as households from these income classes have more financial flexibility. Meanwhile, households belonging in the middle to the lower income classes exhibit a lower marginal propensity to save. The households from these brackets tend to spend more for every additional income, suggesting little savings to even dissaving. This is expected, as their modest income is likely spent entirely on basic necessities. This raises the question on how they source additional funds to finance their consumption in light of their net worth and access to credit.

### Table 1:
MPC Across Income Class

<table>
<thead>
<tr>
<th>Income Class in thousands</th>
<th>Total Annual Income in millions</th>
<th>Total Annual Expenditure in millions</th>
<th>MPC (2015)</th>
</tr>
</thead>
<tbody>
<tr>
<td>all</td>
<td>5,026,798</td>
<td>6,068,162</td>
<td>0.73</td>
</tr>
<tr>
<td>under 40</td>
<td>20,303</td>
<td>11,086</td>
<td>1.10</td>
</tr>
<tr>
<td>40 - 59</td>
<td>71,530</td>
<td>46,104</td>
<td>1.07</td>
</tr>
<tr>
<td>60-99</td>
<td>325,936</td>
<td>266,410</td>
<td>0.99</td>
</tr>
<tr>
<td>100-249</td>
<td>1,443,751</td>
<td>1,671,854</td>
<td>0.85</td>
</tr>
<tr>
<td>250 above</td>
<td>3,165,277</td>
<td>4,072,708</td>
<td>0.73</td>
</tr>
</tbody>
</table>


### 2.2 Access to Credit

Household nominal credit has been expanding at a double-digit rate since 2010, with an average year-on-year growth rate of 15.4% from 2011 to 2017 (Figure 3).\(^{17}\) As of 2017:Q2, total household debt reached P1,937.6 billion from only P662.4 billion in 2010:Q1. From 2010:Q1 to 2017:Q2,

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16. MPS = 1 - MPC
17. Includes household loans from ODCs only.
consumption loans account for about 70% of the households’ total loans, on average. Auto loans, on average, constitute a third of the total loans for consumption purposes and a fifth of the households’ total loans from the bank proper. Meanwhile, loans for production purposes largely consist of housing loans, which comprise, on average, 28.1% of the households’ total loans (Figure 4).

The size of the country’s household indebtedness as a ratio to GDP and GNI is relatively low compared to its peers in the region. On average, the ratio stood at 10.1% and 8.3% from 2010:Q1 – 2017:Q2, respectively (Figure 5). While both ratios moved parallel to each other, the GNI steadily registered a lower value, the GNI being larger since compensation of residents working abroad or more commonly known as Overseas Filipino Workers (OFWs) accounts for the bulk of the net primary income from abroad. In the same vein, it is equally important to calculate the ratio of household debt to household disposable income (HDI), which includes personal transfers—an important source of income for Filipino households. The household sector’s debt to HDI ratio recorded an average of 13.9% in the past seven years. While these ratios offer favorable indications of the sector’s ability to service their debt, and at the same time, suggest that the sector’s debt accumulation remains in check and manageable (Armas, 2016), these modest ratios also signify the households’ limited access to credit in the country, especially for production purposes.

A commonly cited challenge encountered by households borrowing from the formal channels is the collateral requirement. According to the BSP’s National Baseline Survey on Financial Inclusion (2014b), apart from not having the need for credit, the second most common reason for Filipinos not borrowing money is the lack of collateral. Similarly, the collateral concerns along with insufficient documentary requirements were cited as the most common reasons for denied loan applications. It may be noted that physical assets (land and real estate) continues to be the preferred form of collateral among the financial institutions in the country. The lack of real assets and the ineligibility of some households have led them to tap other sources of credit which are less cumbersome compared to banks, particularly money lenders and in-house financing. According to the survey, 10.8% and 7.7% of households reported to have availed of loans from money lenders and in-house financing facilities, respectively.

