PIDS-BSP Annual Macroeconometric Model for the Philippines: Preliminary Estimates and Ways Forward

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Philippine Institute for Development Studies

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Abstract

Given new programs and policies in the Philippines, there is a need to formulate a macroeconometric model (MEM) to gain more insights on how the economy and its sectors are affected. This paper discusses the estimation of an annual MEM that will be used for policy analysis and forecasting with respect to the opportunities and challenges brought about by new developments. The formulation of an annual MEM is useful in assisting major macroeconomic stakeholders such as NEDA and the BSP in their conduct of policy simulations, macroeconomic surveillance, and economic analysis. Given this backdrop, PIDS and BSP have collaborated to estimate an annual MEM, which has four blocks, namely, the real sector, fiscal sector, trade sector, and monetary sector. Using an Autoregressive Distributed Lag model approach, these sectors are modeled separately although the linkages with each other are specified. These sectoral models are then put together and tests on the predictive accuracy of the forecast of the overall model are conducted. Some ways to further improve the annual MEM are provided.

Keywords: Autoregressive Distributed Lag Model, Macroeconometric Model, National Income Accounting

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1. Introduction

The Philippine Development Plan 2017-2022 has identified several strategies that need to be implemented in order to improve the ability of the fiscal sector to promote development and inclusive growth. Given this, the Philippine Institute for Development Studies (PIDS) has collaborated with the *Bangko Sentral ng Pilipinas* (BSP) to build a macroeconometric model (MEM). The formulation of an annual MEM is useful in assisting major macroeconomic stakeholders such as NEDA and the BSP in their conduct of policy simulations, macroeconomic surveillance, and economic analysis.

The development of the PIDS-BSP Annual MEM is useful in policy analysis given various developments at the global and national stage in the past two decades. At the global stage, the country has seen the Global Financial Crisis in 2008, the election of leaders abroad with inward-looking policies, and the trade tension between US and China among other things, unfold. At the national stage, the Philippines has experienced an average gross domestic product (GDP) growth rate of over 6 percent since 2011. It has witnessed the boom of the Information Technology-Business Process Outsourcing (IT-BPO) sector in the early 2000 and has experienced damages of calamitous proportion in the face of typhoon Ondoy in 2009 and the super typhoon Yolanda in 2013. Several policies such as the government's infrastructure program (dubbed as the Build Build Build) and the tax reform program (Tax Reform for Acceleration and Inclusion) are also underway.

In the past, several MEMs in the Philippines had been done. One of these was the PIDS-NEDA Annual MEM, which had several versions (see Constantino and Yap 1988; Constantino et al 1990; Reyes and Yap 1993). The main objective of these MEMs was to provide a coordinated framework for the formulation of medium-term development plans for the Philippines. It was extensively used during the negotiations involving the country's external debt in the early years of the Aquino administration in the late 1980s. It was also used to evaluate the impact of stabilization policies in the Philippine economy.

Reyes and Yap (1993) version of the PIDS-NEDA Annual MEM followed a structuralist approach to macroeconomics, which subscribed to a less than full-employment equilibrium. In this approach, output is primarily determined from the supply side although the demand side also has a role. There were four major sectors in this MEM: (1) Real Sector, (2) Fiscal Sector, (3) Financial Sector, and (4) External Sector. The model focuses on the Real Sector, which has four sub-blocks including production, expenditure, income, wages/employment. GDP was

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determined by the interaction of the production side and the expenditure side while government spending was assumed to be exogenous. This strong link between the production and expenditures was a significant departure from earlier MEMs such as those in Villanueva (1977). Meanwhile, the financial sector determined the money supply and the interest rates, which were used in the real sector to determine output while the trade sector was disaggregated into various components. This version of the PIDS-NEDA Annual MEM had accounted for the role of infrastructure in output determination and the effect of public capital expenditures on power generation. Power outages had been a big issue in the early 1990s.

The PIDS-BSP Annual MEM closely follows the PIDS-NEDA Annual MEM in its attempt to provide a close link between the production and expenditure sub-blocks of the real sector. However, the former has modeled a more disaggregated household final consumption expenditure in order to analyze the effects of consumption-specific taxes and duties. In addition, the wages are also disaggregated to provide better information in the country's production structure. The external sector reflects an updated disaggregation of the goods and services traded by country highlighting the more significant subsectors of the country like Computer Services Exports (BPO) and Tourism. Compared to earlier Philippine MEMs, the accounts in the fiscal sector are also more finely disaggregated and follow more closely the general government income and outlay accounts of the Philippine System of National Accounts.

2. Modelling the Philippine economy: A 4-sector model

Consistent with Reyes and Yap (1993), the theoretical framework of the model is influenced by the structuralist approach to macroeconomics, which takes into account the economy's structural features into policy analysis. The structuralist approach subscribes to the notion of an equilibrium at less than full employment (Taylor, 1991), which to a great extent is observed in the Philippine economy. In 2018, the unemployment and underemployment rates in the country are 5.5% and 17%, respectively.

Following the structuralist approach to obtain equilibrium at less than full-employment, the determination of prices in the sectors follow the fix-price/flex-price method (Hicks, 1985). In the flex-price system, the demand for and supply of commodities determine the price level, which inform producers on whether to expand or contract the quantities they will produce. In the fix-price system, prices can remain unchanged over a period of time although adjustments will eventually be made to address the surplus (shortage) through output contraction (expansion). Sectors are assumed to have excess capacity and producers are operating under a non-competitive scenario where producers practice mark-up pricing. The agricultural sector is assumed to follow the flex-price system while the industrial and services sectors are assumed to follow the fix-price system. This assumption has been made by Reyes and Yap (1993) and is also adapted in this version of the PIDS-BSP Annual MEM as its implications are still observed in the structure of the Philippine economy today.

Similar to Reyes and Yap (1993), the economy is assumed to have four sectors, namely, the real sector, fiscal sector, trade sector, and monetary sector. This version of the PIDS-BSP Annual MEM has 132 behavioral equations, 65, 20, 30, and 17 of which pertain to the real sector, fiscal sector, trade sector, and monetary sector, respectively. The production and expenditure sub-blocks of the real sector are linked by including some household final consumption expenditures into the determination of some of the sectoral gross value added.

The real sector is also linked with the fiscal sector through the inclusion of interest and reverse repurchase rates (RRR) into the production subsector and with the external sector through relevant import and export items (see Appendix 1 for mapping of variables).

2.1. Real Sector

The real sector is made up of four subsectors: production, expenditure, income, and wage/employment. The aggregation of the GVA or the expenditure items can be used to solve for the GDP. These two subsectors are linked through the inclusion of specific expenditure items into the GVA specifications.

The production subsector has eleven groups: agriculture, industry (disaggregated into construction, electricity and steam, water, manufacturing, mining, and finance), and services (real estate, trade, transportation, and other services). An indicator for weather patterns (proxied by the deviation of rainfall from its long-run average) also affects the agricultural production through the implicit price index. The GVA in each subsector is affected by its corresponding implicit price index and is closely linked with the monetary sector through the real effective exchange rate and RRR and with the external sector through the exports and imports of specific items. Meanwhile, the implicit price index of each group is affected by its compensation index per employee. Some of the implicit price indices, such as those of real estate and other services, are also linked with the monetary sector through the lending rate while the implicit price indices of construction and manufacturing are linked with the external sector through the imports of fuel and machinery.

On the expenditure side, the HFCE has ten groups: (a) alcoholic beverages, (b) non-alcoholic beverages, (c) tobacco, (d) education, (e) food, (f) medical, (g) housing, (h) transportation and communication, (i) utilities, and (j) miscellaneous (which covers the rest of the HFCE items). Each sector is affected by its corresponding price index and the disposable income. In turn, the price indices are affected by the price of imports, real interest rate, and exchange rate to pick up cost effects. The link of expenditure side with the fiscal sector is established through the inclusion of tax rates on prices. In this version of the PIDS-BSP Annual MEM, the effective tax rate of alcoholic beverages and import duties affect the implicit price of food while the import duty affects the implicit price of medical goods.

Among the components of Gross Domestic Capital Formation (GDCF), fixed capital such as construction expenditures (private and public) are modeled as functions of financial variables such as the real interest rate, exchange rate, and T-bill rate. Change in inventory, on the other hand, is affected by the $/PhP exchange rate, inflation rate, and capital depreciation.

On the income side, net disposable income is the sum of net compensation of domestic employees, net operating surplus from resident producers, property income, net compensation from the rest of the world, taxes on production and on imports and subsidies, and total transfers from abroad. The first three components are modeled in the real sector and are affected by variables from financial sector such as the real interest rate, exchange rate, and inflation.

In terms of employment, that of the agricultural sector is affected by the sectoral wage indices while that of the industry is affected by external factors such as the imports of machinery to account for the sector's increasing intensity of capital use and the exports of BPO services, which have been booming in recent years. Population also plays a role in the determination of sectoral employment. Meanwhile, the unemployment rate is affected by the labor force while

the labor force is affected by the country's exports of services and use of government income. Consistent with Okun's Law, unemployment rate is affected by wages.

2.2. Fiscal Sector

The econometric models in this sector is designed to simulate and/or forecast general government net lending (borrowing) based on separate time-series models of the different sources of government revenues, and on programmed government expenditures taken exogenously. This module interacts with the rest of the PIDS-BSP Annual MEM through its linkages with other institutional sectors of the economy, namely, households and non-profit institutions serving households, corporations, and the external sector. It also interacts with the monetary sector directly through general government debt and debt servicing, and indirectly through the latter's influence on other institutional sectors. More specifically, this block interacts with the rest of the sectors by using variables from other model blocks, e.g. prices from the real sector, interest rates from the monetary sector, and exchange rates from the external sector, as inputs to predict different government accounts (e.g. taxes and other revenues). Variables form the government sector, on the other hand, are important determinants of outcomes in the real sector (e.g. GDP).

Different streams of tax revenues are modelled separately as a function of effective tax rates and the tax base for the good and/or service to be taxed. The effective tax rates are estimated using individual tax rates for separate goods and services weighted by either value or quantity of each good or service that is taxed, depending on the type of tax. For personal income tax revenues, for example, the time series of effective tax rates are calculated using the distribution of household incomes from the triennial Family Income and Expenditure Survey. Missing values are linearly imputed. Its tax base, on the other hand, are proxied by annual aggregate compensation of employees and gross operating surplus estimates from the national accounts.

In this version of the PIDS-BSP Annual MEM, the following tax revenues from the following sources are modelled separately: (a) import taxes and duties, (b) indirect taxes on business and occupations, (c) other indirect taxes, (d) excise taxes on domestic products, (e) direct taxes on business, (f) direct taxes on individuals, and (g) other indirect taxes. Excise taxes are disaggregated further by commodity, including alcoholic beverages, tobacco, petroleum, and minerals. Other government revenues, such as (h) social contributions, (i) property income, and (j) compulsory fees and fines, are also modelled separately using a similar approach used for government tax revenues. These other government revenues are modelled as a function of the effective contribution rate, whenever available, and the effective revenue base of these accounts, or its proxy variables.

Following Yap (2000), government final consumption expenditures (GFCE) are taken as exogenous in the model although a bridge equation linking actual government expenditures on personal services, and maintenance and other operating expenditures with GFCE is specified to ensure internal consistency. Other expenditures, such as on social security benefits and property expense, are modelled using a similar approach to (h) and (i) above.

General government savings may be derived using estimates/forecasts of the above variables. When combined with other government accounts, such as the GDCF and net asset holdings, annual government surplus, and debt stocks may also be calculated. As such, the fiscal sector is able to capture the influence of different macroeconomic factors on the debt position of the

government through these factors' direct and indirect effects on different government incomes and expenditures.

2.3 Trade Sector

The trade sector models the flow of goods, services, capital, and transfers in and out of the country. The different sectors of imports and exports are modelled using demand equations. On the export side, the export demand equation (EDE) models each subsector good/service as a function of foreign demand (usually proxied by world GDP), the price index of the subsector, and relevant exchange rates. The goods for which the EDE is estimated include the key exports of the country in recent years, namely, (a) electronic components, (b) agricultural exports, (c) minerals, and (d) other manufactured goods exports (residual). In recent years, the export of services has grown significantly. As such, the EDE models of (a) computer services exports (BPO), (b) tourism, and (c) other services exports (residual) are also included.

On the import side, the import demand equation (IDE) models each subsector good/service as a function of domestic demand (captured by household consumption, investment, and/or government spending), the import price, and relevant exchange rate. The IDE models of (a) machinery and equipment, (b) material inputs, (c) fuel, (d) agricultural products, and (e) other imports (residual) are also included.

This disaggregation of exports and imports allows the external sector block to capture changes in demand for key Philippine goods and services brought about by the exogenous factors. The impact of sharp increases in the prices of key production inputs such as fuel is also modelled through the imports equation.

The export and import price deflators are specified as functions of domestic prices and previous price deflators. In addition, tariff rates affect the import price deflators. Finally, the total exports and imports are converted to dollars using the US$-PhP exchange rate. These aggregate accounts enter the Balance of Payments.

2.4 Monetary Sector

The monetary sector attempts to capture the major channels of the monetary policy transmission mechanism. Monetary policy decisions affect output and inflation through the monetary transmission process that conventionally operates through the interest rate channel, credit channel, exchange rate channel, the asset price channel, and the expectations channel. These channels are not mutually exclusive as the effect of one channel could amplify or moderate the effect of another channel. It should be noted that these channels are not invariant over time since they evolve alongside changes in the overall economic and financial conditions.

The overnight RRR, which serves as the BSP's key policy rate, is estimated as the primary driver of domestic interest rates. A change in the BSP's monetary policy stance is transmitted through the various interest rates that affect overall economic activity. The policy rate is estimated to affect savings, time deposit, and lending rates of banks, which influence consumption and investment decisions of households and firms. Moreover, changes in the policy rate is transmitted across the different maturities of the government's yield curve, which influence fiscal conditions.

The exchange rate channel is particularly relevant for small open economies like the Philippines especially with greater integration of commodities, services and financial markets alongside a flexible exchange rate regime. Exchange rates are primarily determined by interest rate and inflation differentials. Movements in the exchange rates influence the price of domestic and foreign goods and services, which influence aggregate demand and inflation.

The model also captures the credit channel of monetary policy by tracing the impact of changes in the policy rate and the reserve requirements ratio (RRR) on domestic liquidity and the banking system's credit activity. In this channel, the traditional interest rate channel is amplified and propagated by how changes in policy rate affect the availability and cost of credit.

3. Empirical strategy

3.1 Autoregressive Distributed Lag Model

The PIDS-BSP Annual MEM will be estimated using an Autoregressive Distributed Lag (ARDL), which is represented by the following:

$$y_t = \alpha_t + \sum_{i=1}^{n} \alpha_i y_{t-1} + \sum_{k=1}^{m} \sum_{i=0}^{n} \beta_{ki} x_{kt-1} + u_t \qquad \text{Equation 1}$$

Here, u_t is assumed to be a white noise error: zero mean $[E(u_t) = 0$, constant variance $[E(u_t^2) = 0$, and serially uncorrelated $[E(u_t u_{t-s}) = 0]$. ARDL has various advantages. It has an Error Correction representation, which allows for the analysis of short-run and long-run relationships of variables. It is a dynamic single equation, which makes for easy implementation and interpretation. It can be used in series with orders 0 [I(0)] or 1 [I(1)] and it can accommodate different lags in x and y.

Given a one explanatory variable x with one lag, equation 1 becomes

$$y_t = \alpha_0 + \alpha_1 y_{t-1} + \beta_0 x_t + \beta_1 x_{t-1} + u_t \qquad \text{Equation 2}$$

Equation 2 can be reparameterized to get the following:

$$\Delta y_t = c + (\alpha_1 - 1)y_{t-1} + \beta_0 \Delta x_t + (\beta_1 + \beta_0)x_{t-1} + u_t \qquad \text{Equation 3}$$

$$\Delta y_t = c + \theta_0[y_{t-1} + \theta_1 x_{t-1}] + \beta_0 \Delta x_t + u_t \qquad \text{Equation 4}$$

Equation 3 is ARDL in differenced form while equation 4 is the ECM representation of the ARDL in differenced form where $\theta_0 = \alpha_1 - 1$ and $\theta_1 = \frac{\beta_1 + \beta_0}{-\theta_0}$. $\theta_0 = \alpha_1 - 1$ is the speed of adjustment to the steady state and $-1 < \theta_0 < 0$ for dynamic stability. θ_1 is the long-run multiplier while β_0 is the short-run multiplier.

3.2. Determination of long-run relationship and pre- and post-estimation routines

The ARDL approach can be used to model a mix of I(0) and I(1)series, which can be implemented using the bounds test procedure developed by Pesaran et al. (2001). The test for the existence of a significant long-run relationship is an F-test for the variables in lagged levels or $H0: \theta_0 = \theta_1 = 0$. The bounds test has the following rules:

- (computed) F-statistic < the lower bound: H0 of no long-run relationship between the variables cannot be rejected.
- (computed) F-statistic > the upper bound: H0 of a no long-run relationship is rejected.
- F-statistic falls within the range of the lower and upper bounds: The test is inconclusive.

Since the bounds test is no longer applicable in the presence of series with higher order, unit root tests have been implemented and results indicate that all series are either I(0) or I(1). All variables are in natural logarithms (see appendix 2 for sources and computation).

A battery of tests has been conducted to ensure the adequacy of each specification. A white noise test (Portmanteau test) is implemented to test the adequacy of the model. In this test, the null hypothesis is that residuals follow a white noise process. This means that the residuals have zero mean, constant variance, and are serially uncorrelated. Nevertheless, additional tests for serial correlation (Durbin-Watson test) and heteroscedasticity (Breusch-Pagan test) are implemented. The null hypothesis of the former is that there is no serial correlation while the null hypothesis of the latter is that the residual has constant variance. Results of these tests are found in Appendix 3.

4. Preliminary results

The preliminary equation-by-equation estimates confirm the expected signs. All the specifications have passed the battery of tests and the bounds test indicate that the variables have long-run relationships. Some pertinent results based on the equation-by-equation estimates include the following:

1. The supply side of the agricultural production is not very sensitive to domestic prices, as output cannot increase easily to meet demand. It is, however, more sensitive to the prices of exported agricultural exports, with an increase in the price of foreign agricultural products resulting in a higher GVA for agricultural product.
2. The price indices in the production side are affected by costs in the other sectors, including the exchange rates, lending rates, as well as by labor market costs such as the sectoral wage indices.
3. The HFCE positively affects the GVA of manufacturing, trade, and transportation.
4. Food prices is negatively affectively by the country's openness. This potentially captures the positive effect of the country's liberalization of its agricultural markets.
5. The prices of tobacco and medical goods are positively affected by tobacco tax rate and import duties, respectively.
6. Investment is sensitive to various measures of interest rate.
7. Operating surplus is negatively affected by the price of capital (interest rates) and positively by the level of investment in capital formation.

8. Capitalization increases the employment in the industry sector while developments in the BPO, such as increased exports of BPO services, decreases the employment in the industry sector.

9. The long-run parameters on tax rates in the fiscal sector ARDL models are positive and statistically significant, implying that the Philippines is still on the upward- sloping side of the Laffer curve over the estimation period. That is, having higher tax rates may increase government tax income holding other things the same. However, the coefficient must be interpreted with caution as there may be other unobservable factors that may confound the parameter estimates.

10. Models of many government sector accounts have poor fit when using the baseline tax rate and taxable amount as predictors. This suggests that there may be other factors in play, e.g. collection effort, in determining these accounts.

11. Real exports of goods (Agriculture, Mineral Exports and Other Goods) and Real exports of services (Tourism, Other Services) are negatively affected by prices and positively affected by the growth of world economy.

12. In the long run, real exports are positively affected by the depreciation of the real exchange rate while real imports are negatively affected by it.

5. Model Validation

There are several measures that can be looked into to determine the extent of the accuracy of the forecast of the MEM. This PIDS-BSP Annual MEM version looked into the mean absolute percentage error (MAPE), which is computed as $MAPE = \frac{1}{n}\sum_{t=1}^{n}|\frac{Actual_t - Predicted_t}{Actual_t}|$. A lower MAPE indicates a better predictive performance of the forecast system.

Table 1 in appendix 4 shows the in-sample MAPE statistics (2002-2016) of key variables as well as the out-of-sample forecasts for 2017 and 2018. It can be seen that the MAPEs of the in-sample forecasts for the production and expenditures subsectors of the real sector block are relatively low at less than 5%. However, the GDCF and some of its components have relatively high MAPEs (greater than 10%). Similarly, the forecasts of some variables in the fiscal sector also have relatively high MAPEs including the import duty, excise tax on domestic product, income taxes on business and individual, total government savings, and total government surplus. The forecasts of some of the external and financial variables also have high MAPEs. These observations are carried over to the 1-step ahead forecasts (2017) and 2-step ahead forecasts (2018), with the latter having higher MAPEs than the former.

6. Ways forward

While the challenges of data collection needed for this type of modeling strategy have been addressed, several important areas should be looked into. These include the following:

1. There is a need to strengthen the link of the real sector with the fiscal sector. This can be done by ensuring that relevant taxes are included in the specifications of the implicit price index (IPIN) of the disaggregated HFCEs and their signs conform to *a priori* expectations.

2. There is a need to strengthen the link of the production and expenditure sub-blocks of the real sector. In the current version, only the GVAs of manufacturing, transportation,

and trade are affected by the relevant HFCEs. The HFCE-education, for example, can be used as an explanatory variable of the GVA of other services while the HFCE-food can be used as an explanatory variable of the GVA of agriculture.

3. While the current model incorporates the relationship between the GVA and IPIN of exports or imports in some equations (e.g. Agriculture GVA), there is a need to strengthen the linkage of the export and/or import price indices and the relevant sectors which may be affected by the change in these prices. For instance, the GVA of manufacturing may be affected by the IPINs of imports of material inputs, machinery, and fuel.

4. There is a need to strengthen the specifications and linkages of the private and public investments. In the current version, there is no link to analyze crowding-in and crowding-out effects of public investments.

5. The specification of cash remittances can be improved by including the world economic growth or the weighted growth of countries where majority of OFWs are deployed.

6. There is a need to streamline the specifications included in the monetary sector. Currently, the model has several T-bill rates although only the 91-day T-bill rate is used in the real sector. In addition, the feedback between the real sector with the monetary sector is somewhat weak. While the exchange rate, lending rate, real interest rate, RRR, and the 91-day T-bill rate are included in the real sector, only the GDP is used in the monetary sector, specifically, in the US$ and JPY nominal exchange rates.

7. The equations for the exchange rates of USD, JPY, and CNY should also be more theoretically consistent by focusing on interest rate and inflation differentials.

8. There is a need to analyze the predictive accuracy of the forecasts through the use of other metrics such as the root mean squared error (RMSE), mean absolute prediction error (MAE), and Theil coefficient.

9. The forecasting accuracy of the fiscal sector models may be improved by expanding the sector's linkages with the rest of the PIDS-BSP MEM. This may be difficult to implement, however, because of the rather short temporal coverage of many of the input data series. Expanding the historical coverage of these series may be an important step moving forward.

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APPENDIX 1: Mapping of variables

APPENDIX 2: Lists of variables, definition, and sources

Variables	Variable Name	Sources	Definition	Unit	
GVA Agriculture, real	gva_agri_r	National Accounts, Philippine Statistics Authority	GVA: Gross value added Agriculture at constant prices	in million PhP	(2000=100)
GVA Agriculture (demand), real	gva_agri_r_d	National Accounts, Philippine Statistics Authority	GVA: Gross value added Agriculture at constant prices (demand side)	in million PhP	(2000=100)
GVA Construction, real	gva_cons_r	National Accounts, Philippine Statistics Authority	GVA: Gross Value Added in Construction at constant prices	in million PhP	(2000=100)
GVA Electricity and Steam, real	gva_elesteam_r	National Accounts, Philippine Statistics Authority	GVA: Gross Gross Value Added in Ultilities (Electricity and steam) at constant prices	in million PhP	(2000=100)
GVA Finance, real	gva_fin_r	National Accounts, Philippine Statistics Authority	GVA: Gross Value Added in Financial Services at constant prices	in million PhP	(2000=100)
GVA Manufacturing, real	gva_manuf_r	National Accounts, Philippine Statistics Authority	GVA: Gross Value Added in Manufacturing at constant prices	in million PhP	(2000=100)
GVA Mining, real	gva_mining_r	National Accounts, Philippine Statistics Authority	GVA: Gross Value Added in Mining at constant prices	in million PhP	(2000=100)
GVA Mining, nominal	gva_mining_n	National Accounts, Philippine Statistics Authority	GVA: Gross Value Added in Mining at current prices	in million PhP	Current prices
GVA Other Services, real	gva_otser_r	National Accounts, Philippine Statistics Authority	GVA: Gross Value Added in Other Services at constant prices	in million PhP	(2000=100)
GVA Real Estate, real	gva_realest_r	National Accounts, Philippine Statistics Authority	GVA: Gross Value Added in Real Estate at constant prices	in million PhP	(2000=100)
GVA Trade, real	gva_trade_r	National Accounts, Philippine Statistics Authority	GVA: Gross Value Added in Trade at constant prices	in million PhP	(2000=100)
GVA Transportation, real	gva_trans_r	National Accounts, Philippine Statistics Authority	GVA: Gross Value Added in Transportation at constant prices	in million PhP	(2000=100)
GVA Water, real	gva_water_r	National Accounts, Philippine Statistics Authority	GVA: Gross Value Added in Utilities (Water) at constant prices	in million PhP	(2000=100)
GVA Electricity , real	gva_elect_r	National Accounts, Philippine Statistics Authority	GVA: Gross Value Added in Electricity at constant prices	in million PhP	(2000=100)
GVA Industry, real	gva_ind_r	National Accounts, Philippine Statistics Authority	GVA: Gross Value Added in Industry Sector at constant prices	in million PhP	(2000=100)
GVA Service, real	gva_serv_r	National Accounts, Philippine Statistics Authority	GVA: Gross Value Added in Services Sector at constant prices	in million PhP	(2000=100)
GDP, real	gdp_r	National Accounts, Philippine Statistics Authority	Gross Domestic Product at constant prices	in million PhP	(2000=100)
GDP, nominal	gdp_n	National Accounts, Philippine Statistics Authority	Gross Domestic Product at current prices	in million PhP	Current prices

Variables	Variable Name	Sources	Definition	Unit	
IPIN GVA Construction	ipin_gva_cons	National Accounts, Philippine Statistics Authority	Implicit Price Index: Nominal GVA/Real GVA in Construction		(2000=100)
IPIN GVA Electricity and Steam	ipin_gva_elesteam	National Accounts, Philippine Statistics Authority	Implicit Price Index: Nominal GVA/Real GVA in Utilities (Electricity and Steam)		(2000=100)
IPIN GVA Finance	ipin_gva_fin	National Accounts, Philippine Statistics Authority	Implicit Price Index: Nominal GVA/Real GVA in Financial Services		(2000=100)
IPIN GVA Manufacturing	ipin_gva_manuf	National Accounts, Philippine Statistics Authority	Implicit Price Index: Nominal GVA/Real GVA in Manufacturing		(2000=100)
IPIN GVA Mining	ipin_gva_mining	National Accounts, Philippine Statistics Authority	Implicit Price Index: Nominal GVA/Real GVA in Mining		(2000=100)
IPIN GVA Other Services	ipin_gva_otser	National Accounts, Philippine Statistics Authority	Implicit Price Index: Nominal GVA/Real GVA in Other Services		(2000=100)
IPIN GVA Real Estate	ipin_gva_realest	National Accounts, Philippine Statistics Authority	Implicit Price Index: Nominal GVA/Real GVA in Real Estate		(2000=100)
IPIN GVA Trade	ipin_gva_trade	National Accounts, Philippine Statistics Authority	Implicit Price Index: Nominal GVA/Real GVA in Trade		(2000=100)
IPIN GVA Transportation	ipin_gva_trans	National Accounts, Philippine Statistics Authority	Implicit Price Index: Nominal GVA/Real GVA in Transportation		(2000=100)
IPIN GVA Water	ipin_gva_water	National Accounts, Philippine Statistics Authority	Implicit Price Index: Nominal GVA/Real GVA in Utilities (Water)		(2000=100)
HFCE - Alcohol	HFCE_alc_r	National Accounts, Philippine Statistics Authority	Household Final Consumption Expenditure in Alcoholic Beverages at constant prices	in PhP	(2000=100)
HFCE - Education	HFCE_educ_r	National Accounts, Philippine Statistics Authority	Household Final Consumption Expenditure in Education at constant prices	in PhP	(2000=100)
HFCE - Food	HFCE_food_r	National Accounts, Philippine Statistics Authority	Household Final Consumption Expenditure in Food at constant prices	in PhP	(2000=100)
HFCE - Medical	HFCE_med_r	National Accounts, Philippine Statistics Authority	Household Final Consumption Expenditure in Medical Care at constant prices	in PhP	(2000=100)
HFCE - Housing	HFCE_housing_r	National Accounts, Philippine Statistics Authority	Household Final Consumption Expenditure in Housing at constant prices	in PhP	(2000=100)
HFCE - Non-Alcoholic	HFCE_nalc_r	National Accounts, Philippine Statistics Authority	Household Final Consumption Expenditure in Non-Alcoholic Beverages at constant prices	in PhP	(2000=100)
HFCE - Miscellaneous	HFCE_misc_r	National Accounts, Philippine Statistics Authority	Household Final Consumption Expenditure in Miscellaneous or Others, N.E.C. at constant prices	in PhP	(2000=100)
HFCE - Tobacco	HFCE_tbc_r	National Accounts, Philippine Statistics Authority	Household Final Consumption Expenditure in Tobacco at constant prices	in PhP	(2000=100)

Variables	Variable Name	Sources	Definition	Unit	
HFCE - Transportation and Communication	HFCE_tcom_r	National Accounts, Philippine Statistics Authority	Household Final Consumption Expenditure in Transportation and Communication at constant prices	in PhP	(2000=100)
HFCE - Utilities	HFCE_util_r	National Accounts, Philippine Statistics Authority	Household Final Consumption Expenditure in Fuel, light, water at constant prices	in PhP	(2000=100)
IPIN HFCE - Alcohol	ipin_exp_alc_n	National Accounts, Philippine Statistics Authority	Implicit Price Index: Nominal HFCE/Real HFCE in Alcoholic Beverages		(2000=100)
IPIN HFCE - Education	ipin_exp_educ_n	National Accounts, Philippine Statistics Authority	Implicit Price Index: Nominal HFCE/Real HFCE in Education		(2000=100)
IPIN HFCE - Food	ipin_exp_food_n	National Accounts, Philippine Statistics Authority	Implicit Price Index: Nominal HFCE/Real HFCE in Food		(2000=100)
IPIN HFCE - Medical	ipin_exp_med_n	National Accounts, Philippine Statistics Authority	Implicit Price Index: Nominal HFCE/Real HFCE in Medical Care		(2000=100)
IPIN HFCE - Housing	ipin_exp_housing_n	National Accounts, Philippine Statistics Authority	Implicit Price Index: Nominal HFCE/Real HFCE in Housing		(2000=100)
IPIN HFCE - Non-Alcoholic	ipin_exp_nalc_n	National Accounts, Philippine Statistics Authority	Implicit Price Index: Nominal HFCE/Real HFCE in Non-Alcoholic Beverages		(2000=100)
IPIN HFCE - Miscellaneous	ipin_exp_misc_n	National Accounts, Philippine Statistics Authority	Implicit Price Index: Nominal HFCE/Real HFCE in Miscellaneous or Others, N.E.C.		(2000=100)
IPIN HFCE - Tobacco	ipin_exp_tbc_n	National Accounts, Philippine Statistics Authority	Implicit Price Index: Nominal HFCE/Real HFCE in Tobacco		(2000=100)
IPIN HFCE - Transportation and Communication	ipin_exp_tcom_n	National Accounts, Philippine Statistics Authority	Implicit Price Index: Nominal HFCE/Real HFCE in Transportation and Communication		(2000=100)
IPIN HFCE - Utilities	ipin_exp_util_n	National Accounts, Philippine Statistics Authority	Implicit Price Index: Nominal HFCE/Real HFCE in Fuel, light, water		(2000=100)
GDCF - Fixed - Durables, real	gdcf_fc_dur_r	National Accounts, Philippine Statistics Authority	Durable Equipment investments under Fixed Capital in Gross Domestic Capital Formation, at real prices	in million PhP	(2000=100)
GDCF - Fixed - Private Construction, real	gdcf_fc_privcons_r	National Accounts, Philippine Statistics Authority	Investments in private construction under Gross Domestic Capital Formation, at real prices	in million PhP	(2000=100)
				in million PhP	
Compensation of Residents	comp_res	National Accounts, Philippine Statistics Authority	Compensation from resident producers	in million PhP	Current prices
Operating Surplus	opsurplus_net	National Accounts, Philippine Statistics Authority	Operating Surplus, net	in million PhP	Current prices
Net Compensation	comp_net	National Accounts, Philippine Statistics Authority	Sum of compensation from resident producers and from rest of the world, less compensation to rest of the world	in million PhP	Current prices

Variables	Variable Name	Sources	Definition	Unit	
Net National Income	netnat_income	National Accounts, Philippine Statistics Authority	Sum of Net Compensation of Employees, Operating Surplus, Property Income, Taxes on Production and on Imports, less subsidies	in million PhP	Current prices
Net Disposable Income	netdisp_income	National Accounts, Philippine Statistics Authority	Sum of Net National Income and Current Transfers from Rest of the World, less Current Transfer from Rest of the World	in million PhP	Current prices
Domestic Demand, Real	dd_r	National Accounts, Philippine Statistics Authority		in million PhP	Current prices
Openness, Nominal	openness_n	National Accounts, Philippine Statistics Authority	Sum of imports and exports in current prices, divided by GDP	percentage	
Employment in Agriculture	emp_agri	Authors' Calculations, Philippine Statistics Authority	Consists of persons in the labor force in Agriculture who are reported either as at work or with a job or business although not at work. Persons at work are those who did some work, even for an hour during the reference period.	in thousands	
Employment in Industry	emp_ind	Authors' Calculations, Philippine Statistics Authority	Consists of persons in the labor force in Industry who are reported either as at work or with a job or business although not at work. Persons at work are those who did some work, even for an hour during the reference period.	in thousands	
Employment in Service	emp_serv	Authors' Calculations, Philippine Statistics Authority	Consists of persons in the labor force in Services who are reported either as at work or with a job or business although not at work. Persons at work are those who did some work, even for an hour during the reference period.	in thousands	
Labor Force	lf	Authors' Calculations, Philippine Statistics Authority	Refers to the population 15 years old and over who contribute to the production of goods and services in the country. It comprises the employed and unemployed.	in thousands	
Unemployment Rate	unemp_rate	Authors' Calculations, Philippine Statistics Authority	Percentage of the total number of unemployed persons to the total number of persons in the labor force.	Percent	
Total Employment (AIS)	temp_ais	Authors' Calculations, Philippine Statistics Authority	Total Employment (Agriculture+ Industry+Services)	in thousands	
Wage Index Agriculture	wageind_agri	Authors' Calculations, Philippine Statistics Authority	Indexed to 1978 from Agricultural Wage Rates of Farm Workers by Type of Farm Workers, Type		(1978=100)

Variables	Variable Name	Sources	Definition	Unit	
Wage Index Construction	wageind_cons	Index of Compensation Per Employee in Non-Agricultural Industries, Philippine Statistics Authority	Receipts of the employees be it in the form of cash or in-kind, including contributions of the employers such as insurance and pension in Construction.		(1978=100)
Wage Index Electricity and Steam	wageind_elect	Index of Compensation Per Employee in Non-Agricultural Industries, Philippine Statistics Authority	Receipts of the employees be it in the form of cash or in-kind, including contributions of the employers such as insurance and pension in Electricity and Steam.		(1978=100)
Wage Index Finance	wageind_fin	Index of Compensation Per Employee in Non-Agricultural Industries, Philippine Statistics Authority	Receipts of the employees be it in the form of cash or in-kind, including contributions of the employers such as insurance and pension in Financial Services.		(1978=100)
Wage Index Manufacturing	wageind_manuf	Index of Compensation Per Employee in Non-Agricultural Industries, Philippine Statistics Authority	Receipts of the employees be it in the form of cash or in-kind, including contributions of the employers such as insurance and pension in Manufacturing.		(1978=100)
Wage Index Mining	wageind_mining	Index of Compensation Per Employee in Non-Agricultural Industries, Philippine Statistics Authority	Receipts of the employees be it in the form of cash or in-kind, including contributions of the employers such as insurance and pension in Mining.		(1978=100)
Wage Index - Private Service	wageind_privserv	Index of Compensation Per Employee in Non-Agricultural Industries, Philippine Statistics Authority	Receipts of the employees be it in the form of cash or in-kind, including contributions of the employers such as insurance and pension in Private Service.		(1978=100)
Wage Index Real Estate	wageind_realest	Index of Compensation Per Employee in Non-Agricultural Industries, Philippine Statistics Authority	Receipts of the employees be it in the form of cash or in-kind, including contributions of the employers such as insurance and pension in Real Estate.		(1978=100)
Wage Index Trade	wageind_trade	Index of Compensation Per Employee in Non-Agricultural Industries, Philippine Statistics Authority	Receipts of the employees be it in the form of cash or in-kind, including contributions of the employers such as insurance and pension in Trade.		(1978=100)
Wage Index Transportation	wageind_transpo	Index of Compensation Per Employee in Non-Agricultural Industries, Philippine Statistics Authority	Receipts of the employees be it in the form of cash or in-kind, including contributions of the employers such as insurance and pension in Transportation.		(1978=100)
GDCF - Fixed - Construction, real	gdcf_fc_cons_r	National Accounts, Philippine Statistics Authority	Construction under Fixed Capital in Gross Domestic Capital Formation, at constant prices	in million PhP	(2000=100)

Variables	Variable Name	Sources	Definition	Unit	
GDCF - Fixed, real	gdcf_fc_r	National Accounts, Philippine Statistics Authority	Fixed Capital under Gross Domestic Capital Formation consisting Construction, Durable Equipment, and Breeding Stock & Orchard Development	in million PhP	(2000=100)
GDCF, real	gdcf_r	National Accounts, Philippine Statistics Authority	Gross Domestic Capital Formation is the sum of fixed capital, changes in inventories and intellectual property products, at constant prices	in million PhP	(2000=100)
GDCF, nominal	gdcf_n	National Accounts, Philippine Statistics Authority	Gross Domestic Capital Formation is the sum of fixed capital, changes in inventories and intellectual property products, at current prices	in million PhP	(2000=100)
BIR - Excise Taxes	BIR_excise	Bureau of Internal Revenue	Excise Taxes	in million PhP	Current prices
CPI from IPIN HFCE, regress	cpi_hfce				
Import Duties and Excise Taxes	gitax_impall				
Taxes in Business and Occupation	gitax_biz	The National Accounts of the Philippines, National Statistical Coordination Board/Philippine Statistical Authority	Taxes in Business and Occ.	in million PhP	Current prices
Other Indirect Taxes	gitax_o	The National Accounts of the Philippines, National Statistical Coordination Board/Philippine Statistical Authority	Other Indirect Taxes	in million PhP	Current prices
BIR - Alcohol Products	BIR_alc	Bureau of Internal Revenue	Alcohol Products	in million PhP	Current prices
BIR - Tobacco Products (including inspection fees)	BIR_tbc	Bureau of Internal Revenue	Tobacco Products (including inspection fees)	in million PhP	Current prices
BIR - Petroleum Products	BIR_oil	Bureau of Internal Revenue	Petroleum Products	in million PhP	Current prices
BIR - Mineral Products	BIR_mnrl	Bureau of Internal Revenue	Mineral Products	in million PhP	Current prices
Excise Tax on Domestic Product	gitax_dp	The National Accounts of the Philippines, National Statistical Coordination Board/Philippine Statistical Authority	Excise Tax on Domestic Product	in million PhP	Current prices
Income Tax on Business	gdtax_b	The National Accounts of the Philippines, National Statistical Coordination Board/Philippine Statistical Authority	Income Tax on Business	in million PhP	Current prices
Income Tax on Individual	gdtax_i	The National Accounts of the Philippines, National Statistical Coordination Board/Philippine Statistical Authority	Income Tax on Individual	in million PhP	Current prices
Other Direct Taxes	gdtax_o	The National Accounts of the Philippines, National Statistical Coordination Board/Philippine Statistical Authority	Other Direct Taxes	in million PhP	Current prices

Variables	Variable Name	Sources	Definition	Unit	
Compulsory fees and fines	ggff	General Government, Income and Outlay Account, National Statistical Coordination Board/Philippine Statistical Authority	Compulsory fees and fines	in million PhP	Current prices
Govt property income	ggproperty	General Government, Income and Outlay Account, National Statistical Coordination Board/Philippine Statistical Authority	Government property income	in million PhP	Current prices
Social security contributions	ggssc	General Government, Income and Outlay Account, National Statistical Coordination Board/Philippine Statistical Authority	Social security contributions	in million PhP	Current prices
Govt property expenditure	ggpropexp	General Government, Income and Outlay Account, National Statistical Coordination Board/Philippine Statistical Authority	Government property expenditure	in million PhP	Current prices
Social security benefits	ggsbenefit	General Government, Income and Outlay Account, National Statistical Coordination Board/Philippine Statistical Authority	Social security benefits	in million PhP	Current prices
Implicit Price Index, Government Spending	ipin_gfce				
Total Indirect Taxes	i_tot_indirect_tax				
Total Direct Taxes	i_tot_direct_tax				
Total Taxes	i_tot_tax				
Total Govt Income	i_tot_gov_inc				
Total Govt Expenditure	i_tot_gov_exp				
Total Govt Savings	i_tot_govt_sav				
Total Govt Surplus	i_gov_surp				
Total Govt Debt	i_gov_debt				
IPIN Agricultural Imports	ipin_mgagri	Authors' calculations. Implicit Price = Nominal value / Real value	Implicit Price Deflator of Agricultural Imports	Unit	
IPIN Fuel Imports	ipin_mgfuel	Authors' calculations. Implicit Price = Nominal value / Real value	Implicit Price Deflator of Fuel Imports		
IPIN Machinery Imports	ipin_mgmach	Authors' calculations. Implicit Price = Nominal value / Real value	Implicit Price Deflator of Machinery Imports		
IPIN Materials Imports	ipin_mgmat	Authors' calculations. Implicit Price = Nominal value / Real value	Implicit Price Deflator of Materials Imports		

Variables	Variable Name	Sources	Definition	Unit	
IPIN Other Good Imports	ipin_mgoth	Authors' calculations. Implicit Price = Nominal value / Real value	Implicit Price Deflator of Other Goods Imports		
IPIN Electronic Exports	ipin_xgelec	Authors' calculations. Implicit Price = Nominal value / Real value	Implicit Price Deflator of Electronic Exports		
IPIN Agricultural Exports	ipin_xgagri	Authors' calculations. Implicit Price = Nominal value / Real value	Implicit Price Deflator of Agricultural Exports		
IPIN Mineral Exports	ipin_xgmine	Authors' calculations. Implicit Price = Nominal value / Real value	Implicit Price Deflator of Mineral Exports		
IPIN Other Good Exports	ipin_xgoth	Authors' calculations. Implicit Price = Nominal value / Real value	Implicit Price Deflator of Other Goods Exports		
IPIN Service Imports	ipin_ms	Authors' calculations. Implicit Price = Nominal value / Real value	Implicit Price Deflator of Services Imports		
IPIN BPO Service Exports	ipin_xsbpo	Authors' calculations. Implicit Price = Nominal value / Real value	Implicit Price Deflator of BPO Services Exports		
IPIN Tourism Service Exports	ipin_xstour	Authors' calculations. Implicit Price = Nominal value / Real value	Implicit Price Deflator of Tourism Exports		
IPIN Other Service Exports	ipin_xsoth	Authors' calculations. Implicit Price = Nominal value / Real value	Implicit Price Deflator of Other Services Exports		
Electronic Exports, real	xgelec_r	Authors' calculations. Values are based on proportions derived from the PSA National Income Accounts. These derived proportions were then used to divide the value of Total Exports from the PIDS-Economic and Social Database.	Electronic Exports. Since the PSA National Income Accounts have multiple disaggregation differing through the years, categories were regrouped. The technical notes on the Trade Sector Dataset provide a complete enumeration.	in million PhP	(2000=100)
Agricultural Exports, real	xgagri_r	Authors' calculations. Values are based on proportions derived from the PSA National Income Accounts. These derived proportions were then used to divide the value of Total Exports from the PIDS-Economic and Social Database.	Agricultural Exports. Since the PSA National Income Accounts have multiple disaggregation differing through the years, categories were regrouped. The technical notes on the Trade Sector Dataset provide a complete enumeration.	in million PhP	(2000=100)
Mineral Exports, real	xgmine_r	Authors' calculations. Values are based on proportions derived from the PSA National Income Accounts. These derived proportions were then used to divide the value of Total Exports from the PIDS-Economic and Social Database.	Mineral Exports. Since the PSA National Income Accounts have multiple disaggregation differing through the years, categories were regrouped. The technical notes on the Trade Sector Dataset provide a complete enumeration.	in million PhP	(2000=100)

Variables	Variable Name	Sources	Definition	Unit	
Other Good Exports, real	xgoth_r	Authors' calculations. Values are based on proportions derived from the PSA National Income Accounts. These derived proportions were then used to divide the value of Total Exports from the PIDS-Economic and Social Database.	Other Goods Exports. Since the PSA National Income Accounts have multiple disaggregation differing through the years, categories were regrouped. The technical notes on the Trade Sector Dataset provide a complete enumeration.	in million PhP	(2000=100)
BPO Service Exports, real	xsbpo_r	Authors' calculations. Values are based on proportions derived from the PSA National Income Accounts. These derived proportions were then used to divide the value of Total Exports from the PIDS-Economic and Social Database.	BPO Services Exports. Since the PSA National Income Accounts have multiple disaggregation differing through the years, categories were regrouped. The technical notes on the Trade Sector Dataset provide a complete enumeration.	in million PhP	(2000=100)
Tourism Service Exports, real	xstour_r	Authors' calculations. Values are based on proportions derived from the PSA National Income Accounts. These derived proportions were then used to divide the value of Total Exports from the PIDS-Economic and Social Database.	Tourism Services Exports. Since the PSA National Income Accounts have multiple disaggregation differing through the years, categories were regrouped. The technical notes on the Trade Sector Dataset provide a complete enumeration.	in million PhP	(2000=100)
Other Service Exports	xsoth_r	Authors' calculations. Values are based on proportions derived from the PSA National Income Accounts. These derived proportions were then used to divide the value of Total Exports from the PIDS-Economic and Social Database.	Other Services Exports. Since the PSA National Income Accounts have multiple disaggregation differing through the years, categories were regrouped. The technical notes on the Trade Sector Dataset provide a complete enumeration.	in million PhP	(2000=100)
BOP - Total Good Exports, nominal	bopxg_n	Bangko Sentral ng Pilipinas	Total Goods Exports, Credit	in million US$	Current prices
BOP - Total Service Exports, nominal	bopxs_n	Bangko Sentral ng Pilipinas	Total Services Exports, Credit	in million US$	Current prices
Agricultural Imports, real	mgagri_r	Authors' calculations. Values are based on proportions derived from the PSA National Income Accounts. These derived proportions were then used to divide the value of Total Imports from the PIDS-Economic and Social Database.	Agricultural Imports. Since the PSA National Income Accounts have multiple disaggregation differing through the years, categories were regrouped. The technical notes on the Trade Sector Dataset provide a complete enumeration.	in million PhP	(2000=100)
Fuel Imports, real	mgfuel_r	Authors' calculations. Values are based on proportions derived from the PSA National Income Accounts. These derived proportions were then used to divide the value of Total Imports from the PIDS-Economic and Social Database.	Fuel Imports. Since the PSA National Income Accounts have multiple disaggregation differing through the years, categories were regrouped. The technical notes on the Trade Sector Dataset provide a complete enumeration.	in million PhP	(2000=100)

Variables	Variable Name	Sources	Definition	Unit	
Machinery Imports, real	mgmach_r	Authors' calculations. Values are based on proportions derived from the PSA National Income Accounts. These derived proportions were then used to divide the value of Total Imports from the PIDS-Economic and Social Database.	Machinery Imports. Since the PSA National Income Accounts have multiple disaggregation differing through the years, categories were regrouped. The technical notes on the Trade Sector Dataset provide a complete enumeration.	in million PhP	(2000=100)
Materials Imports, real	mgmat_r	Authors' calculations. Values are based on proportions derived from the PSA National Income Accounts. These derived proportions were then used to divide the value of Total Imports from the PIDS-Economic and Social Database.	Materials Imports. Since the PSA National Income Accounts have multiple disaggregation differing through the years, categories were regrouped. The technical notes on the Trade Sector Dataset provide a complete enumeration.	in million PhP	(2000=100)
Other Good Imports, real	mgoth_r	Authors' calculations. Values are based on proportions derived from the PSA National Income Accounts. These derived proportions were then used to divide the value of Total Imports from the PIDS-Economic and Social Database.	Other Goods Imports. Since the PSA National Income Accounts have multiple disaggregation differing through the years, categories were regrouped. The technical notes on the Trade Sector Dataset provide a complete enumeration.	in million PhP	(2000=100)
Total Service Imports, real	ms_r	Authors' calculations. Values are based on proportions derived from the PSA National Income Accounts. These derived proportions were then used to divide the value of Total Imports from the PIDS-Economic and Social Database.	Total Services Imports	in million PhP	(2000=100)
BOP -Total Good Imports, nominal	bopmg_n	Bangko Sentral ng Pilipinas	Total Goods Exports, Debit	in million US$	Current prices
BOP - Total Service Imports, nominal	bopms_n	Bangko Sentral ng Pilipinas	Total Services Exports, Debit	in million US$	Current prices
Total Export of Goods, Real	xg_r	Authors' calculations. Values are based on proportions derived from the PSA National Income Accounts. These derived proportions were then used to divide the value of Total Exports from the PIDS-Economic and Social Database.	Total Goods Exports	in million PhP	(2000=100)
Total Export of Services, Real	xs_r	Authors' calculations. Values are based on proportions derived from the PSA National Income Accounts. These derived proportions were then used to divide the value of Total Exports from the PIDS-Economic and Social Database.	Total Services Exports	in million PhP	(2000=100)
Total Exports, Real	xtot_r	PIDS-Economic and Social Database	Total Exports of Goods and Services	in million PhP	(2000=100)
Total Import of Goods, Real	mg_r	Authors' calculations. Values are based on proportions derived from the PSA National Income Accounts. These derived proportions were	Total Goods Imports	in million PhP	(2000=100)

Variables	Variable Name	Sources	Definition	Unit	
		then used to divide the value of Total Imports from the PIDS-Economic and Social Database.			
Total Imports, Real	mtot_r	PIDS-Economic and Social Database	Total Imports of Goods and Services	in million PhP	(2000=100)
Total Imports, Nominal	mtot_n	PIDS-Economic and Social Database	Total Imports of Goods and Services	in million PhP	Current prices
Net Exports(real)	netx_tot				
M1	narrowmoney	Bangko Sentral ng Pilipinas	Consists of currency in circulation (or currency outside depository corporations) and peso demand deposits.	in million PhP	
M3	broadmoney	Bangko Sentral ng Pilipinas	Consists of M2 plus peso deposit substitutes, such as promissory notes and commercial papers (i.e., securities other than shares included in broad money)	in million PhP	
Total Loans	loans	Bangko Sentral ng Pilipinas			
Resources of the Financial System	fsresources	Bangko Sentral ng Pilipinas	Excludes the Bangko Sentral ng Pilipinas; amount includes allowance for probable losses. Includes Investment Houses, Finance Companies, Investment Companies, Securities Dealers/Brokers, Pawnshops, Lending Investors, Non Stocks Savings and Loan Associations, Credit Card Companies (which are under BSP supervision), and Private and Government Insurance Companies (i.e., SSS and GSIS).	in billion PhP	
Cash Remittances	cashremit	Bangko Sentral ng Pilipinas	Overseas Filipinos' Cash Remittances	In Thousand US$	
Money Multiplier	mm				
Inflation* (actual forecast)	Inf_hfce_all				

APPENDIX 3: Equation-by-equation estimates

Note: Figures in parentheses are standard errors.