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18. Consumption loans include the following: credit card, motor vehicle loans, salary loans, loans for consumption purposes – others, other purposes, while agrarian reform and other agricultural loans, and microfinance loans. Accrued interest payable is also lodged under loans for consumption purposes.

19. Excludes loans from NSSLAs and NBQBs due to the limited information on the breakdown of the type of loans. Thus, total household loans used in the calculation is lower than the total used in the other ratios mentioned.

20. Includes households’ loans (as defined in the with 2008 System of National Accounts Manual) to ODCs only (i.e., U/KBs, TBs, RBs, NSSLAs, and NBQBs). Estimates started in 2008 since there was a break in the series following a shift in the compilation framework. Quarterly household debt ratios are computed using annualized GDP and GNI.

21. HDI is computed as household sector’s total income less property expense, taxes on income and wealth, compulsory fees, social security contributions, and current transfers paid. The HDI is calculated as household final consumption expenditure plus net savings as in the box article titled “Analyzing the Trends and Developments in the Household Sector’s Economic Behavior.” Sources: 2016 BSP Annual Report and PSA’s System of National Accounts.

22. Personal transfers are defined as “current transfers in cash or in kind by OF workers with work contracts of one year or more as well as other household-to-household transfers between Filipinos who have migrated abroad and their families in the Philippines.” Source: www.bsp.gov.ph

23. Includes housing loans, agricultural loans, and loans for microfinance.

Figure 3:
Outstanding Loans, by Type Of Purpose

Figure 4:
Outstanding Loans, by Type of Loan
Average share from 2010Q1 to 2017:Q2
2.3 Residential House Prices

The households’ ownership of dwellings and land has become more important following the advent of financial liberalization, which has enhanced the market for de-cumulated real assets.\textsuperscript{25} To provide a better picture of the housing market in the country, this study presents three alternative measures of housing prices in the country. The first one is the housing price index calculated as the implicit price index (IPIN) of the Nominal/Real Gross Value Added of Real Estate and Ownership of Dwellings (Figure 6).\textsuperscript{26} Hence, the index is based on both actual (real estate, both residential and non-residential) and imputed (ownership of dwellings) rents. It can be observed that the housing prices are on the uptrend as the indicator reached 181 in 2016.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure5.png}
\caption{Household Indebtedness Indicators}
\end{figure}

Source: Standardized Report Forms- Department of Economic Statistics, Philippine Statistics Authority (PSA), and Author’s calculations.


\textsuperscript{26} The derivation of the index follows the paper by Glindro, E. and Delloro, V. (June 2010) titled “Identifying and Measuring Asset Price Bubbles in the Philippines,” BSP Working Paper Series No. 2010-02. It may be noted that IPIN on real estate also covers real estate developers and brokers. Source: Philippine National Accounts.
The second measure is based on the average cost per floor area of residential property construction. Consistent with the rise of housing rents, the value of residential properties has also risen as evidenced in the more than double increase in the average annual cost per floor area of residential property construction since the early 2000s to 2016 (Figure 7). A simple correlation test conducted between the average cost per square meter of residential construction and an estimated house price index based on the imputed rents of housing services covering the periods 2000:Q1 to 2017:Q2 indicate a high positive correlation at 0.95. The study employs this indicator as it captures the actual value of the residential real property asset, which is more relevant to our variable of interest—real property as collateral for credit availing.

The third measure is the Residential Real Estate Price Index (RREPI), which was introduced by the BSP in 2015 as part of its financial soundness indicators and asset price monitoring for monetary policy consideration. The weighted chain-linked index measures the prices of residential real estate in the country based on new housing units across time, regions, and types of units. The index is derived from the banking system’s data on housing loans granted, the appraised value per square meter, and share of floor area of new housing units. While this would have been a promising alternative measure of house prices, this study is unable to utilize the index due to its short time series.