Real Sector

1. Gross Value Added – Agriculture, Real
Estimation Period: 1982 – 2016

$$\Delta GVA\ Agriculture, Real = \underbrace{\frac{-0.566\ GVA\ Agriculture, Real_{t-1}}{(0.114)}}_{Adjustment}$$

$$\underbrace{+\ 4.291 +0.066\ IPIN\ GVA\ Agriculture -0.019\ High\ Temperature}_{}$$
$$\underbrace{\quad(0.880)\qquad\qquad(0.024)\qquad\qquad\qquad(0.011)}_{}$$
$$\underbrace{+0.247\ IPIN, Agricultural\ Exports +0.039\ Total\ Agricultutal\ Production\ Loan}_{Long-run}$$
$$\underbrace{(0.015)\qquad\qquad\qquad\qquad(0.013)}_{}$$

$$\underbrace{+0.336\ \Delta GVA\ Agriculture, Real_{t-1} +0.630\ \Delta GVA\ Agriculture, Real_{t-2} -0.110\ \Delta IPIN\ Agricultural\ Exports}_{}$$
$$\underbrace{(0.131)\qquad\qquad\qquad\qquad(0.124)\qquad\qquad\qquad\qquad(0.029)}_{}$$
$$\underbrace{-0.058\ \Delta IPIN\ Agricultural\ Exports_{t-1} -0.040\ \Delta IPIN\ Agricultural\ Exports_{t-2}}_{}$$
$$\underbrace{(0.022)\qquad\qquad\qquad\qquad(0.018)}_{}$$
$$\underbrace{-0.011\ \Delta Total\ Agricultural\ Production\ Loan -0.014\ \Delta Total\ Agricultural\ Production\ Loan_{t-1}}_{}$$
$$\underbrace{(0.008)\qquad\qquad\qquad\qquad(0.007)}_{}$$
$$\underbrace{-\ 0.052\ \Delta Total\ Agricultural\ Production\ Loan_{t-2}}_{Short-run}$$
$$(0.007)$$

Table A1. Summary of model tests

Bounds Tests		Heteroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ^2 (33)	Portmanteau Q-Statistic χ^2 (16)	MAE	RMSE	R^2
7.433	-4.968	0.542	8.739	0.010	0.013	0.840
[0.001, 0.007]	[0.001, 0.010]	[0.461]	[0.923]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) GVA Agriculture, Real are 0.022, 0.030, -0.072, and 0.098 respectively.

Figure 1. Actual v. Predicted GVA Agriculture, Real, along with residuals
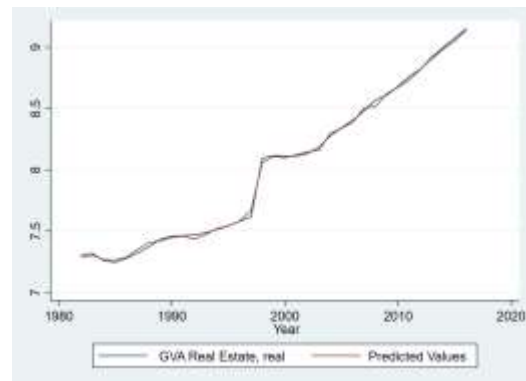
Panel A: Log first-difference
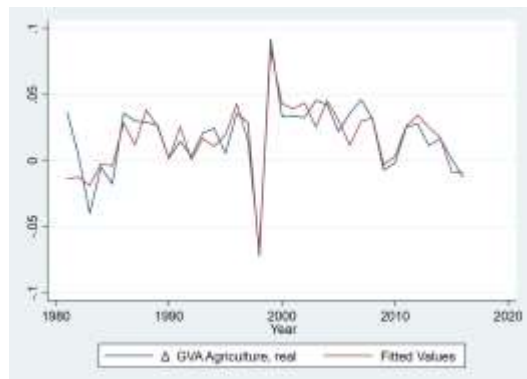
Panel B: Log level
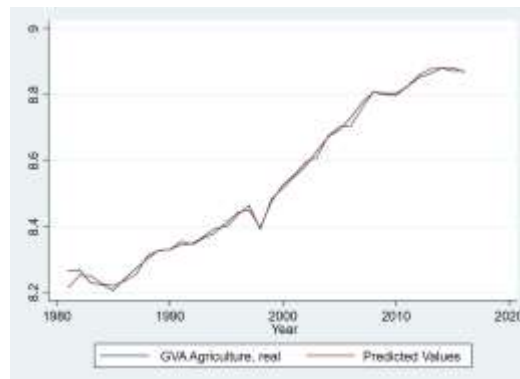
Panel C: Model Residuals
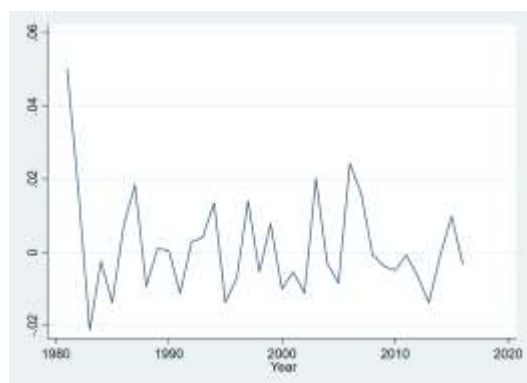
Panel D: Autocorrelation of Residuals
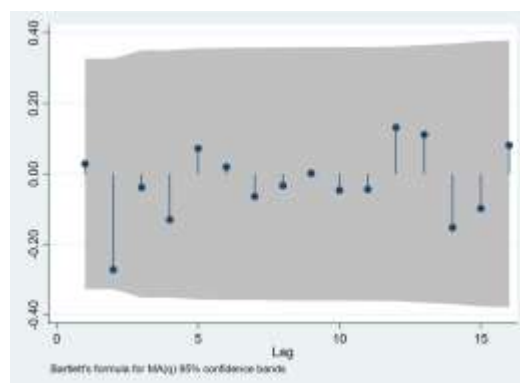
2. Gross Value Added – Agriculture (Demand), Real

Estimation Period: 1971 – 2016

$$\Delta GVA\ Agriculture\ (Demand), Real = \underbrace{\begin{matrix} -0.266\ GVA\ Agriculture\ (Demand), Real_{t-1} \\ (0.075) \end{matrix}}_{Adjustment}$$

$$\underbrace{\begin{matrix} +\ 1.418\quad -0.218\ IPIN\ GVA\ Agriculture \\ (0.495)\qquad\quad (0.083) \\ +0.306\ Compensation\ of\ Residents +0.094\ Real\ Effective\ Exchange\ Rate \\ (0.059)\qquad\qquad\qquad\qquad (0.089) \end{matrix}}_{Long-run}$$

$$\underbrace{\begin{matrix} -0.108\ \Delta Compensation\ of\ Residents -0.162\ \Delta Compensation\ of\ Residents_{t-1} \\ (0.043)\qquad\qquad\qquad\qquad (0.044) \\ -0.101\ \Delta Real\ Effective\ Exchange\ Rate -0.054\ \Delta Real\ Effective\ Exchange\ Rate_{t-1} \\ (0.031)\qquad\qquad\qquad\qquad (0.027) \end{matrix}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Heteroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2$ (44)	Portmanteau Q-Statistic $\chi 2$ (22)	MAE	RMSE	R^2
6.220	-3.551	0.621	12.364	0.016	0.021	0.522
[0.002, 0.013]	[0.010, 0.081]	[0.430]	[0.949]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) GVA Agriculture (Demand), Real are 0.022, 0.030, -0.072, and 0.098 respectively.

Figure 1. Actual v. Predicted GVA Agriculture (Demand), Real, along with residuals

Panel A: Log first-difference
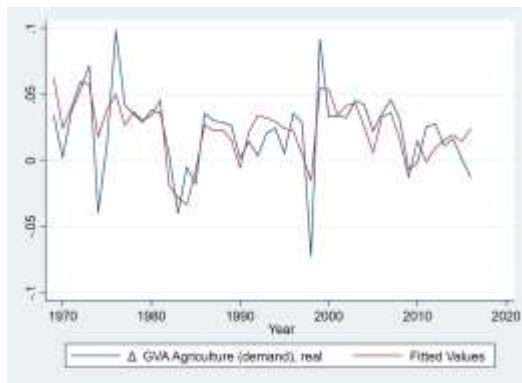
Panel B: Log level
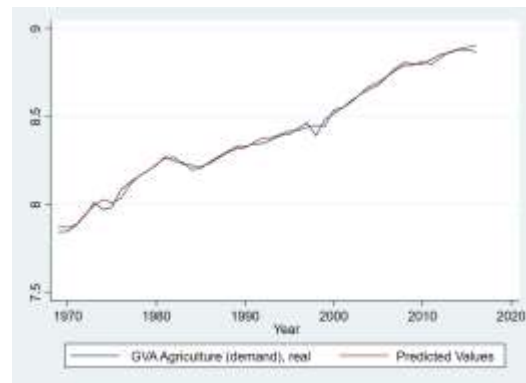
Panel C: Model Residuals
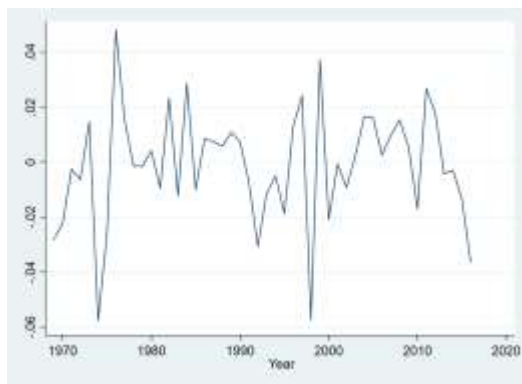
Panel D: Autocorrelation of Residuals
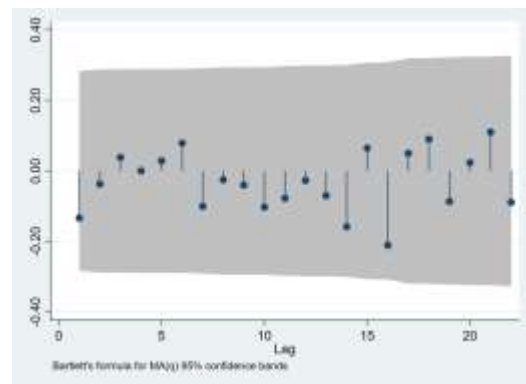
3. Gross Value Added – Construction, Real

Estimation Period: 1977 – 2016

$$\Delta GVA\ Construction, Real = \underbrace{\frac{-0.495\ GVA\ Construction.Real_{\ t-1}}{(0.122)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} +\ \underset{(0.876)}{4.718} \underset{(0.169)}{-0.445}\ IPIN\ GVA\ Construction \underset{(0.171)}{-0.771}\ Real\ Effective\ Exchange\ Rate \\ \underset{(0.143)}{-0.123}\ Lending\ Rate \underset{(0.140)}{+0.303}\ Resources\ of\ the\ Financial\ System \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} \underset{(0.128)}{-0.215}\ \Delta GVA\ Construction, Real_{t-1} \underset{(0.293)}{+0.143}\ \Delta IPIN\ GVA\ Construction \underset{(0.308)}{-1.183}\ \Delta IPIN\ GVA\ Construction_{t-1} \\ \underset{(0.134)}{+0.346}\ \Delta Real\ Effective\ Exchange\ Rate \underset{(0.107)}{+0.327}\ \Delta Lending\ Rate \end{array}}_{Short-run}$$

Table A1. Summary of model tests

| Bounds Tests		Heteroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2$ (38)	Portmanteau Q-Statistic $\chi2$ (19)	MAE	RMSE	R^2
8.021	-4.040	0.144	15.995	0.061	0.087	0.795
[0.000, 0.002]	[0.003, 0.050]	[0.703]	[0.657]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) GVA Construction, Real are 0.043, 0.147, -0.655, and 0.362 respectively.

Figure 1. Actual v. Predicted GVA Construction, Real, along with residuals

Panel A: Log first-difference
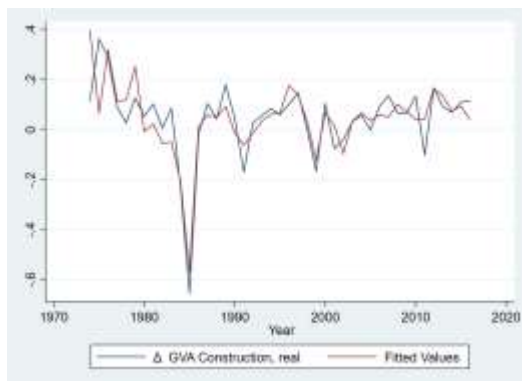
Panel B: Log level
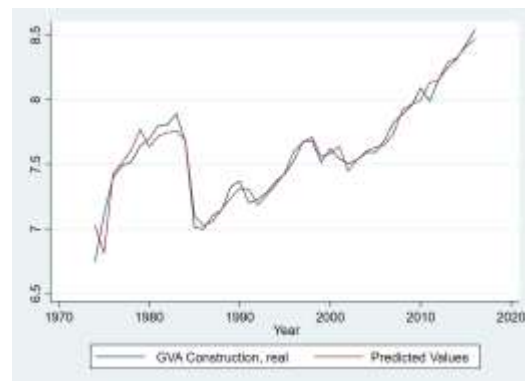
Panel C: Model Residuals
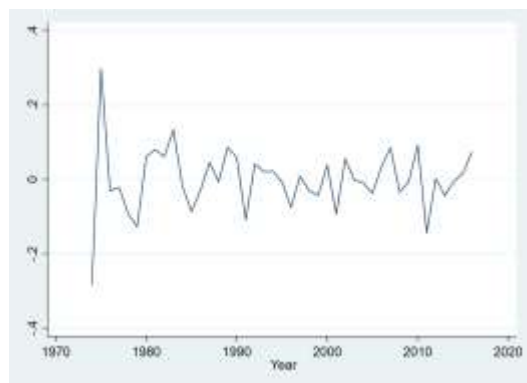
Panel D: Autocorrelation of Residuals
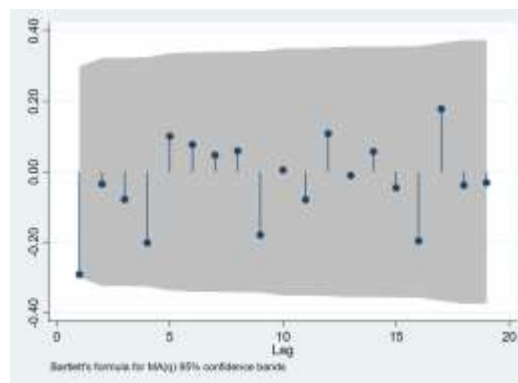
4. Gross Value Added – Electricity and Steam, Real

Estimation Period: 1977 – 2016

$$\Delta GVA\ Electricity\ and\ Steam, Real = \underbrace{\underset{(0.079)}{-0.249}\ GVA\ Electricity\ and\ Steam, Real_{t-1}}_{Adjustment}$$

$$\underbrace{+\ \underset{(0.239)}{0.055}\ \underset{(0.147)}{-0.083}\ IPIN\ GVA\ Electricity\ and\ Steam}$$

$$\underbrace{+ \underset{(0.149)}{0.533}\ Capital\ Formation - Fixed - Durables, Real + \underset{(0.093)}{0.232}\ Electronic\ Exports, Real}_{Long-run}$$

$$\underbrace{- \underset{(0.129)}{0.410}\ \Delta GVA\ Electricity\ and\ Steam, Real_{t-1} - \underset{(0.079)}{0.167}\ \Delta IPIN\ GVA\ Electricity\ snd\ Steam}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Heteroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (38)	Portmanteau Q-Statistic χ2 (20)	MAE	RMSE	R^2
6.616	-3.132	0.933	8.423	0.041	0.074	0.528
[0.002, 0.010]	[0.030, 0.165]	[0.333]	[0.988]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) GVA Electricity and Steam, Real are 0.065, 0.087, -0.136, and 0.482 respectively.

Figure 1. Actual v. Predicted GVA Electricity and Steam, Real, along with residuals

Panel A: Log first-difference
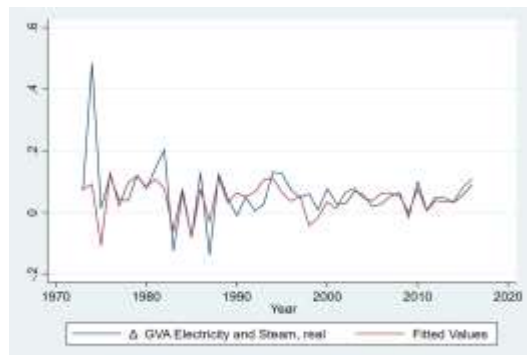
Panel B: Log level
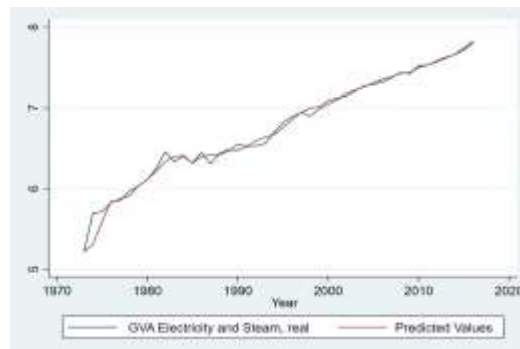
Panel C: Model Residuals
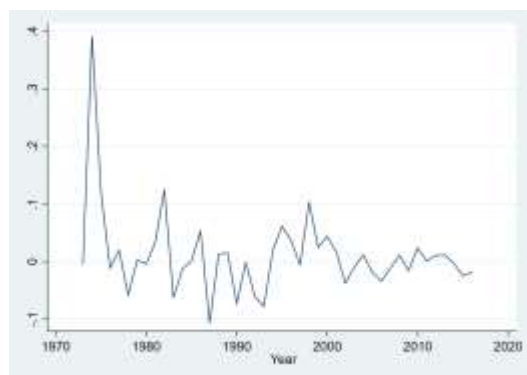
Panel D: Autocorrelation of Residuals
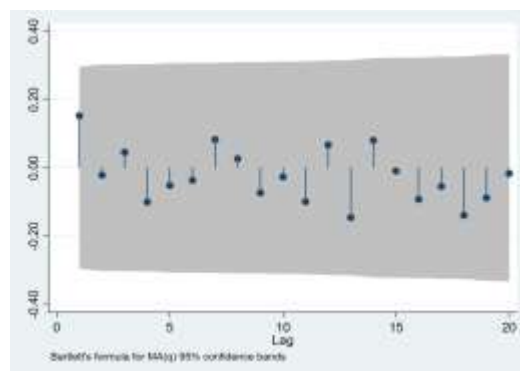
5. Gross Value Added – Finance, Real

Estimation Period: 1989 – 2016

$$\Delta GVA\ Finance, Real = \underbrace{\frac{-0.390\ GVA\ Finance, Real_{t-1}}{(0.075)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} +\ 2.314\ +0.446\ IPIN\ GVA\ Finance -0.454\ Reverse\ Repurchase\ Rate \\ (0.349) \qquad (0.059) \qquad\qquad (0.061) \\ +0.097\ Capital\ Formation - Fixed - Construction, Real \\ (0.117) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} -0.418\ \Delta IPIN\ GVA\ Finance +0.287\ \Delta IPIN\ GVA\ Finance_{t-1} +0.228\ \Delta Reverse\ Repurchase\ Rate \\ (0.107) \qquad\qquad (0.107) \qquad\qquad\qquad (0.040) \\ +0.163\ \Delta Reverse\ Repurchase\ Rate_{t-1} +0.083\ \Delta Reverse\ Repurchase\ Rate_{t-2} \\ (0.036) \qquad\qquad\qquad (0.031) \\ +0.306\ \Delta Capital\ Formation - Fixed - Construction, Real \\ (0.062) \\ +0.318\ \Delta Capital\ Formation - Fixed - Construction, Real_{t-1} \\ (0.053) \\ +0.100\ \Delta Capital\ Formation - Fixed - Construction, Real_{t-2} \\ (0.049) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Heteroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (26)	Portmanteau Q-Statistic χ2 (12)	MAE	RMSE	R^2
11.999	-5.153	0.807	15.814	0.010	0.012	0.918
[0.000, 0.002]	[0.001, 0.007]	[0.368]	[0.199]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) GVA Finance, Real are 0.057, 0.073, -0.211, and 0.146 respectively.

Figure 1. Actual v. Predicted GVA Finance, Real, along with residuals

Panel A: Log first-difference
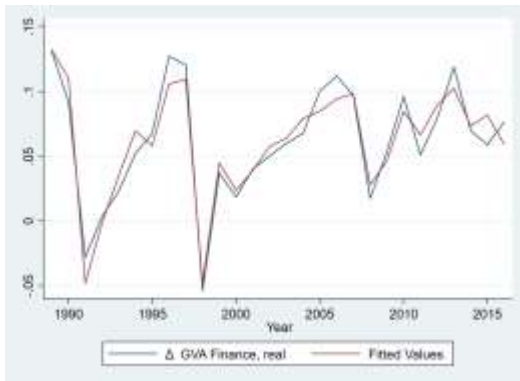
Panel B: Log level
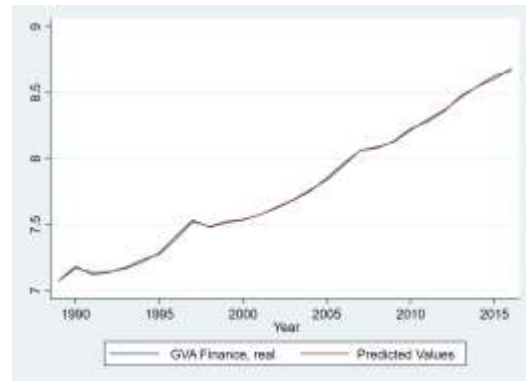
Panel C: Model Residuals
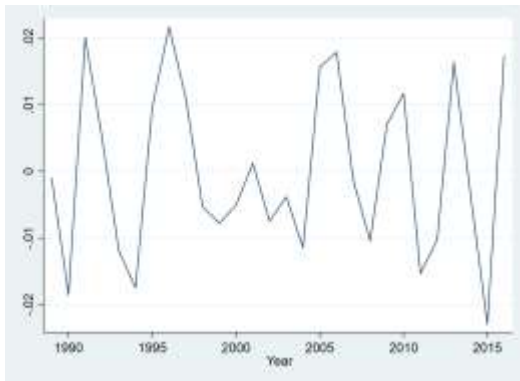
Panel D: Autocorrelation of Residuals
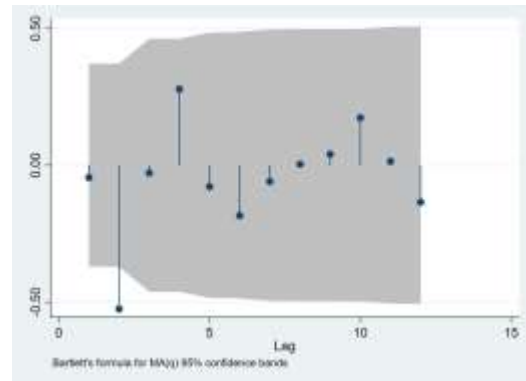
6. Gross Value Added – Manufacturing, Real

Estimation Period: 1979 – 2016

$$\Delta GVA\ Manufacturing, Real = \underbrace{\frac{-0.508\ GVA\ Manufacturing, Real_{t-1}}{(0.152)}}_{Adjustment}$$

$$\underbrace{-\ 2.627 \underset{(0.918)}{} -0.185\ IPIN\ GVA\ Manufacturing + 1.023\ Household\ Consumption - Total}_{Long-run}$$
$$\underset{(0.025)}{} \underset{(0.052)}{}$$

$$\underbrace{+0.156\ \Delta GVA\ Manufacturing, Real_{t-1} -0.124\ \Delta IPIN\ GVA\ Manufacturing -0.138\ \Delta IPIN\ GVA\ Manufacturing_{t-1}}_{}$$
$$\underset{(0.165)}{} \underset{(0.078)}{} \underset{(0.083)}{}$$
$$\underbrace{+0.304\ \Delta Household\ Consumption - Total + 0.115\ \Delta Household\ Consumption - Total_{t-1}}_{Short-run}$$
$$\underset{(0.481)}{} \underset{(0.421)}{}$$

Table A1. Summary of model tests

Bounds Tests		Heteroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (36)	Portmanteau Q-Statistic χ2 (17)	MAE	RMSE	R²
5.346	-3.341	0.004	10.123	0.016	0.021	0.742
[0.017, 0.051]	[0.019, 0.079]	[0.949]	[0.898]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) GVA Manufacturing, Real are 0.037, 0.042, -0.102, and 0.137 respectively.

Figure 1. Actual v. Predicted GVA Manufacturing, Real, along with residuals

Panel A: Log first-difference
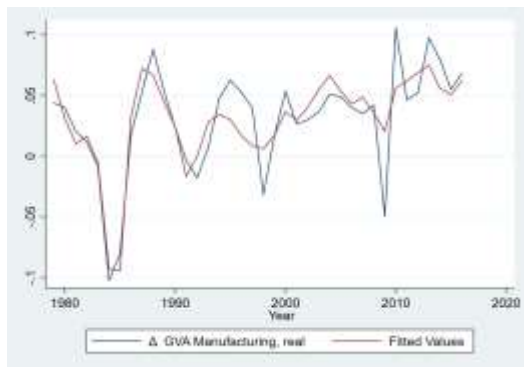
Panel B: Log level
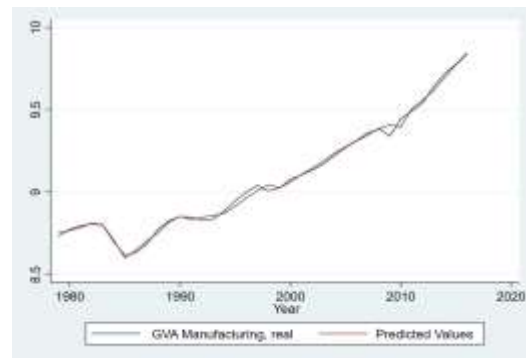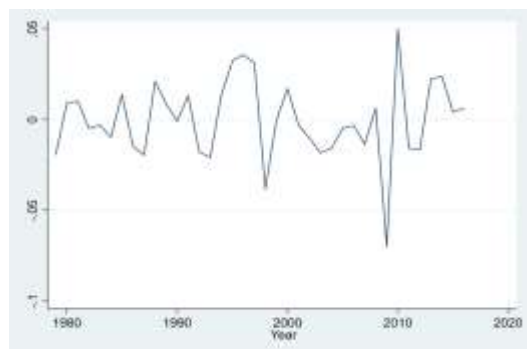
Panel C: Model Residuals   Panel D: Autocorrelation of Residuals
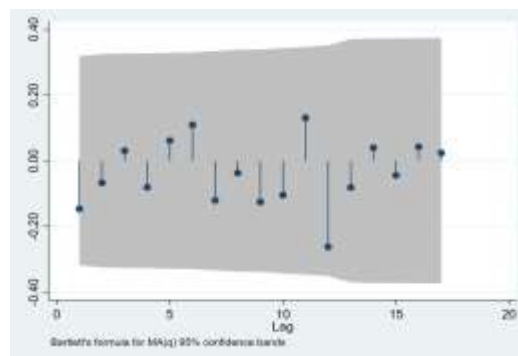
7. Gross Value Added – Mining, Real
Estimation Period: 1990 – 2016

$$\Delta GVA\ Mining, Real = \underbrace{\frac{-0.919\ GVA\ Mining, Real_{t-1}}{(0.140)}}_{Adjustment}$$

$$\underbrace{\begin{matrix} -10.629 - 0.226\ IPIN\ GVA\ Mining - 0.538\ IPIN\ Electronic\ Exports \\ (3.038) \qquad\qquad (0.152) \qquad\qquad\qquad (0.070) \\ + 0.813\ World\ GDP.Real + 0.269\ Gold\ Price\ PHP \\ (0.176) \qquad\qquad\qquad (0.135) \end{matrix}}_{Long-run}$$

$$\underbrace{\begin{matrix} -0.278\ \Delta IPIN\ GVA\ Mining + 0.361\ \Delta IPIN\ Electronic\ Exports - 0.358\ \Delta World\ GDP, Real \\ (0.191) \qquad\qquad\qquad (0.138) \qquad\qquad\qquad (0.284) \\ -0.400\ \Delta World\ GDP, Real_{t-1} + 0.048\ \Delta World\ GDP, Real_{t-2} - 0.574\ \Delta World\ GDP, Real_{t-3} \\ (0.215) \qquad\qquad\qquad (0.208) \qquad\qquad\qquad (0.243) \end{matrix}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Heteroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2\ (25)$	Portmanteau Q-Statistic $\chi2\ (13)$	MAE	RMSE	R^2
12.104	-6.552	0.022	12.342	0.071	0.126	0.901
[0.000, 0.001]	[0.000, 0.001]	[0.880]	[0.499]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) GVA Mining, Real are 0.037, 0.134, -0.579, and 0.495 respectively.

Figure 1. Actual v. Predicted GVA Mining, Real, along with residuals

Panel A: Log first-difference
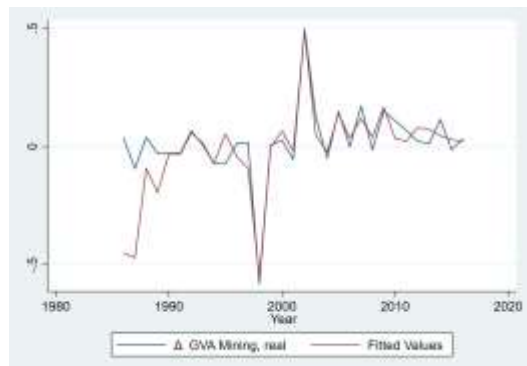
Panel B: Log level
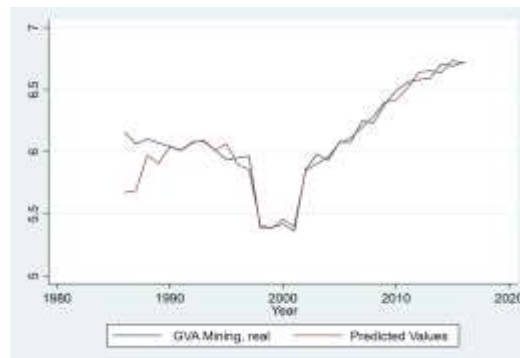
Panel C: Model Residuals

Panel D: Autocorrelation of Residuals
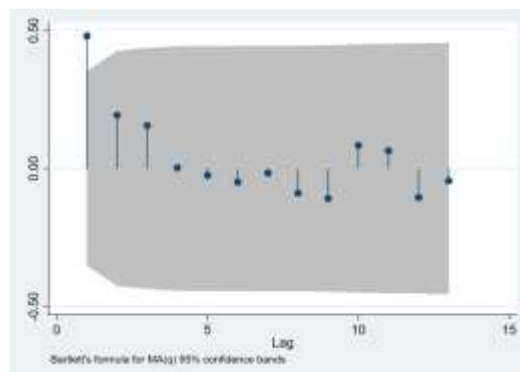
8. Gross Value Added – Other Services, Real

Estimation Period: 1984 – 2016

$$\Delta GVA\ Other\ Services, Real = \underbrace{\frac{-0.462\ GVA\ Other\ Services, Real_{t-1}}{(0.067)}}_{Adjustment}$$

$$\underbrace{-\ 0.914 - 0.839\ IPIN\ GVA\ Other\ Services, Real - 0.044\ IPIN\ Tourism\ Service\ Exports}_{}$$
$$\underset{(0.202)}{}\quad \underset{(0.046)}{}\quad \underset{(0.017)}{}$$
$$\underbrace{+0.928\ Net\ Disposable\ Income}_{Long-run}$$
$$(0.030)$$

$$\underbrace{-0.516\ \Delta IPIN\ GVA\ Other\ Services}_{Short-run}$$
$$(0.063)$$

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Table A1. Summary of model tests

Bounds Tests		Heteroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ^2 (31)	Portmanteau Q-Statistic χ^2 (16)	MAE	RMSE	R^2
20.584	-6.862	0.660	12.050	0.016	0.028	0.915
[0.000, 0.000]	[0.000, 0.000]	[0.416]	[0.740]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) GVA Other Services, Real are 0.049, 0.043, -0.063, and 0.258 respectively.

Figure 1. Actual v. Predicted GVA Other Services, Real, along with residuals

Panel A: Log first-difference
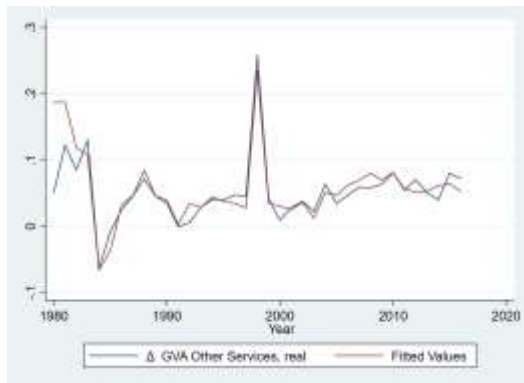
Panel B: Log level
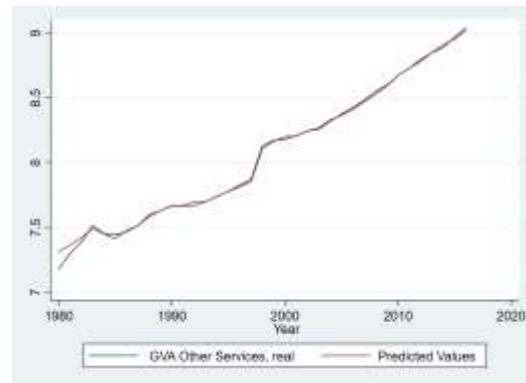
Panel C: Model Residuals
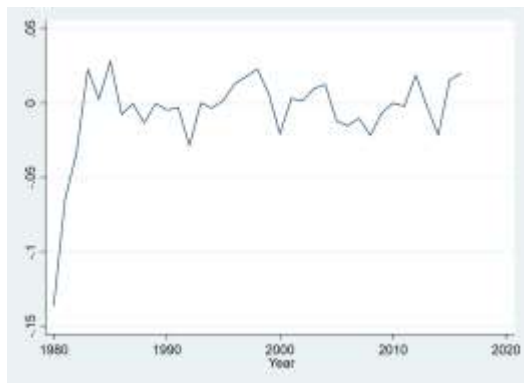
Panel D: Autocorrelation of Residuals
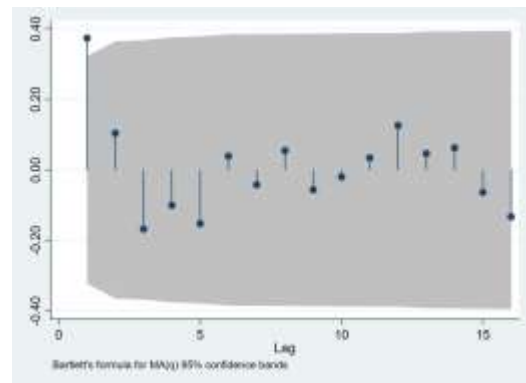
9. Gross Value Added – Real Estate, Real

Estimation Period: 1979 – 2016

$$\Delta GVA\ Real\ Estate, Real = \underbrace{\frac{-0.635\ GVA\ Real\ Estate, Real_{t-1}}{(0.093)}}_{Adjustment}$$

$$\underbrace{-\ \underset{(11.904)}{42.605}\ \underset{(0.068)}{-0.796\ IPIN\ GVA\ Real\ Estate} + \underset{(0.713)}{4.069\ Total\ Population}}$$
$$\underset{(0.058)}{+0.134\ Capital\ Formation - Fixed - Construction, Real}$$
$$\underbrace{\underset{(0.024)}{+0.092\ Tourism\ Service\ Exports, Real} + \underset{(0.113)}{0.210\ Compensation\ of\ Residents}}_{Long-run}$$

$$\underset{(0.187)}{-1.108\ \Delta IPIN\ GVA\ Real\ Estate} - \underset{(0.126)}{2.981\ \Delta Total\ Population} + \underset{(0.262)}{3.176\ \Delta Total\ Population_{t-1}}$$
$$\underset{(0.053)}{-0.461\ \Delta Capital\ Formation - \ Fixed - Construction, Real}$$
$$\underbrace{\underset{(0.053)}{+0.104\ \Delta Capital\ Formation - \ Fixed - Construction, Real_{t-1}}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Heteroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2\ (33)$	Portmanteau Q-Statistic $\chi 2\ (15)$	MAE	RMSE	R^2
16.790	-6.806	2.001	16.525	0.017	0.021	0.928
[0.000, 0.000]	[0.000, 0.001]	[0.157]	[0.348]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) GVA Real Estate, Real are 0.042, 0.071, -0.058, and 0.480 respectively.

Figure 1. Actual v. Predicted GVA Real Estate, Real, along with residuals

Panel A: Log first-difference
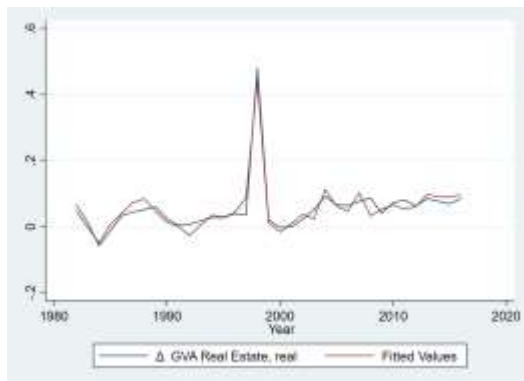
Panel B: Log level

Panel C: Model Residuals
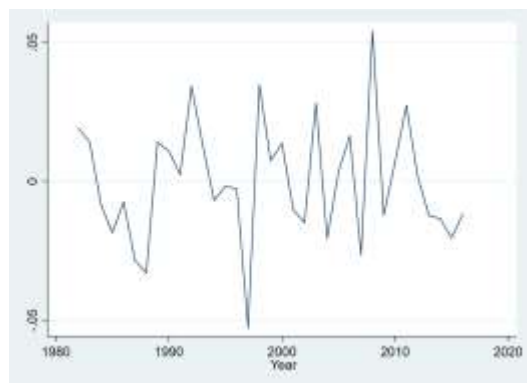
Panel D: Autocorrelation of Residuals
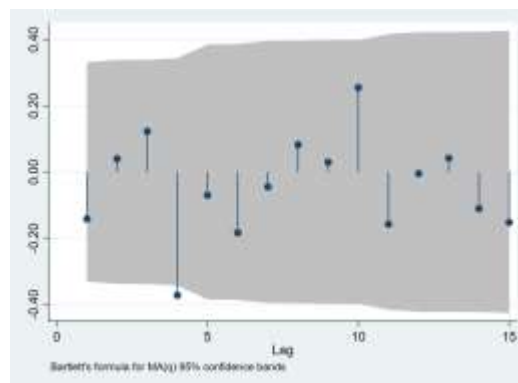
10. Gross Value Added – Trade, Real
Estimation Period: 1981 – 2016

$$\Delta GVA\ Trade, Real = \underbrace{\frac{-0.539\ GVA\ Trade, Real_{t-1}}{(0.143)}}_{Adjustment}$$

$$\underbrace{-\ 4.501\ -0.339\ IPIN\ GVA\ Trade + 1.181\ Household\ Consumption - Total \atop (1.225) \qquad (0.062) \qquad\qquad (0.055) \atop +0.257\ IPIN\ GVA\ Agriculture \atop (0.070)}_{Long-run}$$

$$\underbrace{-0.360\ \Delta IPIN\ GVA\ Trade + 0.168\ \Delta IPIN\ GVA\ Agriculture \atop (0.076) \qquad\qquad (0.072)}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Heteroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (34)	Portmanteau Q-Statistic χ2 (18)	MAE	RMSE	R^2
4.398	-3.770	1.098	16.256	0.019	0.025	0.820
[0.021, 0.078]	[0.007, 0.058]	[0.294]	[0.574]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) GVA Trade, Real are 0.042, 0.042, -0.177, and 0.083 respectively.

Figure 1. Actual v. Predicted GVA Trade, Real, along with residuals

Panel A: Log first-difference
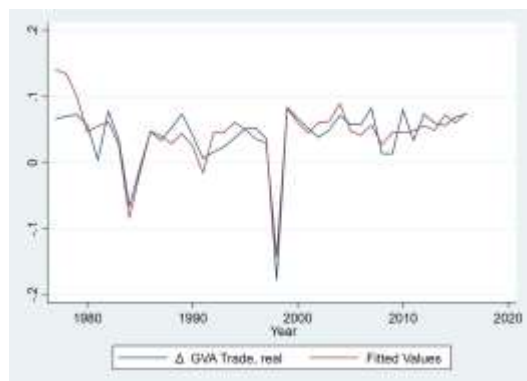
Panel B: Log level
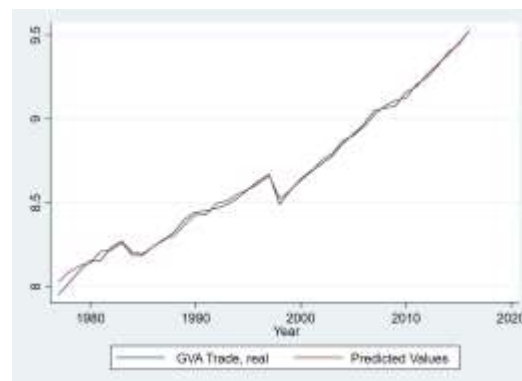
Panel C: Model Residuals
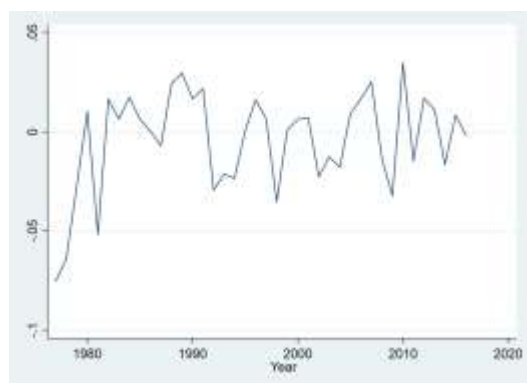
Panel D: Autocorrelation of Residuals
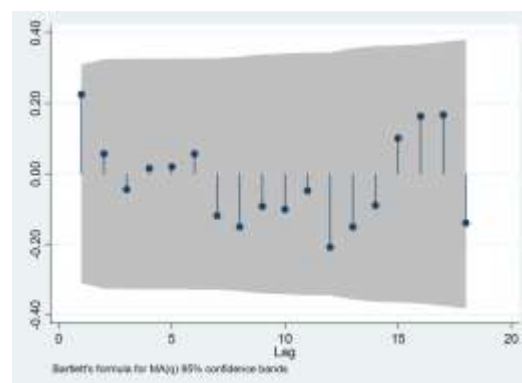
11. Gross Value Added – Transportation, Real
Estimation Period: 1984 – 2016

$$\Delta GVA\ Transportation, Real = \underbrace{\frac{-0.910\ GVA\ Transportation, Real_{t-1}}{(0.120)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -33.414 - 0.459\ IPIN\ GVA\ Transportation + 0.569\ HFCE\ Transportation\ and\ Communication \\ (4.858) \qquad\qquad (0.071) \qquad\qquad\qquad\qquad (0.105) \\ + 2.168\ Total\ Population + 0.009\ IPIN\ Electronic\ Exports \\ (0.320) \qquad\qquad\qquad (0.026) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} + 0.550\ \Delta GVA\ Transportation, Real_{t-1} + 0.323\ \Delta GVA\ Transportation, Real_{t-2} + 0.402\ \Delta GVA\ Transportation, Real_{t-3} \\ (0.098) \qquad\qquad\qquad (0.091) \qquad\qquad\qquad\qquad (0.086) \\ - 0.325\ \Delta HFCE\ Transportation\ and\ Communication - 0.860\ \Delta HFCE\ Transportation\ and\ Communication_{t-1} \\ (0.220) \qquad\qquad\qquad\qquad\qquad (0.211) \\ - 0.322\ \Delta HFCE\ Transportation\ and\ Communication_{t-2} + 0.404\ \Delta HFCE\ Transportation\ and\ Communication_{t-3} \\ (0.196) \qquad\qquad\qquad\qquad\qquad (0.191) \\ + 1.307\ \Delta Total\ Population - 0.130\ \Delta IPIN\ Electronic\ Exports \\ (0.651) \qquad\qquad\qquad (0.026) \end{array}}_{Short-run}$$

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Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2$ (31)	Portmanteau Q-Statistic $\chi2$ (16)	MAE	RMSE	R^2
15.710	-7.575	2.257	17.015	0.021	0.044	0.934
[0.000, 0.000]	[0.000, 0.000]	[0.132]	[0.384]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) GVA Transportation, Real are 0.050, 0.047, -0.195, and 0.115 respectively.

Figure 1. Actual v. Predicted GVA Transportation, Real, along with residuals

Panel A: Log first-difference
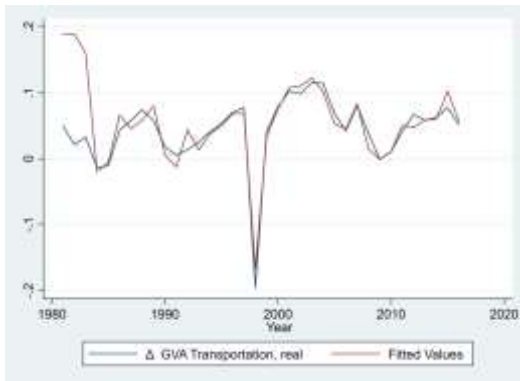
Panel B: Log level
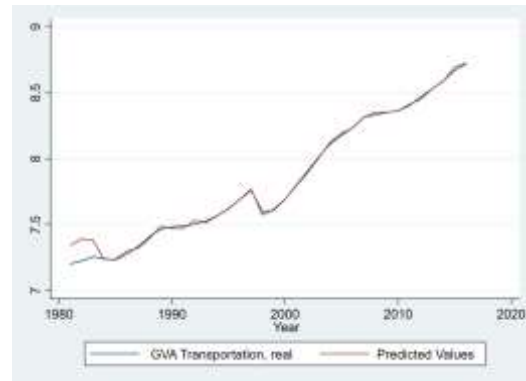
Panel C: Model Residuals
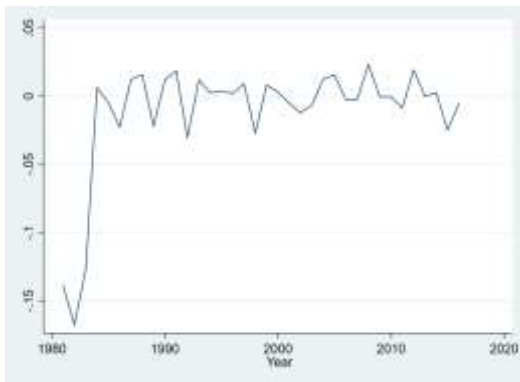
Panel D: Autocorrelation of Residuals
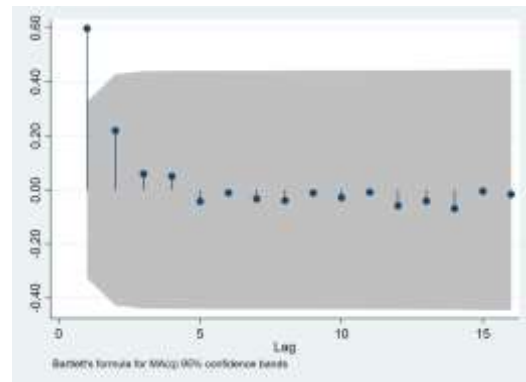
12. Gross Value Added – Water, Real

Estimation Period: 1983 – 2016

$$\Delta GVA\,Water, Real = \underbrace{\frac{-0.976\,GVA\,Water, Real_{t-1}}{(0.126)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -57.793 - 0.546\,IPIN\,GVA\,Water + 3.482\,Total\,Population \\ (7.499) \qquad\qquad (0.052) \qquad\qquad\qquad (0.230) \\ + 0.706\,GVA\,Service, Real \\ (0.094) \\ -0.448\,Capital\,Formation - Fixed - Construction, Real \\ (0.050) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} -0.018\,\Delta IPIN\,GVA\,Water + 0.065\,\Delta IPIN\,GVA\,Water_{t-1} - 0.172\,\Delta IPIN\,GVA\,Water_{t-2} \\ (0.080) \qquad\qquad\qquad (0.046) \qquad\qquad\qquad\qquad (0.049) \\ -4.521\,\Delta Total\,Population - 0.003\,\Delta Capital\,Formation - Fixed - Construction, Real \\ (0.159) \qquad\qquad\qquad\qquad\qquad\qquad (0.046) \\ + 0.126\,\Delta Capital\,Formation - Fixed - Construction, Real_{t-1} \\ (0.051) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2$ (32)	Portmanteau Q-Statistic $\chi 2$ (16)	MAE	RMSE	R^2
22.856	-7.697	0.005	8.404	0.029	0.067	0.932
[0.000, 0.000]	[0.000, 0.000]	[0.942]	[0.935]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) GVA Water, Real are 0.072, 0.090, -0.075, and 0.361 respectively.

Figure 1. Actual v. Predicted GVA Water, Real, along with residuals
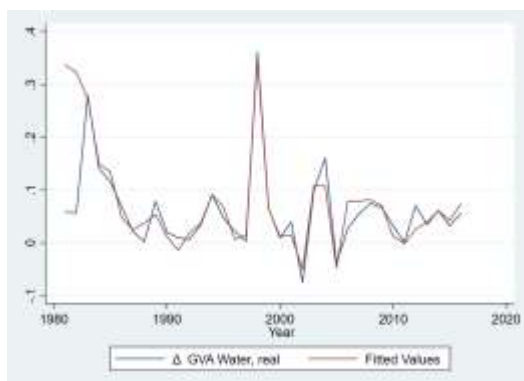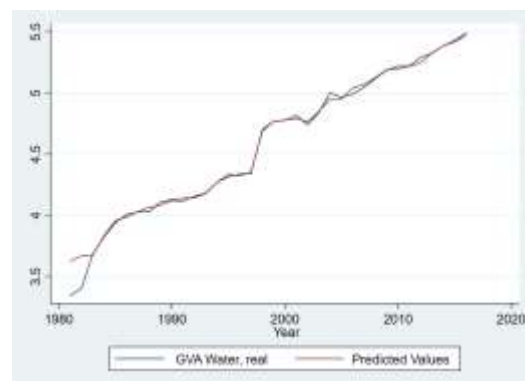
Panel A: Log first-difference

Panel B: Log level
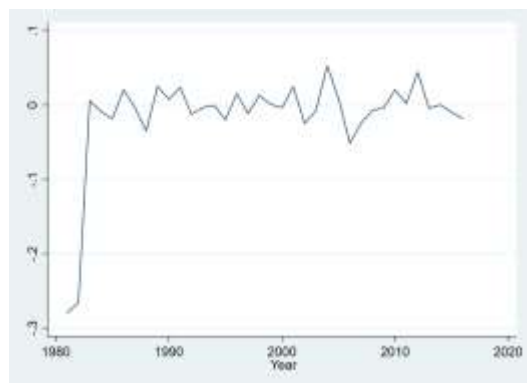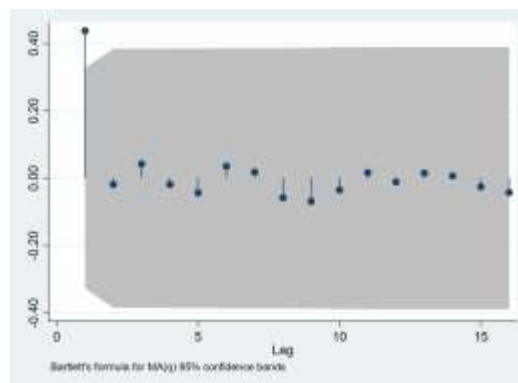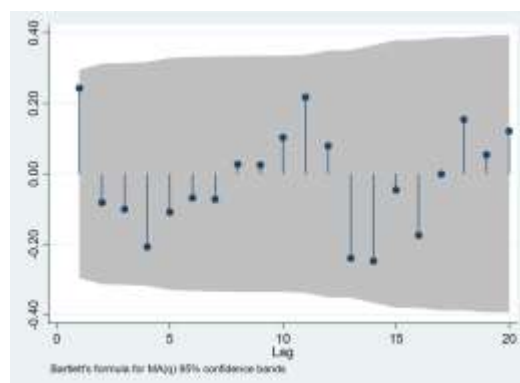
13. Implicit Price Index of Gross Value Added - Construction
Estimation Period: 1971 – 2016

$$\Delta IPIN\,GVA, Construction = \underbrace{\frac{-0.467\,IPIN\,GVA, Construction_{t-1}}{(0.126)}}_{Adjustment}$$

$$\underbrace{-\,\underset{(0.162)}{0.221} + \underset{(0.033)}{0.922}\,IPIN\,GVA, Manufacturing}$$

$$\underbrace{+\underset{(0.022)}{0.059}\,IPIN, Fuel\,Imports + \underset{(0.025)}{0.073}\,Machinery\,Imports, Real}_{Long-run}$$

$$\underbrace{+\underset{(0.133)}{0.579}\,\Delta IPIN\,GVA, Manufacturing + \underset{(0.027)}{0.096}\,\Delta Machinery\,Imports, Real}_{Short-run}$$

Table A1. Summary of model tests

| Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2\,(44)$	Portmanteau Q-Statistic $\chi2\,(22)$	MAE	RMSE	R^2
4.167	-3.688	1.509	12.315	0.027	0.037	0.844
[0.022, 0.085]	[0.007, 0.065]	[0.219]	[0.950]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN GVA – Construction are 0.087, 0.077, -0.011, and 0.417 respectively.

Figure 1. Actual v. Predicted IPIN GVA – Construction, along with residuals

Panel A: Log first-difference
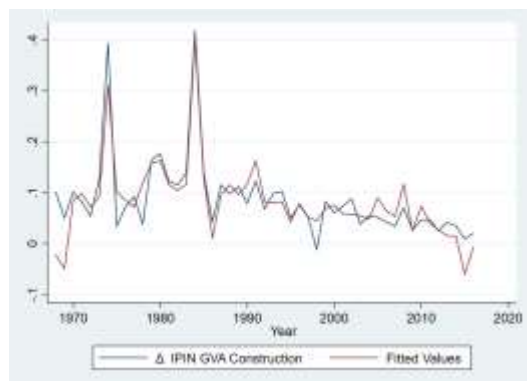
Panel B: Log level
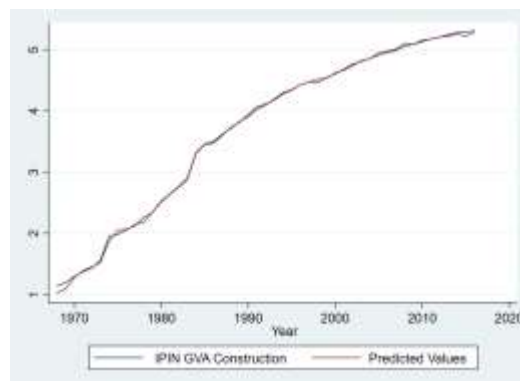
Panel C: Model Residuals
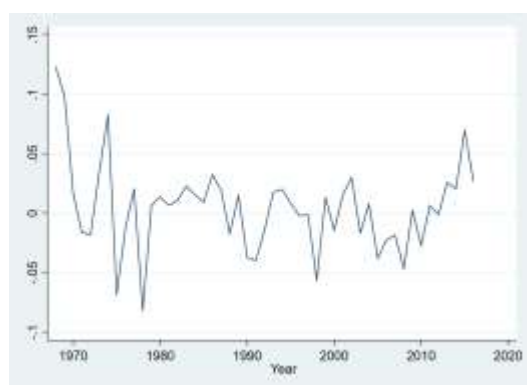
Panel D: Autocorrelation of Residuals
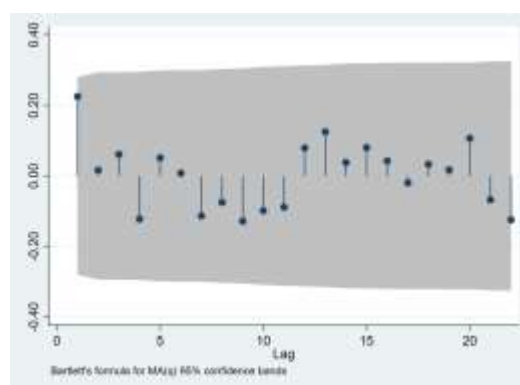
14. Implicit Price Index of Gross Value Added – Electricity and Steam
Estimation Period: 1984 – 2016

$$\Delta IPIN\ GVA, Electricity\ and\ Steam = \underbrace{\frac{-0.725\ IPIN\ GVA, Electricity\ and\ Steam_{t-1}}{(0.133)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -21.418 + 0.844\ Wage\ Index, Electricity\ and\ Steam \\ (4.688) \qquad\qquad (0.238) \\ +0.710\ IPIN\ Capital\ Formation - Fixed - Durables + 1.451\ Total\ Population \\ (0.077) \qquad\qquad\qquad\qquad\qquad (0.195) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} -0.457\ \Delta Wage\ Index, Electricity\ and\ Steam - 0.325\ \Delta Wage\ Index, Electricity\ and\ Steam_{t-1} \\ (0.136) \qquad\qquad\qquad\qquad (0.112) \\ +0.382\ \Delta IPIN\ Capital\ Formation - Fixed - Durables + 0.382\ \Delta IPIN\ Capital\ Formation - Fixed - Durables_{t-1} \\ (0.137) \qquad\qquad\qquad\qquad\qquad\qquad (0.132) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi^2(31)$	Portmanteau Q-Statistic $\chi^2(16)$	MAE	RMSE	R^2
8.764	-5.428	2.447	6.353	0.043	0.070	0.803
[0.001, 0.003]	[0.000, 0.002]	[0.117]	[0.983]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN GVA, Electricity and Steam are 0.084, 0.108, -0.094, and 0.432 respectively.

Figure 1. Actual v. Predicted IPIN GVA, Electricity and Steam, along with residuals

Panel A: Log first-difference
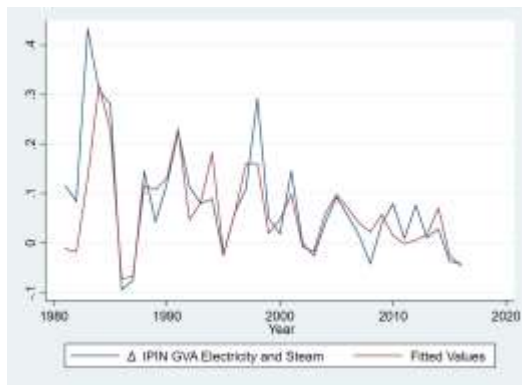
Panel B: Log level
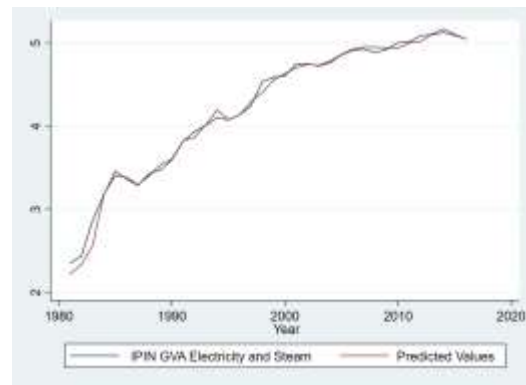
Panel C: Model Residuals
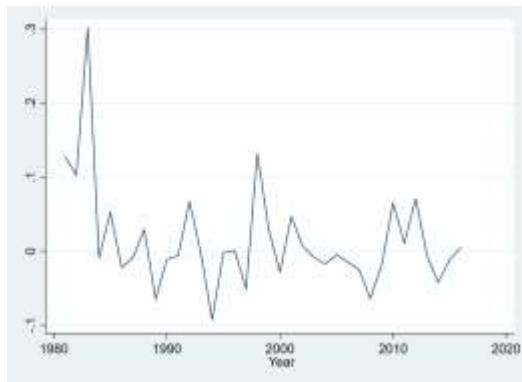
Panel D: Autocorrelation of Residuals
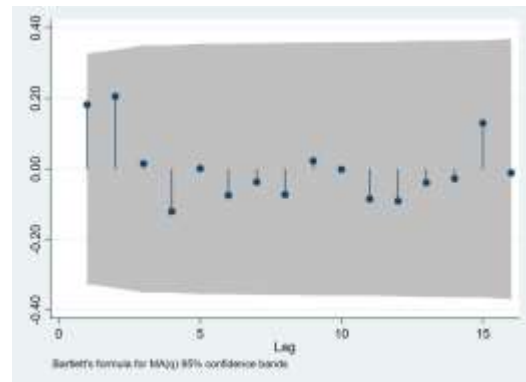
15. Implicit Price Index of Gross Value Added – Finance

Estimation Period: 1986 – 2016

$$\Delta IPIN\ GVA, Finance = \underbrace{\frac{-\ 0.168\ IPIN\ GVA, Finance_{t-1}}{(0.036)}}_{Adjustment}$$

$$\underbrace{-\ 0.359\ \underset{(0.247)}{} + 1.160\ \underset{(0.438)}{} Wage\ Index, Finance + 0.536\ \underset{(0.)}{} USD\ Nominal\ Exchange\ Rate}_{Long-run}$$

$$\underbrace{\begin{array}{c} -0.245\ \underset{(0.133)}{\Delta IPIN\ GVA, Finance_{t-1}} - 0.406\ \underset{(0.110)}{\Delta IPIN\ GVA, Finance_{t-2}} - 0.271\ \underset{(0.128)}{\Delta IPIN\ GVA, Finance_{t-3}} \\ -0.360\ \underset{(0.100)}{\Delta Wage\ Index, Finance} - 0.151\ \underset{(0.090)}{\Delta Wage\ Index, Finance_{t-1}} - 0.321\ \underset{(0.099)}{\Delta Wage\ Index, Finance_{t-2}} \\ -0.327\ \underset{(0.116)}{\Delta Wage\ Index, Finance_{t-3}} + 0.277\ \underset{(0.088)}{\Delta USD\ Nominal\ Exchange\ Rate} \end{array}}_{Short-run}$$

Table A1. Summary of model tests

| Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (29)	Portmanteau Q-Statistic χ2 (13)	MAE	RMSE	R²
10.605	-4.666	0.905	15.043	0.017	0.022	0.824
[0.001, 0.003]	[0.001, 0.008]	[0.341]	[0.304]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN GVA – Finance are 0.092, 0.077, 0.007, and 0.407 respectively.

Figure 1. Actual v. Predicted IPIN GVA – Finance, along with residuals

Panel A: Log first-difference
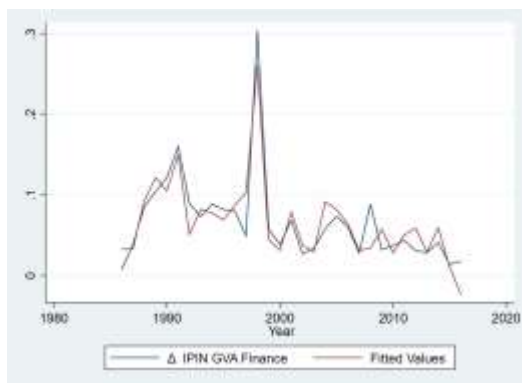
Panel B: Log level
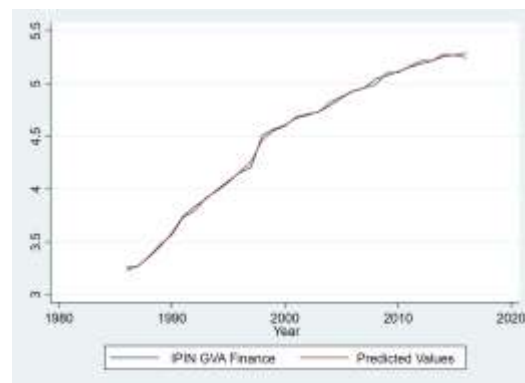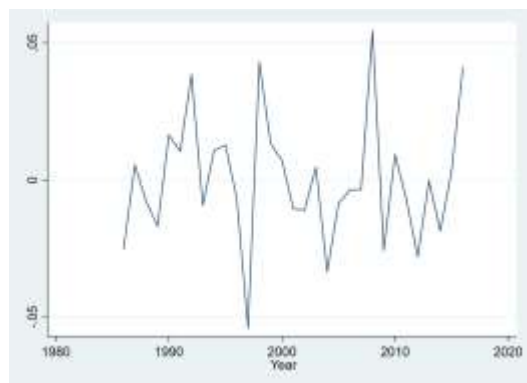
Panel C: Model Residuals   Panel D: Autocorrelation of Residuals
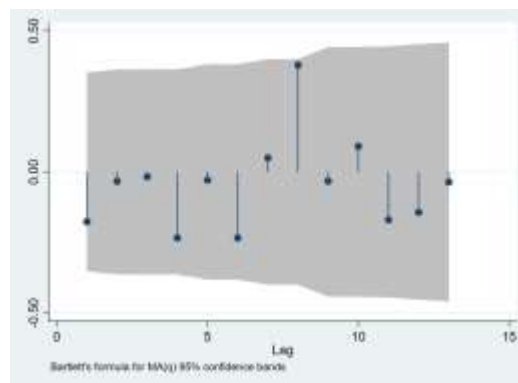
16. Implicit Price Index of Gross Value Added – Manufacturing

Estimation Period: 1983 – 2016

$$\Delta IPIN\ GVA, Manufacturing = \underbrace{\frac{-0.312\ IPIN\ GVA, Manufacturing_{t-1}}{(0.059)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -\ 2.008\ +0.077\ Wage\ Index, Manufacturing \\ (0.608)\quad\quad\quad (0.124) \\ +0.723\ Operating\ Surplus \\ (0.045)\quad\quad\quad (0.071) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} +0.422\ \Delta IPIN\ GVA, Manufacturing_{t-1}\quad \Delta Wage\ Index, Manufacturing \\ (0.128)\quad\quad\quad\quad\quad\quad (0.) \\ \Delta Operating\ Surplus\quad \Delta Operating\ Surplus_{t-1} \\ (0.)\quad\quad\quad\quad (0.) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2\ (32)$	Portmanteau Q-Statistic $\chi2\ (16)$	MAE	RMSE	R^2
8.586	-5.218	2.396	9.461			
[0.001, 0.003]	[0.000, 0.003]	[0.121]	[0.893]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN GVA – Manufacturing are 0.082, 0.080, -0.030, and 0.473 respectively.

Figure 1. Actual v. Predicted IPIN GVA – Manufacturing, along with residuals

Panel A: Log first-difference
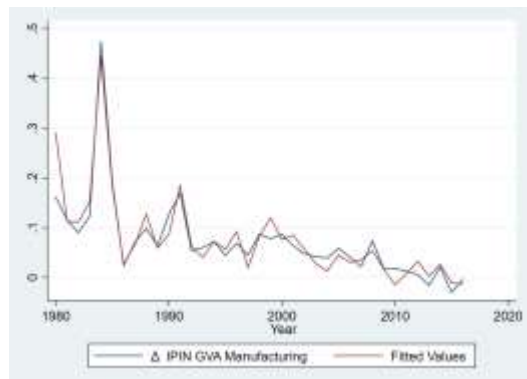
Panel B: Log level

Panel C: Model Residuals
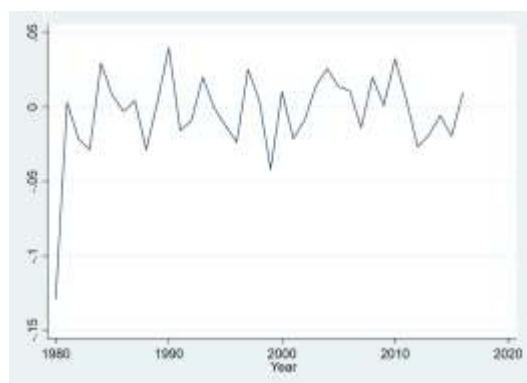
Panel D: Autocorrelation of Residuals
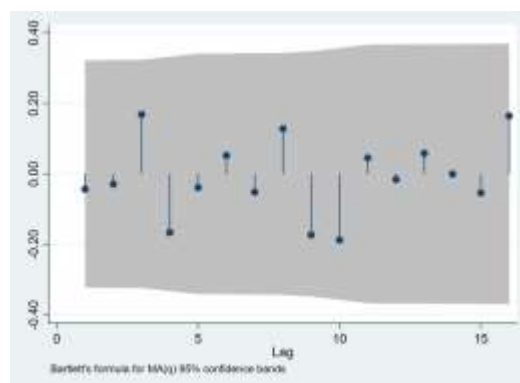
17. Implicit Price Index of Gross Value Added – Mining
Estimation Period: 1983– 2016

$$\Delta IPIN\ GVA, Mining = \underbrace{\frac{-0.559\ IPIN\ GVA, Mining_{t-1}}{(0.078)}}_{Adjustment}$$

$$\underbrace{\begin{array}{l} +\ 4.248\ +0.411\ IPIN, Fuel\ Imports +0.270\ IPIN, Machinery\ Imports \\ \ \ (0.650)\ \ \ \ \ \ \ \ \ \ (0.042)\ (0.071) \\ -0.640\ Wag\ Index, Mining \\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ (0.162)\ \ \ \ \ \ \ \ \ \ \ (0.) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{l} +0.303\ \Delta Wage\ Index, Mining +0.287\ \Delta Wage\ Index, Mining \\ \ \ \ \ \ \ (0.143)\ (0.139) \\ -0.263\ \Delta Introduction\ of\ PH\ Mining\ Law +0.454\ \Delta Introduction\ of\ PH\ Mining\ Law_{t-1} \\ \ \ \ \ (0.093)\ (0.096) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2$ (32)	Portmanteau Q-Statistic $\chi 2$ (16)	MAE	RMSE	R^2
13.949	-7.171	0.939	13.248	0.044	0.067	0.908
[0.000, 0.000]	[0.000, 0.000]	[0.332]	[0.654]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN GVA – Mining are 0.079, 0.185, -0.453, and 0.755 respectively.

Figure 1. Actual v. Predicted IPIN GVA – Mining, along with residuals

Panel A: Log first-difference
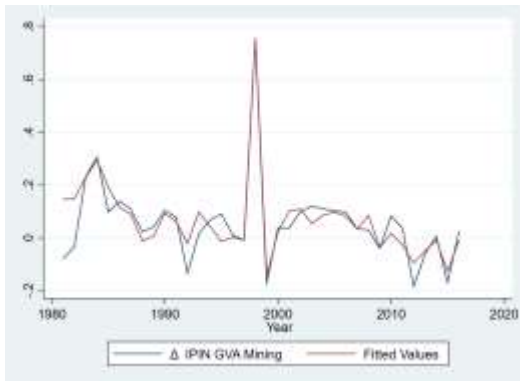
Panel B: Log level
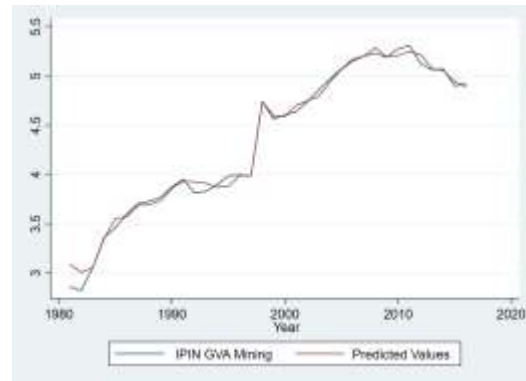
Panel C: Model Residuals
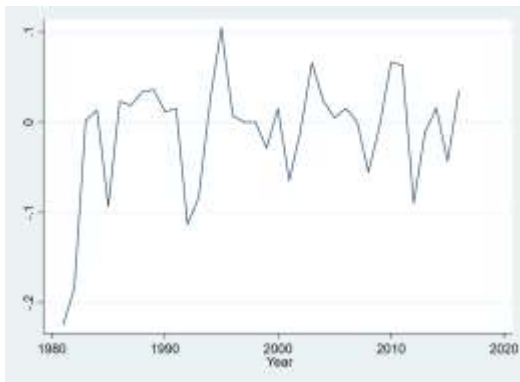
Panel D: Autocorrelation of Residuals
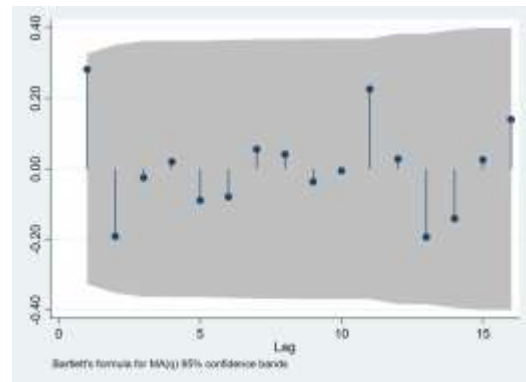
18. Implicit Price Index of Gross Value Added – Other Services

Estimation Period: 1983 – 2016

$$\Delta IPIN\ GVA, Other\ Services = \underbrace{\frac{-0.309\ IPIN\ GVA, Other\ Services_{t-1}}{(0.050)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -\ 2.056\ +1.074\ IPIN\ GVA, Agriculture +1.044\ Wage\ Index, Trade \\ (0.505) \qquad\qquad (0.123) \qquad\qquad\qquad (0.210) \\ +0.416\ Lending\ Rate +0.089\ IPIN\ GVA, Water \\ (0.092) \qquad\qquad (0.114) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} -0.259\ \Delta Wage\ Index, Trade -0.240\ \Delta Wage\ Index, Trade_{t-1} -0.062\ \Delta Lending\ Rate \\ (0.071) \qquad\qquad\qquad (0.076) \qquad\qquad\qquad (0.036) \\ -0.091\ \Delta Lending\ Rate_{t-1} +0.175\ \Delta IPIN\ GVA, Water \\ (0.035) \qquad\qquad\qquad (0.050) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2$ (32)	Portmanteau Q-Statistic $\chi2$ (16)	MAE	RMSE	R^2
21.072	-6.092	0.011	20.628	0.016	0.020	0.903
[0.000, 0.000]	[0.000, 0.001]	[0.916]	[0.193]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN GVA – Other Services are 0.079, 0.061, -0.108, and 0.303 respectively.

Figure 1. Actual v. Predicted IPIN GVA – Other Services, along with residuals

Panel A: Log first-difference
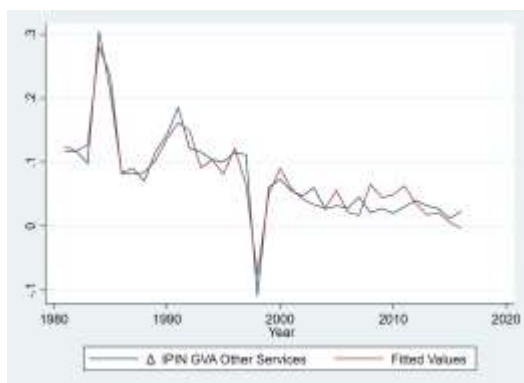
Panel B: Log level
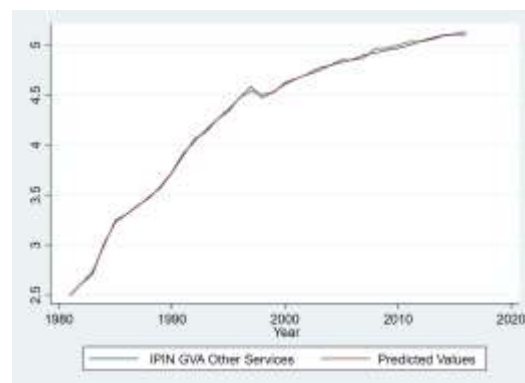
Panel C: Model Residuals
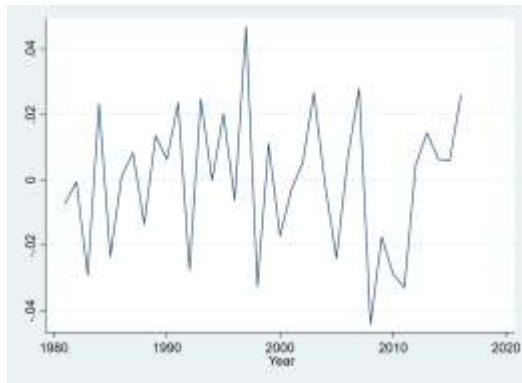
Panel D: Autocorrelation of Residuals
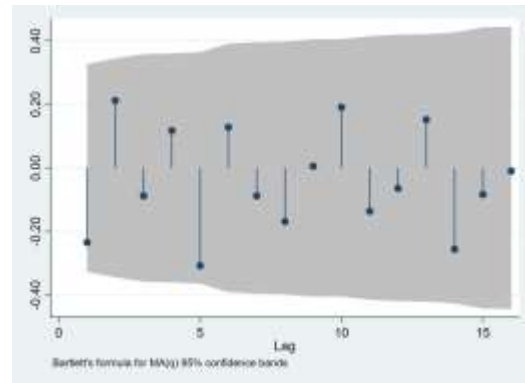
19. Implicit Price Index of Gross Value Added – Real Estate
Estimation Period: 1977 – 2016

$$\Delta IPIN\ GVA, Real\ Estate = \underbrace{\frac{-0.171\ IPIN\ GVA, Real\ Estate_{t-1}}{(0.043)}}_{Adjustment}$$

$$\underbrace{-\ 1.495\ +0.654\ Lending\ Rate + 0.806\ Net\ Compensation}_{Long-run}$$
$$(0.420)(0.155)(0.041)$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (38)	Portmanteau Q-Statistic χ2 (20)	MAE	RMSE	R²
25.328	-3.901	2.594	24.430	0.029	0.043	0.678
[0.000, 0.000]	[0.004, 0.027]	[0.107]	[0.224]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN GVA – Real Estate are 0.090, 0.063, - 0.038, and 0.294 respectively.

Figure 1. Actual v. Predicted IPIN GVA – Real Estate, along with residuals

Panel A: Log first-difference
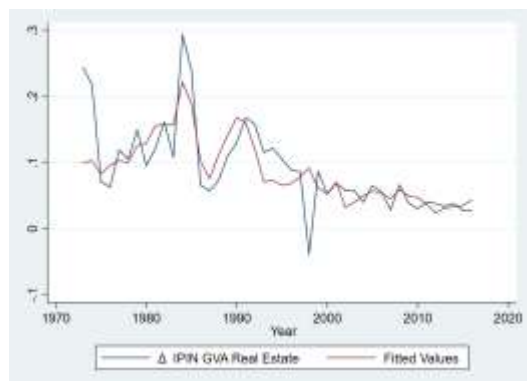
Panel B: Log level
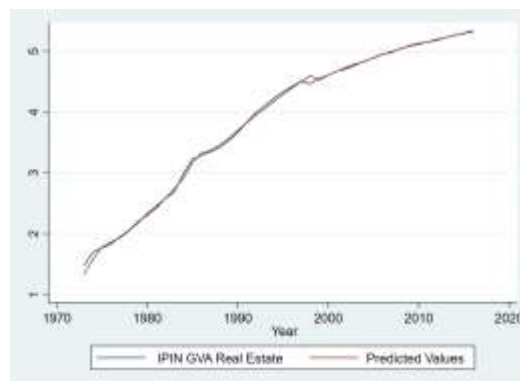
Panel C: Model Residuals
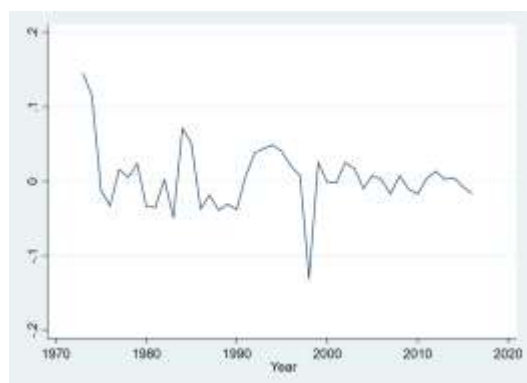
Panel D: Autocorrelation of Residuals

20. Implicit Price Index of Gross Value Added – Trade
Estimation Period: 1983 – 2016

$$\Delta IPIN\ GVA, Trade = \underbrace{\frac{-0.690\ IPIN\ GVA, Trade_{t-1}}{(0.155)}}_{Adjustment}$$

$$\underbrace{+\ 3.072\ +0.752\ IPIN\ GVA, Real\ Estate}_{}$$
$$(1.335)\qquad\qquad (0.050)$$
$$\underbrace{-0.629\ Wage\ Index, Trade -0.152\ Import\ Duties\ Tax\ Rate}_{Long-run}$$
$$(0.313)\qquad\qquad\qquad (0.058)$$

$$+0.373\ \Delta IPIN\ GVA, Real\ Estate -0.554\ \Delta IPIN\ GVA, Real\ Estate_{t-1} -1.050\ \Delta IPIN\ GVA, Real\ Estate_{t-2}$$
$$(0.285)\qquad\qquad (0.278)\qquad\qquad (0.284)$$
$$\underbrace{-0.460\ \Delta IPIN\ GVA, Real\ Estate_{t-3} -0.113\ \Delta Wage\ Index, Trade +0.058\ \Delta Wage\ Index, Trade_{t-1}}_{}$$
$$(0.251)\qquad\qquad (0.251)\qquad\qquad (0.189)$$
$$\underbrace{-0.388\ \Delta Wage\ Index, Trade_{t-2} -0.567\ \Delta Wage\ Index, Trade_{t-3}}_{Short-run}$$
$$(0.184)\qquad\qquad (0.181)$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ^2 (32)	Portmanteau Q-Statistic χ^2 (15)	MAE	RMSE	R^2
7.964	-4.453	0.388	21.979	0.031	0.042	0.813
[0.001, 0.007]	[0.002, 0.017]	[0.533]	[0.108]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN GVA – Trade are 0.096, 0.093, 0.002, and 0.486 respectively.

Figure 1. Actual v. Predicted IPIN GVA – Trade, along with residuals

Panel A: Log first-difference
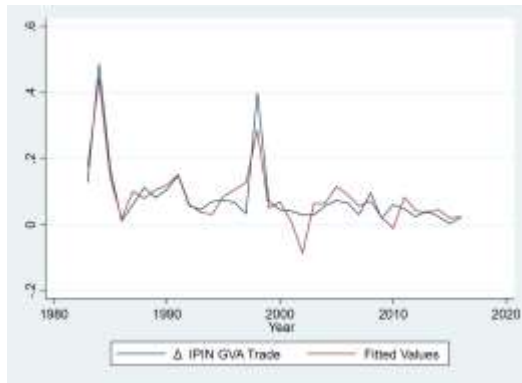
Panel B: Log level
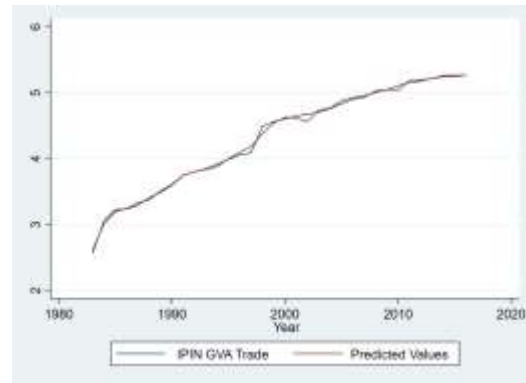
Panel C: Model Residuals
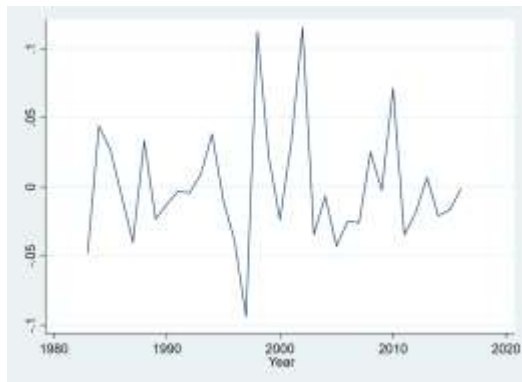
Panel D: Autocorrelation of Residuals
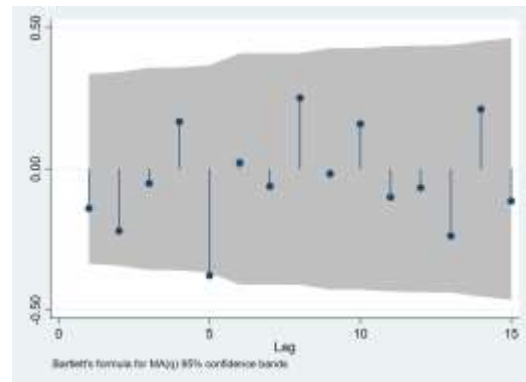
21. Implicit Price Index of Gross Value Added – Transportation

Estimation Period: 1983 – 2016

$$\Delta IPIN\,GVA, Transportation = \underbrace{\frac{-\,0.639\;IPIN\,GVA, Transportation_{t-1}}{(0.102)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c}-\;1.131\;+0.934\;Wage\,Index, Transportation+0.317\;IPIN, Fuel\,Imports\\(0.927)\qquad\qquad(0.188)\qquad\qquad\qquad(0.025)\\+0.272\;Petroleum\,Tax\,Rate+0.092\;IPIN, Electronics\,Exports\\(0.089)\qquad\qquad\qquad(0.088)\end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c}-1.092\;\Delta Wage\,Index, Transportation-0.312\;\Delta Wage\,Index, Transportation_{t-1}-0.350\;\Delta Wage\,Index, Transportation_{t-2}\\(0.245)\qquad\qquad\qquad(0.182)\qquad\qquad\qquad\qquad(0.172)\\-0.145\;\Delta\,IPIN, Fuel\,Imports-0.147\;\Delta Petroleum\,Tax\,Rate+0.115\;\Delta IPIN, Electronics\,Exports\\(0.059)\qquad\qquad\qquad(0.058)\qquad\qquad\qquad(0.062)\end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2$ (32)	Portmanteau Q-Statistic $\chi2$ (15)	MAE	RMSE	R^2
9.129	-6.212	2.543	20.796	0.037	0.047	0.841
[0.000, 0.002]	[0.000, 0.001]	[0.110]	[0.143]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN GVA – Transportation are 0.087, 0.101, -0.004, and 0.471 respectively.