27. Source: Philippine Statistics Authority’s Construction Statistics based on Building Permits
28. Lifted from the Technical Notes of the RREPI
3. Review of Related Literature

Bjørnland and Jacobsen (2010) use the structural vector autoregression (SVAR) model estimated for U.K., Norway, and Sweden to study the role of house prices in the monetary transmission mechanism in small open economies. The research identifies six (6) endogenous variables: foreign interest rate, inflation, 3-month domestic interest rate, real exchange rate, and real house prices and centers on two shocks to monetary policy and house prices.\(^{29}\) The model employs both long-run and short-run restrictions to enable the interest rates and house prices to respond simultaneously. This allows house prices and the REER to respond immediately to shocks, and at the same time, enables monetary policy to incorporate fluctuations in asset prices. Using the data covering 1983:Q1 to 2006:Q4, Bjørnland and Jacobsen (2010) find that monetary policy shocks have an immediate and pronounced effect on house prices. The research also observes that a shock in house prices affects interest rates, albeit with varying lags and magnitude.

Robstad (2014) extends the work of Bjørnland and Jacobsen’s (2010) research by incorporating household credit in the model. While the shock in the study is limited to a contractionary monetary policy shock, Robstad (2014) identifies three (3) different Bayesian structural VAR models to analyze the impact of the said shock on household prices and credit in Norway for the periods 1994:Q1 to 2013:Q4. To wit, the study simulates (1) two Cholesky identification VAR models—one with the interest rate ordered last and the other with credit; (2) a model as in Bjørnland and Jacobsen (2010) which allows for multidimensional contemporaneous effects between interest rates, house prices, and credit; and lastly, (3) an identification which employs sign restrictions akin to Uhlig (2005). The study consistently finds that a rise in the interest rates has significant negative effect on house prices across all models, as in Bjørnland and Jacobsen (2010). However, the research also concludes

\(^{29}\) All variables are in real terms and in log form except for the interest rates.
that a contractionary monetary policy shock affects household credit only modestly in all three VAR identifications.

On a broader context, Musso, Neri, and Stracca (2010) employ a SVAR framework using a Bayesian approach with short-run restrictions to compare the multidirectional impact of three (3) structural shocks between the United States (U.S.) and the Euro Area (includes Germany, France, Italy, Spain, and the Netherlands) between the years 1986:Q1 to 2008:Q4. The model’s vector of endogenous variables includes: consumer price index, private consumption, residential investment, real house price, 3-month interbank interest rate, mortgage lending rate, and nominal mortgage debt. These variables were used to simulate the following shocks: 1) contractionary monetary policy; 2) negative credit supply shock (increase in mortgage lending rate); and 3) housing demand shock (an increase in real house price). The study infers that a monetary policy shock results in a decline in residential investments, real house price, mortgage debt, and private consumption in both economies, albeit the effect is larger in the U.S. Meanwhile, credit supply shocks have significant negative effect on both residential investment and real house price, but with limited transmission on consumption. Lastly, house price shocks were observed to positively impact on all variables, with a more pronounced effect on consumption in the U.S. Musso, Neri, and Stracca (2010) conclude that housing variables play a key role in the transmission of monetary policy shocks, especially in the U.S.

A similar cross-country study by Singh and Nadkarni (2017) analyzes the interlinkages between asset prices, bank credit, and monetary policy by employing a panel VAR model across 22 emerging markets and developing economies (including the Philippines) for the periods 1995:Q1 to 2014:Q4. The research employs the Cholesky decomposition with the following ordering of first differenced variables: real GDP growth, inflation, interest rate, credit growth, changes in house and equity prices. The research simulates a string of shocks: positive aggregate demand shock, contractionary monetary policy, bank credit boom, and positive asset price shock for both house and equity prices. Singh and Nadkarni (2017) find that a positive monetary policy shock leads to a decrease in bank credit—following a momentary increase—and a decline in asset prices, especially for equity prices. Meanwhile, a credit boom results in an increase in GDP and asset prices, albeit with insignificant effect for equity prices. Similarly, the study observes that an expansionary aggregate demand shock leads to rise in asset prices and credit growth. Lastly, an equity price shock results in an expansion of credit demand and output, albeit, house price shocks offer mixed results. In sum, Singh and Nadkarni (2017) conclude that monetary policy shocks have more impact on stock prices, while credit shocks have bigger and more persistent effect on house prices.