Figure 1. Actual v. Predicted IPIN GVA – Transportation, along with residuals

Panel A: Log first-difference
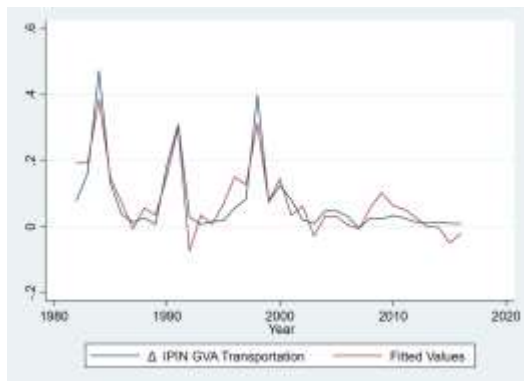
Panel B: Log level

Panel C: Model Residuals
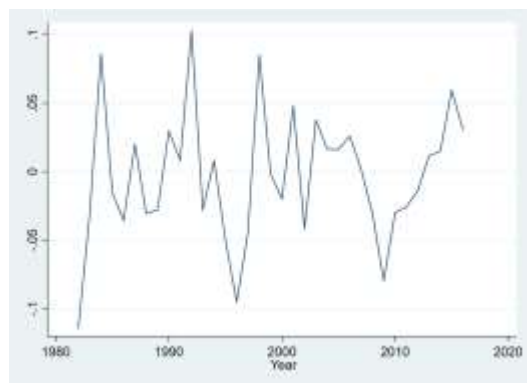
Panel D: Autocorrelation of Residuals
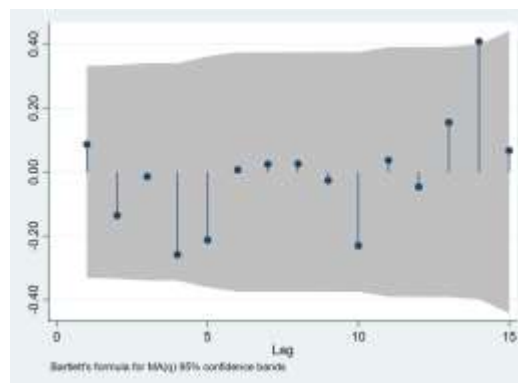
22. Implicit Price Index of Gross Value Added – Water

Estimation Period: 1983 – 2016

$$\Delta IPIN\ GVA, Water = \underbrace{\frac{-0.469\ IPIN\ GVA, Water_{t-1}}{(0.093)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -2.470 + 0.030\ Wage\ Index, Private\ Service \\ (1.091) \qquad\qquad (0.179) \\ +0.962\ Capital\ Formation - Fixed - Construction + 1.169\ Wage\ Index, Construction \\ (0.122) \qquad\qquad\qquad (0.464) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} -0.197\ \Delta Wage\ Index, Private\ Service + 0.114\ \Delta Wage\ Index, Private\ Service_{t-1} + 0.041\ \Delta Wage\ Index, Private\ Service_{t-2} \\ (0.140) \qquad\qquad (0.133) \qquad\qquad (0.133) \\ -0.885\ \Delta Wage\ Index, Private\ Service_{t-3} - 0.446\ \Delta Capital\ Formation - Fixed - Construction \\ (0.132) \qquad\qquad\qquad (0.196) \\ -0.552\ \Delta Wage\ Index, Construction - 0.483\ \Delta Wage\ Index, Construction_{t-1} \\ (0.218) \qquad\qquad (0.215) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2$ (32)	Portmanteau Q-Statistic $\chi 2$ (15)	MAE	RMSE	R^2
9.488	-5.003	0.983	21.007	0.038	0.048	0.815
[0.000, 0.002]	[0.000, 0.006]	[0.321]	[0.136]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN GVA – Water are 0.088, 0.108, -0.415, and 0.287 respectively.

Figure 1. Actual v. Predicted IPIN GVA – Water, along with residuals

Panel A: Log first-difference
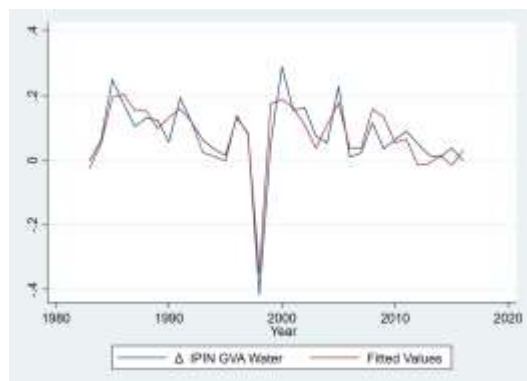
Panel B: Log level
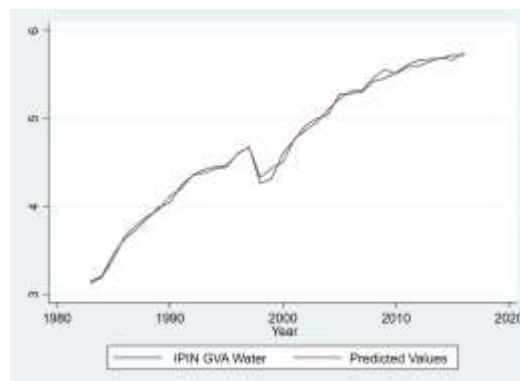
Panel C: Model Residuals
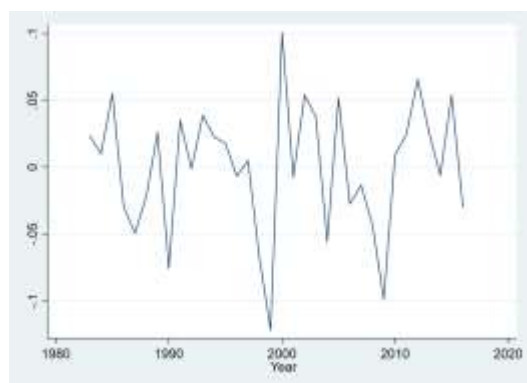
Panel D: Autocorrelation of Residuals
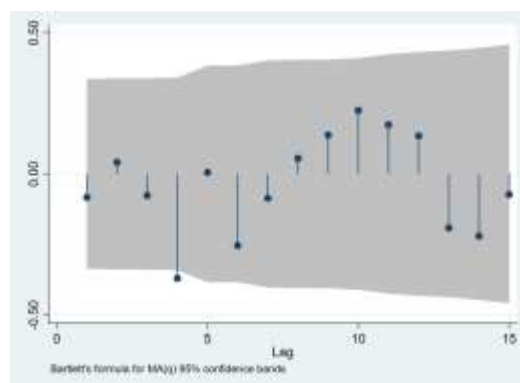
23. Household Final Consumption Expenditure – Alcohol
Estimation Period: 1981 – 2016

$$\Delta HFCE, Alcohol = \underbrace{\begin{array}{c} -\ 0.438\ HFCE, Alcohol_{t-1} \\ (0.056) \end{array}}_{Adjustment}$$

$$\underbrace{\begin{array}{cc} -\ 2.610 & -1.356\ IPIN\ HFCE, Alcohol \\ (1.027) & (0.119) \\ +0.586\ Net\ Disposable\ Income & +1.301\ HFCE, Tobacco \\ (0.119) & (0.350) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{ccc} +0.135\ \Delta IPIN\ HFCE, Alcohol_{t-1} & +0.343\ \Delta IPIN\ HFCE, Alcohol_{t-2} & -0.529\ \Delta HFCE, Tobacco \\ (0.189) & (0.179) & (0.281) \\ -0.759\ \Delta HFCE, Tobacco_{t-1} & -0.780\ \Delta HFCE, Tobacco_{t-2} & -0.766\ \Delta HFCE, Tobacco_{t-3} \\ (0.353) & (0.289) & (0.285) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2$ (34)	Portmanteau Q-Statistic $\chi2$ (16)	MAE	RMSE	R^2
16.405	-7.757	0.046	13.249	0.017	0.022	0.844
[0.000, 0.000]	[0.000, 0.000]	[0.829]	[0.654]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) HFCE – Alcohol are 0.010, 0.057, -0.151, and 0.093 respectively.

Figure 1. Actual v. Predicted HFCE – Alcohol, along with residuals

Panel A: Log first-difference
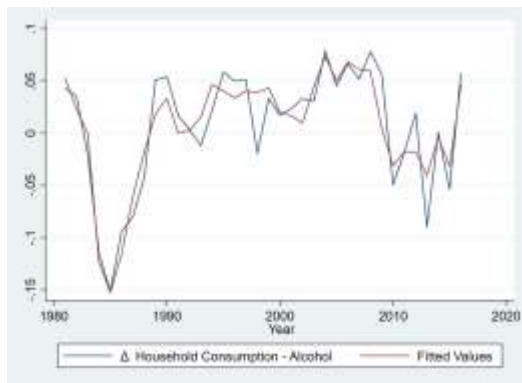
Panel B: Log level
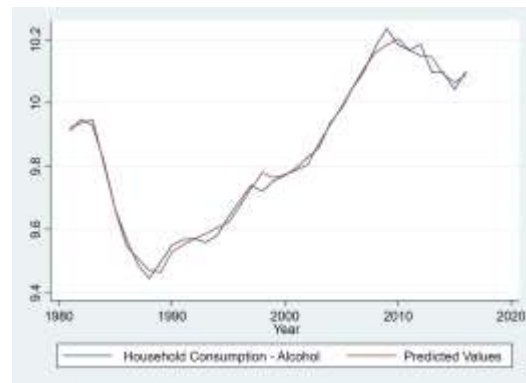
Panel C: Model Residuals
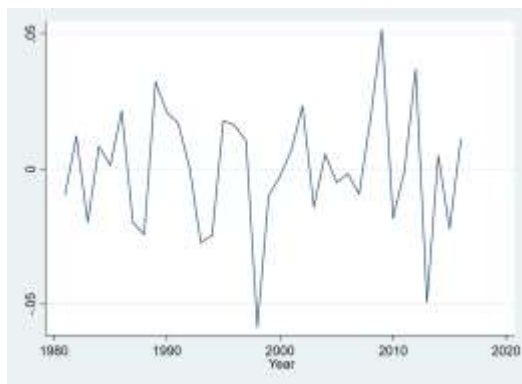
Panel D: Autocorrelation of Residuals
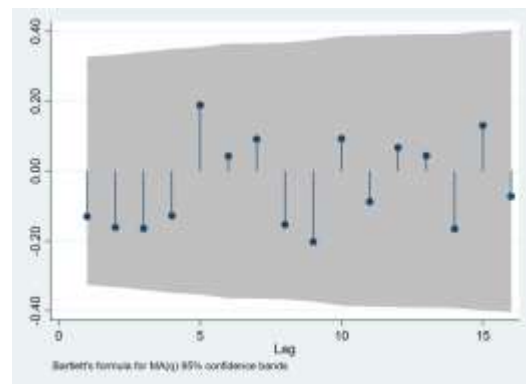
24. Household Final Consumption Expenditure – Education

Estimation Period: 1990 – 2016

$$\Delta HFCE, Education = \underbrace{\frac{-0.530\ HFCE, Education_{t-1}}{(0.069)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -\ \ 1.483\ \ -0.906\ IPIN\ HFCE, Education \\ (0.415) \qquad\qquad (0.097) \\ +1.398\ Net\ Disposable\ Income -0.601\ IPIN\ HFCE, Food \\ (0.069) \qquad\qquad\qquad (0.\ ) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} -0.385\ \Delta IPIN\ HFCE, Education +0.172\ \Delta IPIN\ HFCE, Education_{t-1} +0.319\ \Delta IPIN\ HFCE, Education_{t-2} \\ (0.106) \qquad\qquad (0.118) \qquad\qquad (0.097) \\ +0.242\ \Delta IPIN\ HFCE, Education_{t-3} -0.793\ \Delta Net\ Disposable\ Income -0.500\ \Delta Net\ Disposable\ Income_{t-1} \\ (0.094) \qquad\qquad (0.149) \qquad\qquad (0.145) \\ +1.038\ \Delta IPIN\ HFCE, Food +0.298\ \Delta IPIN\ HFCE, Food_{t-1} \\ (0.139) \qquad\qquad (0.153) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

| Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2\ (34)$	Portmanteau Q-Statistic $\chi 2\ (16)$	MAE	RMSE	R^2
21.548	-7.663	1.435	12.608	0.009	0.012	0.903
[0.000, 0.000]	[0.000, 0.000]	[0.230]	[0.701]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) HFCE – Education are 0.025, 0.039, -0.057, and 0.098 respectively.

Figure 1. Actual v. Predicted HFCE – Education, along with residuals

Panel A: Log first-difference
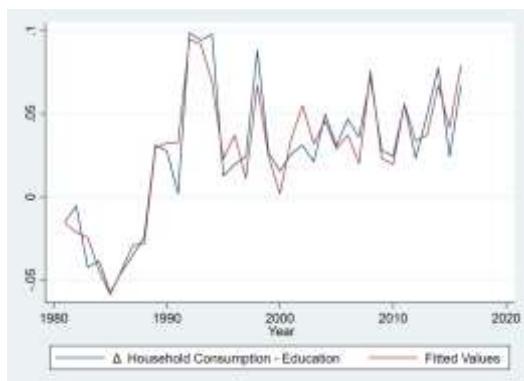
Panel B: Log level
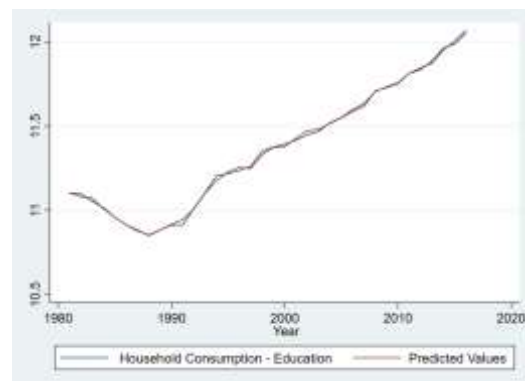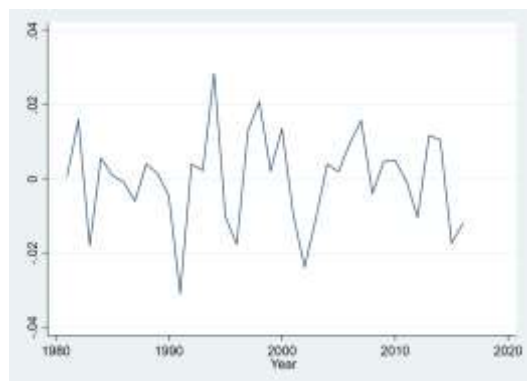
Panel C: Model Residuals	Panel D: Autocorrelation of Residuals
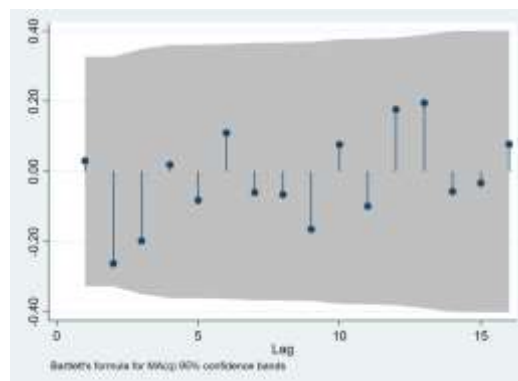
25. Household Final Consumption Expenditure – Food

Estimation Period: 1980 – 2016

$$\Delta HFCE, Food = \underbrace{\frac{-0.257\ HFCE, Food_{t-1}}{(0.055)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -\ 2.927\ -0.774\ IPIN\ HFCE, Food - 0.286\ IPIN\ HFCE, Education \\ (0.807) \qquad (0.200) \qquad\qquad (0.104) \\ +0.315\ IPIN\ HFCE, Tobacco + 0.403\ Net\ Disposable\ Income + 2.209\ Total\ Employment \\ (0.169) \qquad\qquad (0.112) \qquad\qquad\qquad (0.367) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} -0.235\ \Delta Total\ Employment \\ (0.123) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (35)	Portmanteau Q-Statistic χ2 (17)	MAE	RMSE	R²
8.847	-4.683	0.801	12.795	0.008	0.010	0.648
[0.000, 0.001]	[0.001, 0.024]	[0.370]	[0.749]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) HFCE – Food are 0.039, 0.016, -0.017, and 0.068 respectively.

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Figure 1. Actual v. Predicted HFCE – Food, along with residuals

Panel A: Log first-difference
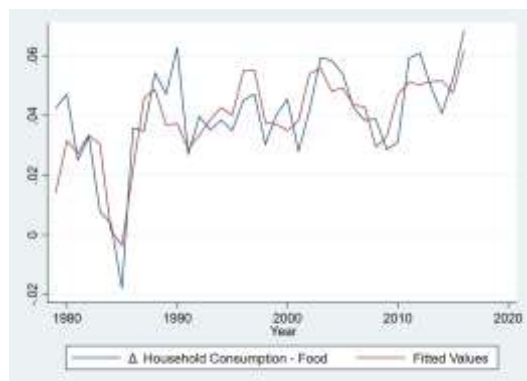
Panel B: Log level
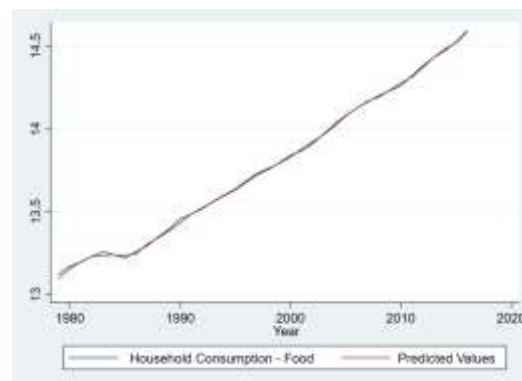
Panel C: Model Residuals
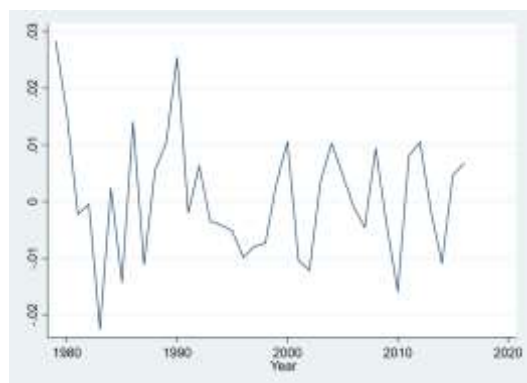
Panel D: Autocorrelation of Residuals
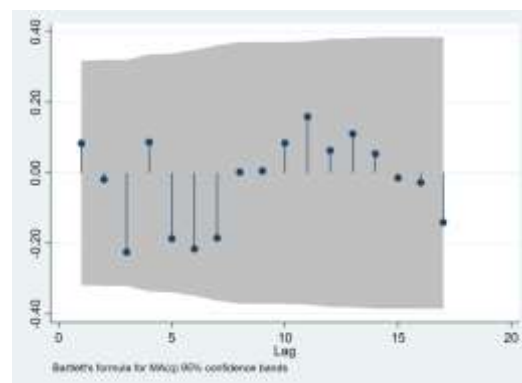
26. Household Final Consumption Expenditure – Medical

Estimation Period: 1979 – 2016

$$\Delta HFCE, Medical = \underbrace{\frac{-0.297 \ HFCE, Medical_{t-1}}{(0.070)}}_{Adjustment}$$

$$\underbrace{\begin{array}{cc} -0.418 & -2.852 \ IPIN \ HFCE, Medical \\ (0.445) & (0.286) \\ +1.248 \ Net \ Disposable \ Income & +1.452 \ IPIN \ HFCE, Education \\ (0.151) & (0.362) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{ccc} +0.447 \ \Delta HFCE, Medical_{t-1} & +0.082 \ \Delta IPIN \ HFCE, Medical & +0.592 \ \Delta IPIN \ HFCE, Medical_{t-1} \\ (0.130) & (0.407) & (0.347) \\ -0.198 \ \Delta Net \ Disposable \ Income & -0.343 \ \Delta Net \ Disposable \ Income_{t-1} \\ (0.174) & (0.179) \\ -0.090 \ \Delta IPIN \ HFCE, Education & -0.320 \ \Delta IPIN \ HFCE, Education_{t-1} \\ (0.351) & (0.) \end{array}}_{Short-run}$$

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Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ^2 (36)	Portmanteau Q-Statistic χ^2 (17)	MAE	RMSE	R^2
4.901	-4.201	0.204	18.468	0.014	0.019	0.829
[0.012, 0.054]	[0.003, 0.025]	[0.650]	[0.359]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) HFCE – Medical are 0.031, 0.047, -0.063, and 0.111 respectively.

Figure 1. Actual v. Predicted HFCE – Medical, along with residuals

Panel A: Log first-difference
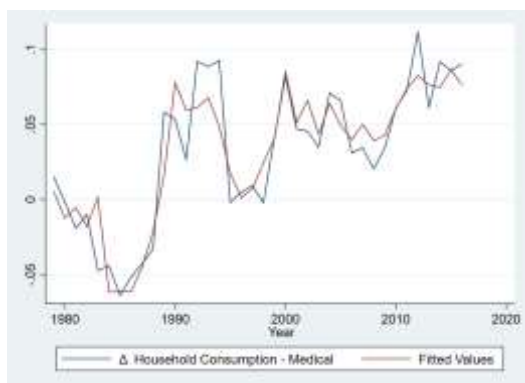
Panel B: Log level
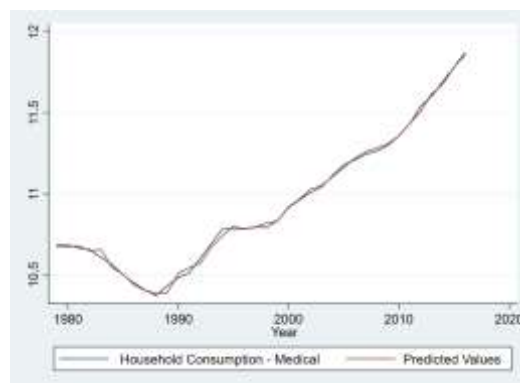
Panel C: Model Residuals
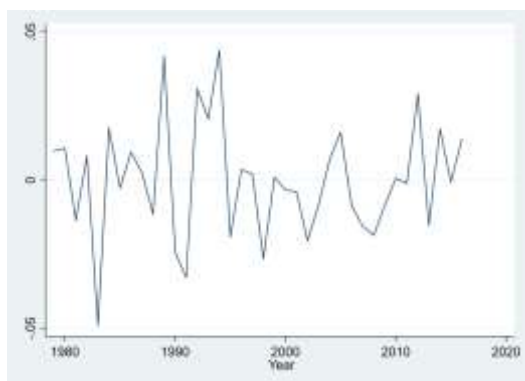
Panel D: Autocorrelation of Residuals
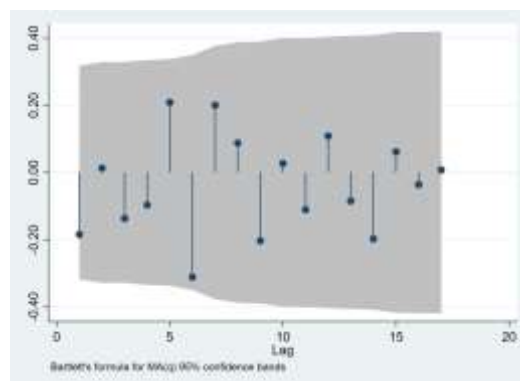
27. Household Final Consumption Expenditure – Housing

Estimation Period: 1981 – 2016

$$\Delta HFCE, Housing = \underbrace{\frac{-1.401\ HFCE, Housing_{t-1}}{(0.208)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} +\ 12.222\ +0.500\ IPIN\ HFCE, Housing +0.227\ Net\ Disposable\ Income \\ (1.841) \qquad\qquad (0.071) \qquad\qquad\qquad (0.029) \\ -\ 0.476\ IPIN\ GVA, Manufacturing -0.049\ IPIN, Materials\ Imports \\ (0.042) \qquad\qquad\qquad\qquad (0.010) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} -0.718\ \Delta IPIN\ HFCE, Housing -0.532\ \Delta IPIN\ HFCE, Housing_{t-1} -0.338\ \Delta IPIN\ HFCE, Housing_{t-2} \\ (0.157) \qquad\qquad\qquad (0.116) \qquad\qquad\qquad\qquad (0.108) \\ -0.085\ \Delta IPIN\ HFCE, Housing_{t-3} +0.601\ \Delta IPIN\ GVA, Manufacturing \\ (0.047) \qquad\qquad\qquad\qquad (0.131) \\ +0.386\ \Delta IPIN\ GVA, Manufacturing_{t-1} +0.250\ \Delta IPIN\ GVA, Manufacturing_{t-2} \\ (0.095) \qquad\qquad\qquad\qquad (0.085) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

| Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2\ (34)$	Portmanteau Q-Statistic $\chi2\ (16)$	MAE	RMSE	R^2
10.604	-6.734	0.427	11.274	0.006	0.008	0.780
[0.000, 0.001]	[0.000, 0.000]	[0.512]	[0.792]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) HFCE – Housing are 0.036, 0.019, -0.008, and 0.074 respectively.

Figure 1. Actual v. Predicted HFCE – Housing, along with residuals

Panel A: Log first-difference
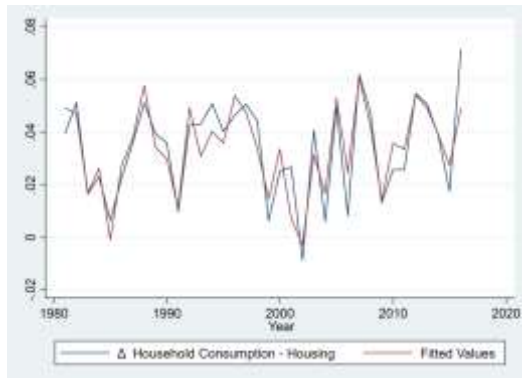
Panel B: Log level
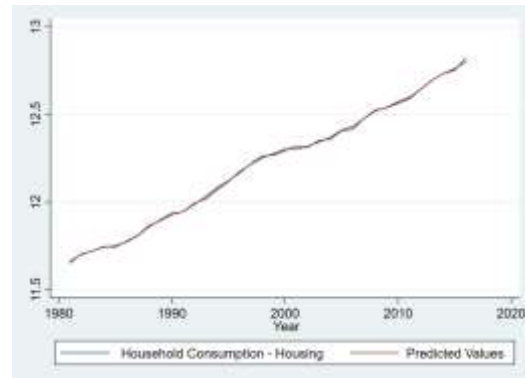
Panel C: Model Residuals
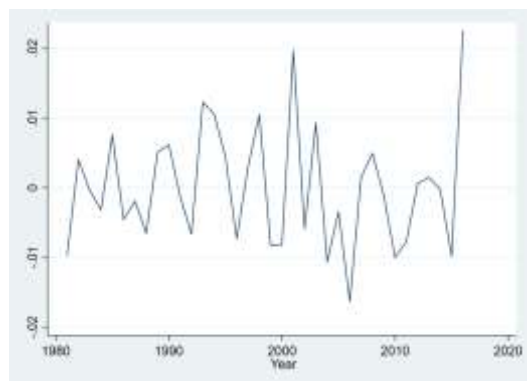
Panel D: Autocorrelation of Residuals
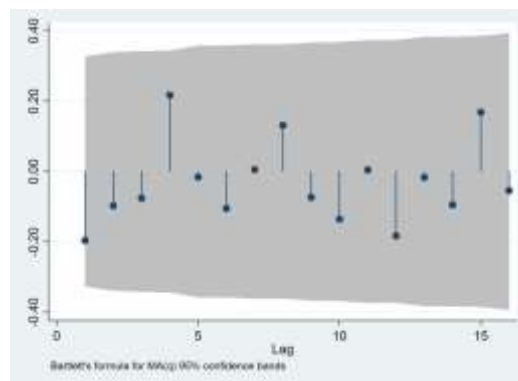
28. Household Final Consumption Expenditure – Non-alcoholic Beverages
Estimation Period: 1981 – 2016

$$\Delta HFCE, Non - alcohol = \underbrace{\begin{matrix} -0.355\ HFCE, Non - alcohol_{t-1} \\ (0.085) \end{matrix}}_{Adjustment}$$

$$\underbrace{\begin{matrix} +\ 0.855\ -0.242\ IPIN\ HFCE, Non - alcohol + 0.350\ Net\ Disposable\ Income \\ (0.433) \qquad\qquad (0.150) \qquad\qquad\qquad (0.042) \\ -0.891\ Share\ of\ CPI, Alcohol - 0.266\ Openness \\ (0.289) \qquad\qquad (0.061) \end{matrix}}_{Long-run}$$

$$\underbrace{\begin{matrix} +0.472\ \Delta HFCE, Non - alcohol + 0.238\ \Delta HFCE, Non - alcohol \\ (0.120) \qquad\qquad\qquad (0.140) \\ -0.252\ \Delta HFCE, Non - alcohol + 0.187\ \Delta IPIN\ HFCE, Non - alcohol \\ (0.148) \qquad\qquad\qquad (0.076) \end{matrix}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Heteroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2\ (34)$	Portmanteau Q-Statistic $\chi 2\ (16)$	MAE	RMSE	R^2
9.506	-4.149	1.160	12.793	0.013	0.015	0.838
[0.000, 0.001]	[0.003, 9.506]	[0.281]	[0.687]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) HFCE – Non-alcoholic Beverages are 0.057, 0.039, -0.020, and 0.142 respectively.

Figure 1. Actual v. Predicted HFCE – Non-alcoholic Beverages, along with residuals

Panel A: Log first-difference
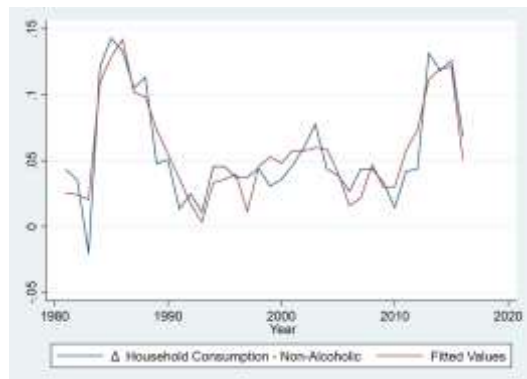
Panel B: Log level
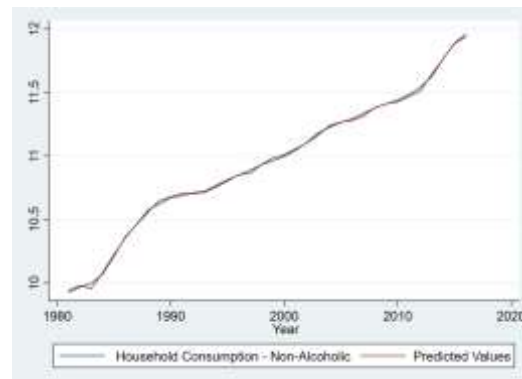
Panel C: Model Residuals
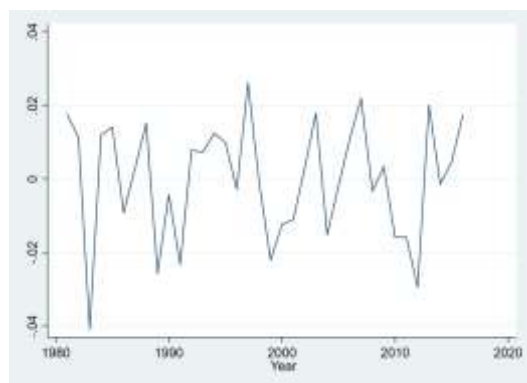
Panel D: Autocorrelation of Residuals
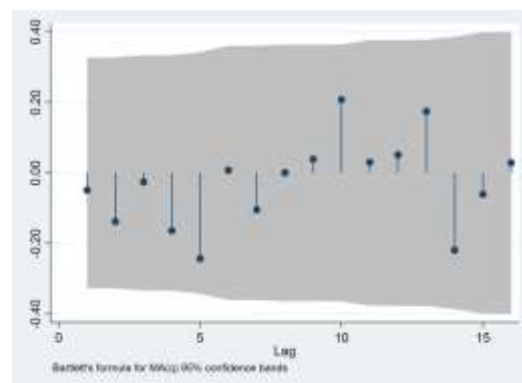
29. Household Final Consumption Expenditure – Miscellaneous
Estimation Period: 1984 – 2016

$$\Delta HFCE, Miscellaneous = \underbrace{\dfrac{-271\ HFCE, Miscellaneous_{t-1}}{(0.048)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -\ 0.305\ +1.087\ Net\ Disposable\ Income -1.101\ IPIN\ GVA, Other\ Services \\ (0.395)\qquad\qquad (0.103)\qquad\qquad\qquad (0.100) \\ -0.117\ IPIN, Tourism\ Service\ Exports +0.299\ Other\ Service\ Exports \\ (0.057)\qquad\qquad\qquad\qquad (0.063) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} -0.110\ \Delta Net\ Disposable\ Income +0.020\ \Delta IPIN, Tourism\ Service\ Exports +0.040\ \Delta IPIN, Tourism\ Service\ Exports \\ (0.055)\qquad\qquad\qquad (0.008)\qquad\qquad\qquad\qquad (0.007) \\ +0.042\ \Delta IPIN, Tourism\ Service\ Exports +0.038\ \Delta\ Other\ Service\ Exports \\ (0.007)\qquad\qquad\qquad\qquad (0.007) \\ -0.060\ \Delta\ Other\ Service\ Exports -0.019\ \Delta \\ (0.006)\qquad\qquad\qquad (0.012) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ^2 (31)	Portmanteau Q-Statistic χ^2 (14)	MAE	RMSE	R^2
34.147	-5.565	0.623	14.473	0.005	0.007	0.906
[0.000, 0.000]	[0.000, 0.004]	[0.429]	[0.415]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) HFCE – Miscellaneous are 0.039, 0.022, -0.013, and 0.089 respectively.

Figure 1. Actual v. Predicted HFCE – Miscellaneous, along with residuals

Panel A: Log first-difference
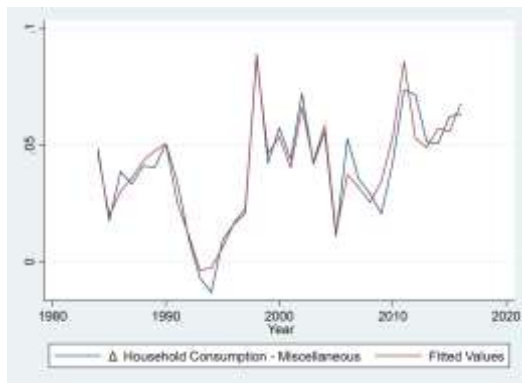
Panel B: Log level
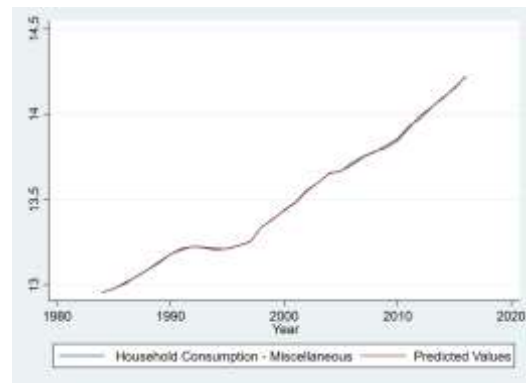
Panel C: Model Residuals
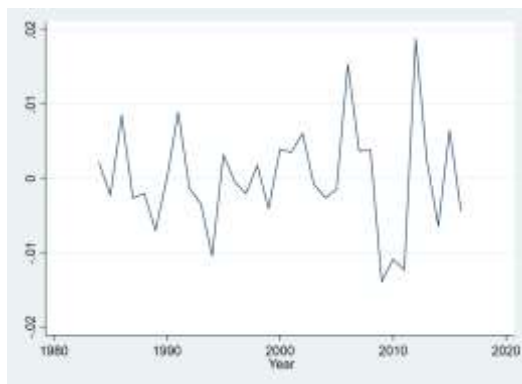
Panel D: Autocorrelation of Residuals
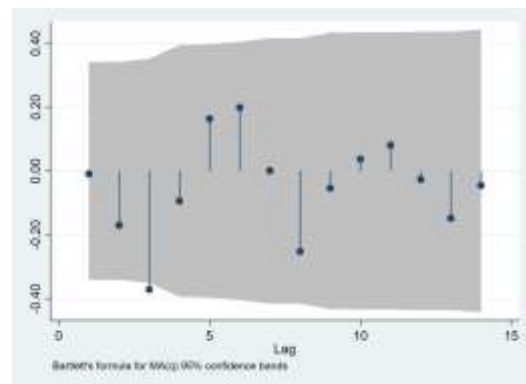
30. Household Final Consumption Expenditure – Tobacco

Estimation Period: 1981 – 2016

$$\Delta HFCE, Tobacco = \underbrace{\frac{-\ 0.655\ HFCE, Tobacco_{t-1}}{(0.078)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} +\ 2.890\ -0.599\ IPIN\ HFCE, Tobacco +0.408\ Net\ Compensation \\ (0.434) \qquad\quad (0.156) \qquad\qquad\qquad (0.122) \\ +0.512\ HFCE, Non-alcohol -0.324\ HFCE, Alcohol \\ (0.061) \qquad\qquad\qquad (0.114) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} +1.019\ \Delta HFCE, Tobacco_{t-1} +0.011\ \Delta HFCE, Tobacco_{t-2} +0.247\ \Delta HFCE, Tobacco_{t-3} \\ (0.134) \qquad\qquad\qquad (0.107) \qquad\qquad\qquad (0.111) \\ +0.297\ \Delta IPIN\ HFCE, Tobacco +0.480\ \Delta IPIN\ HFCE, Tobacco_{t-1} -0.009\ \Delta Net\ Compensation \\ (0.111) \qquad\qquad\qquad (0.093) \qquad\qquad\qquad (0.082) \\ -0.528\ \Delta Net\ Compensation_{t-1} -0.141\ \Delta HFCE, Non-alcohol +0.157\ \Delta HFCE, Non-alcohol_{t-1} \\ (0.085) \qquad\qquad\qquad (0.088) \qquad\qquad\qquad (0.091) \\ -0.426\ \Delta HFCE, Non-alcohol_{t-2} +0.315\ \Delta HFCE, Alcohol -0.225\ \Delta HFCE, Alcohol_{t-1} \\ (0.100) \qquad\qquad\qquad (0.070) \qquad\qquad\qquad (0.048) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

| Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2\ (34)$	Portmanteau Q-Statistic $\chi2\ (16)$	MAE	RMSE	R^2
19.254	-8.391	0.844	16.577	0.004	0.006	0.967
[0.000, 0.000]	[0.000, 0.000]	[0.358]	[0.413]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) HFCE – Tobacco are 0.033, 0.032, -0.021, and 0.153 respectively.

Figure 1. Actual v. Predicted HFCE – Tobacco, along with residuals

Panel A: Log first-difference
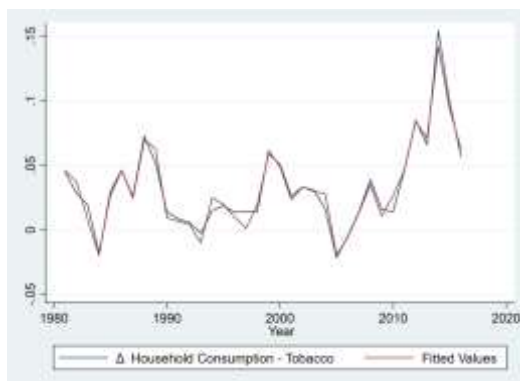
Panel B: Log level
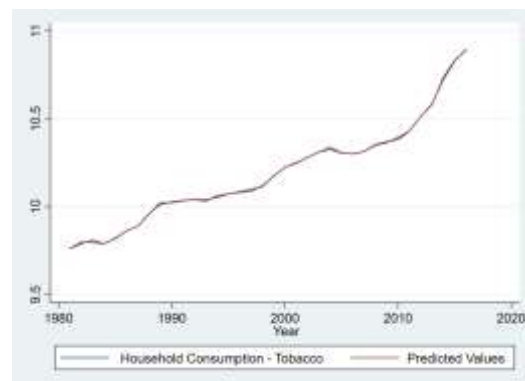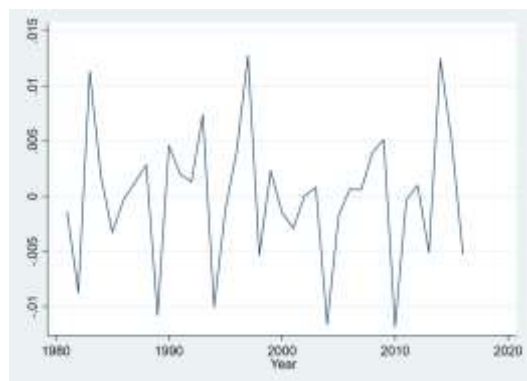
Panel C: Model Residuals   Panel D: Autocorrelation of Residuals
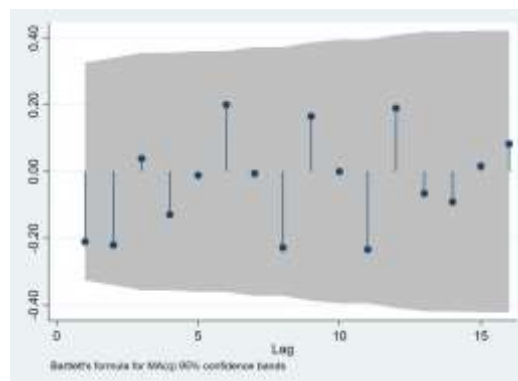
31. Household Final Consumption Expenditure – Transportation and Communication

Estimation Period: 1984 – 2016

$$\Delta HFCE, Transportation\ and\ Communication = \underbrace{\dfrac{-0.189\ HFCE, Transportation\ and\ Communication_{t-1}}{(0.041)}}_{Adjustment}$$

$$\underbrace{+\ \underset{(0.199)}{0.709}\ +\underset{(0.137)}{1.220}\ Net\ Disposable\ Income -\underset{(0.110)}{0.351}\ Capital\ Formation-Fixed-Public\ Construction, Real \\ -\underset{(0.235)}{1.226}\ IPIN\ GVA\ Manufacturing -\underset{(0.038)}{0.104}\ BPO\ Service\ Exports, Real}_{Long-run}$$

$$\underbrace{+0.058\ \Delta Capital\ Formation-Fixed-Public\ Construction, Real \\ (0.015)}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Heteroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2\ (31)$	Portmanteau Q-Statistic $\chi 2\ (16)$	MAE	RMSE	R^2
8.863	-4.512	0.703	11.661	0.013	0.018	0.694
[0.000, 0.002]	[0.001, 0.023]	[0.401]	[0.766]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) HFCE – Transportation and Communication are 0.050, 0.027, -0.015, and 0.112 respectively.

Figure 1. Actual v. Predicted HFCE – Transportation and Communication, along with residuals

Panel A: Log first-difference
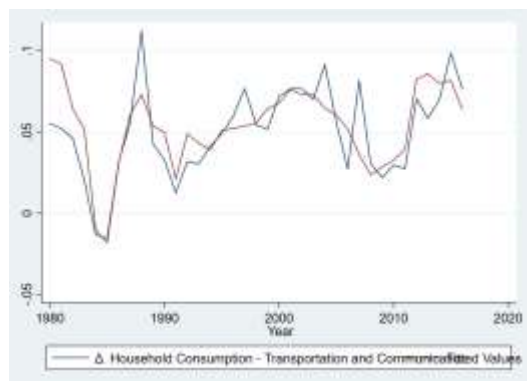
Panel B: Log level
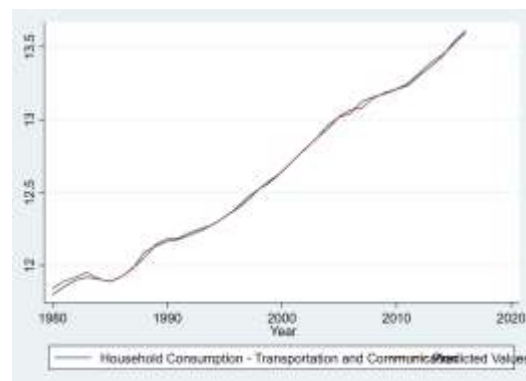
Panel C: Model Residuals
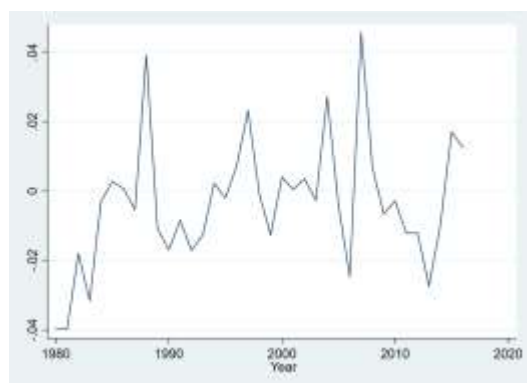
Panel D: Autocorrelation of Residuals
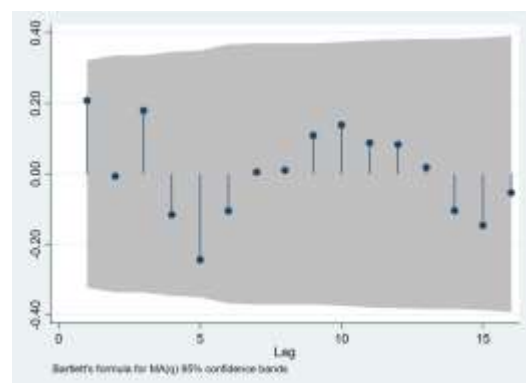
32. Household Final Consumption Expenditure – Utilities
Estimation Period: 1983 – 2016

$$\Delta HFCE, Utilities = \underbrace{\begin{matrix} -0.645\ HFCE, Utilities_{t-1} \\ (0.176) \end{matrix}}_{Adjustment}$$

$$\underbrace{\begin{matrix} -\ 30.487\ -0.339\ IPIN\ HFCE - Utilities \\ (12.926) \qquad\qquad (0.103) \\ +0.063\ Net\ Disposable\ Income + 3.274\ Total\ Population \\ (0.176) \qquad\qquad\qquad (0.729) \end{matrix}}_{Long-run}$$

$$\underbrace{\begin{matrix} +0.648\ \Delta HFCE, Utilities_{t-1}\ +0.506\ \Delta HFCE, Utilities_{t-2} - 0.068\ \Delta IPIN\ HFCE - Utilities \\ (0.216) \qquad\qquad\quad (0.240) \qquad\qquad\qquad (0.110) \\ +0.240\ \Delta IPIN\ HFCE - Utilities_{t-1} + 0.220\ \Delta IPIN\ HFCE - Utilities_{t-2} \\ (0.135) \qquad\qquad\qquad\quad (0.151) \\ +0.197\ \Delta Net\ Disposable\ Income - 0.097\ \Delta Net\ Disposable\ Income_{t-1} - 0.339\ \Delta Net\ Disposable\ Income_{t-2} \\ (0.207) \qquad\qquad\qquad (0.163) \qquad\qquad\qquad\qquad (0.232) \\ -3.410\ \Delta Total\ Population - 2.689\ \Delta Total\ Population_{t-1} - 0.480\ \Delta Total\ Population_{t-2} \\ (0.236) \qquad\qquad\qquad (0.298) \qquad\qquad\qquad (0.856) \end{matrix}}_{Short-run}$$

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Table A1. Summary of model tests

Bounds Tests		Heteroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2$ (32)	Portmanteau Q-Statistic $\chi 2$ (15)	MAE	RMSE	R^2
4.411	-3.665	0.202	13.188	0.011	0.014	0.779
[0.023, 0.093]	[0.010, 0.066]	[0.652]	[0.587]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Household Consumption - Utilities are 0.049, 0.030, -0.030, and 0.111 respectively.

Figure 1. Actual v. Predicted Household Consumption - Utilities, along with residuals

Panel A: Log first-difference
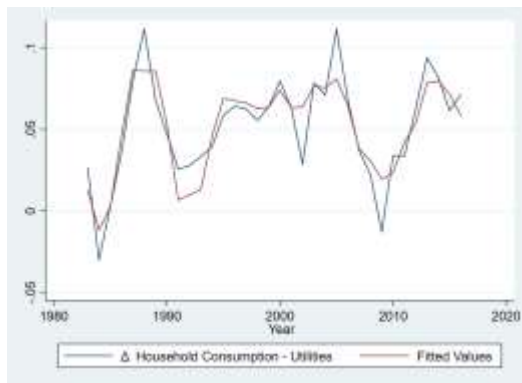
Panel B: Log level
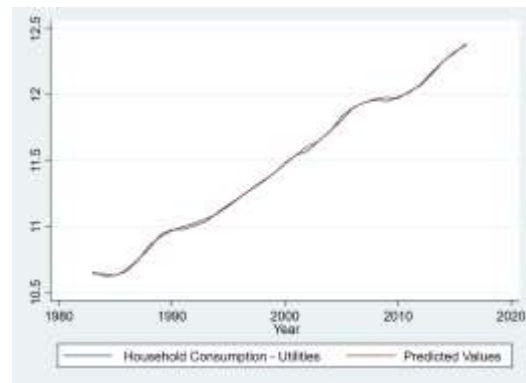
Panel C: Model Residuals
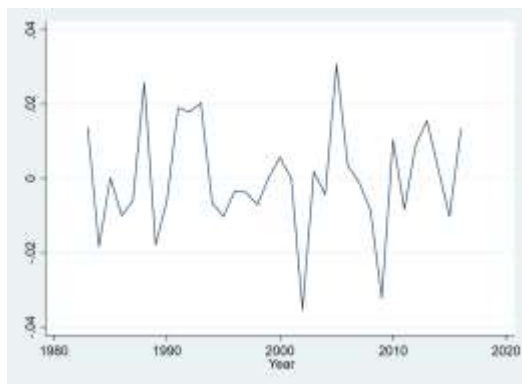
Panel D: Autocorrelation of Residuals
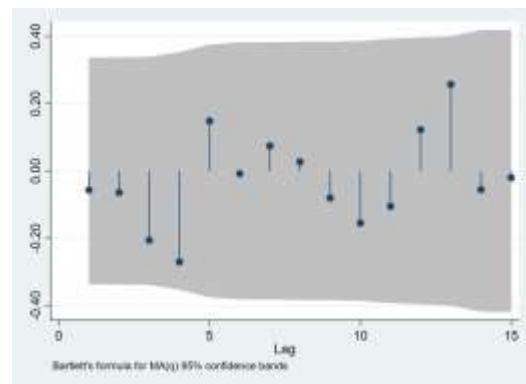
33. Implicit Price Index Household Final Consumption Expenditure - Alcohol

Estimation Period: 1981 – 2016

$$\Delta IPIN\ HFCE - Alcohol = \underbrace{\frac{-0.542\ IPIN\ HFCE - Alcohol_{t-1}}{(0.078)}}_{Adjustment}$$

$$\underbrace{+\ 1.792\ \underset{(0.482)}{} +0.720\ \underset{(0.066)}{IPIN\ GVA\ Agriculture} -0.068\ \underset{(0.078)}{IPIN\ Other\ Good\ Imports} -0.115\ \underset{(0.030)}{Effective\ Tax\ Rate, Import\ Duties}$$
$$+0.676\ \underset{(0.208)}{Effective\ Tax\ Rate, Alcoholic\ Beverages\ (Share\ of\ Price)}}_{Long-run}$$

$$\underbrace{+0.129\ \underset{(0.047)}{\Delta IPIN\ Other\ Good\ Imports} +0.088\ \underset{(0.042)}{\Delta IPIN\ Other\ Good\ Imports_{t-1}} +0.121\ \underset{(0.039)}{\Delta IPIN\ Other\ Good\ Imports_{t-2}}$$
$$+0.069\ \underset{(0.021)}{\Delta Effective\ Tax\ Rate, Import\ Duties} -0.158\ \underset{(0.076)}{\Delta Effective\ Tax\ Rate, Alcoholic\ Beverages\ (Share\ of\ Price)}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Heteroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2\ (34)$	Portmanteau Q-Statistic $\chi 2\ (17)$	MAE	RMSE	R^2
18.725	-6.880	1.456	5.992	0.025	0.048	0.880
[0.000, 0.000]	[0.000, 0.000]	[0.227]	[0.993]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN HFCE – Alcohol are 0.077, 0.069, 0.021, and 0.370 respectively.

Figure 1. Actual v. Predicted IPIN HFCE – Alcohol, along with residuals

Panel A: Log first-difference
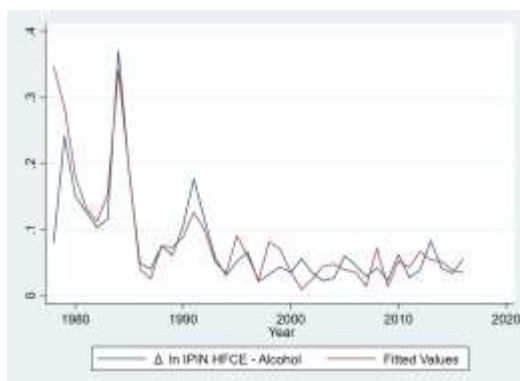
Panel B: Log level
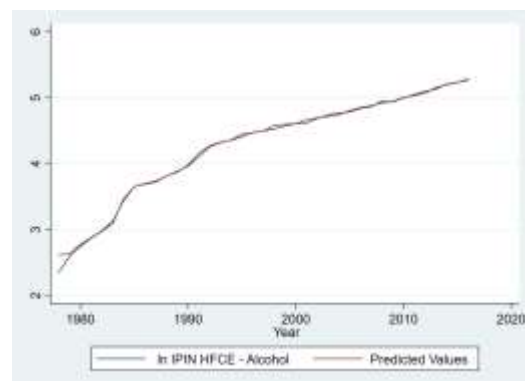
Panel C: Model Residuals
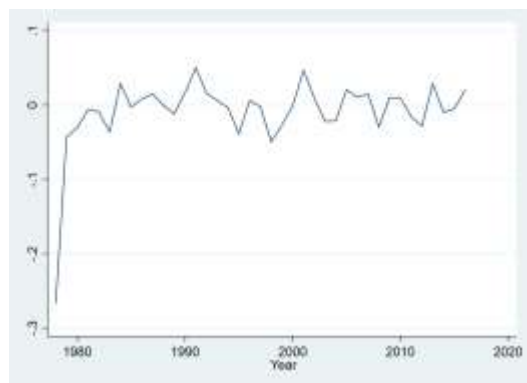
Panel D: Autocorrelation of Residuals
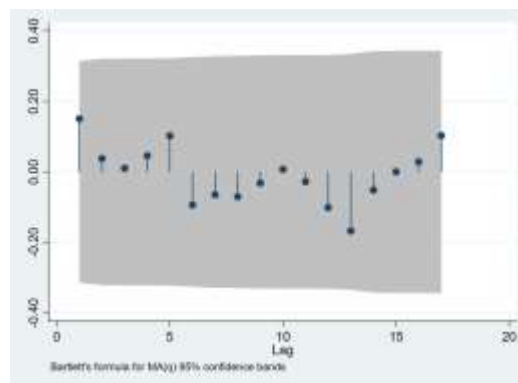
34. Implicit Price Index Household Final Consumption Expenditure - Education
Estimation Period: 1989 – 2016

$$\Delta IPIN\ HFCE - Education = \underbrace{\begin{array}{c} -0.241\ IPIN\ HFCE - Education_{t-1} \\ (0.069) \end{array}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -\ 0.265\ \ +0.140\ Real\ Interest\ Rate +0.266\ IPIN\ GVA\ Real\ Estate \\ (0.177) \qquad\qquad (0.065) \qquad\qquad\qquad (0.233) \\ +0.971\ IPIN\ Private\ Construction \\ (0.280) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} +0.087\ \Delta IPIN\ HFCE - Education_{t-1} +0.442\ \ \Delta IPIN\ HFCE - Education_{t-2} -0.029\ \Delta Real\ Interest\ Rate \\ (0.206) \qquad\qquad\qquad (0.222) \qquad\qquad\qquad (0.010) \\ -0.013\ \Delta Real\ Interest\ Rate_{t-1} +0.037\ \Delta IPIN\ GVA\ Real\ Estate -0.259\ \Delta IPIN\ GVA\ Real\ Estate_{t-1} \\ (0.006) \qquad\qquad\qquad (0.119) \qquad\qquad\qquad (0.132) \\ -0.371\ \Delta IPIN\ GVA\ Real\ Estate_{t-2} -0.212\ \Delta IPIN\ GVA\ Real\ Estate_{t-3} \\ (0.131) \qquad\qquad\qquad (0.126) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Heteroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2\ (26)$	Portmanteau Q-Statistic $\chi2\ (13)$	MAE	RMSE	R^2
9.249	-3.486	0.216	10.521	0.012	0.020	0.903
[0.001, 0.006]	[0.017, 0.091]	[0.642]	[0.650]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN HFCE – Education are 0.097, 0.063, 0.024, and 0.396 respectively.

Figure 1. Actual v. Predicted IPIN HFCE – Education, along with residuals

Panel A: Log first-difference
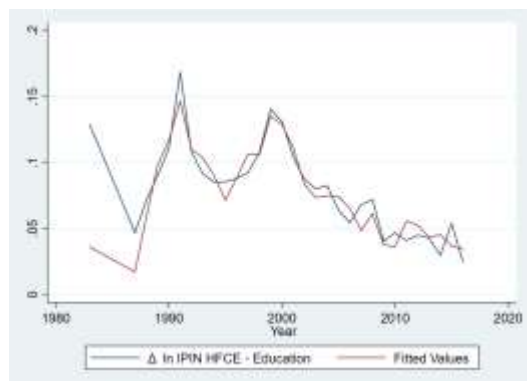
Panel B: Log level
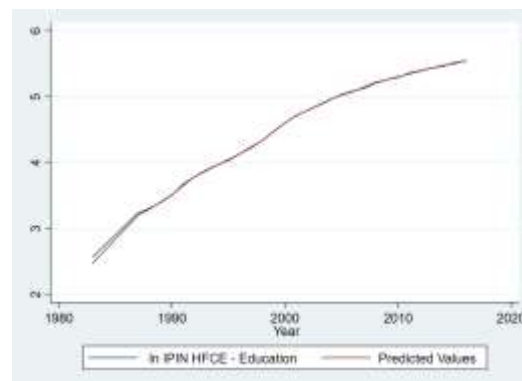
Panel C: Model Residuals
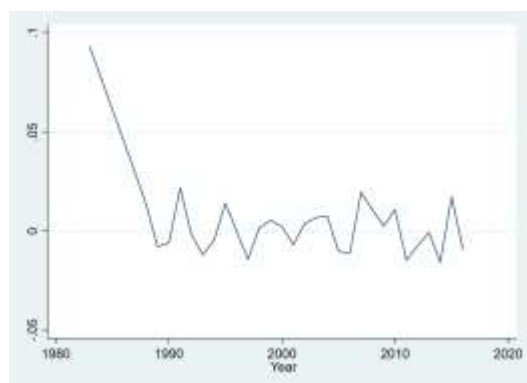
Panel D: Autocorrelation of Residuals
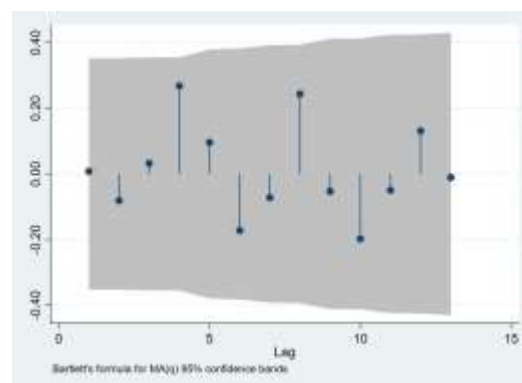
35. Implicit Price Index Household Final Consumption Expenditure – Food

Estimation Period: 1981 – 2016

$$\Delta IPIN\ HFCE, Food = \underbrace{\begin{array}{c} -0.765\ IPIN\ HFCE, Food_{t-1} \\ (0.039) \end{array}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} +\ 0.715\ +0.161\ IPIN, Agricultural\ Imports + 0.870\ IPIN\ GVA, Agriculture \\ (0.100)\qquad\quad (0.021)\qquad\qquad\qquad\qquad (0.019) \\ -0.072\ Openness - 3.124\ Value\ Added\ Tax\ Rate \\ (0.033)\qquad\qquad (0.175) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} +2.997\ \Delta\ Value\ Added\ Tax\ Rate \\ (0.124) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2$ (34)	Portmanteau Q-Statistic $\chi2$ (17)	MAE	RMSE	R^2
110.085	-19.171	1.152	27.299	0.016	0.023	0.950
[0.000, 0.000]	[0.000, 0.000]	[0.283]	[0.053]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN HFCE – Food are 0.074, 0.071, 0.003, and 0.427 respectively.

Figure 1. Actual v. Predicted IPIN HFCE – Food, along with residuals

Panel A: Log first-difference
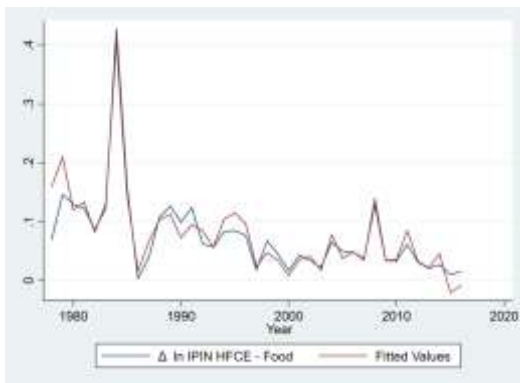
Panel B: Log level
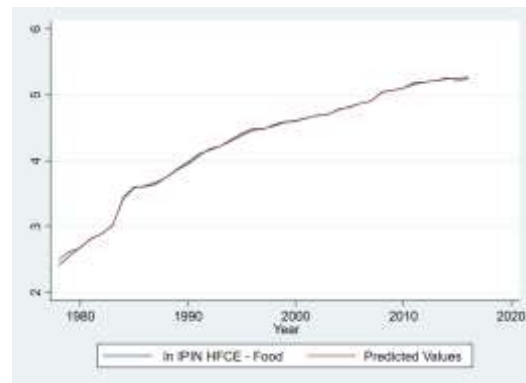
Panel C: Model Residuals
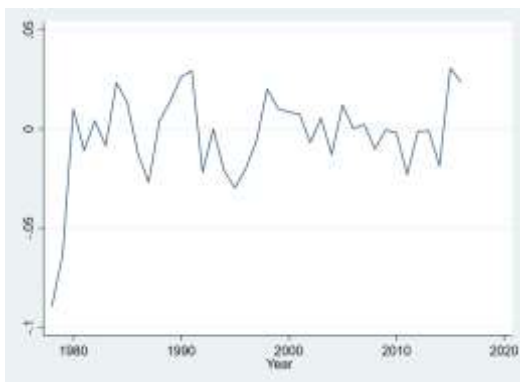
Panel D: Autocorrelation of Residuals
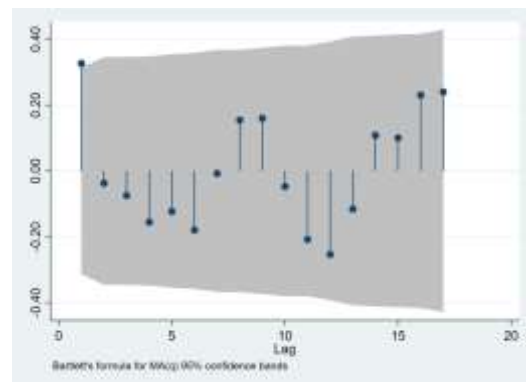
36. Implicit Price Index Household Final Consumption Expenditure – Medical

Estimation Period: 1990 – 2016

$$\Delta IPIN\ HFCE, Medical = \underbrace{\frac{-0.718\ IPIN\ HFCE, Medical_{t-1}}{(0.056)}}_{Adjustment}$$

$$\underbrace{\begin{array}{cc} -29.911 & +2.543\ Total\ Population \\ (3.169) & (0.097) \\ +0.086\ Import\ Duties\ Tax\ Rate & +\ 0.507 \\ (0.022) & (0.032) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} -0.041\ \Delta Import\ Duties\ Tax\ Rate \\ (0.019) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

| Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ^2 (31)	Portmanteau Q-Statistic χ^2 (16)	MAE	RMSE	R^2
75.331	-12.668	2.016	22.655	0.024	0.039	0.917
[0.000, 0.000]	[0.000, 0.000]	[0.155]	[0.123]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN HFCE – Medical are 0.090, 0.065, 0.017, and 0.396 respectively.

Figure 1. Actual v. Predicted IPIN HFCE – Medical, along with residuals

Panel A: Log first-difference
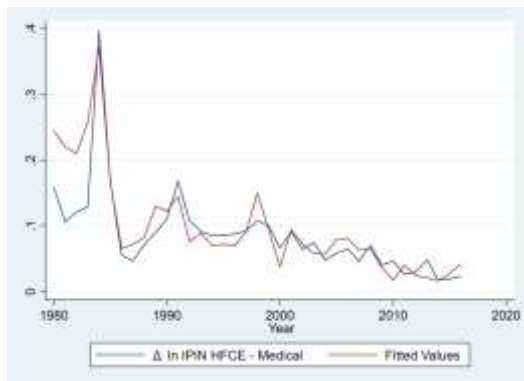
Panel B: Log level
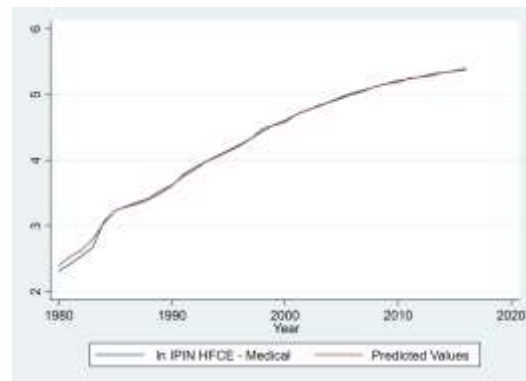
Panel C: Model Residuals

Panel D: Autocorrelation of Residuals
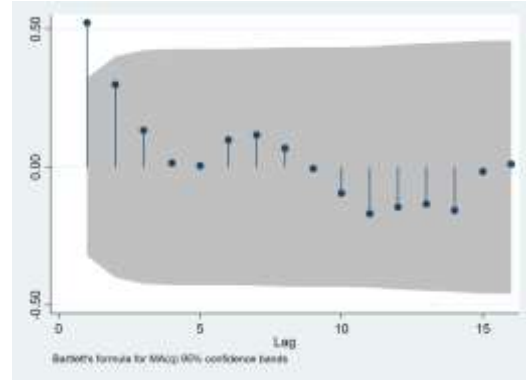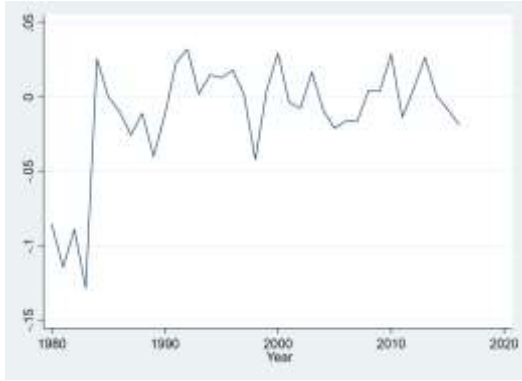
37. Implicit Price Index Household Final Consumption Expenditure – Housing
 Estimation Period: 1980 – 2016

$$\Delta IPIN\,HFCE, Housing = \underbrace{\frac{-\,IPIN\,HFCE, Housing_{t-1}}{(0.)}}_{Adjustment}$$

$$\underbrace{+\;\underset{(0.577)}{2.381}\;+\underset{(0.181)}{0.152}\,IPIN, Materials\,Imports}_{}$$
$$\underbrace{+\underset{(0.162)}{0.747}\,IPIN, Other\,Goods\,Imports\;+\underset{(0.465)}{2.194}\,Value\,Added\,Tax\,Rate}_{Long-run}$$

$$\underbrace{+\underset{(0.057)}{0.150}\,\Delta IPIN, Materials\,Imports}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Heteroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2\,(35)$	Portmanteau Q-Statistic $\chi 2\,(17)$	MAE	RMSE	R^2
9.574	-4.635	11.089	11.447	0.033	0.042	0.717
[0.000, 0.001]	[0.001, 0.010]	[0.000]	[0832]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN HFCE – Housing are 0.087, 0.069, -0.016,
 and 0.396 respectively.

Figure 1. Actual v. Predicted IPIN HFCE – Housing, along with residuals

Panel A: Log first-difference
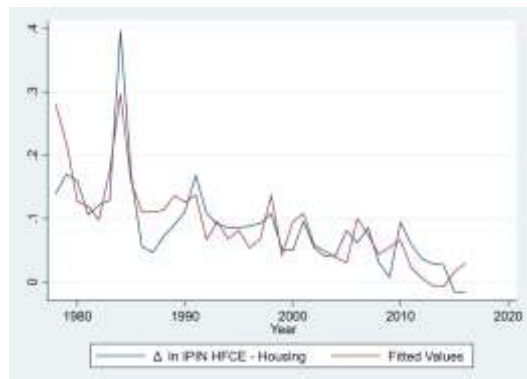
Panel B: Log level
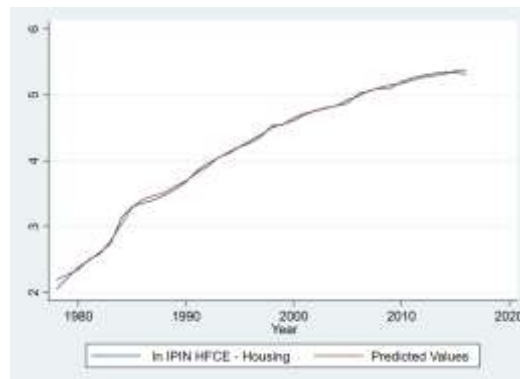
Panel C: Model Residuals
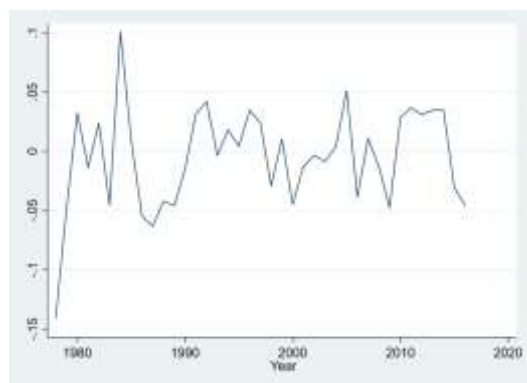
Panel D: Autocorrelation of Residuals
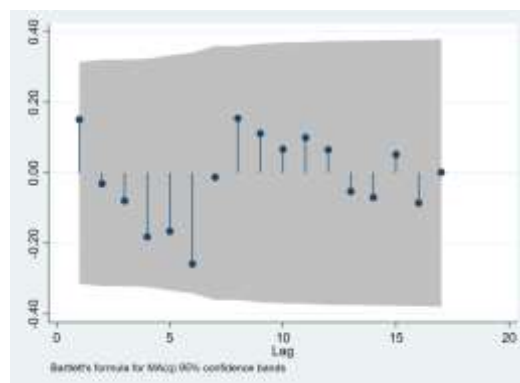
38. Implicit Price Index Household Final Consumption Expenditure – Non-Alcoholic Beverages
Estimation Period: 1981 – 2016

$$\Delta IPIN\ HFCE, Non-alcohol = \underbrace{\frac{-0.460\ HFCE, Non-alcohol_{t-1}}{(0.098)}}_{Adjustment}$$

$$\underbrace{+\ 0.356\ \underset{(0.091)}{} +0.106\ \underset{(0.034)}{IPIN, Agricultural\ Imports} +0.839\ \underset{(0.043)}{IPIN\ GVA, Agriculture}}_{Long-run}$$

$$\underbrace{+0.239\ \underset{(0.066)}{\Delta HFCE, Non-alcohol_{t-1}} +0.218\ \underset{(0.096)}{\Delta IPIN\ GVA, Agriculture}}_{Short-run}$$

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Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi^2 (34)$	Portmanteau Q-Statistic $\chi^2 (17)$	MAE	RMSE	R^2
9.095	-4.674	0.520	13.077	0.015	0.019	0.912
[0.001, 0.003]	[0.001, 0.005]	[0.470]	[0.730]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN HFCE – Non-Alcohol are 0.076, 0.071, 0.010, and 0.370 respectively.

Figure 1. Actual v. Predicted IPIN HFCE – Non-Alcohol, along with residuals

Panel A: Log first-difference
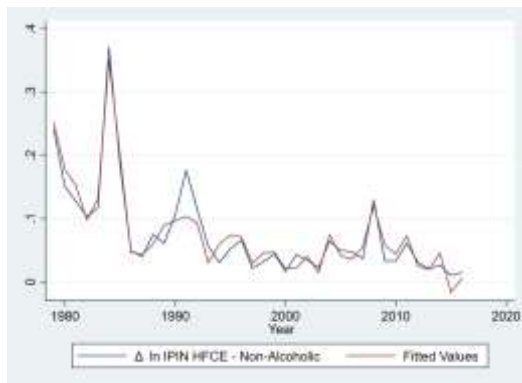
Panel B: Log level
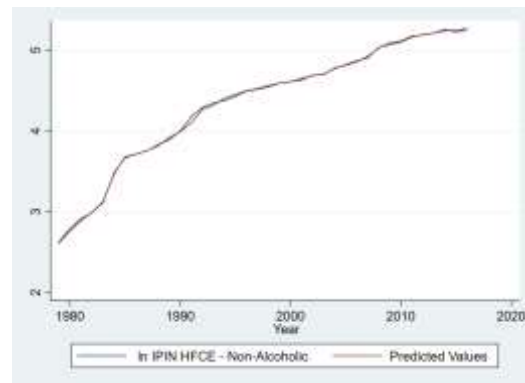
Panel C: Model Residuals
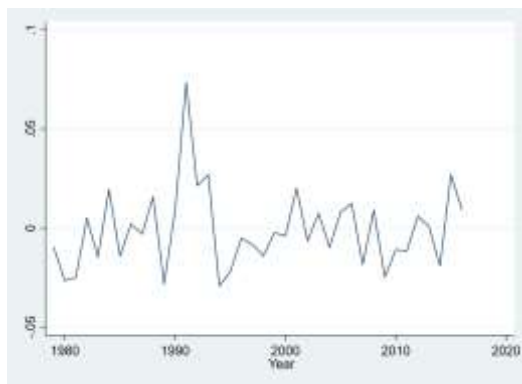
Panel D: Autocorrelation of Residuals
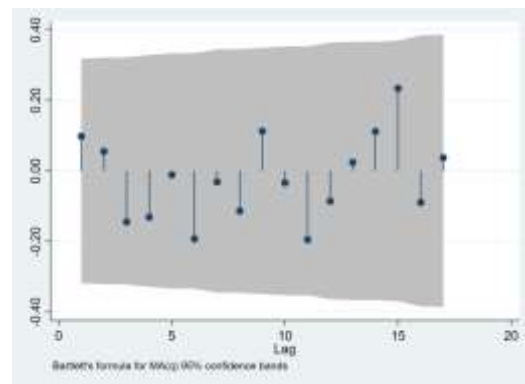
39. Implicit Price Index Household Final Consumption Expenditure – Miscellaneous

Estimation Period: 1990 – 2016

$$\Delta IPIN\ HFCE, Miscellaneous = \underbrace{\frac{-\ 0.352\ IPIN\ HFCE, Miscellaneous_{t-1}}{(0.097)}}_{Adjustment}$$

$$\underbrace{\begin{array}{cc} -\ 0.422 & +0.134\ Reverse\ Repurchase\ Rate \\ (0.221) & (0.081) \\ -2.095\ IPIN\ HFCE, Education & +3.300\ IPIN\ HFCE, Medical \\ (0.565) & (0.603) \end{array}}_{Long-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2\ (25)$	Portmanteau Q-Statistic $\chi 2\ (13)$	MAE	RMSE	R^2
19.981	-3.607	1.021	8.751	0.018	0.022	0.784
[0.000, 0.000]	[0.013, 0.081]	[0.312]	[0.791]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN HFCE – Miscellaneous are 0.084, 0.079, -0.009, and 0.464 respectively.

Figure 1. Actual v. Predicted IPIN HFCE – Miscellaneous, along with residuals

Panel A: Log first-difference
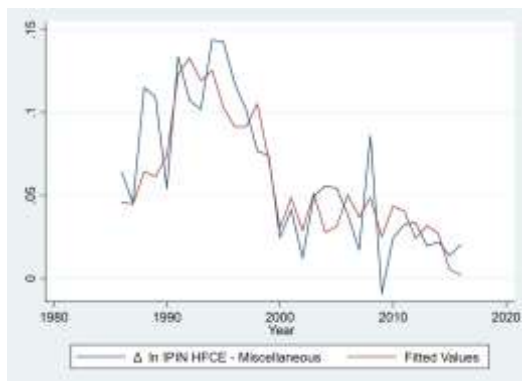
Panel B: Log level
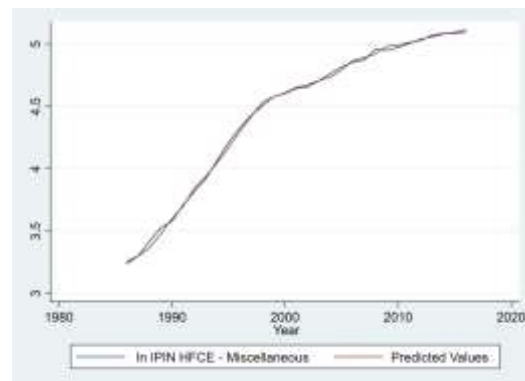
Panel C: Model Residuals
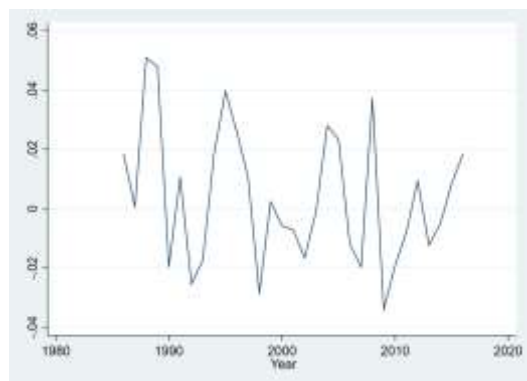
Panel D: Autocorrelation of Residuals
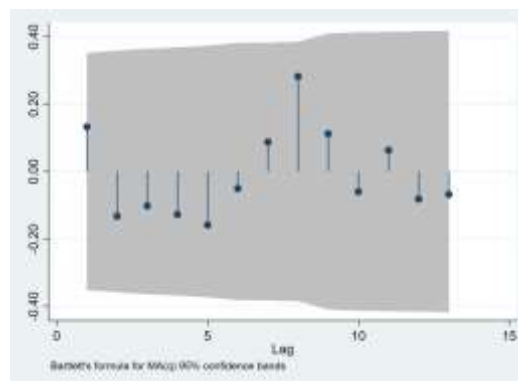
40. Implicit Price Index Household Final Consumption Expenditure – Tobacco

Estimation Period: 1982 – 2016

$$\Delta IPIN\ HFCE, Tobacco = \underbrace{\frac{-1.514\ IPIN\ HFCE, Tobacco_{t-1}}{(0.168)}}_{Adjustment}$$

$$\underbrace{+\ \underset{(0.203)}{0.056} + \underset{(0.009)}{0.120}\ Tobacco\ Tax\ Rate\ (Share\ of\ Price) + \underset{(0.014)}{0.705}\ IPIN\ GVA, Agriculture}$$

$$\underbrace{+ \underset{(0.014)}{0.087}\ IPIN, Agricultural\ Imports + \underset{(0.023)}{0.149}\ Wage\ Index, Manufacturing + \underset{(0.015)}{0.247}\ USD\ Nominal\ Exchange\ Rate}_{Long-run}$$

$$\underbrace{-\underset{(0.128)}{0.524}\ \Delta IPIN\ GVA, Agriculture - \underset{(0.061)}{0.155}\ \Delta USD\ Nominal\ Exchange\ Rate}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (33)	Portmanteau Q-Statistic χ2 (17)	MAE	RMSE	R^2
16.292	-9.006	0.229	14.426	0.027	0.051	0.939
[0.000, 0.000]	[0.000, 0.000]	[0.631]	[0.636]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN HFCE – Tobacco are 0.076, 0.075, 0.022, and 0.464 respectively.

Figure 1. Actual v. Predicted IPIN HFCE – Tobacco, along with residuals

Panel A: Log first-difference
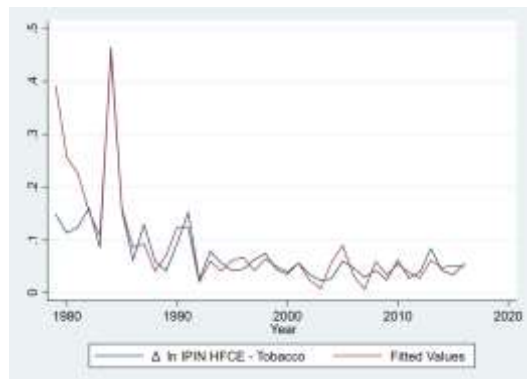
Panel B: Log level
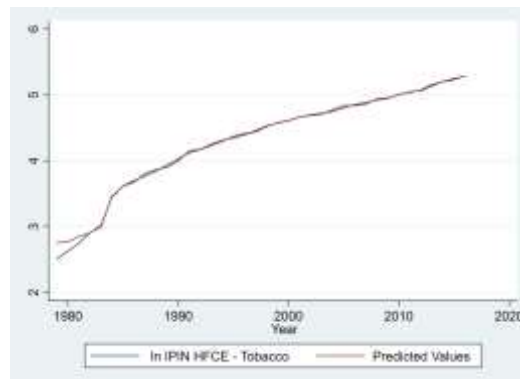
Panel C: Model Residuals
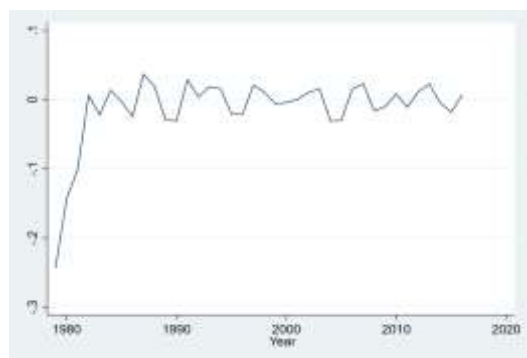
Panel D: Autocorrelation of Residuals
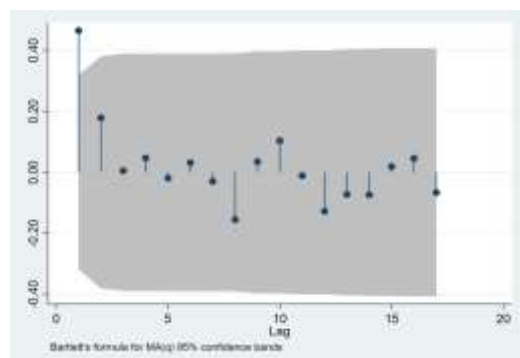
41. Implicit Price Index Household Final Consumption Expenditure – Transportation and Communication
Estimation Period: 1981 – 2016

$$\Delta IPIN\ HFCE, Transportation\ and\ Communication$$
$$= \underbrace{-0.441\ IPIN\ HFCE, Transportation\ and\ Communication_{t-1}}_{Adjustment}$$
$$\underset{(0.106)}{}$$

$$\underbrace{+\ 0.374 \underset{(0.129)}{} +0.124\ IPIN, Fuel\ Imports \underset{(0.030)}{} +0.832\ IPIN\ GVA, Manufacturing \underset{(0.050)}{}}_{Long-run}$$

$$\underbrace{+0.456\ \Delta IPIN\ HFCE, Transportation\ and\ Communication_{t-1} \underset{(0.141)}{} +0.630\ \Delta IPIN\ GVA, Manufacturing \underset{(0.156)}{}}$$
$$\underbrace{-0.548\ \Delta IPIN\ GVA, Manufacturing_{t-1}}_{Short-run}$$
$$\underset{(0.184)}{}$$

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Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2$ (34)	Portmanteau Q-Statistic $\chi 2$ (17)	MAE	RMSE	R^2
6.133	-4.149	0.237	17.873	0.029	0.038	0.857
[0.009, 0.029]	[0.003, 0.017]	[0.625]	[0.396]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN HFCE – Transportation and Communication are 0.083, 0.104, -0.017, and 0.468 respectively.

Figure 1. Actual v. Predicted IPIN HFCE – Transportation and Communication, along with residuals

Panel A: Log first-difference
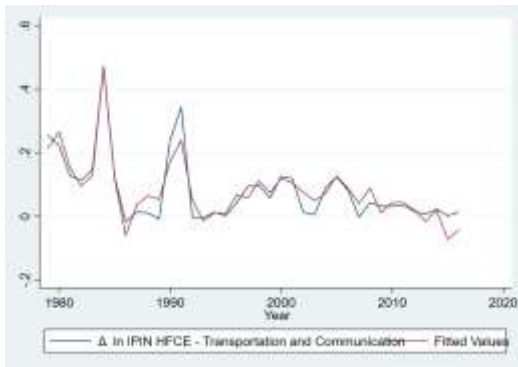
Panel B: Log level
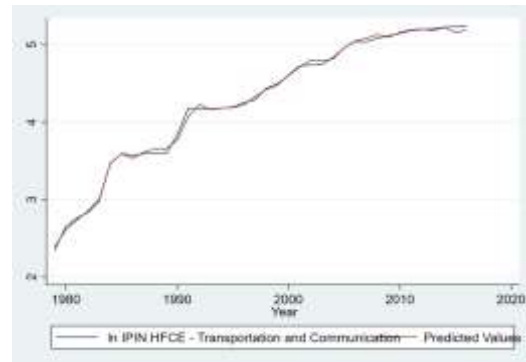
Panel C: Model Residuals
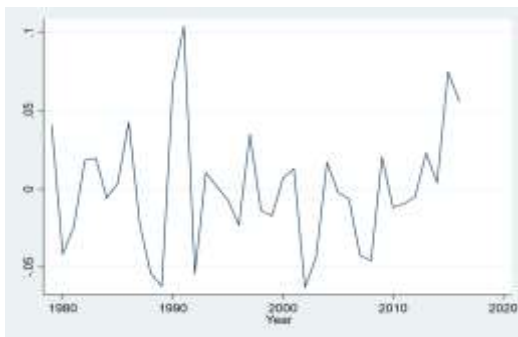
Panel D: Autocorrelation of Residuals
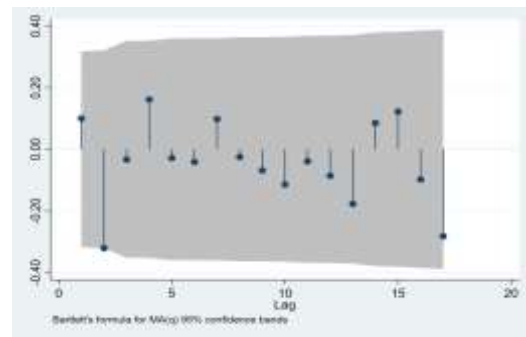
42. Implicit Price Index Household Final Consumption Expenditure – Utilities

Estimation Period: 1981 – 2016

$$\Delta IPIN\ HFCE, Utilities = \underbrace{\frac{-0.881\ IPIN\ HFCE, Utilities_{t-1}}{(0.139)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} +\ 0.750\ +0.656\ IPIN\ GVA, Water +0.100\ IPIN\ GVA, Electricity\ and\ Steam \\ (0.284) \qquad\qquad (0.072) \qquad\qquad\qquad (0.120) \\ +0.099\ USD\ Nominal\ Exchange\ Rate +0.186\ JPY\ Nominal\ Exchange\ Rate \\ (0.097) \qquad\qquad\qquad\qquad (0.050) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} +0.249\ \Delta IPIN\ HFCE, Utilities_{t-1} -0.379\ \Delta IPIN\ HFCE, Utilities_{t-2} -0.266\ \Delta IPIN\ GVA, Water \\ (0.127) \qquad\qquad\qquad (0.126) \qquad\qquad\qquad (0.103) \\ -0.345\ \Delta IPIN\ GVA, Water_{t-1} +0.022\ \Delta IPIN\ GVA, Water_{t-2} -0.130\ \Delta IPIN\ GVA, Water_{t-3} \\ (0.082) \qquad\qquad\qquad (0.068) \qquad\qquad\qquad (0.060) \\ -0.012\ \Delta IPIN\ GVA, Electricity\ and\ Steam +0.319 \Delta IPIN\ GVA, Electricity\ and\ Steam_{t-1} \\ (0.112) \qquad\qquad\qquad\qquad (0.097) \\ +0.418\ \Delta IPIN\ GVA, Electricity\ and\ Steam_{t-2} +0.172\ \Delta IPIN\ GVA, Electricity\ and\ Steam_{t-3} \\ (0.084) \qquad\qquad\qquad\qquad (0.079) \\ +0.334\ \Delta USD\ Nominal\ Exchange\ Rate -0.101\ \Delta JPY\ Nominal\ Exchange\ Rate \\ (0.116) \qquad\qquad\qquad\qquad (0.072) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (34)	Portmanteau Q-Statistic χ2 (16)	MAE	RMSE	R²
11.653	-6.296	0.219	6.928	0.016	0.023	0.950
[0.000, 0.001]	[0.000, 0.001]	[0.639]	[0.974]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN HFCE – Utilities are 0.091, 0.094, -0.018, and 0.441 respectively.

Figure 1. Actual v. Predicted IPIN HFCE – Utilities, along with residuals

Panel A: Log first-difference
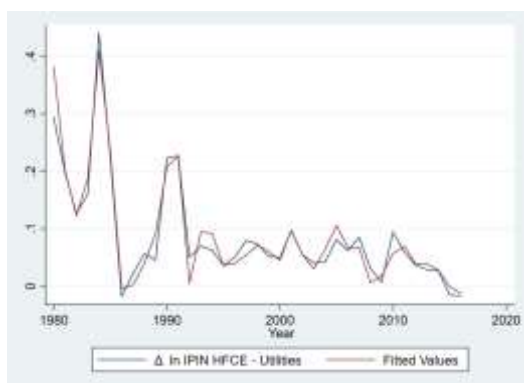
Panel B: Log level
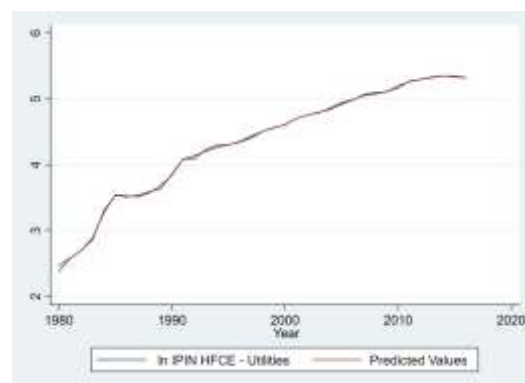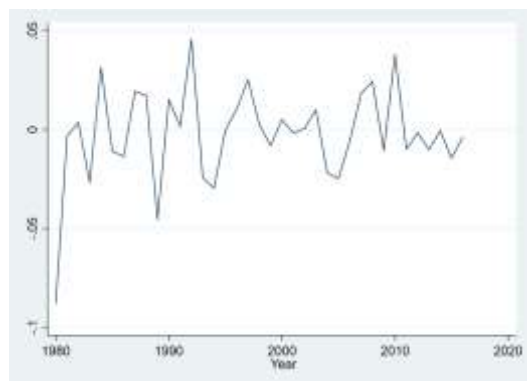
Panel C: Model Residuals   Panel D: Autocorrelation of Residuals
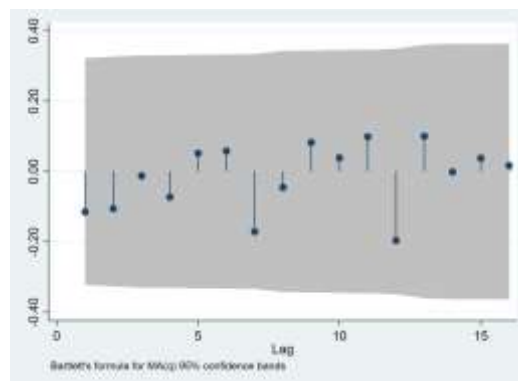
43. Capital Formation – Change in Inventory, Real
Estimation Period: 1968 – 2016

$$\Delta Change\ in\ Inventory = \underbrace{\frac{-\ Change\ in\ Inventory_{t-1}}{(0.)}}_{Adjustment}$$

$$\underbrace{\begin{array}{cc} -\ 3.348 * 10^5 & +1.345 * 10^3\ USD\ Nominal\ Exchange\ Rate \\ (1.508 * 10) & (0.524) \\ -2.451 * 10^3 Depreciation\ of\ Assets & -147.409\ Inflation\ Rate \\ (0.604) & (0.719) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{cc} -\Delta 1.148 * 10^3\ \Delta USD\ Nominal\ Exchange\ Rate & +1.001 * 10^3 \Delta Depreciation\ of\ Assets \\ (0.001) & (0.074) \\ +126.825\ \Delta Inflation\ Rate & +177.592\ \Delta Year \\ (0.645) & (0.354) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2\ (47)$	Portmanteau Q-Statistic $\chi 2\ (22)$	MAE	RMSE	R^2
7.192	-5.279	1.361	16.246	359.095	505.143	0.427
[0.003, 0.012]	[0.000, 0.005]	[0.243]	[0.803]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Change in Inventory are 1.054, 563.583, -1905.255, and 1796.208 respectively.