4. Methodology

4.1 Dataset and Specification

This study uses monthly data on housing prices, household credit, weighted monetary operations rate (WMOR), household final consumption expenditure (HFCE), inflation, and exchange rate (ER) covering the periods 2010:M1 to 2017:M5. The data were sourced from the Bangko Sentral ng Pilipinas and the Philippine Statistics Authority. The said variables were adopted based on the studies by Bjørnland and Jacobsen (2010) and Robstad (2014). However, since the study centers on the household sector dynamics, HFCE is used instead of output as in Musso, Neri, and Stracca (2011). Since the Philippine National Accounts is only available on a quarterly basis, the research applied

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30. All variables are in log form except for interest rates.
cubit spline interpolation to the quarterly data on output and housing prices to generate the monthly data on said variables. The variables were transformed to log forms, except for the inflation and WMOR, and were all detrended using the Hodrick-Prescott filter.

The research first identifies the vector of macroeconomic variables as follows:

$$y_t = [HFCE, housing prices, ER, household credit, inflation, WMOR ]_t'$$

A Structural Vector Autoregressive (SVAR) model is then specified with sign restrictions following Robstad (2014), Uhlig (2005) and Musso, Neri, and Stracca (2011) and defined accordingly as:

$$Ay_t = c + B(L)y_{t-1} + \varepsilon_t$$

where $A$ is the matrix of contemporaneous interactions where the sign restrictions are applied, $y$ is the vector of endogenous variables, $c$ is a constant, $B(L)$ is a matrix of polynomial in the lag operator in which its order of four (4) lags and $\varepsilon$ is the vector of structural shocks. The lag was determined by the Hannan-Quinn information criterion (HQ) along with reasonable judgment given the model’s limitations. The shocks are identified as: (1) expansionary monetary policy shock; (2) housing price boom; and (3) positive credit supply shock.

The identification of the sign restrictions and its corresponding durations are drawn from relevant literatures and to some extent, determined arbitrarily utilizing fundamental economic theories as well as recognizing the limitations of the model/sample size. The shocks are characterized as one standard deviation away from the mean and the sign restrictions are applied to the impulse response functions (IRFs) for several months after the impact or the set lag, i.e., 1 or 3 to 12 months (Uhlig, 2005). The shocks are all assumed to affect economic activity (i.e., household consumption) with a quarter lag (Robstad, 2014, and Musso, Neri, and Stracca, 2011). For the expansionary monetary policy shock, the variables were left unrestricted, except for consumption, so as to let the data to determine the effect on household credit and housing prices. The housing demand represented by household credit is allowed to respond contemporaneously (Jarociński and Smets, 2008) to the housing price shock, while the rest of the variables are unrestricted.

As discussed in the previous section, borrowing conditions in the Philippines is tightly linked to the value of their real properties which serve as the collateral. Meanwhile, housing prices are set to respond with a quarter lag in an expansionary credit supply shock. This takes into consideration the transmission mechanism of the shock adversely affecting the sector’s investment activity/demand before eventually driving down housing prices. Moreover, it may be noted that while household credit is predominantly housing loans, it also includes other types of loans. Table 2 summarizes the sign restrictions employed in the study.