Figure 1. Actual v. Predicted Change in Inventory, along with residuals

Panel A: Log first-difference
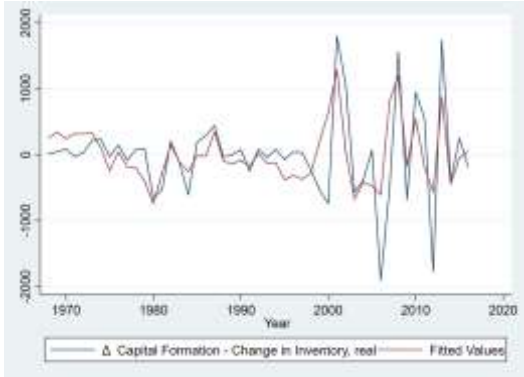
Panel B: Log level
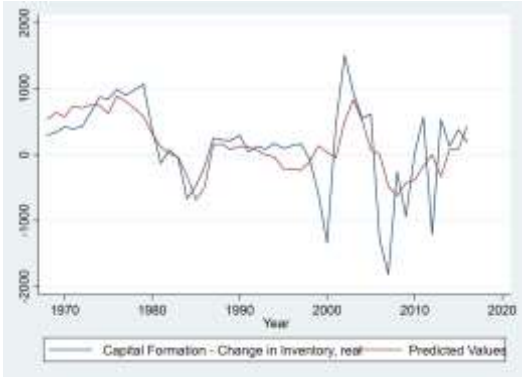
Panel C: Model Residuals
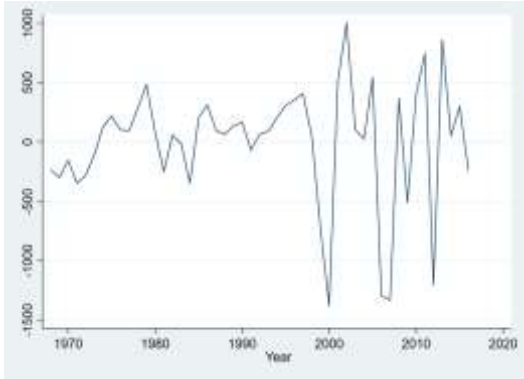
Panel D: Autocorrelation of Residuals
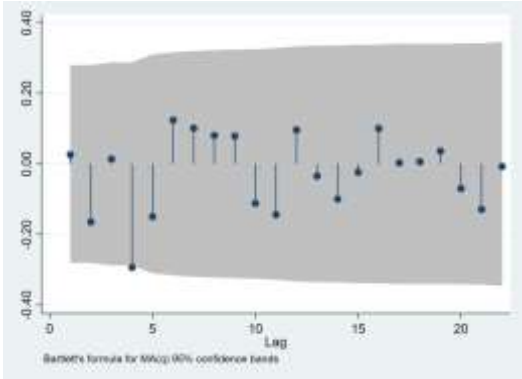
44. Capital Formation – Fixed – Durables, Real
Estimation Period: 1990 – 2016

$$\Delta Durables = \underbrace{\frac{-0.855\ Durables_{t-1}}{(0.160)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -\ 2.555\ +0.700\ Machinery\ Imports, Real \\ (1.734) \qquad\qquad (0.096) \\ -0.477\ Reverse\ Repurchase\ Rate +0.917\ USD\ Real\ Exchange\ Rate \\ (0.033) \qquad\qquad\qquad (0.244) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} +0.699\ \Delta Durables +0.118\ \Delta Machinery\ Imports, Real -0.385\ \Delta Machinery\ Imports, Real \\ (0.188) \qquad\qquad (0.121) \qquad\qquad\qquad (0.101) \\ +0.180\ \Delta Reverse\ Repurchase\ Rate -1.127\ \Delta USD\ Real\ Exchange\ Rate -0.593\ \Delta USD\ Real\ Exchange\ Rate \\ (0.095) \qquad\qquad\qquad (0.309) \qquad\qquad\qquad (0.227) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (25)	Portmanteau Q-Statistic χ2 (13)	MAE	RMSE	R^2
8.609	-5.323	0.532	6.518	0.037	0.047	0.839
[0.002, 0.008]	[0.000, 0.005]	[0.465]	[0.925]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Durables are 0.082, 0.217, -0.447, and 1.402 respectively.

Figure 1. Actual v. Predicted Durables, along with residuals

Panel A: Log first-difference
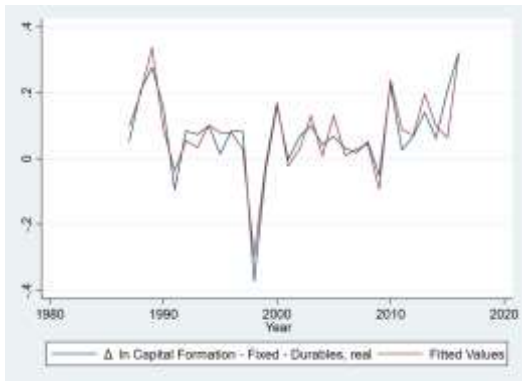
Panel B: Log level
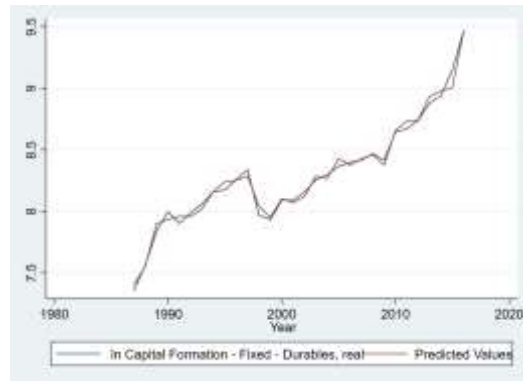
Panel C: Model Residuals
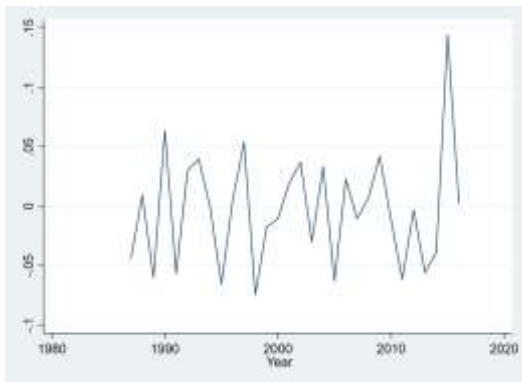
Panel D: Autocorrelation of Residuals
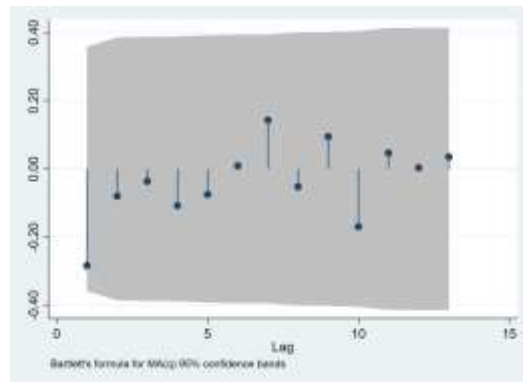
45. Capital Formation - Fixed - Private Construction, Real

Estimation Period: 1977 – 2016

$$\Delta Private\ Construction = \underbrace{\frac{-0.381\ Private\ Construction_{t-1}}{(0.066)}}_{Adjustment}$$

$$\underbrace{+\ 13.557 + 0.778\ Durables - 0.631\ Lending\ Rate}_{Long-run}$$
$$\quad\ \ (4.388)\qquad (0.150)\qquad\qquad (0.143)$$

$$\underbrace{-0.006\ \Delta Year}_{Short-run}$$
$$\qquad (0.)$$

Table A1. Summary of model tests

Bounds Tests		Heteroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (38)	Portmanteau Q-Statistic χ2 (20)	MAE	RMSE	R^2
21.066	-5.765	2.348	9.007	0.064	0.088	0.662
[0.000, 0.000]	[0.000, 0.001]	[0.125]	[0.982]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Private Construction are 0.040, 0.151, -0.491, and 0.435 respectively.

Figure 1. Actual v. Predicted Private Construction, along with residuals

Panel A: Log first-difference
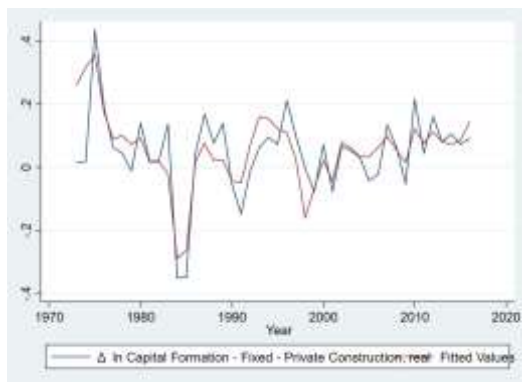
Panel B: Log level
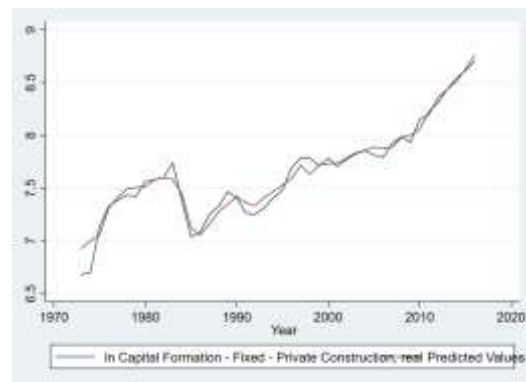
Panel C: Model Residuals
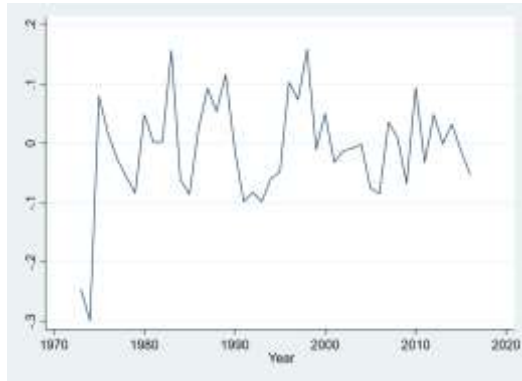
Panel D: Autocorrelation of Residuals
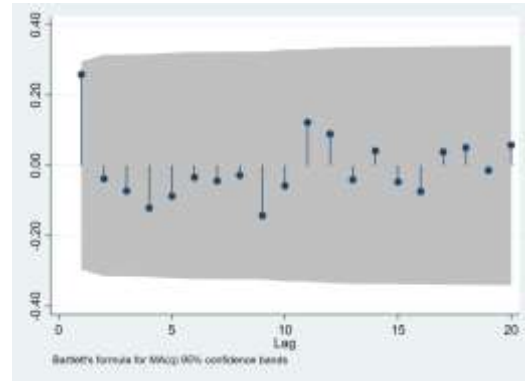
46. Capital Formation - Fixed - Public Construction, Real
Estimation Period: 1974 – 2016

$$\Delta Public\ Construction = \underbrace{\frac{-0.666\ Public\ Construction_{t-1}}{(0.108)}}_{Adjustment}$$

$$\underbrace{+\ 3.835\ +0.576\ Resources\ of\ the\ Financial\ System}_{}$$
$$(0.602) \qquad (0.099)$$
$$\underbrace{+0.223\ 91day\ TBill\ Rate -1.072\ USD\ Nominal\ Exchange\ Rate}_{Long-run}$$
$$(0.070) \qquad\qquad (0.)$$

$$\underbrace{+0.247\ \Delta Public\ Construction_{t-1}}_{Short-run}$$
$$(0.115)$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (41)	Portmanteau Q-Statistic χ2 (21)	MAE	RMSE	R^2
11.099	-6.124	0.190	12.281	0.156	0.232	0.561
[0.000, 0.000]	[0.000, 0.000]	[0.662]	[0.931]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Public Construction are 0.079, 0.298, -0.804, and 1.311 respectively.

Figure 1. Actual v. Predicted , along with residuals

Panel A: Log first-difference
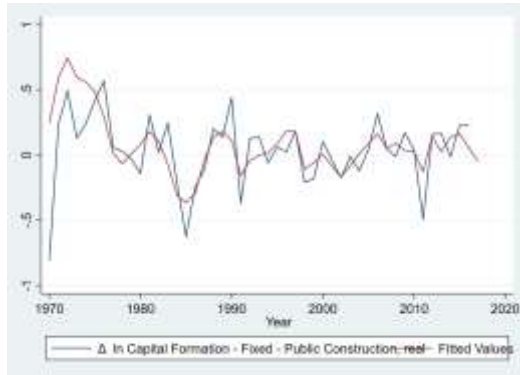

Panel B: Log level

Panel C: Model Residuals
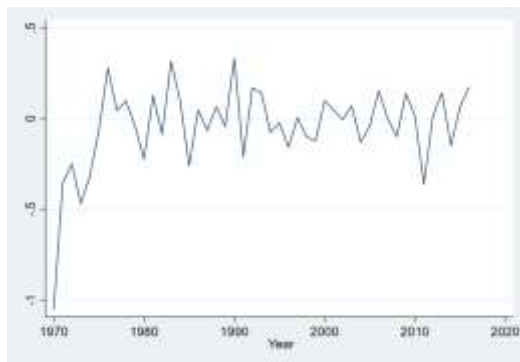
Panel D: Autocorrelation of Residuals
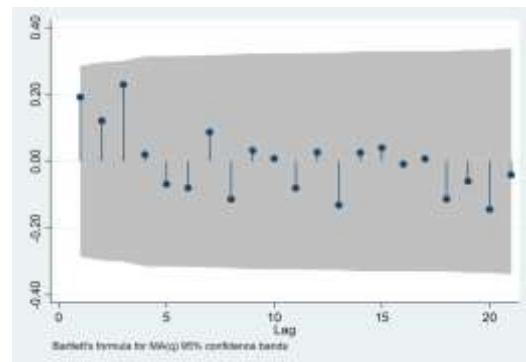
47. Net Compensation
 Estimation Period: 1996 – 2016

$$\Delta Net\ Compensation = \underbrace{\frac{-0.604\ Net\ Compensation_{t-1}}{(0.168)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} +\ 1.207\ +0.104\ Real\ Interest\ Rate \\ (0.425)\quad\ \ (0.037) \\ +2.616\ CPI, Philippines +0.051\ Total\ Loans \\ (0.143)\qquad\qquad (0.058) \end{array}}_{Long-run}$$

$$\underbrace{+1.381\ \Delta CPI, Philippines -0.736\ \Delta CPI, Philippines_{t-1} +0.219\ \Delta Total\ Loans}_{Short-run}$$
$$(0.545)\qquad\qquad (0.356)\qquad\qquad\quad (0.056)$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2$ (19)	Portmanteau Q-Statistic $\chi 2$ (9)	MAE	RMSE	R^2
7.379	-3.593	0.086	6.387	0.017	0.020	0.856
[0.006, 0.021]	[0.017, 0.086]	[0.768]	[0.700]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Net Compensation are , , , and respectively.

Figure 1. Actual v. Predicted Net Compensation, along with residuals

Panel A: Log first-difference
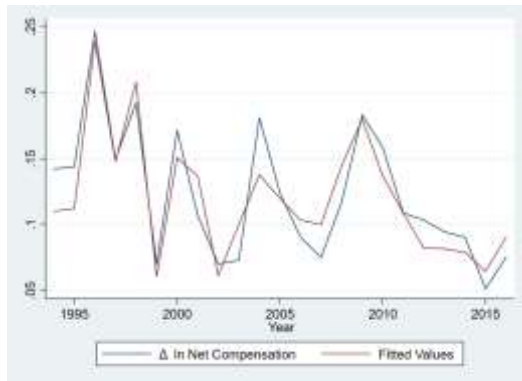
Panel B: Log level
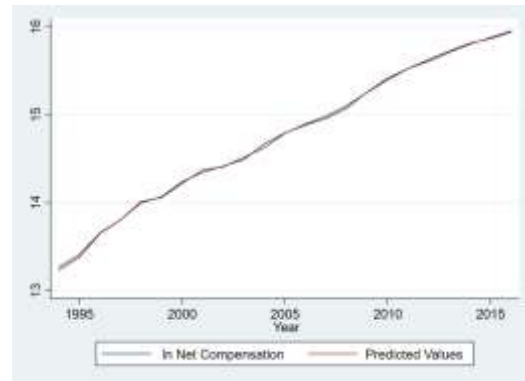
Panel C: Model Residuals
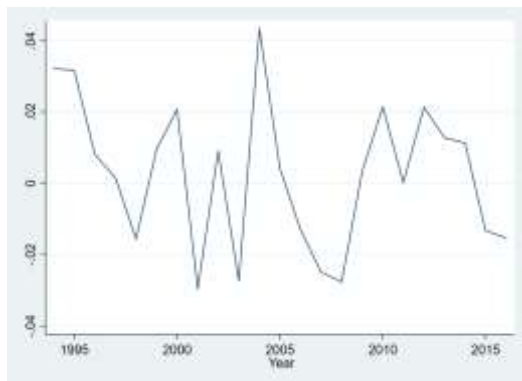
Panel D: Autocorrelation of Residuals
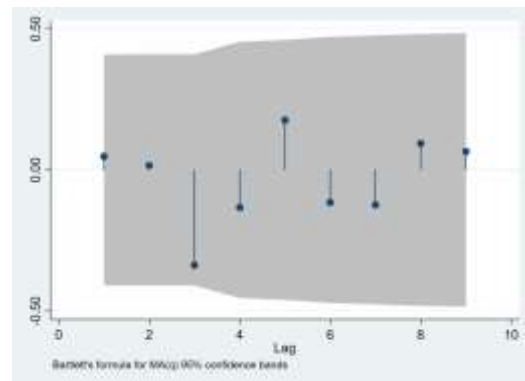
48. Operating Surplus

Estimation Period: 1996 – 2016

$$\Delta Operating\ Surplus = \underbrace{\frac{-0.133\ Operating\ Surplus_{t-1}}{(0.034)}}_{Adjustment}$$

$$\underbrace{\begin{array}{cc} +\ 1.060 & -0.307\ Real\ Interest\ Rate \\ (0.218) & (0.071) \\ -0.326\ Total\ Loans & +1.389\ Capital\ Formation - Fixed, Real \\ (0.356) & (0.541) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} -0.114\ \Delta Total\ Loans \\ (0.070) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2$ (19)	Portmanteau Q-Statistic $\chi2$ (9)	MAE	RMSE	R^2
5.892	-3.865	1.719	5.573	0.018	0.028	0.622
[0.013, 0.041]	[0.010, 0.058]	[0.189]	[0.781]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Operating Surplus are 0.125, 0.082, 0.016, and 0.443 respectively.

Figure 1. Actual v. Predicted Operating Surplus, along with residuals

Panel A: Log first-difference

Panel B: Log level

86
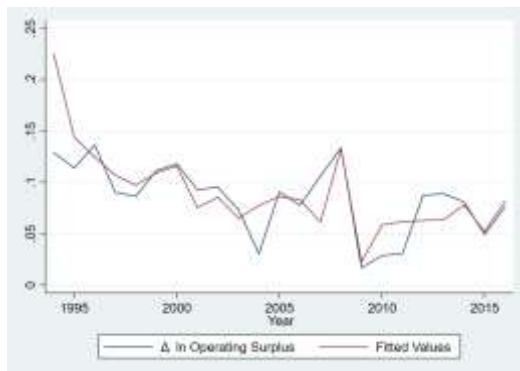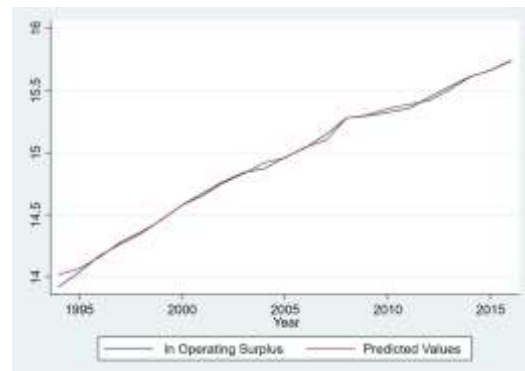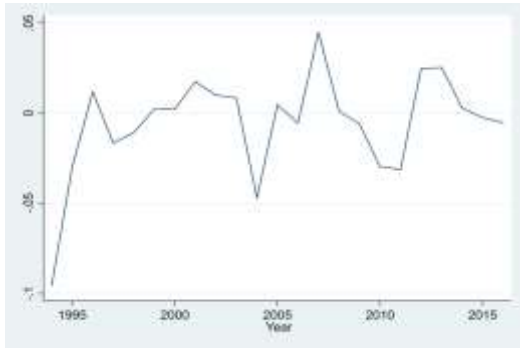
Panel C: Model Residuals   Panel D: Autocorrelation of Residuals
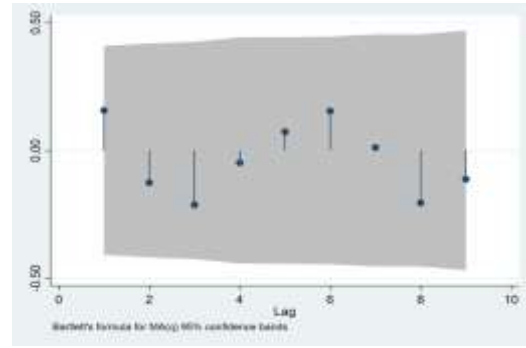
49. Net Property Income
Estimation Period: 1990 – 2016

$$\Delta Net\ Property\ Income = \underbrace{- 0.639\ Net\ Property\ Income_{t-1}}_{Adjustment}$$
$$(0.156)$$

$$\underbrace{- \ 3.089 * 10^5 \ + 1.805 * 10^5 Reverse\ Repurchase\ Rate}_{Long-run}$$
$$(7.463 * 10^4) \qquad\qquad (0.453)$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2\ (25)$	Portmanteau Q-Statistic $\chi 2\ (13)$	MAE	RMSE	R^2
8.667	-4.084	2.525	16.291	$2.583*10^4$	$3.494*10^4$	0.419
[0.008, 0.015]	[0.004, 0.011]	[0.112]	[0.233]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Net Property Income are , , , and respectively.

Figure 1. Actual v. Predicted Net Property Income, along with residuals

Panel A: Log first-difference   Panel B: Log level

87
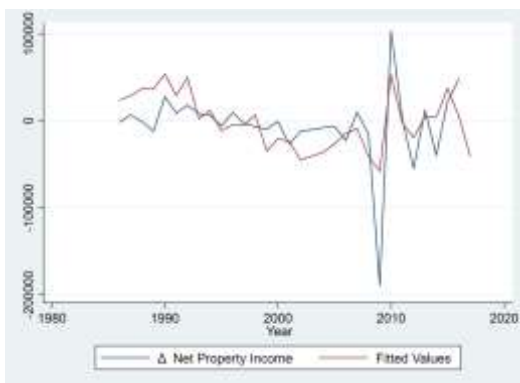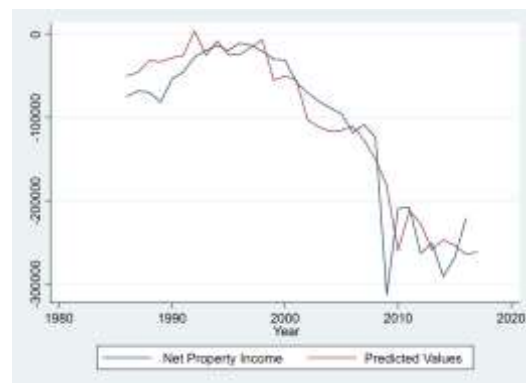
Panel C: Model Residuals
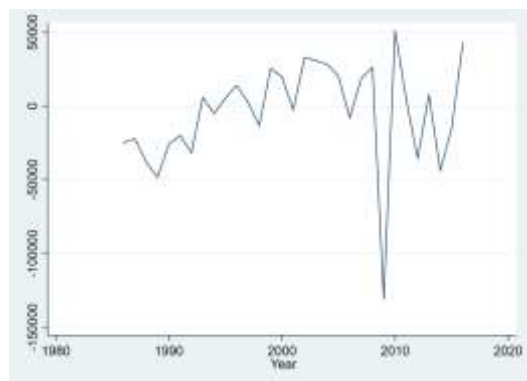
Panel D: Autocorrelation of Residuals
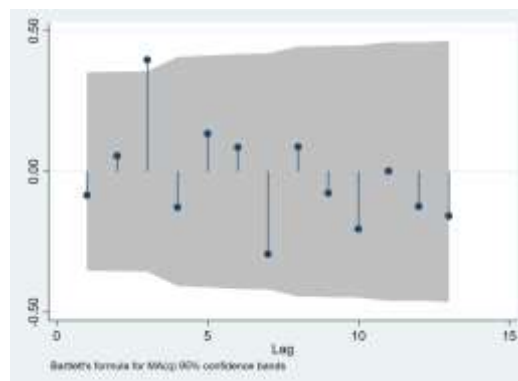
50. Employment in Agriculture

Estimation Period: 1982 – 2016

$$\Delta Employment\ in\ Agriculture = \underbrace{\begin{matrix} -0.830\ Employment\ in\ Agriculture_{t-1} \\ (0.110) \end{matrix}}_{Adjustment}$$

$$\underbrace{\begin{matrix} +\ 23.854 + 0.270\ IPIN, Agricultural\ Imports - 0.354\ Wage\ Index, Private\ Service \\ (4.247) \qquad\qquad (0.026) \qquad\qquad\qquad (0.054) \\ -0.214\ Wage\ Index, Manufacturing + 0.376\ Wage\ Index, Agriculture \\ (0.047) \qquad\qquad\qquad (0.101) \end{matrix}}_{Long-run}$$

$$\underbrace{\begin{matrix} -0.188\ \Delta IPIN, Agricultural\ Imports - 0.156\ \Delta IPIN, Agricultural\ Imports_{t-1} - 0.108\ \Delta IPIN, Agricultural\ Imports_{t-2} \\ (0.035) \qquad\qquad\qquad (0.027) \qquad\qquad\qquad (0.026) \\ +0.118\ \Delta Wage\ Index, Private\ Service + 0.221\ \Delta Wage\ Index, Private\ Service_{t-1} - 0.254\ \Delta Wage\ Index, Manufacturing \\ (0.047) \qquad\qquad\qquad (0.046) \qquad\qquad\qquad (0.057) \\ +0.260\ \Delta Wage\ Index, Agriculture - 0.349\ \Delta Wage\ Index, Agriculture_{t-1} \\ (0.130) \qquad\qquad\qquad (0.118) \\ -0.250\ \Delta Wage\ Index, Agriculture_{t-2} - 0.007\ \Delta Year \\ (0.082) \qquad\qquad\qquad (0.001) \end{matrix}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Heteroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2\ (33)$	Portmanteau Q-Statistic $\chi 2\ (16)$	MAE	RMSE	R^2
15.283	-7.525	0.270	9.603	0.011	0.015	0.875
[0.000, 0.000]	[0.000, 0.000]	[0.602]	[0.886]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Employment in Agriculture are 0.009, 0.035, -0.111, and 0.071 respectively.

Figure 1. Actual v. Predicted Employment in Agriculture, along with residuals

Panel A: Log first-difference
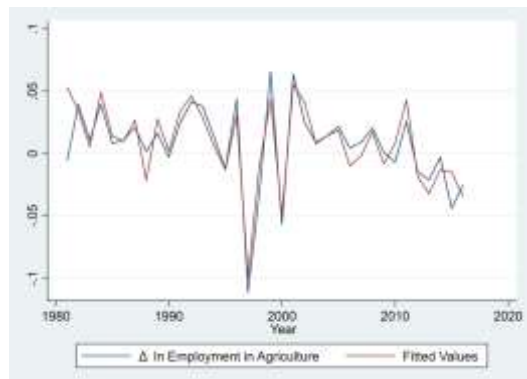
Panel B: Log level
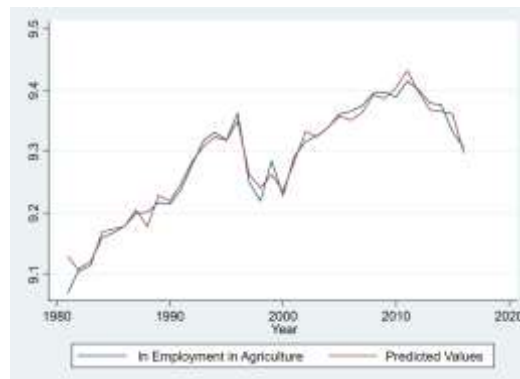
Panel C: Model Residuals
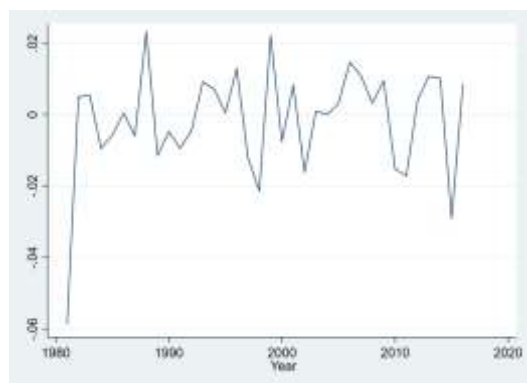
Panel D: Autocorrelation of Residuals
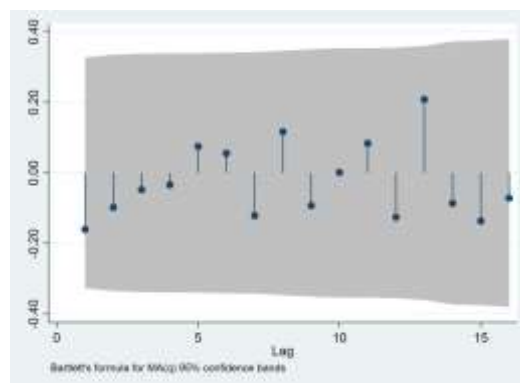
51. Employment in Industry

Estimation Period: 1984 – 2016

$$\Delta Employment\ in\ Industry = \underbrace{\frac{-0.963\ Employment\ in\ Industry_{t-1}}{(0.168)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -\ 9.875\ +0.187\ Machinery\ Imports, Real \\ (2.092)\quad\quad\quad (0.015) \\ -0.083\ BPO\ Service\ Exports, Real +0.959\ Total\ Population \\ (0.013)\quad\quad\quad\quad\quad\quad (0.) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} -0.009\ \Delta Machinery\ Imports, Real -0.101\ \Delta Machinery\ Imports, Real_{t-1} -0.077\ \Delta Machinery\ Imports, Real_{t-2} \\ (0.025)\quad\quad\quad\quad\quad (0.021)\quad\quad\quad\quad\quad\quad (0.027) \\ +0.043\ \Delta BPO\ Service\ Exports, Real +0.054\ \Delta BPO\ Service\ Exports, Real_{t-1} +0.033\ \Delta BPO\ Service\ Exports, Real_{t-2} \\ (0.014)\quad\quad\quad\quad\quad\quad (0.012)\quad\quad\quad\quad\quad\quad\quad (0.13) \\ -0.049\ \Delta Total\ Population -1.533\ \Delta Total\ Population_{t-1} -2.024\ \Delta Total\ Population_{t-2} \\ (0.665)\quad\quad\quad\quad\quad (0.831)\quad\quad\quad\quad\quad (0.724) \end{array}}_{Short-run}$$
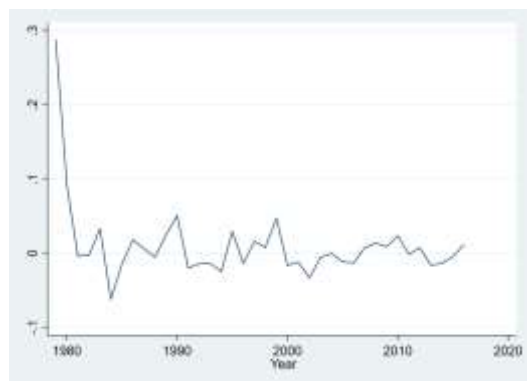
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Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2$ (31)	Portmanteau Q-Statistic $\chi 2$ (15)	MAE	RMSE	R^2
11.714	-5.721	0.927	6.632	0.011	0.017	0.838
[0.000, 0.001]	[0.000, 0.002]	[0.335]	[0.967]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Employment in Industry are 0.031, 0.034, -0.014, and 0.132 respectively.

Figure 1. Actual v. Predicted Employment in Industry, along with residuals

Panel A: Log first-difference
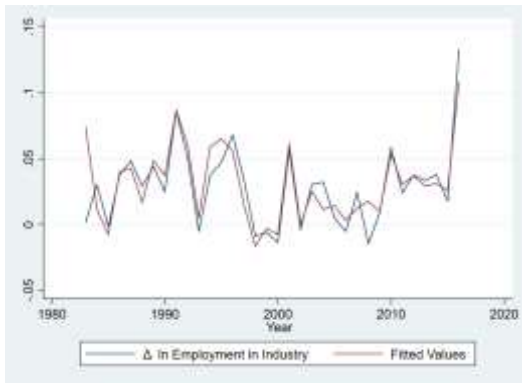
Panel B: Log level
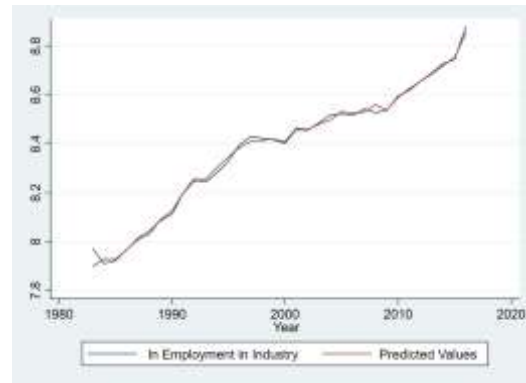
Panel C: Model Residuals
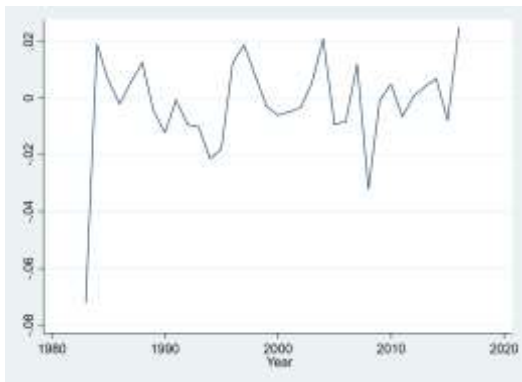
Panel D: Autocorrelation of Residuals
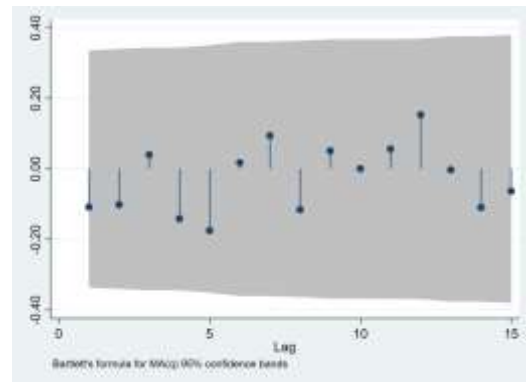
52. Employment in Service

Estimation Period: 1984 – 2016

$$\Delta Employment\ in\ Service = \underbrace{\frac{-0.967\ Employment\ in\ Service_{t-1}}{(0.191)}}_{Adjustment}$$

$$\underbrace{\begin{array}{ccc} -19.275 & +0.105\ GVA\ Service, Real & +1.560\ Total\ Population \\ (4.052) & (0.034) & (0.073) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} +0.422\ \Delta Employment\ in\ Service_{t-1} +0.509\ \Delta Employment\ in\ Service_{t-2} +0.549\ \Delta Employment\ in\ Service_{t-3} \\ (0.197) \qquad\qquad (0.183) \qquad\qquad (0.196) \\ -1.184\ \Delta Total\ Population -0.969\ \Delta Total\ Population_{t-1} \\ (0.536) \qquad\qquad (0.512) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (31)	Portmanteau Q-Statistic χ2 (15)	MAE	RMSE	R^2
9.106	-5.048	0.226	14.715	0.010	0.014	0.540
[0.001, 0.005]	[0.000, 0.003]	[0.634]	[0.472]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Employment in Service are 0.040, 0.018, 0.016, and 0.082 respectively.

Figure 1. Actual v. Predicted Employment in Service, along with residuals

Panel A: Log first-difference
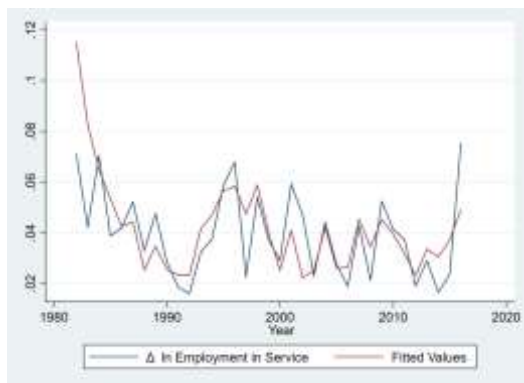
Panel B: Log level
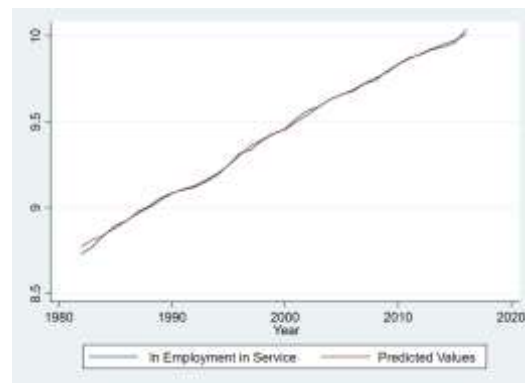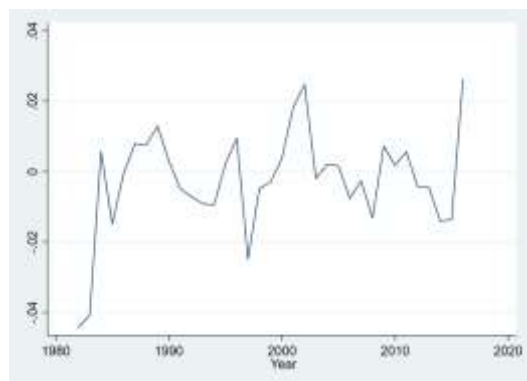
Panel C: Model Residuals   Panel D: Autocorrelation of Residuals
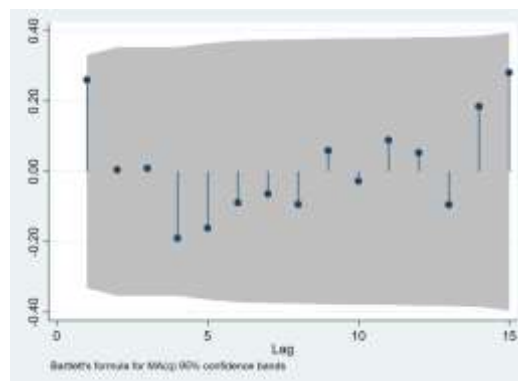
53. Labor Force
Estimation Period: 1982 – 2016

$$\Delta Labor\ Force = \underbrace{\frac{-0.596\ Labor\ Force_{t-1}}{(0.130)}}_{Adjustment}$$

$$\underbrace{+\ 4.957\ \underset{(1.043)}{}\ +0.086\ Total\ Use\ of\ Government\ Income}_{} $$
$$\underset{(0.026)}{}$$
$$\underbrace{-0.053\ Export\ of\ Services, Real\ +0.117\ Compensation\ of\ Residents}_{Long-run}$$
$$\underset{(0.012)}{}\qquad\qquad\underset{(0.026)}{}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2\ (33)$	Portmanteau Q-Statistic $\chi2\ (16)$	MAE	RMSE	R^2
7.418	-4.579	1.457	19.049	0.10	0.014	0.497
[0.001, 0.006]	[0.001, 0.012]	[0.227]	[0.266]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Labor Force are 0.026, 0.025, -0.033, and 0.092 respectively.

Figure 1. Actual v. Predicted Labor Force, along with residuals

Panel A: Log first-difference
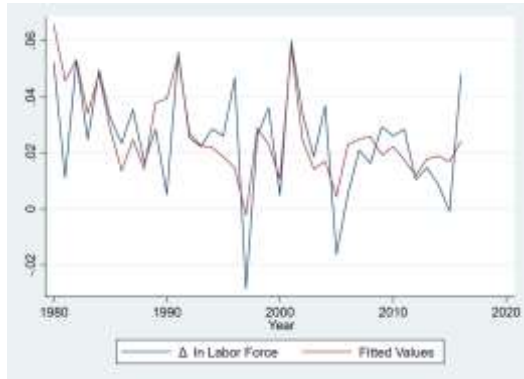
Panel B: Log level
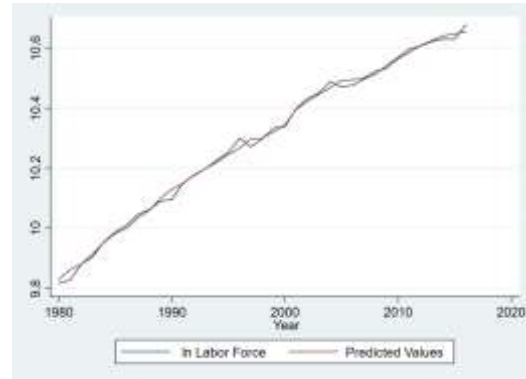
Panel C: Model Residuals
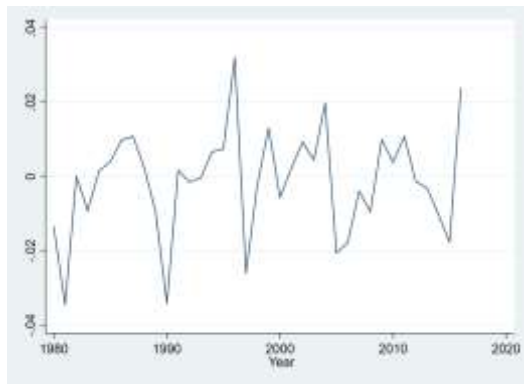
Panel D: Autocorrelation of Residuals
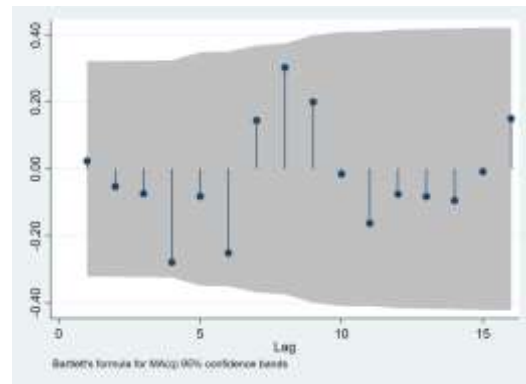
54. Unemployment Rate
Estimation Period: 1967 – 2016

$$\Delta Unemployment\ Rate = \underbrace{\frac{-1.354\ Unemployment\ Rate_{t-1}}{(0.135)}}_{Adjustment}$$

$$\underbrace{+\ 10.720 - 0.660\ Labor\ Force + \ 0.501}_{Long-run}$$
$$\quad (1.228) \qquad (0.056) \qquad (0.033)$$

$$+1.144\ \Delta Labor\ Force + 1.738\ \Delta Labor\ Force_{t-1}$$
$$\qquad (0.650) \qquad\qquad\quad (0.665)$$
$$\underbrace{+2.056\ \Delta Labor\ Force_{t-2} - 0.430\ \Delta}_{Short-run}$$
$$\qquad (0.663) \qquad\qquad (0.112)$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2$ (48)	Portmanteau Q-Statistic $\chi2$ (24)	MAE	RMSE	R^2
33.846	-10.014	0.042	12.238	0.079	0.109	0.718
[0.000, 0.000]	[0.000, 0.000]	[0.837]	[0.977]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Unemployment Rate are -0.004, 0.190, -0.584, and 0.531 respectively.

Figure 1. Actual v. Predicted Unemployment Rate, along with residuals

Panel A: Log first-difference
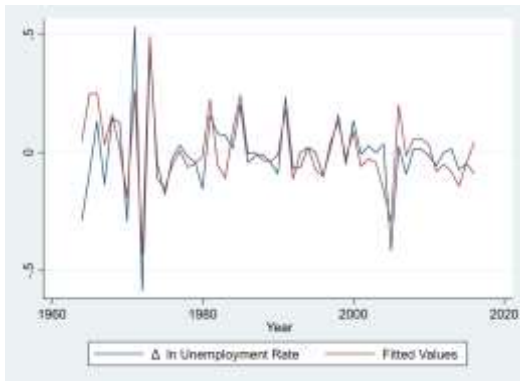
Panel B: Log level
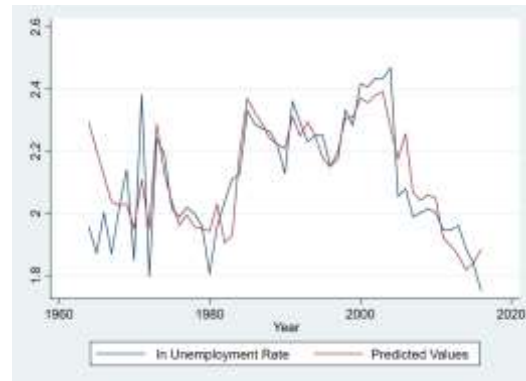
Panel C: Model Residuals
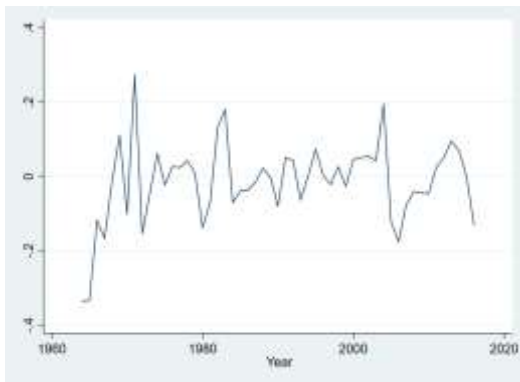
Panel D: Autocorrelation of Residuals
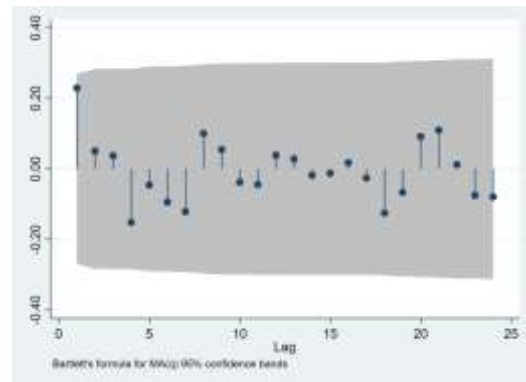
55. Wage Index – Agriculture

Estimation Period: 1982 – 2016

$$\Delta Wage\ Index, Agriculture = \underbrace{\frac{-1.216\ Wage\ Index, Agriculture_{t-1}}{(0.179)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -\ 1.295\ +0.691\ Employment\ in\ Industry -0.134\ IPIN, Agricultural\ Exports \\ (0.138) \qquad (0.028) \qquad\qquad\qquad (0.011) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} +0.345\ \Delta Wage\ Index, Agriculture_{t-1} -0.531\ \Delta Employment\ in\ Industry \\ (0.138) \qquad\qquad\qquad (0.187) \\ +0.084\ \Delta IPIN, Agricultural\ Exports +0.073\ \Delta IPIN, Agricultural\ Exports_{t-1} \\ (0.031) \qquad\qquad\qquad (0.026) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2$ (33)	Portmanteau Q-Statistic $\chi 2$ (17)	MAE	RMSE	R^2
15.547	-6.787	2.218	8.460	0.026	0.053	0.658
[0.000, 0.000]	[0.000, 0.000]	[0.136]	[0.955]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Wage Index – Agriculture are 0.008, 0.056, -0.127, and 0.201 respectively.