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31. Simulations were carried out using Matlab (50,000 replications).
32. The Schwarz Information Criterion recommends a lag order of three (3). However, at that lag order the variables are auto correlated, especially at the lower lag levels. Meanwhile, sequential modified LR test statistic, final prediction error, and Akaike information criterion suggest a lag order of six (6), however, considering the short series of the study this may not be plausible.
Table 2:
Sign Restrictions of the Different Shocks

<table>
<thead>
<tr>
<th>Variables</th>
<th>Expansionary Monetary Policy Shock (EMP)</th>
<th>Housing Price Boom (HPB)</th>
<th>Positive Credit Supply Shock (PCS)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sign</td>
<td>Period</td>
<td>Sign</td>
</tr>
<tr>
<td>HFCE</td>
<td>+</td>
<td>3-12</td>
<td>+</td>
</tr>
<tr>
<td>Housing Prices</td>
<td>0</td>
<td>0</td>
<td>+</td>
</tr>
<tr>
<td>REER</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Household Credit</td>
<td>0</td>
<td>0</td>
<td>+</td>
</tr>
<tr>
<td>Inflation</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>WMOR</td>
<td>-</td>
<td>1-12</td>
<td>0</td>
</tr>
</tbody>
</table>

Note: 1 -12 months implies that the sign restriction is imposed for a year following the variables’ contemporaneous reaction to the shock, while 3 – 12 months indicates that the variable is restricted to react to the shock, according to the imposed sign, only after a quarter lag and lasting until the next three quarters.

4.2 Endogenous Variables

A. Real Housing Prices (RHP) = average price of residential construction per square meter based on construction statistics from building permits and deflated using the consumer price index (CPI, 2006=100). The data were seasonally adjusted.

B. Real Credit to Households (RHDEBT) = households’ loan availment from Universal/Commercial and Thrift banks and deflated using the CPI. The coverage is limited to UKBs and TBS only since monthly data is unavailable for rural and cooperative banks as well as NSSLAs and NBQBs. The data were seasonally adjusted.

C. Exchange Rate (ER) = the price of a unit of foreign currency in terms of the domestic currency. The exchange rate is conventionally expressed as the value of one US dollar in peso equivalent (i.e., US$1 = P50.00). The data were seasonally adjusted.

D. Inflation (INF) = the rate of change in the average prices of goods and services typically purchased by consumers or the consumer price index (CPI). Measured as the month-on-month growth rate of the CPI.

E. Weighted Monetary Operations Rate (WMOR) = the monetary policy rate. For the periods 2010:M1 to 2016:M5, the variable is calculated as the average between the weighted average rates of the reverse repurchase (RRP, overnight) and the Special Deposit Accounts rates. Following the implementation of the interest rate corridor in June 2016, data from said month and onwards include the weighted average rates of the RRP, overnight deposit facility (ODF),

33. Definition lifted from the relevant technical notes/metadata published by the Bangko Sentral ng Pilipinas and Philippine Statistics Authority
and term deposit facility (TDF). This variable represents the monetary policy setting in the model.

F. Household Final Consumption Expenditure (HFCE) = accounts for the various expenditures of the households and non-profit institutions serving households (NPISH). The data are at constant prices (2000=100) and were seasonally adjusted.

5. Presentation and Analysis of Results

5.1 Expansionary Monetary Policy Shock

Expansionary monetary policy action has significant impact on real property assets as the lower market interest rates, brought about by a reduction in policy rates, shore up the value of existing residential real property assets and enhance wealth accumulation (Glindro and Delloro, 2002). Similarly, the decrease in interest rates lowers the cost of borrowing thereby encouraging credit availment. The strengthened household credit activity and higher wealth holding jointly promote household consumption.

Simulating a one standard deviation negative monetary policy shock, this study finds consistent results (Figure 8) with the existing literature. Housing prices and household credit both exhibit increasing trends at the onset. Tuaño-Amador, Claveria, and Glindro’s (2009) inference on both the negative relationship between real policy rates and credit lends support to the households’ credit reaction on impact. However, the positive response of household sector’s bank borrowing is transitory lasting only for about a quarter despite sustained reduction in policy rates. Guinigundo

Figure 8: Impulse Response Functions to an Expansionary Monetary Policy Shock

34. The repurchase (RP) and Special Deposit Account (SDA) windows were replaced by standing overnight lending and overnight deposit facilities, respectively. The reverse repurchase (RRP) facility was changed to a purely overnight RRP. Lastly, the term deposit facility (TDF) is the main policy tool in absorbing liquidity. Source: http://www.bsp.gov.ph/publications/media.asp?id=4063
Household Debt in SEACEN Economies
Household Sector Dynamics and Monetary Policy in the Philippines

(2008) attributes the abated bank lending channel of monetary policy transmission mechanism to financial liberalization and the availability of other sources of financing, particularly for the private non-financial corporate sector (i.e., securities and equity). Correspondingly, the CFS (2014) results indicate that most of the households tapped non-bank government institutions, in-house financing, and money lenders for real property, vehicle, and other loans (Figure 9), which are not captured in the study.\(^{35}\) Hence, households have found alternative sources of financing outside the banking system that are beyond the purview of the central bank. In the medium-term, both housing prices and credit gradually descend to the negative territory.

![Figure 9: Loan Providers to the Households 2014, in percent](image)

Source: Consumer Finance Survey (BSP, 2014a).

Household consumption expands in the short-run benefitting from the low interest rate environment and heightened credit activity. However, the decline in house prices and credit in the latter part of the year induces household consumption to gradually contract after the first year. The inflation’s instantaneous reaction to the shock suggest evidence of a price puzzle.\(^ {36,37}\) Goodhart and Hofmann (2008) reckon that this could be attributed to the forward-looking monetary policy setting, i.e., the IRF is able to partially incorporate the policy’s response to the expected direction of inflation in the future. In addition, the appreciation of the ER may have initially dampened the

35. The CFS (2014) defines moneylenders as “those who provide informal loans to people who have no access to formal sources like banks and other non-bank lending institutions. These lenders are not regulated, nor registered.”

36. According to Balke and Emery (1994), price puzzle is “an unexpected tightening in monetary policy leads to an increase rather than a decrease in the price level.”

37. The model implies symmetric shocks, hence, an expansionary shock is the opposite of a contractionary shock. Consistent with related literature, e.g., Bjørnland and Jacobsen (2010), Robstad (2014), and Singh and Nadkarni (2017).
shock’s impact on inflation (Guinigundo, 2008). Nonetheless, inflation swiftly picks up after about the first month reflecting the rise in rents—via housing prices—bank lending, and expansion in the real economy. Meanwhile, the ER momentarily appreciates following the reduction in the interest rate, which dissipates about halfway through the first year. Aligning with the a priori expectations, the ER depreciates in the second half of the year but is statistically insignificant. The ER’s atypical initial reaction to the monetary shock could be partly traced to the model’s specification (i.e., absence of capital flows, remittances, and the gamut of other factors that determine the exchange rate).

5.2 House Price Boom

This sub-section investigates the presence of reverse causation between housing prices and monetary policy as well as household credit. The model allows household credit to contemporaneously react to the shock, since the value of residential real estate properties is closely linked to the bank lending channel in the Philippines. These properties serve as collateral for the loans and help determine the approval and terms of credit. The increase in the value of said properties are accounted for at the time of the loan application wherein the relevant property is appraised. Figure 10 illustrates the impact of a one standard deviation increase in housing prices to the other variables.