Figure 1. Actual v. Predicted Wage Index – Agriculture, along with residuals

Panel A: Log first-difference
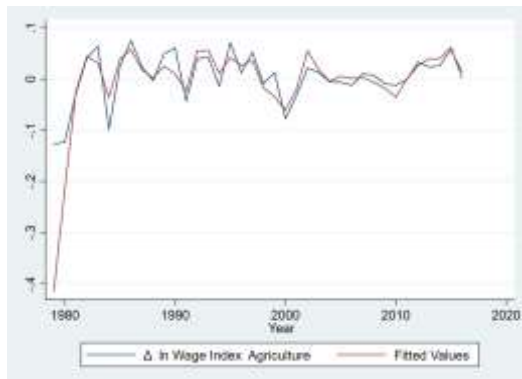
Panel B: Log level
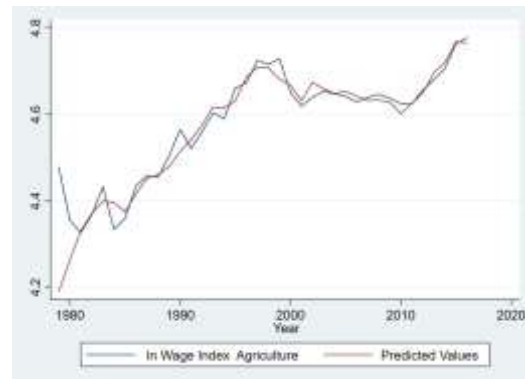
Panel C: Model Residuals

Panel D: Autocorrelation of Residuals
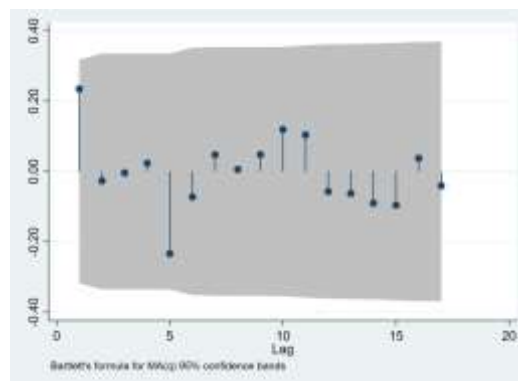
56. Wage Index – Construction
Estimation Period: 1980 – 2016

$$\Delta Wage\ Index, Construction = \underbrace{\frac{-0.489\ Wage\ Index, Construction_{t-1}}{(0.121)}}_{Adjustment}$$

$$\underbrace{-26.487 + 0.531\ Unemployment\ Rate - 0.377\ IPIN, Capital\ Formation}_{Long-run}$$
$$\ \ \ \ \ (9.379) \qquad\quad (0.184) \qquad\qquad\qquad (0.150)$$

$$\underbrace{-0.200\ \Delta Unemployment\ Rate + 0.140\ \Delta IPIN, Capital\ Formation + 0.014\ \Delta Year}_{Short-run}$$
$$\qquad\quad (0.089) \qquad\qquad\qquad\quad (0.139) \qquad\qquad\qquad (0.004)$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (35)	Portmanteau Q-Statistic χ2 (16)	MAE	RMSE	R^2
7.680	-4.037	0.014	19.053	0.031	0.045	0.458
[0.008, 0.023]	[0.015, 0.053]	[0.905]	[0.265]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Wage Index – Construction are 0.006, 0.062, -0.156, and 0.170 respectively.

Figure 1. Actual v. Predicted Wage Index – Construction, along with residuals

Panel A: Log first-difference

Panel B: Log level
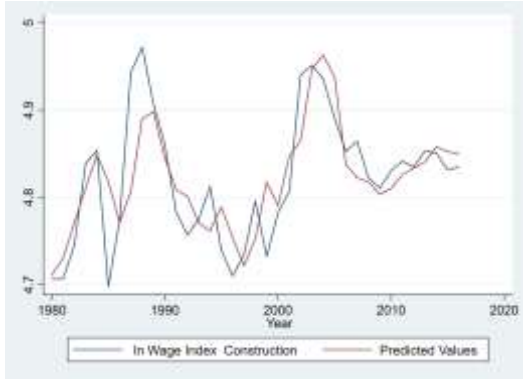
Panel C: Model Residuals
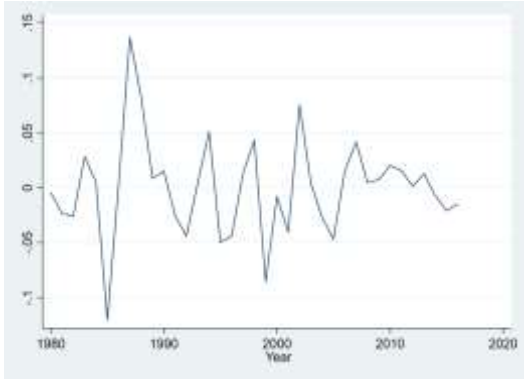
Panel D: Autocorrelation of Residuals
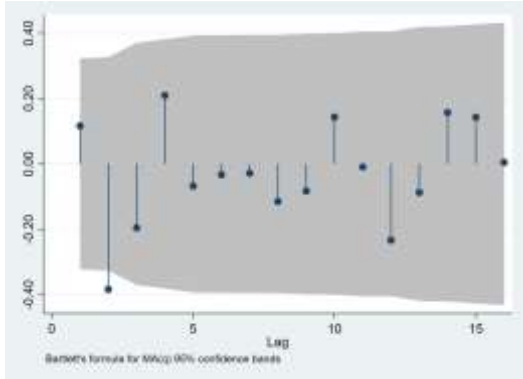
57. Wage Index – Electricity and Steam

Estimation Period: 1983 – 2016

$$\Delta Wage\ Index, Electricity\ and\ Steam = \underbrace{\frac{-0.701\ Wage\ Index, Electricity\ and\ Steam_{t-1}}{(0.178)}}_{Adjustment}$$

$$\underbrace{\begin{array}{cc} -11.090 + & 0.220 \\ (5.118) & (0.145) \end{array}}_{Long-run}$$
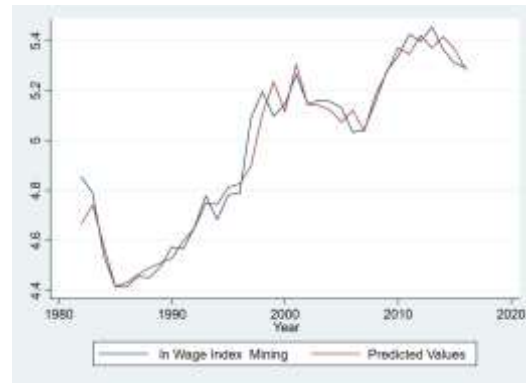
$$\underbrace{+0.007\ \Delta Year}_{Short-run} \\ (0.002)$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2$ (32)	Portmanteau Q-Statistic $\chi2$ (16)	MAE	RMSE	R^2
7.785	-3.936	0.011	18.949	0.054	0.080	0.342
[0.036, 0.058]	[0.020, 0.041]	[0.914]	[0.271]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Wage Index – Electricity and Steam are 0.014, 0.103, -0.259, and 0.248 respectively.

Figure 1. Actual v. Predicted Wage Index – Electricity and Steam, along with residuals
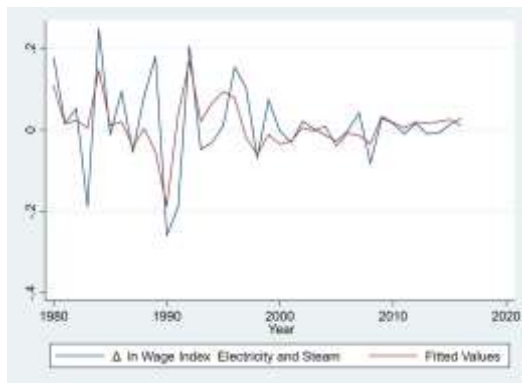
Panel A: Log first-difference

Panel B: Log level

Panel C: Model Residuals

Panel D: Autocorrelation of Residuals

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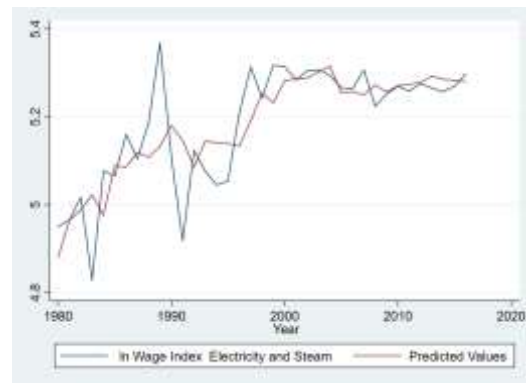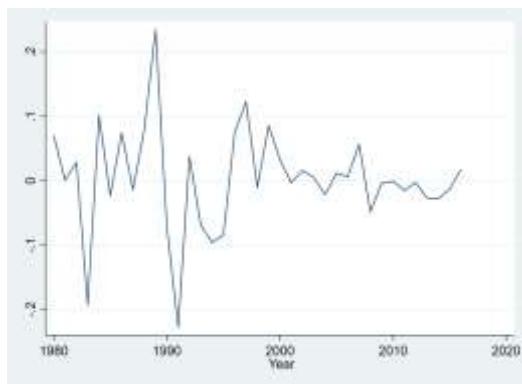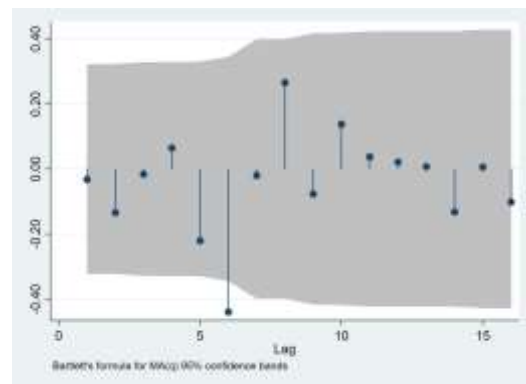
58. Wage Index – Finance

Estimation Period: 1990 – 2016

$$\Delta Wage\ Index, Finance = \underbrace{\frac{-1.226\ Wage\ Index, Finance_{t-1}}{(0.139)}}_{Adjustment}$$

$$\underbrace{+\ \underset{(0.410)}{3.333}\ +\underset{(0.020)}{0.258}\ Reverse\ Repurchase\ Rate + \underset{(0.031)}{0.417}\ USD\ Nominal\ Exchange\ Rate}_{Long-run}$$

$$\underbrace{\begin{array}{c}+0.423\ \underset{(0.101)}{\Delta Wage\ Index, Finance_{t-1}} +0.453\ \underset{(0.116)}{\Delta Wage\ Index, Finance_{t-2}} -0.228\ \underset{(0.051)}{\Delta Reverse\ Repurchase\ Rate} \\ -0.297\ \underset{(0.055)}{\Delta Reverse\ Repurchase\ Rate_{t-1}} -0.219\ \underset{(0.054)}{\Delta Reverse\ Repurchase\ Rate_{t-2}} \\ -0.710\ \underset{(0.097)}{\Delta USD\ Nominal\ Exchange\ Rate} -0.787\ \underset{(0.122)}{\Delta USD\ Nominal\ Exchange\ Rate_{t-1}} \\ -0.478\ \underset{(0.117)}{\Delta USD\ Nominal\ Exchange\ Rate_{t-2}} -0.403\ \underset{(0.114)}{\Delta USD\ Nominal\ Exchange\ Rate_{t-3}} \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2$ (25)	Portmanteau Q-Statistic $\chi 2$ (12)	MAE	RMSE	R^2
26.354	-8.794	2.397	7.308	0.020	0.026	0.906
[0.000, 0.000]	[0.000, 0.000]	[0.121]	[0.836]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Wage Index – Finance are 0.006, 0.090, -0.253, and 0.194 respectively.

Figure 1. Actual v. Predicted Wage Index – Finance, along with residuals

Panel A: Log first-difference

Panel B: Log level

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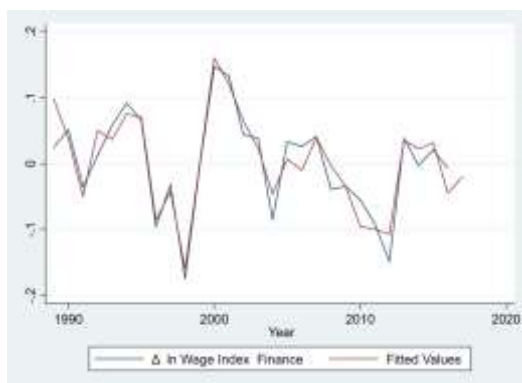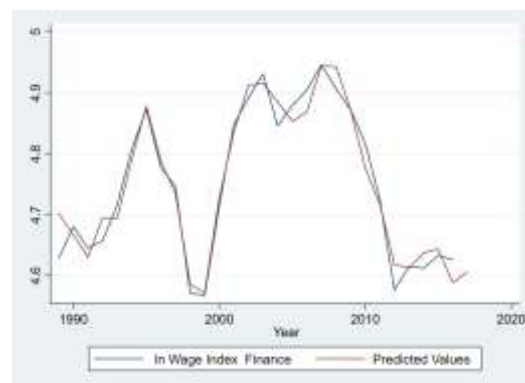
Panel C: Model Residuals
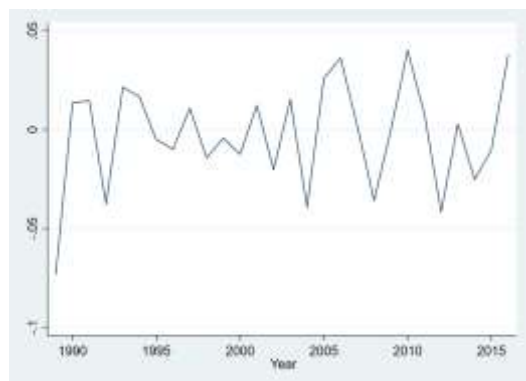
Panel D: Autocorrelation of Residuals
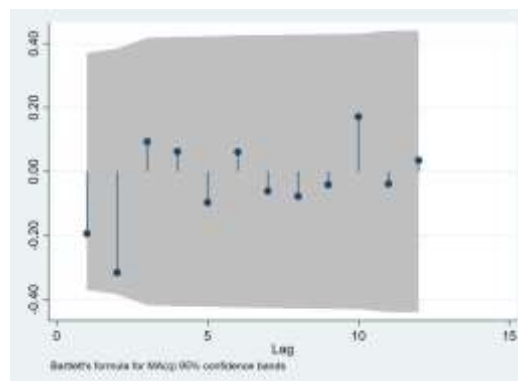
59. Wage Index – Manufacturing

Estimation Period: 1981 – 2016

$$\Delta Wage\ Index, Manufacturing = \underbrace{\frac{-0.413\ Wage\ Index, Manufacturing_{t-1}}{(0.087)}}_{Adjustment}$$

$$\underbrace{+\ 1.853\ +0.390\ IPIN, Materials\ Imports -0.942\ IPIN, Machinery\ Imports}_{}$$
$$\underset{(0.388)}{}\quad\underset{(0.138)}{}\quad\underset{(0.215)}{}$$
$$\underbrace{-0.119\ IPIN, Fuel\ Imports +0.415\ IPIN, Export\ Goods}_{Long-run}$$
$$\underset{(0.033)}{}\quad\underset{(0.187)}{}$$

$$+0.215\ \Delta Wage\ Index, Manufacturing_{t-1} -0.306\ \Delta IPIN, Materials\ Imports$$
$$\underset{(0.129)}{}\quad\underset{(0.080)}{}$$
$$\underbrace{-0.105\ \Delta IPIN, Fuel\ Imports -0.074\ \Delta IPIN, Fuel\ Imports_{t-1}}_{Short-run}$$
$$\underset{(0.045)}{}\quad\underset{(0.040)}{}$$

Table A1. Summary of model tests

| Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (34)	Portmanteau Q-Statistic χ2 (16)	MAE	RMSE	R^2
7.122	-4.705	0.739	15.076	0.029	0.042	0.678
[0.001, 0.006]	[0.001, 0.016]	[0.389]	[0.519]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Wage Index – Manufacturing are -0.012, 0.074, -0.226, and 0.234 respectively.

Figure 1. Actual v. Predicted Wage Index – Manufacturing, along with residuals

Panel A: Log first-difference



Panel B: Log level
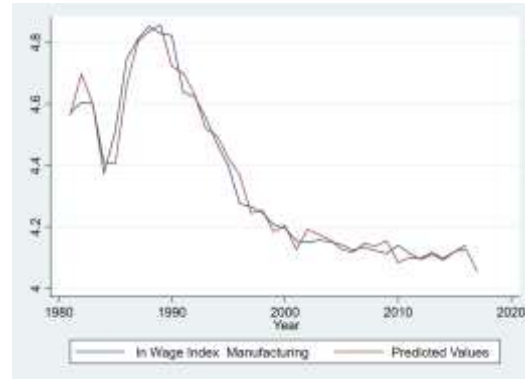
Panel C: Model Residuals
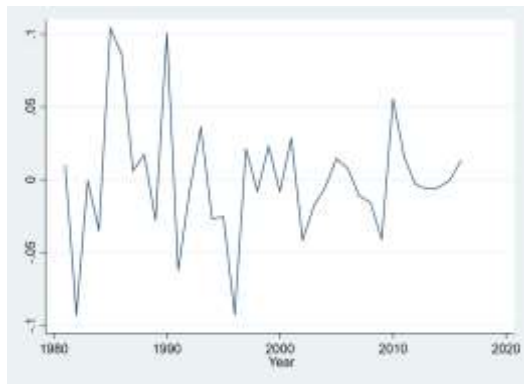
Panel D: Autocorrelation of Residuals
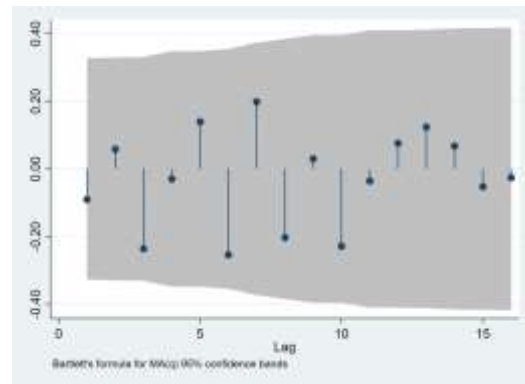
60. Wage Index – Mining

Estimation Period: 1983 – 2016

$$\Delta Wage\ Index, Mining = \underbrace{\genfrac{}{}{0pt}{}{-0.529\ Wage\ Index, Mining_{t-1}}{(0.102)}}_{Adjustment}$$

$$+ \underbrace{\genfrac{}{}{0pt}{}{3.466}{(0.734)} \genfrac{}{}{0pt}{}{-0.665\ Unemployment\ Rate}{(0.158)} + \genfrac{}{}{0pt}{}{0.468\ IPIN\ Machinery\ Imports}{(0.047)}}_{Long-run}$$

$$\underbrace{\genfrac{}{}{0pt}{}{+0.074\ \Delta Wage\ Index, Mining_{t-1}}{(0.144)} + \genfrac{}{}{0pt}{}{0.299\ \Delta Wage\ Index, Mining_{t-2}}{(0.139)} + \genfrac{}{}{0pt}{}{0.504\ \Delta Unemployment\ Rate}{(0.166)}}_{}$$

$$\genfrac{}{}{0pt}{}{+0.414\ \Delta Unemployment\ Rate_{t-1}}{(0.158)} + \genfrac{}{}{0pt}{}{0.350\ \Delta Unemployment\ Rate_{t-2}}{(0.152)}$$

$$\underbrace{\genfrac{}{}{0pt}{}{-0.095\ \Delta IPIN\ Machinery\ Imports}{(0.080)} - \genfrac{}{}{0pt}{}{0.362\ \Delta IPIN\ Machinery\ Imports_{t-1}}{(0.080)}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2$ (32)	Portmanteau Q-Statistic $\chi2$ (15)	MAE	RMSE	R^2
9.082	-5.094	0.889	18.452	0.047	0.065	0.654
[0.001, 0.005]	[0.000, 0.003]	[0.345]	[0.239]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Wage Index – Mining are 0.015, 0.100, -0.252, and 0.301 respectively.

Figure 1. Actual v. Predicted Wage Index – Mining, along with residuals

Panel A: Log first-difference
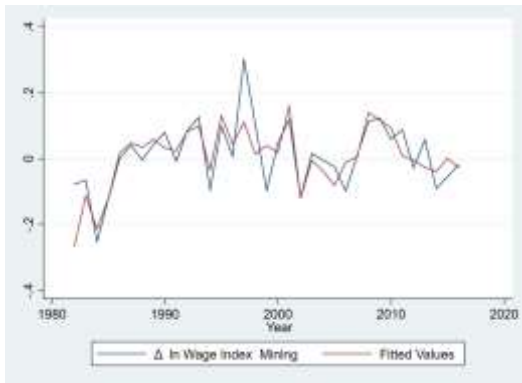
Panel B: Log level

Panel C: Model Residuals
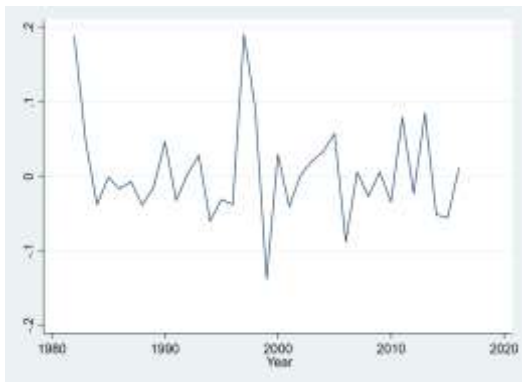
Panel D: Autocorrelation of Residuals
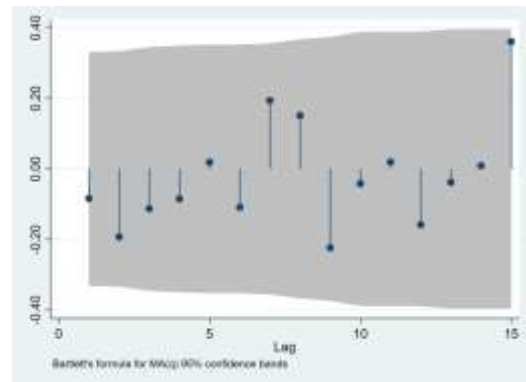
61. Wage Index – Private Service

Estimation Period: 1983 – 2016

$$\Delta Wage\ Index, Private\ Service = \underbrace{\frac{-0.320\ Wage\ Index, Private\ Service_{t-1}}{(0.106)}}_{Adjustment}$$

$$\underbrace{-\ 29.775\ +0.882\ Unemployment\ Rate}_{Long-run}$$
$$\underset{(10.058)}{}\underset{(0.297)}{}$$

$$\underbrace{+0.343\ \Delta Wage\ Index, Private\ Service_{t-1}+0.015\ \Delta Year}_{Short-run}$$
$$\underset{(0.168)}{}\underset{(0.005)}{}$$

Table A1. Summary of model tests

Bounds Tests		Heteroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (32)	Portmanteau Q-Statistic χ2 (16)	MAE	RMSE	R²
4.919	-3.015	1.185	12.173	0.049	0.079	0.276
[0.171, 0.241]	[0.135, 0.211]	[0.276]	[0.731]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Wage Index – Private Service are 0.032, 0.084, -0.106, and 0.437 respectively.

Figure 1. Actual v. Predicted Wage Index – Private Service, along with residuals

Panel A: Log first-difference
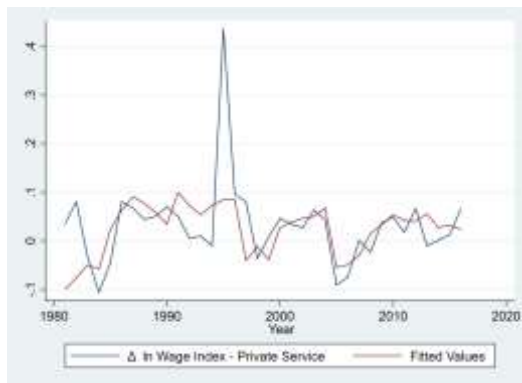
Panel B: Log level
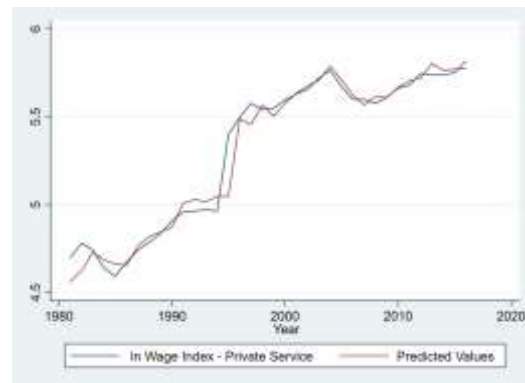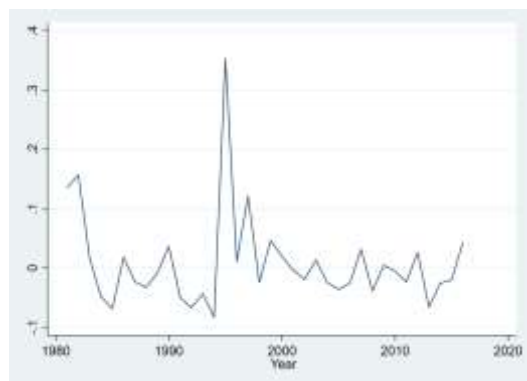
Panel C: Model Residuals   Panel D: Autocorrelation of Residuals
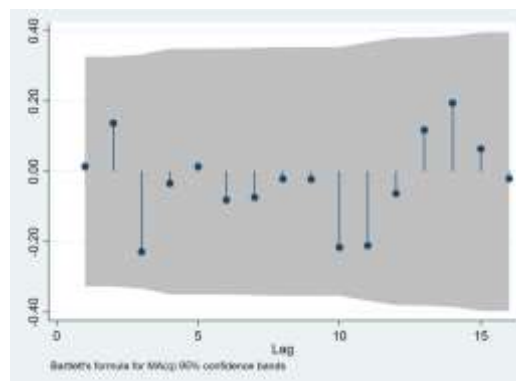
62. Wage Index – Real Estate

Estimation Period: 1990 – 2016

$$\Delta Wage\ Index, Real\ Estate = \underbrace{\frac{-0.884\ Wage\ Index, Real\ Estate_{t-1}}{(0.187)}}_{Adjustment}$$

$$\underbrace{+ \underset{(12.584)}{36.819} \underset{(0.101)}{-0.020\ Unemployment\ Rate}}{}$$
$$\underbrace{-\underset{(0.133)}{0.392\ Lending\ Rate} - \underset{(0.043)}{0.178\ IPIN, Service\ Exports}}_{Long-run}$$

$$\underbrace{+\underset{(0.095)}{0.330\ \Delta Lending\ Rate} + \underset{(0.106)}{0.287\ \Delta Lending\ Rate_{t-1}} + \underset{(0.006)}{0.016\ \Delta Year}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2$ (29)	Portmanteau Q-Statistic $\chi2$ (15)	MAE	RMSE	R^2
6.195	-4.716	0.753	15.777	0.055	0.077	0.545
[0.014, 0.044]	[0.004, 0.024]	[0.385]	[0.396]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Wage Index – Real Estate are -0.010, 0.082, -0.218, and 0.245 respectively.

Figure 1. Actual v. Predicted Wage Index – Real Estate, along with residuals

Panel A: Log first-difference
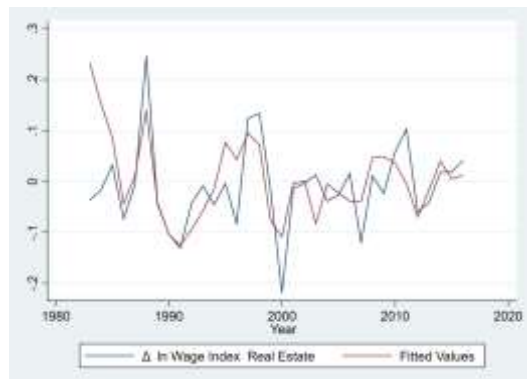
Panel B: Log level
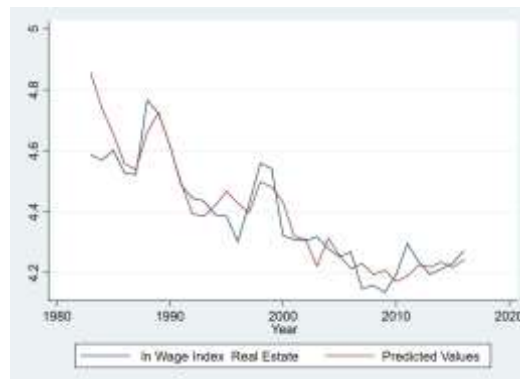
Panel C: Model Residuals
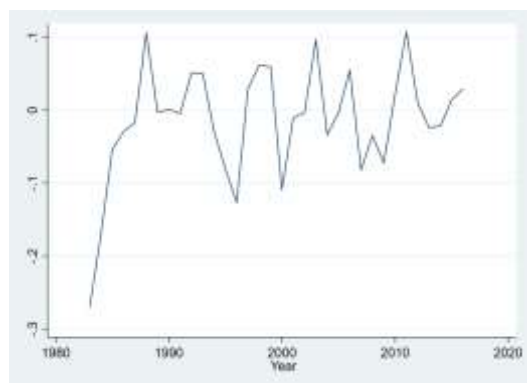
Panel D: Autocorrelation of Residuals
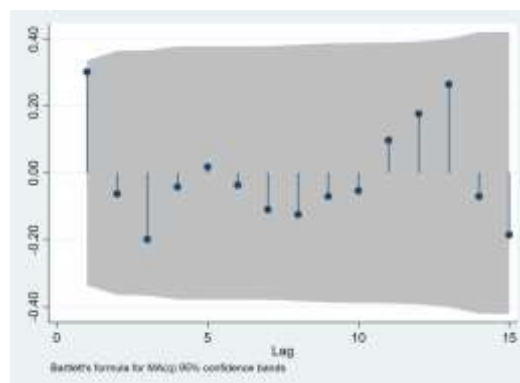
63. Wage Index – Trade

Estimation Period: 1983 – 2016

$$\Delta Wage\ Index, Trade = \underbrace{\frac{-0.779\ Wage\ Index, Trade_{t-1}}{(0.201)}}_{Adjustment}$$

$$\underbrace{+\ 4.381\ +0.140\ Unemployment\ Rate - 0.303\ Wage\ Index, Manufacturing}_{Long-run}$$
$$\quad\ (1.173)\qquad\ (0.080)\qquad\qquad\qquad (0.057)$$

$$\underbrace{+0.577\ \Delta Wage\ Index, Trade_{t-1} +0.420\ \Delta Wage\ Index, Trade_{t-2} +0.502\ \Delta Wage\ Index, Manufacturing}_{Short-run}$$
$$\quad (0.164)\qquad\qquad\qquad (0.179)\qquad\qquad\qquad (0.181)$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2$ (32)	Portmanteau Q-Statistic $\chi2$ (15)	MAE	RMSE	R^2
5.265	-3.873	1.394	12.150	0.045	0.057	0.550
[0.020, 0.056]	[0.006, 0.031]	[0.237]	[0.667]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ)Wage Index – Trade are 0.001, 0.081, -0.324, and 0.175 respectively.

Figure 1. Actual v. Predicted Wage Index – Trade, along with residuals

Panel A: Log first-difference

Panel B: Log level
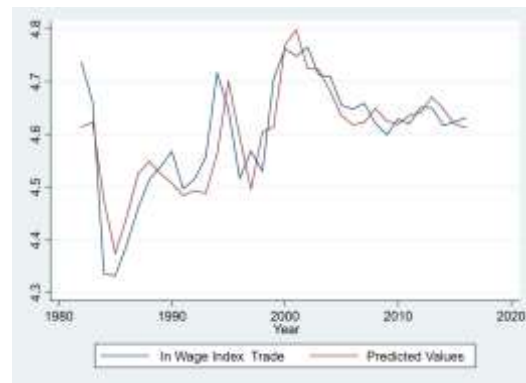
Panel C: Model Residuals
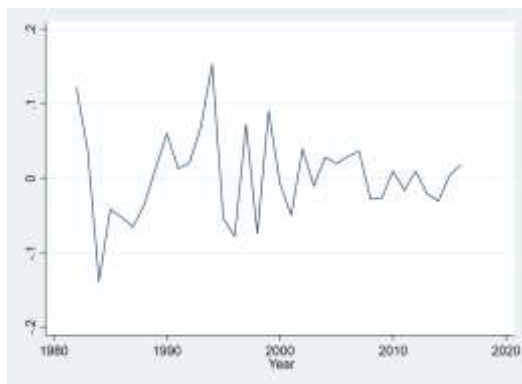
Panel D: Autocorrelation of Residuals
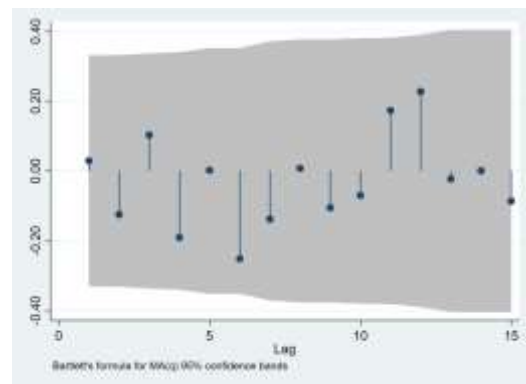
64. Wage Index – Transportation

Estimation Period: 1983 – 2016

$$\Delta Wage\ Index, Transportation = \underbrace{\frac{-0.737\ Wage\ Index, Transportation_{t-1}}{(0.197)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} +\ 2.600\ +0.123\ Unemployment\ Rate \\ (0.613) \qquad\quad (0.079) \\ +0.309\ IPIN, Capital\ Formation +0.187\ Inflation\ Rate \\ (0.054) \qquad\qquad\qquad (0.039) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} +0.403\ \Delta Wage\ Index, Transportation_{t-1} -0.025\ \Delta Unemployment\ Rate -0.181\ \Delta Unemployment\ Rate_{t-1} \\ (0.177) \qquad\qquad\qquad (0.092) \qquad\qquad\qquad (0.100) \\ -0.280\ \Delta Unemployment\ Rate_{t-2} -0.924\ \Delta IPIN, Capital\ Formation -0.643\ \Delta IPIN, Capital\ Formation_{t-1} \\ (0.095) \qquad\qquad\qquad (0.188) \qquad\qquad\qquad (0.234) \\ -0.580\ \Delta IPIN, Capital\ Formation_{t-2} -0.107\ \Delta Inflation\ Rate -0.107\ \Delta Inflation\ Rate_{t-1} \\ (0.221) \qquad\qquad\qquad (0.033) \qquad\qquad\qquad (0.019) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Heteroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ^2 (32)	Portmanteau Q-Statistic χ^2 (16)	MAE	RMSE	R^2
10.023	-3.734	0.061	20.122	0.030	0.042	0.780
[0.000, 0.002]	[0.009, 0.059]	[0.804]	[0.214]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Wage Index – Transportation are 0.023, 0.072, -0.176, and 0.145 respectively.

Figure 1. Actual v. Predicted Wage Index – Transportation, along with residuals

Panel A: Log first-difference
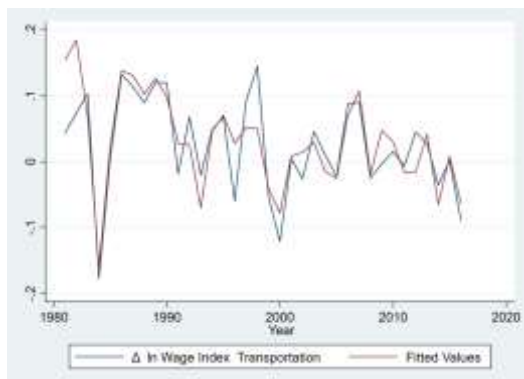
Panel B: Log level

Panel C: Model Residuals
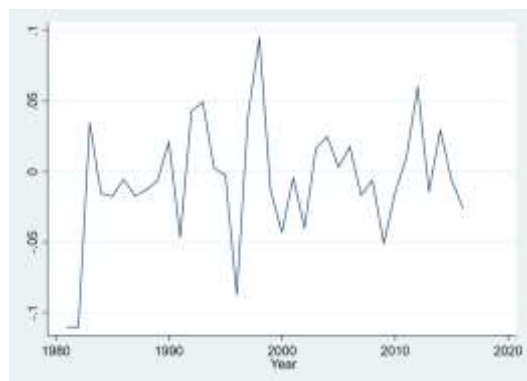
Panel D: Autocorrelation of Residuals
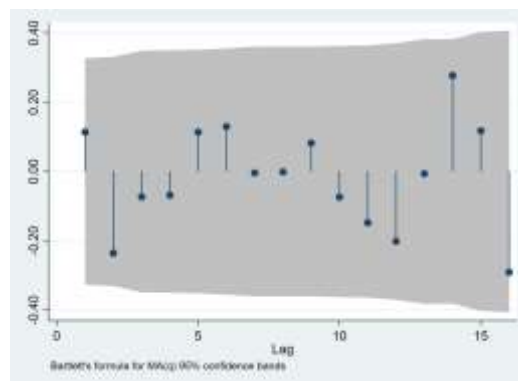
65. Consumer Price Index, Philippines

Estimation Period: 1981 – 2016

$$\Delta CPI, Philippines = \underbrace{\frac{-0.771\ CPI, Philippines_{t-1}}{(0.124)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -\ 2.457\ +0.204\ Broad\ Money +0.121\ Petroleum\ Tax\ Rate \\ (0.427) \qquad (0.021) \qquad\qquad (0.024) \\ +0.688\ IPIN\ GVA, Agriculture -0.360\ Value\ Added\ Tax\ Rate \\ (0.049) \qquad\qquad\qquad (0.128) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} -0.240\ \Delta Broad\ Money -0.007\ \Delta Broad\ Money_{t-1} -0.152\ \Delta Broad\ Money_{t-2} \\ (0.096) \qquad\qquad (0.078) \qquad\qquad (0.085) \\ +0.194\ \Delta Broad\ Money_{t-3} -0.084\ \Delta Petroleum\ Tax\ Rate -0.063\ \Delta Petroleum\ Tax\ Rate_{t-1} \\ (0.086) \qquad\qquad (0.019) \qquad\qquad (0.022) \\ -0.074\ \Delta Petroleum\ Tax\ Rate_{t-2} -0.068\ \Delta Petroleum\ Tax\ Rate_{t-3} +0.027\ \Delta IPIN\ GVA, Agriculture \\ (0.015) \qquad\qquad (0.020) \qquad\qquad (0.120) \\ +0.191\ \Delta IPIN\ GVA, Agriculture_{t-1} +0.402\ \Delta\ Value\ Added\ Tax\ Rate +0.328\ \Delta\ Value\ Added\ Tax\ Rate_{t-1} \\ (0.060) \qquad\qquad (0.134) \qquad\qquad (0.140) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Heteroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2\ (34)$	Portmanteau Q-Statistic $\chi2\ (16)$	MAE	RMSE	R^2
11.217	-6.194	0.721	8.868	0.009	0.012	0.966
[0.000, 0.001]	[0.000, 0.001]	[0.395]	[0.918]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Consumer Price Index, Philippines are 0.079, 0.069, -0.007, and 0.399 respectively.

Figure 1. Actual v. Predicted Consumer Price Index, Philippines, along with residuals

Panel A: Log first-difference
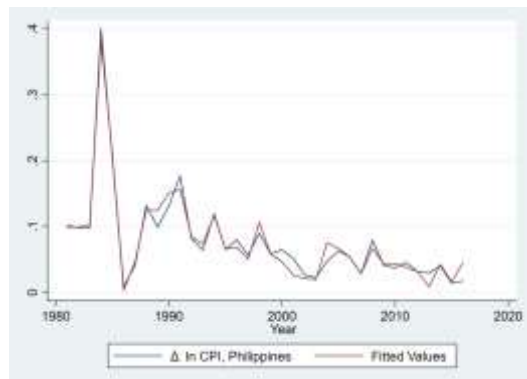
Panel B: Log level
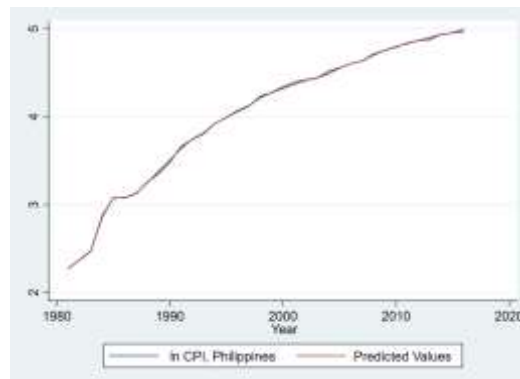
Panel C: Model Residuals
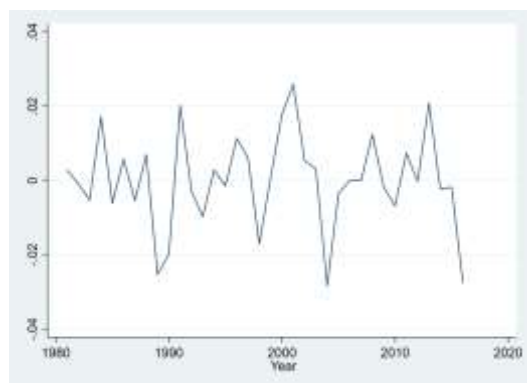
Panel D: Autocorrelation of Residuals
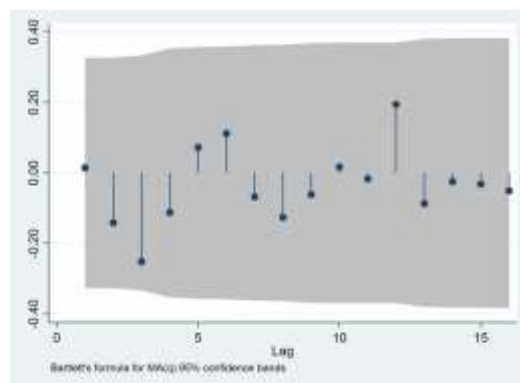
Fiscal Sector

1. Import Duties
Estimation Period: 1990 – 2016

$$\Delta Import\ Duties = \underbrace{\frac{-0.790\ Import\ duties_{t-1}}{(0.098)}}_{Adjustment}$$

$$\underbrace{-\ 2.764\ \ +1.020\ Total\ Imports, Nominal_{t-1} + 0.118\ Import\ Duties_{t-1} + +1.256\ BIR\ 2011\ Reform_{t-1}}_{Long-run}$$
$$(2.414)(0.198)(0.028)(0.139)$$

$$\underbrace{-0.051\ \Delta Total\ Imports, Nominal - 1.506\ \Delta Total\ Imports, Nominal_{t-1} + 0.093\ \Delta Import\ Duties - 0.993\ \Delta BIR\ 2011\ Reform}_{Short-run}$$
$$(0.467)(0.462)(0.024)(0.145)$$

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Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2$ (25)	Portmanteau Q-Statistic $\chi2$ (12)	MAE	RMSE	R^2
19.906	0.019	0.662	13.201	0.138	0.184	0.821
[0.000, 0.000]	[0.000, 0.000]	[0.415]	[0.354]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Import Duties are 0.099, 0.316, -1.486, and 0.702 respectively.

Figure 1. Actual v. Predicted 91-day T-bill Rate, along with residuals

Panel A: Log first-difference
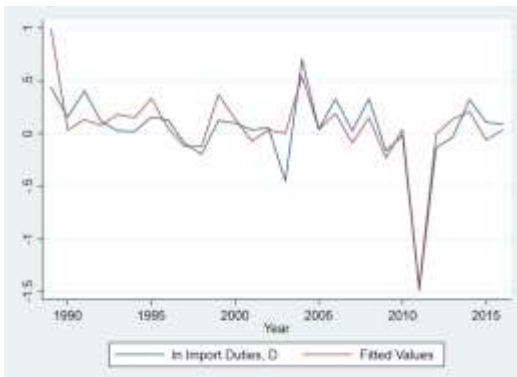
Panel B: Log level
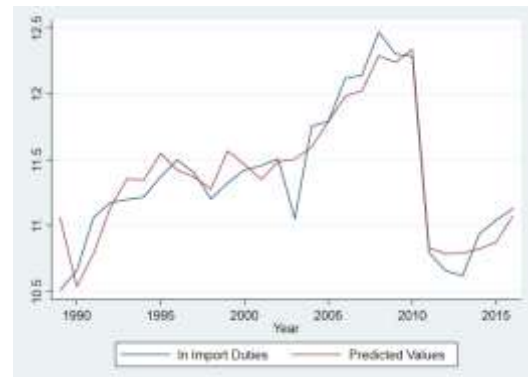
Panel C: Model Residuals
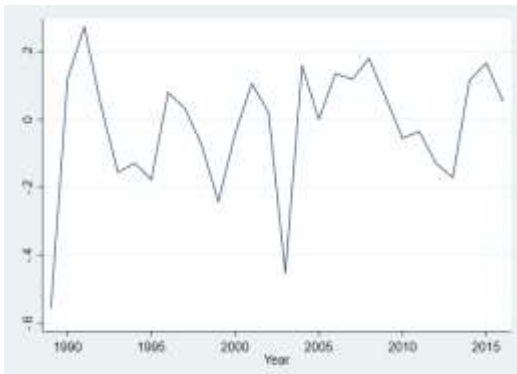
Panel D: Autocorrelation of Residuals
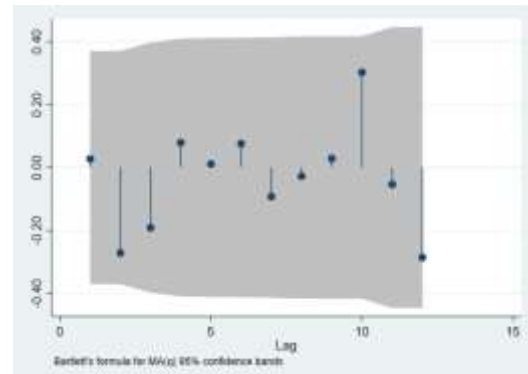
2. Excise Tax on Imports

Estimation Period: 1990 – 2016

$$\Delta Import\ Duties\ and\ Excise\ Taxes = \underbrace{\frac{-0.873\ Import\ Duties\ and\ Excise\ Taxes_{t-1}}{(0.101)}}_{Adjustment}$$

$$\underbrace{-\ \underset{(2.125)}{3.338}\ +\underset{(0.155)}{1.042\ Total\ Imports, Nominal_{t-1}}+\underset{(0.022)}{0.119\ Import\ duties_{t-1}}-\underset{(0.111)}{0.916\ BIR\ 2011\ Reform_{t-1}}}_{Long-run}$$

$$\underbrace{+\underset{(0.097)}{0.174\ \Delta Import\ Duties\ and\ Excise\ Taxes_{t-1}}+\underset{(0.403)}{0.060\ \Delta Total\ Imports, Nominal}-\underset{(0.404)}{1.599\ \Delta Total\ Imports, Nominal_{t-1}}}$$

$$\underbrace{+\underset{(0.022)}{0.104\ \Delta Import\ Duties}-\underset{(0.122)}{0.800\ BIR\ 2011\ Reform}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2\ (25)$	Portmanteau Q-Statistic $\chi2\ (12)$	MAE	RMSE	R^2
8.000	-4.750	0.079	3.516	0.505	0.723	0.510
[0.003, 0.010]	[0.001, 0.006]	[0.777]	[0.990]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Excise Tax on Imports are 0.089, 1.361, -4.770, and 4.770 respectively.