Figure 10: Impulse Response Functions to a Housing Price Boom

The shock in housing prices leads to a peak impact on the policy rates. Halfway through the year, policy rates start to tread the negative territory. On the contrary, inflation dips on impact and dissipates unevenly through the year. Inflation starts to pick up in the medium-term shortly after the

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38 According to Guinigundo (2008), a peso appreciation translates to a 0.01 percentage point decrease in inflation, and dampens the average annual inflation rate by 0.043 percentage point based on the sensitivity analyses conducted using the BSP’s inflation forecasting models. Employing the 2000 input-output table, a one percent appreciation of the peso would diminish the inflation rate by 0.14 percentage point.
reduction in policy rates. The rise in housing prices feeds into the inflation with a considerable lag. This is potentially due to the sluggish adjustment of rental fees following the increase in housing prices.\(^{39}\) Figure 11 shows the different price indices for residential real estate. While residential prices (based on cost per square meter of residential construction) exhibit significant volatility, IPIN (based mainly on imputed rents) treads a smooth increasing path. This is likely because of the rent controls on residential units in place in the country.\(^{40}\) Meanwhile, the rise in policy rates drives the exchange rate to appreciate, which persists for almost two years. The higher domestic interest rates partly strengthen the peso through the surge of capital flows in the domestic market by profit-taking investors.

**Figure 11:**
Measures of Housing Prices
For the periods indicated

Moving forward, the house price boom has a strong positive impact on household credit, lasting for about 15 months. This highlights the considerable influence of house prices on the bank lending conditions to the household sector in the country. Guinigundo (2008) explains that since the banks dominate the financial system, the asset price channel is tightly hinged to the banking lending channel. As such, an improvement in the asset quality stimulates more credit activity, among others (i.e., declining policy rates). Singh and Nadkarni (2017) explain that developments in the housing prices help ease credit conditions, which in turn, generates more investments, thus, creating a reciprocal relationship between credit and house prices. Lastly, the improvement in house prices boosts consumption. The effect of enhanced credit access along with price-induced housing wealth following the improvement in the housing prices is evident in the increase of household consumption well throughout the first year. Correspondingly, the decline in housing prices is followed by a slowdown in credit and a fall in consumption. Hence, real asset price fluctuations are able to affect real aggregates (i.e., consumption and output indirectly).

\(^{39}\) The former is the one included in the calculation of the CPI.

\(^{40}\) See Ballesteros, Ramos, and Magtibay (December 2016).
5.3 Positive Credit Supply Shock

The bank lending activities’ diminishing ability to manifest the monetary policy stance is evident in the results of the expansionary monetary policy shock. Moreover, the previous subsection’s discussion reckons that house price booms are found to positively impact household debt. This sub-section examines the feedback loop between credit, housing prices, and monetary policy. In order to distinguish the positive credit supply shock, the model is identified such that the response of housing prices is set with a quarter lag. Unlike the previous simulation wherein a contemporaneous response for both variables is allowed, a lag was imposed under the assumption that financial variables take time to feed into the real sector, particularly the housing market. Explicitly, a decline in credit will still be reflected as a slowdown in demand to drive house prices down, and thus, a lag is plausible. Notwithstanding the relative congruity of the last two shocks, a positive credit shock is simulated to close the loop. As anticipated and given the close link between credit and residential real property prices in the Philippines, the IRFs of the two shocks chart similar trends.

As in the literature, the results of a one standard deviation expansionary shock to household credit finds a bi-directional effect between credit and house prices, as shown in the trend and timing of the household debt’s IRF (Figure 12). As for the policy rates, while the initial reaction is consistent with the expectations, the increase is relatively short-lived. The policy rates’ response moves to negative section midway through the first year, implying an expansionary monetary policy stance. Following the household credit’s knee-jerk reaction around the second month to the rise in interest rate on impact, it is unable to sustain its expected response to the changes in policy rates. Specifically, bank lending to households continues to expand in the short-run despite the policy rate hikes during the first half of the year. This is consistent with the earlier findings on the abating link between credit and monetary policy. Meanwhile, household consumption moves broadly in tandem with household credit and house prices as in the previous simulation outcomes. Consumption expands in the short-run following an improvement in the credit conditions and the housing market, but tightens accordingly in the medium-term. Meanwhile, the decline in inflation on impact and the appreciation of the exchange rate are attune with the rise in policy rates, as shown in the previous section.

41. See Musso, Neri, and Stracca (2010), Goodhart and Hofmann (2008), and Singh and Nadkarni (2017)
6. Conclusion and Recommendations

In the past seven years, household debt has more than doubled and has not shown any signs of slowing down. As of 2017:Q2, household debt to GDP ratio stood at 12.8%, well below the 85% threshold specified in Lombardi, Mohanty, and Shim’s (2017) cross-country research household debt and Cecchetti, Mohanty, and Zampolli’s (2011) earlier study on sectoral debt sustainability, respectively.\textsuperscript{42,43} In terms of loan quality, non-performing consumer loans (NPCL) to total consumer loans ratio registered at 4.1% only, while non-performing residential real estate loans (RREL) to total RREL ratio is recorded at 3%.\textsuperscript{44} Nonetheless, continued vigilance is warranted. The recent implementation of the first package of the TRAIN will have significant effects on the Filipino households’ income and spending, given the sector’s noted economic behavior. Moreover, the risks of an interest rate hike arising from potential inflationary pressures following said developments could cause debts to bourgeon. Lastly, the households’ considerable borrowing activity with non-bank institutions/companies (i.e., shadow banking) as well as with informal lending channels also pose significant credit risks. Thus, while the outlook on the households’ credit availment with the banking system is benign, there is a need to remain prudent, and adopt a broader approach on monitoring and assessing households’ indebtedness.

\textsuperscript{42} The household debt includes loans from ODCs. Source: Standardized Report Forms and author’s calculation. \\
\textsuperscript{43} According to Cecchetti, Mohanty, and Zampolli (2011), the households’ debt level becomes a strain to the economy whilst making the households vulnerable to shocks at more than 85% of GDP. \\
\textsuperscript{44} Since this indicator is unavailable for the dataset used in the study, the ratio was taken from the BSP’s Consumer Loans statistics. Consumer loans include motor vehicle, residential real estate, salary-based general-purpose consumption, and other consumer loans and credit card receivables from UKBs and TBs. The ratio of total non-performing loans to total loan portfolio (net of interbank loans) stood at a mere 1.98%, with NPCL comprising 39.12% of the total.
Employing a SVAR model with sign restrictions, this study looks into the feedback loop between household credit, housing prices, and monetary policy in the Philippines. An expansionary monetary policy shock, a boom in housing prices, and a positive credit supply shock are carried out to examine the said multidimensional interlinkages and their effect on the macroeconomy. The study offers three key findings. First, there is a muted link between household credit and policy rates in the country. In particular, the household credit from banks does not seem to consistently react to the changes in policy rates. This is partly on account of the alternative funding sources tapped by the sector which are not captured in the study. Second, the research finds a bi-directional connection between household debt and housing prices. In the credit supply shock and housing price boom, the IRFs of two variables move in parallel to each other. Third, monetary variables (i.e., policy rates, housing prices, and credit) are able to influence real aggregates (i.e., household consumption). A negative monetary policy shock results in a growth in consumption in the short-run, while an increase in housing prices enhances household consumption through the price-induced wealth effect and improved access to credit. Moreover, household consumption generally moves in tandem with credit in all simulations. Overall, the findings on the key variables are consistent with the existing literature.

The results have also identified some drawbacks of this precursor study on the subject. First, the six-variable model has been significantly constrained by the short time series, spanning from 2010 to 2017 only. The availability of a longer series will improve the model specification and determination of restrictions. Second, a more comprehensive indicator could be used for the household credit—to include non-bank sources—and real estate prices. Finally, the study highlights the need for more empirical literature on household-related variables in the country. Nevertheless, the present model allows us to advance our understanding of the household sector, the housing market, and their role in the conduct of monetary policy in the Philippines. It paves the way for more advanced research in the future, which could further integrate the country’s household sector dynamics in policy analysis.

45. While increasing the lag level addresses the autocorrelation, it reduces the degrees of freedom.
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