Figure 1. Actual v. Predicted Excise Tax on Imports, along with residuals

Panel A: Log first-difference   Panel B: Log level
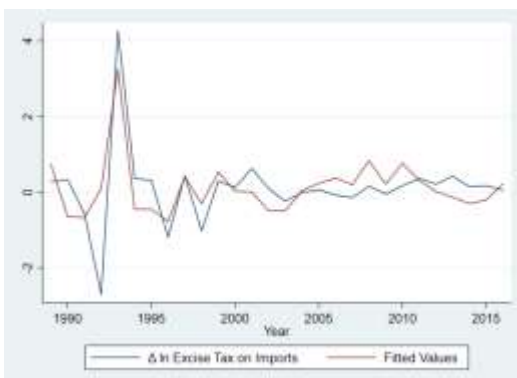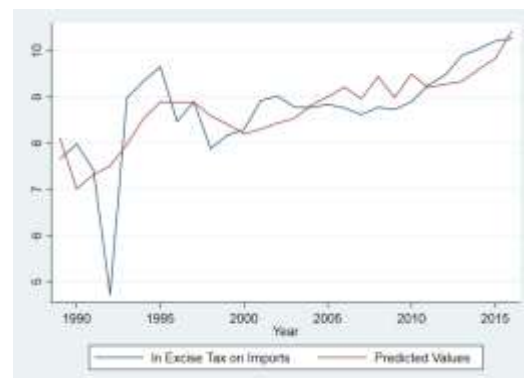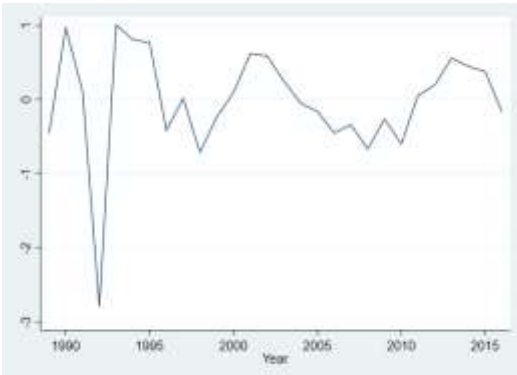
Panel C: Model Residuals   Panel D: Autocorrelation of Residuals
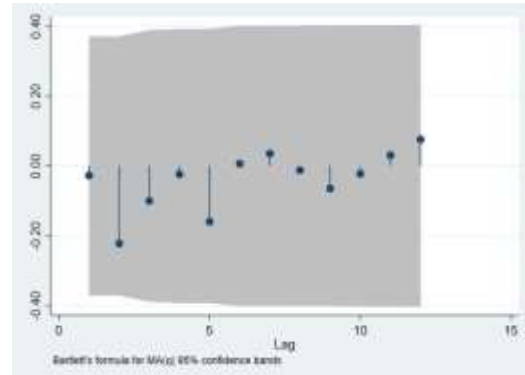
3. Import Duties and Excise Taxes

Estimation Period: 1990 – 2016

$$\Delta Import\ Duties\ and\ Excise\ Taxes = \underbrace{\begin{matrix} -0.873\ Import\ Duties\ and\ Excise\ Taxes_{t-1} \\ (0.101) \end{matrix}}_{Adjustment}$$

$$\underbrace{-\ 3.338\ \underset{(2.125)}{} +1.042\ \underset{(0.155)}{Total\ Imports, Nominal_{t-1}} +0.119\ \underset{(0.022)}{Import\ duties_{t-1}} -0.916\ \underset{(0.111)}{BIR\ 2011\ Reform_{t-1}}}_{Long-run}$$

$$\underbrace{+0.174\ \underset{(0.097)}{\Delta Import\ Duties\ and\ Excise\ Taxes_{t-1}} +0.060\ \underset{(0.403)}{\Delta Total\ Imports, Nominal} -1.599\ \underset{(0.404)}{\Delta Total\ Imports, Nominal_{t-1}}}{}$$
$$\underbrace{+0.104\ \underset{(0.022)}{\Delta Import\ Duties} -0.800\ \underset{(0.122)}{\Delta BIR\ 2011\ Reform}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ^2 (25)	Portmanteau Q-Statistic χ^2 (12)	MAE	RMSE	R^2
22.190	-8.569	0.471	12.195	0.120	0.174	0.846
[0.000, 0.000]	[0.000, 0.000]	[0.492]	[0.430]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Import Duties and Excise Taxes are 0.096, 0.302, -1.325, and 0.655 respectively.

Figure 1. Actual v. Predicted Import Duties and Excise Taxes, along with residuals

Panel A: Log first-difference
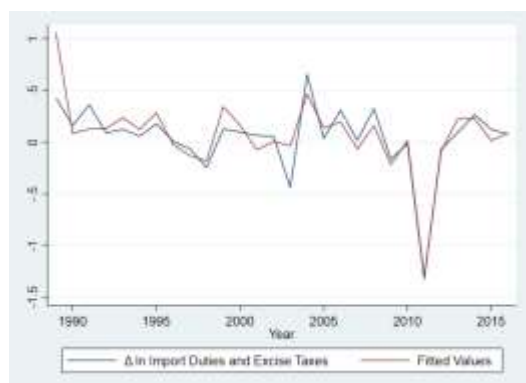
Panel B: Log level
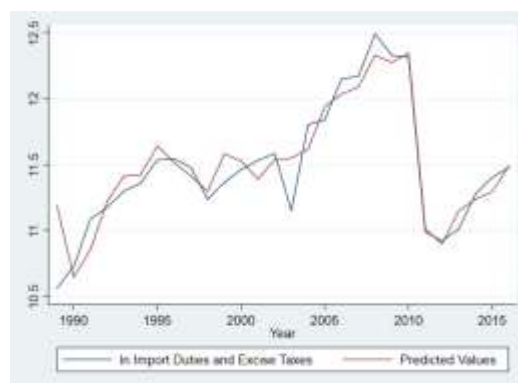
Panel C: Model Residuals
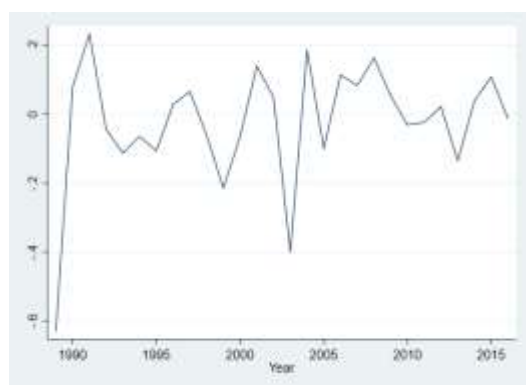
Panel D: Autocorrelation of Residuals
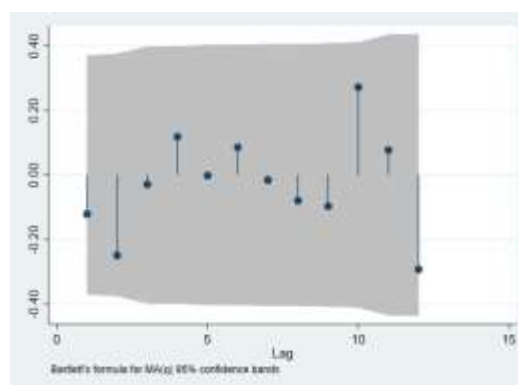
4. Taxes in Business and Occupation

Estimation Period: 1990 – 2016

$$\Delta Taxes\ on\ Business\ and\ Occupation = \underbrace{\frac{-0.726\ Taxes\ in\ Business\ and\ Occupation_{t-1}}{(0.109)}}_{Adjustment}$$

$$\underbrace{+ \underset{(2.971)}{10.960} - \underset{(0.284)}{0.542}\ HFCE\ All\ Goods, Nominal_{t-1} - \underset{(0.474)}{17.461}\ Corporate\ Income\ Taxe\ Rate_{t-1}}_{Long-run}$$
$$\underbrace{+ \underset{(0.790)}{37.378}\ Personal\ Income\ Tax\ Rate_{t-1} + \underset{(0.311)}{31.613}\ Value\ Added\ Tax\ Rate_{t-1}}_{Long-run}$$

$$\underbrace{+ \underset{(0.823)}{0.103}\ \Delta HFCE\ All\ Goods, Nominal - \underset{(0.735)}{0.337}\ \Delta HFCE\ All\ Goods, Nominal_{t-1} + \underset{(0.860)}{2.691}\ \Delta HFCE\ All\ Goods, Nominal_{t-2}}_{Short-run}$$
$$\underbrace{+ \underset{(0.400)}{1.723}\ Corporate\ Income\ Tax\ Rate + \underset{(0.288)}{12.615}\ Personal\ Income\ Tax\ Rate + \underset{(0.210)}{0.512}\ Personal\ Income\ Tax\ Rate_{t-1}}_{Short-run}$$
$$\underbrace{- \underset{(0.923)}{49.555}\ Personal\ Income\ Tax\ Rate_{t-2} + \underset{(0.945)}{22.978}\ Value\ Added\ Tax\ Rate}_{Short-run}$$

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Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (35)	Portmanteau Q-Statistic χ2 (16)	MAE	RMSE	R²
11.159	-6.624	0.902	12.417	0.147	0.191	0.755
[0.000, 0.000]	[0.000, 0.000]	[0.342]	[0.714]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ)Taxes in Business and Occupation are 0.151, 0.351, -0.530, and 1.356 respectively.

Figure 1. Actual v. Predicted Taxes in Business and Occupation, along with residuals

Panel A: Log first-difference
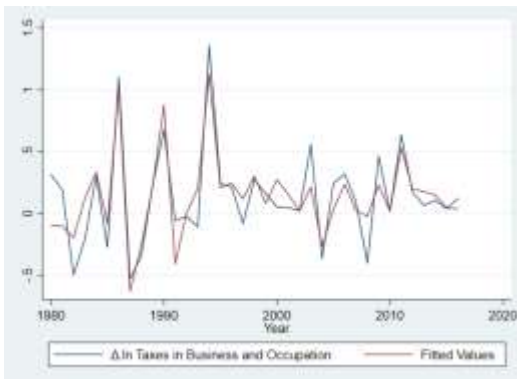
Panel B: Log level
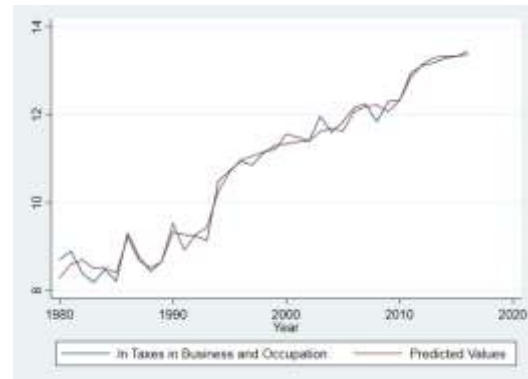
Panel C: Model Residuals
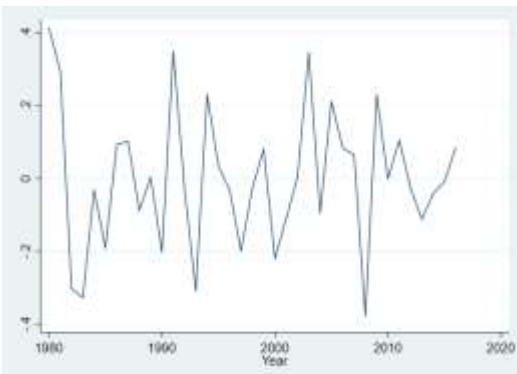
Panel D: Autocorrelation of Residuals
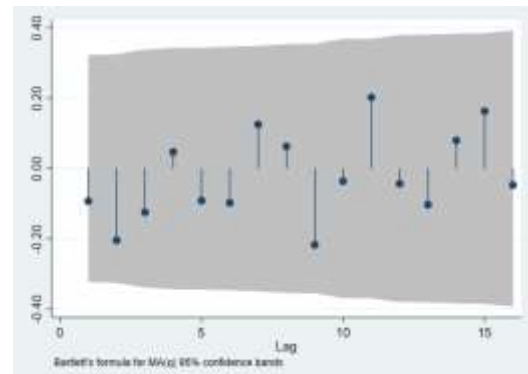
5. Other Indirect Taxes

Estimation Period: 1979 – 2016

$$\Delta Other\ Indirect\ Taxes = \underbrace{\frac{-0.493\ Other\ Indirect\ Taxes_{t-1}}{(0.113)}}_{Adjustment}$$

$$\underbrace{-\ \underset{(0.878)}{3.009}\ +\underset{(0.116)}{1.078}\ HFCE\ All\ Goods, Nominal_{t-1} +\underset{(0.956)}{7.671}\ Value\ Added\ Tax\ Rate_{t-1}}_{Long-run}$$

$$\underbrace{+\underset{(0.134)}{0.325}\ \Delta Other\ Indirect\ Taxes_{t-1} +\underset{(0.117)}{0.513}\ \Delta HFCE\ All\ Goods, Nominal +\underset{(0.121)}{3.782}\ \Delta Value\ Added\ Tax\ Rate}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2$ (36)	Portmanteau Q-Statistic $\chi2$ (17)	MAE	RMSE	R^2
7.014	-4.346	0.035	23.379	0.220	0.330	0.397
[0.004, 0.013]	[0.001, 0.010]	[0.851]	[0.137]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Other Indirect Taxes are 0.130, 0.351, -0.785, and 1.028 respectively.

Figure 1. Actual v. Predicted Other Indirect Taxes, along with residuals

Panel A: Log first-difference
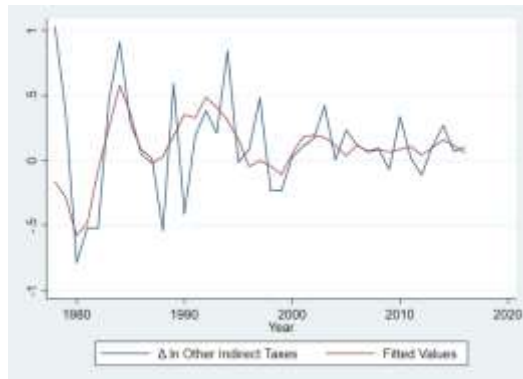
Panel B: Log level
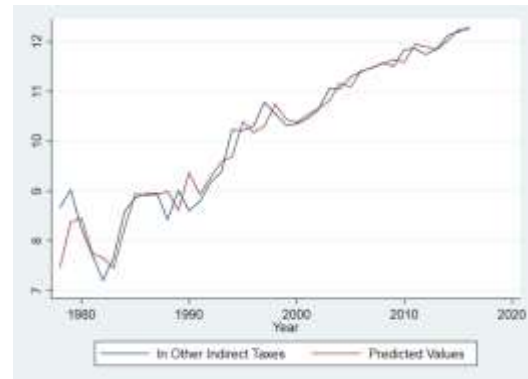
Panel C: Model Residuals
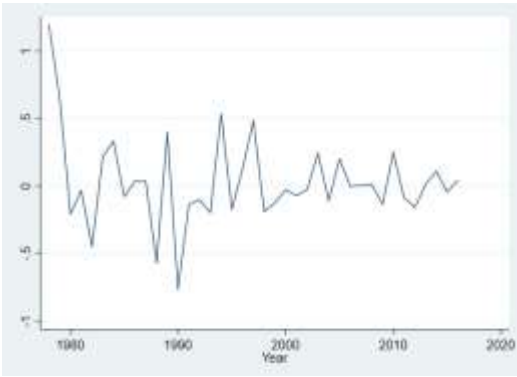
Panel D: Autocorrelation of Residuals
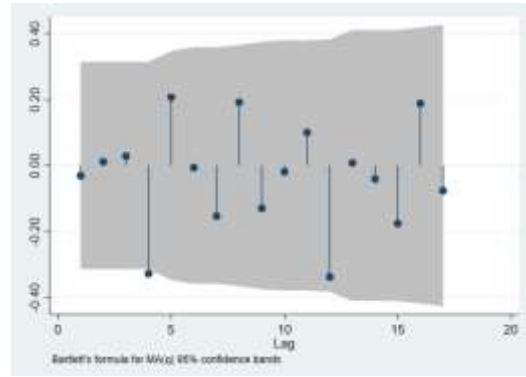
6. BIR – Alcoholic Products

Estimation Period: 1982 – 2016

$$\Delta BIR - Alcoholic\ Products = \underbrace{\frac{-0.532\ BIR - Alcoholic\ Products_{\ t-1}}{(0.121)}}_{Adjustment}$$

$$\underbrace{-\ \underset{(0.278)}{0.420}\ +\underset{(0.059)}{0.830}\ HFCE - Tobacco, Nominal_{t-1} +\underset{(0.142)}{23.601}\ Share\ of\ Price\ Tax\ Rate, Alcoholic\ Beverages_{t-1}}_{Long-run}$$

$$\underbrace{+\underset{(0.152)}{0.314}\ \Delta BIR - Alcoholic\ Products_{\ t-1} +\underset{(0.126)}{0.204}\ \Delta BIR - Alcoholic\ Products_{\ t-2} +\underset{(0.129)}{0.450}\ \Delta BIR - Alcoholic\ Products_{\ t-3}}$$

$$+\underset{(0.288)}{0.821}\ \Delta HFCE - Tobacco, Nominal\ -\underset{(0.324)}{0.520}\ \Delta HFCE - Tobacco, Nominal_{\ t-1} -\underset{(0.322)}{0.965}\ \Delta HFCE - Tobacco, Nominal_{\ t-2}$$

$$+\underset{(0.337)}{0.134}\ \Delta HFCE - Tobacco, Nominal_{\ t-3} -\underset{(0.314)}{1.110}\ \Delta HFCE - Tobacco, Nominal_{\ t-4}$$

$$+\underset{(0.131)}{19.906}\ \Delta Share\ of\ Price\ Tax\ Rate, Alcoholic\ Beverages$$

$$\underbrace{-\underset{(0.303)}{22.067}\ \Delta Share\ of\ Price\ Tax\ Rate, Alcoholic\ Beverages_{t-1}}_{Short-run}$$

Table A1. Summary of model tests

| Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ^2 (33)	Portmanteau Q-Statistic χ^2 (15)	MAE	RMSE	R^2
6.850	-4.372	1.582	18.083	0.050	0.061	0.784
[0.006, 0.023]	[0.002, 0.012]	[0.208]	[0.258]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) BIR – Alcoholic Products are 0.120, 0.128, -0.081, and 0.474 respectively.

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Figure 1. Actual v. Predicted BIR – Alcoholic Products, along with residuals

Panel A: Log first-difference
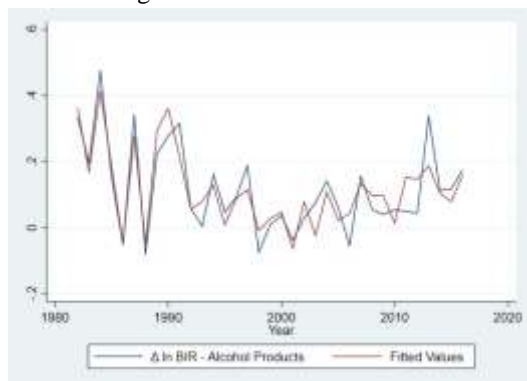
Panel B: Log level
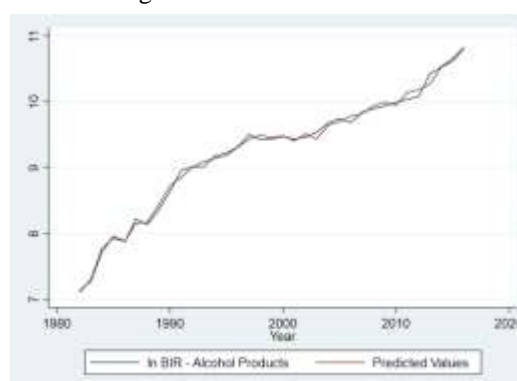
Panel C: Model Residuals
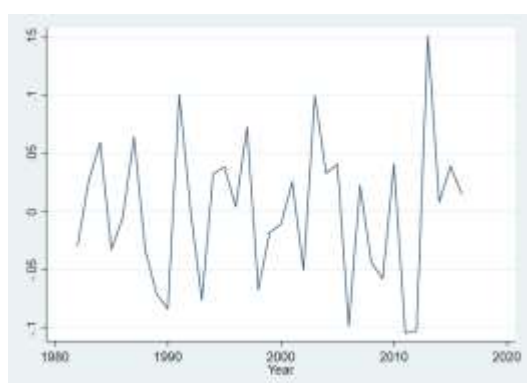
Panel D: Autocorrelation of Residuals
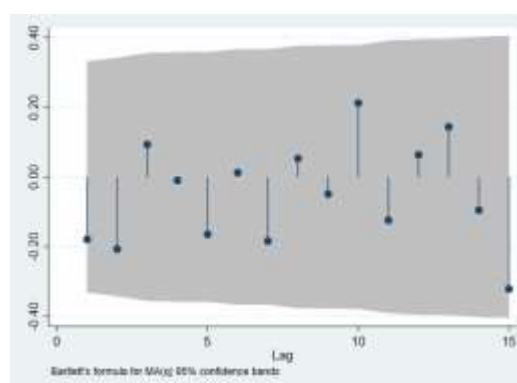
7. BIR – Tobacco Products

Estimation Period: 1979 – 2016

$$\Delta BIR - Tobacco\ Products = \underbrace{\frac{-0.717\ BIR - Tobacco\ Products_{t-1}}{(0.139)}}_{Adjustment}$$

$$\underbrace{-\ 0.282 + \underset{(0.037)}{0.949}\ HFCE - Alcohol, Nominal_{t-1} - \underset{(0.971)}{1.016}\ Share\ of\ Price\ Tax\ Rate, Tobacco_{t-1}}_{Long-run}$$
$$\underset{(0.287)}{}$$

$$\underbrace{\underset{(0.306)}{-0.219}\ \Delta HFCE - Alcohol, Nominal - \underset{(0.321)}{0.641}\ \Delta HFCE - Alcohol, Nominal_{t-1}}{}$$
$$\underbrace{+\underset{(0.063)}{7.039}\ \Delta Share\ of\ Price\ Tax\ Rate, Tobacco}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ^2 (36)	Portmanteau Q-Statistic χ^2 (17)	MAE	RMSE	R^2
19.214	-5.123	0.700	20.873	0.074	0.094	0.710
[0.000, 0.000]	[0.000, 0.002]	[0.402]	[0.231]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) BIR – Tobacco Products are 0.124, 0.175, -0.199, and 0.776 respectively.

Figure 1. Actual v. Predicted BIR – Tobacco Products, along with residuals

Panel A: Log first-difference
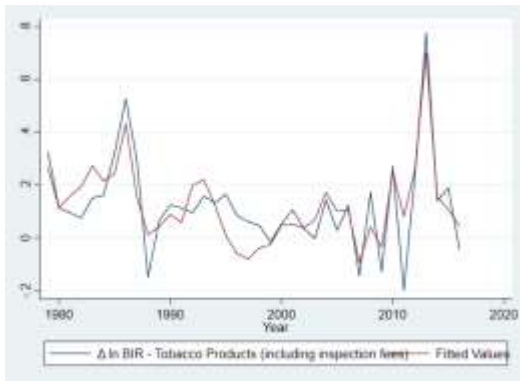
Panel B: Log level
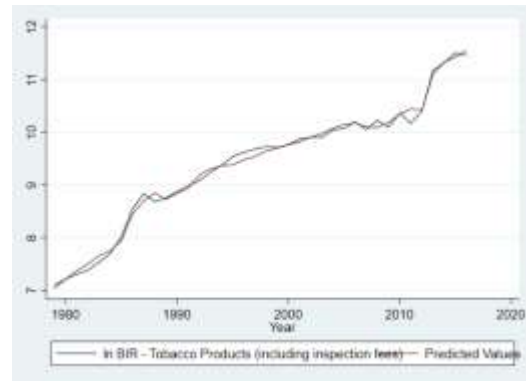
Panel C: Model Residuals
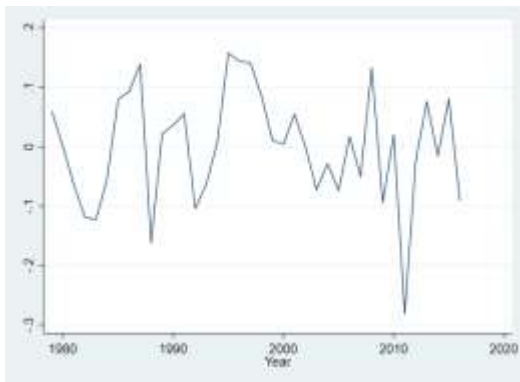
Panel D: Autocorrelation of Residuals
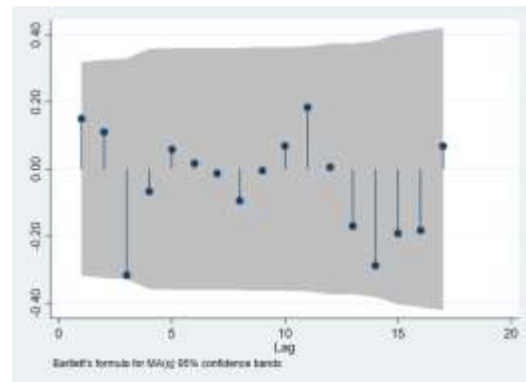
8. BIR – Petroleum Products

Estimation Period: 1981 – 2016

$$\Delta BIR - Petroleum\ Products = \underbrace{\frac{-0.871\ BIR - \ Petroleum\ Products\ _{t-1}}{(0.129)}}_{Adjustment}$$

$$\underbrace{+\ 3.430 \underset{(0.515)}{} +0.414 \underset{(0.015)}{Operating\ Surplus_{t-1}} -0.382 \underset{(0.028)}{Crude\ Oil - Brent_{t-1}} -0.006 \underset{(0.000)}{Petroleum\ Tax\ Rate_{t-1}}}_{Long-run}$$

$$+0.360 \underset{(0.052)}{\Delta Operating\ Surplus} -0.084 \underset{(0.030)}{\Delta Crude\ Oil - Brent}$$

$$\underbrace{+0.098 \underset{(0.043)}{\Delta Crude\ Oil - Brent\ _{t-1}} +0.007 \underset{(0.000)}{\Delta Petroleum\ Tax\ Rate}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2$ (34)	Portmanteau Q-Statistic $\chi2$ (16)	MAE	RMSE	R^2
14.283	-6.734	0.012	25.387	0.030	0.038	0.974
[0.000, 0.000]	[0.000, 0.000]	[0.912]	[0.063]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) BIR – Petroleum Products are 0.050, 0.235, -0.633, and 0.594 respectively.

Figure 1. Actual v. Predicted BIR – Petroleum Products, along with residuals

Panel A: Log first-difference

Panel B: Log level

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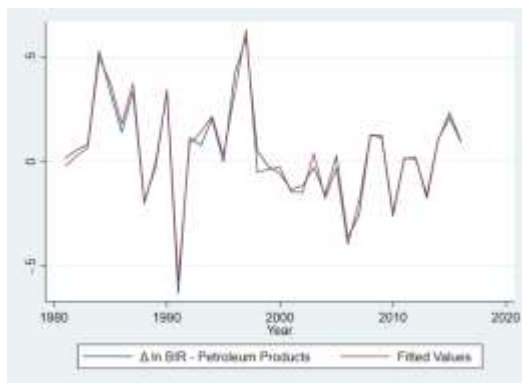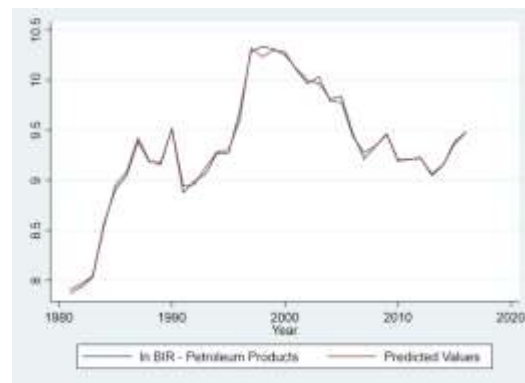
Panel C: Model Residuals
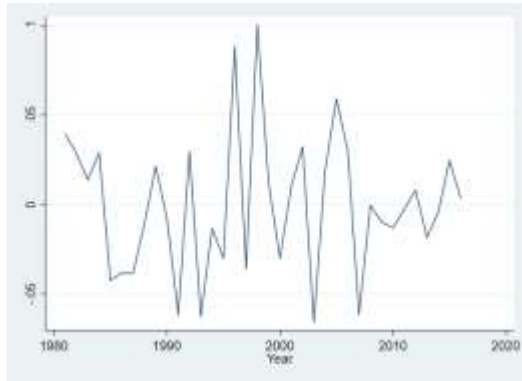
Panel D: Autocorrelation of Residuals
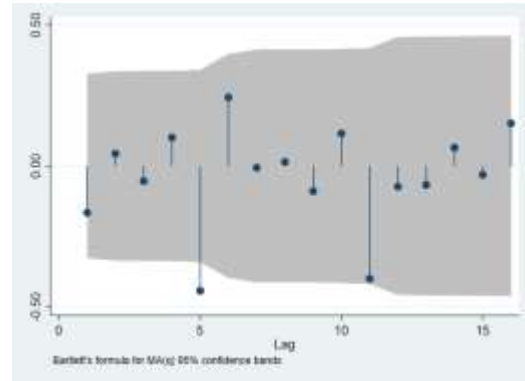
9. BIR – Mineral Products

Estimation Period: 1981 – 2016

$$\Delta BIR - Mineral\ Products = \underbrace{\frac{-0.308\ BIR - Mineral\ Products_{t-1}}{(0.122)}}_{Adjustment}$$

$$\underbrace{-\ \underset{(0.790)}{1.694}\ +\underset{(0.186)}{1.033_{t-1}}+\underset{(0.354)}{44.441\ Mineral\ Products\ Tax\ Rate_{t-1}}}_{Long-run}$$

$$\underbrace{+\underset{(0.121)}{0.319\ \Delta}+\underset{(0.815)}{43.799\ \Delta Mineral\ Products\ Tax\ Rate}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (34)	Portmanteau Q-Statistic χ2 (17)	MAE	RMSE	R^2
2.767	-2.520	0.089	23.105	0.226	0.287	0.787
[0.169, 0.328]	[0.112, 0.290]	[0.764]	[0.145]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) BIR – Mineral Products are 0.090, 0.599, -1.481, and 1.676 respectively.

Figure 1. Actual v. Predicted BIR – Mineral Products, along with residuals

Panel A: Log first-difference
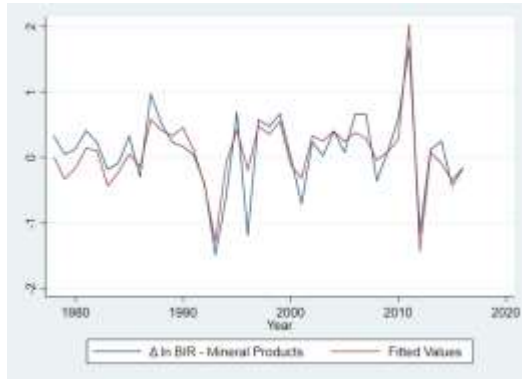
Panel B: Log level
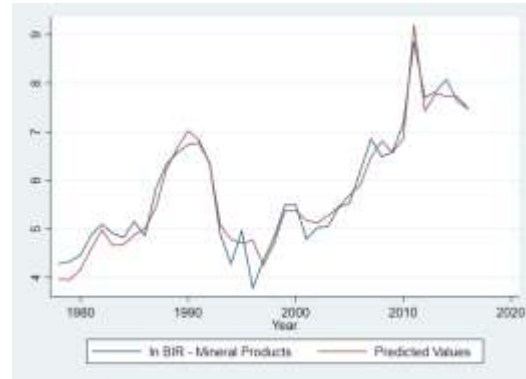
Panel C: Model Residuals
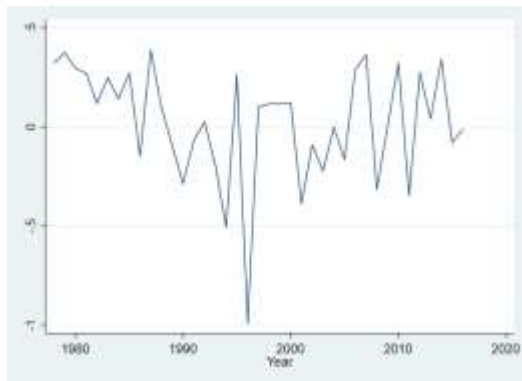
Panel D: Autocorrelation of Residuals
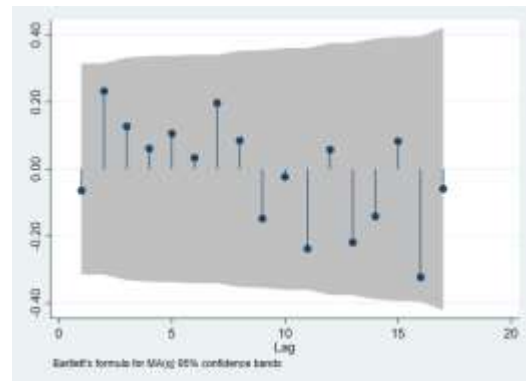
10. Income Tax on Business

Estimation Period: 1969– 2016

$$\Delta Income\ Tax\ on\ Business = \underbrace{\frac{-0.429\ Income\ Tax\ on\ Business_{t-1}}{(0.102)}}_{Adjustment}$$

$$\underbrace{-\ 2.813 \ +1.310\ Operating\ Surplus_{t-1} -2.554\ Corporate\ Income\ Tax\ Rate_{t-1}}_{Long-run}$$
$$(0.799)\qquad\quad (0.051)\qquad\qquad\qquad (0.913)$$

$$\underbrace{+0.563\ \Delta Operating\ Surplus - 1.097\ \Delta Corporate\ Income\ Tax\ Rate}_{Short-run}$$
$$(0.140)\qquad\qquad\qquad (0.463)$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (46)	Portmanteau Q-Statistic χ2 (22)	MAE	RMSE	R^2
6.272	-4.186	0.256	9.778	0.138	0.190	0.299
[0.006, 0.019]	[0.002, 0.013]	[0.612]	[0.988]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Income Tax on Business are 0.145, 0.232, -0.401, and 0.836 respectively.

Figure 1. Actual v. Predicted Income Tax on Business, along with residuals

Panel A: Log first-difference
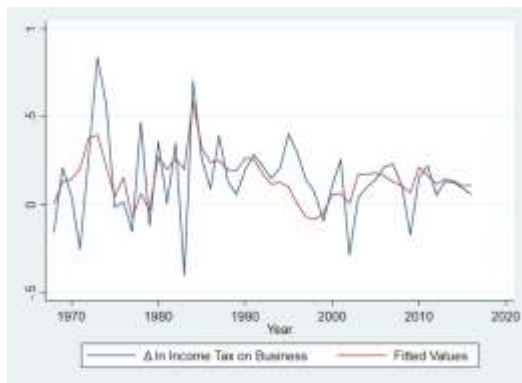
Panel B: Log level
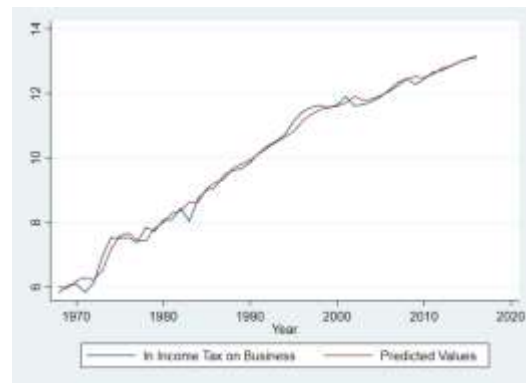
Panel C: Model Residuals
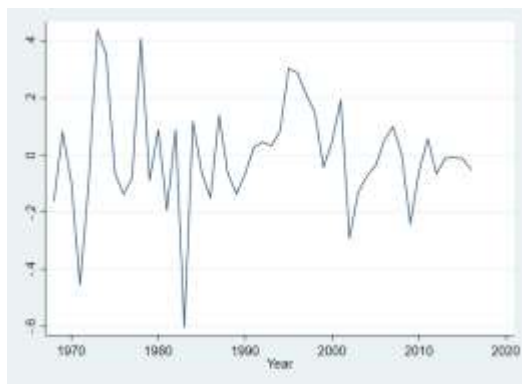
Panel D: Autocorrelation of Residuals
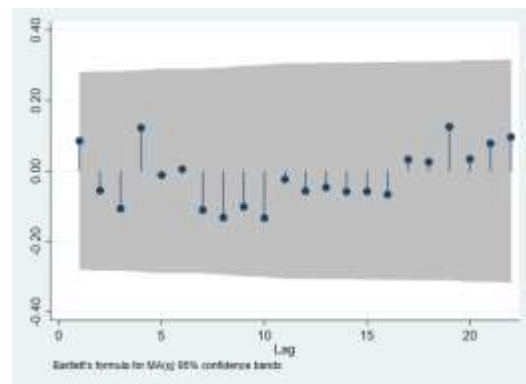
11. Income Tax on Individual

Estimation Period: 1969 – 2016

$$\Delta Income\ Tax\ on\ Individual = \underbrace{\frac{-0.471\ Income\ Tax\ on\ Individual_{t-1}}{(0.135)}}_{Adjustment}$$

$$\underbrace{-\ 0.589\ +0.758\ Compensation\ of\ Residents_{t-1} +11.845\ Personal\ Income\ Tax\ Rate_{t-1}}_{Long-run}$$
$$\quad\ (1.108) \qquad\qquad (0.227) \qquad\qquad\qquad\qquad (0.453)$$

$$\underbrace{+0.358\ \Delta Compensation\ of\ Residents +5.591\ Personal\ Income\ Tax\ Rate}_{Short-run}$$
$$\qquad\quad (0.166) \qquad\qquad\qquad\qquad (0.783)$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2$ (46)	Portmanteau Q-Statistic $\chi 2$ (22)	MAE	RMSE	R^2
4.900	-3.480	0.055	13.732	0.184	0.280	0.250
[0.022, 0.061]	[0.012, 0.063]	[0.813]	[0.910]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Income Tax on Individual are 0.148, 0.317, -1.241, and 1.097 respectively.

Figure 1. Actual v. Predicted Income Tax on Individual, along with residuals

Panel A: Log first-difference   Panel B: Log level
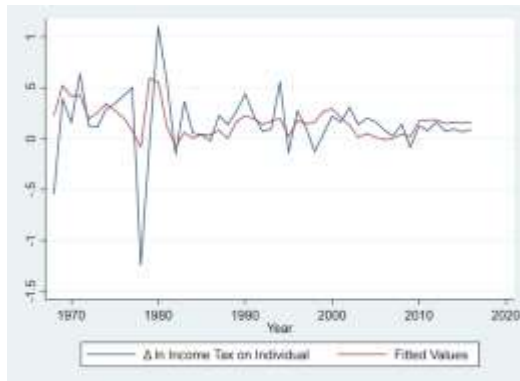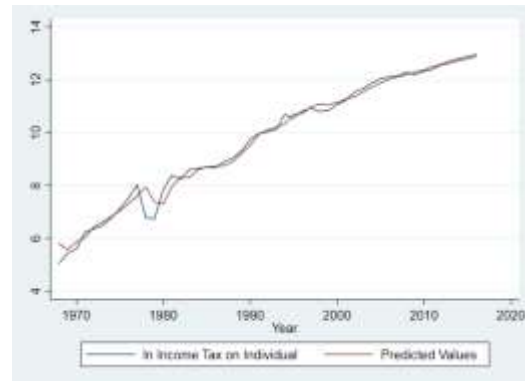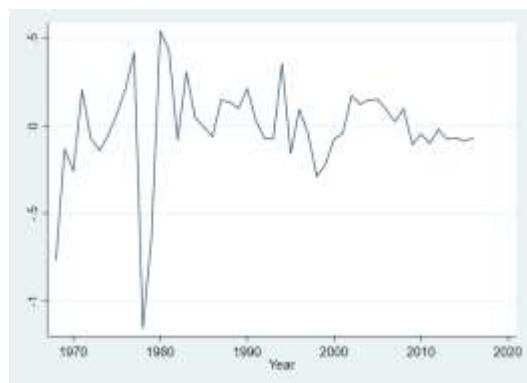
Panel C: Model Residuals   Panel D: Autocorrelation of Residuals
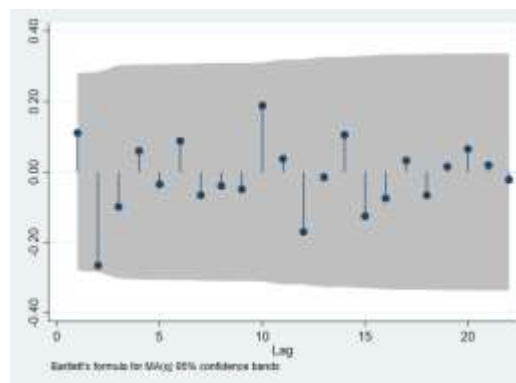
12. Other Direct Taxes

Estimation Period: 1969 – 2016

$$\Delta Other\ Direct\ Taxes = \underbrace{\frac{-0.456\ Other\ Direct\ Taxes_{t-1}}{(0.099)}}_{Adjustment}$$

$$\underbrace{-\ 1.347 \underset{(1.594)}{} + 0.966 \underset{(0.303)}{Net\ NAtional\ Income_{t-1}} + 0.768 \underset{(0.251)}{Corporate\ Income\ Tax\ Rate_{t-1}} - 6.427 \underset{(0.493)}{Personal\ Income\ Tax\ Rate_{t-1}}}_{Long-run}$$

$$\underbrace{+ 0.440 \underset{(0.159)}{\Delta Net\ National\ Income} + 0.350 \underset{(0.125)}{\Delta Corporate\ Income\ Tax\ Rate} + 19.731 \underset{(0.092)}{\Delta Personal\ Income\ Tax\ Rate}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2$ (46)	Portmanteau Q-Statistic $\chi 2$ (22)	MAE	RMSE	R^2
6.550	-4.604	0.590	17.799	0.195	0.269	0.414
[0.001, 0.008]	[0.001, 0.009]	[0.442]	[0.717]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Other Direct Taxes are 0.113, 0.356, -0.784, and 1.429 respectively.

Figure 1. Actual v. Predicted Other Direct Taxes, along with residuals

Panel A: Log first-difference
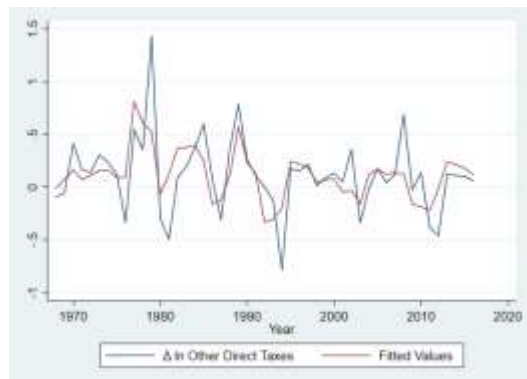
Panel B: Log level
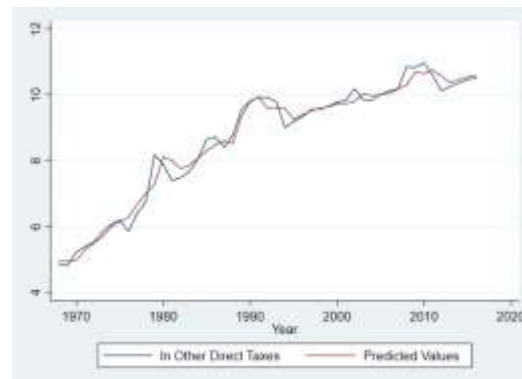
Panel C: Model Residuals
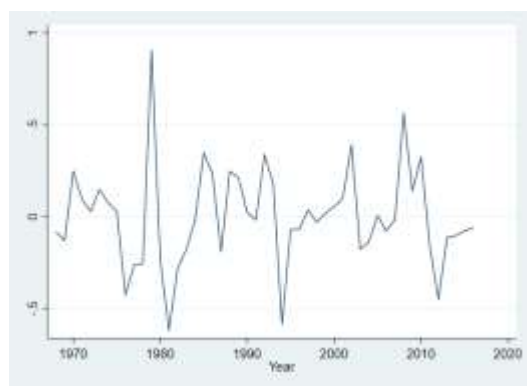
Panel D: Autocorrelation of Residuals
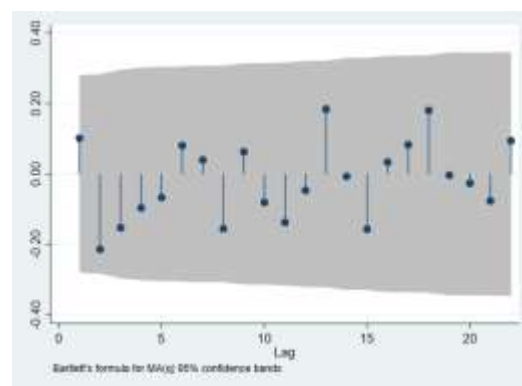
13. Compulsory Fees and Fines
Estimation Period: 1970 – 2016

$$\Delta Compulsory\ Fees\ and\ Fines = \underbrace{\frac{-0.458\ Compulsory\ Fees\ and\ Fines_{t-1}}{(0.114)}}_{Adjustment}$$

$$\underbrace{-\ 2.983 + 1.229\ Compensation\ of\ Residents_{t-1}}_{Long-run}$$
$$(0.848) \qquad (0.042)$$

$$\underbrace{+0.563\ \Delta Compensation\ of\ Residents}_{Short-run}$$
$$(0.144)$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (45)	Portmanteau Q-Statistic χ2 (22)	MAE	RMSE	R^2
8.185	-4.015	0.429	27.730	0.151	0.210	0.271
[0.006, 0.012]	[0.003, 0.008]	[0.512]	[0.184]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Compulsory Fees and Fines are 0.149, 0.250, -0.577, and 0.869 respectively.

Figure 1. Actual v. Predicted Compulsory Fees and Fines, along with residuals

Panel A: Log first-difference
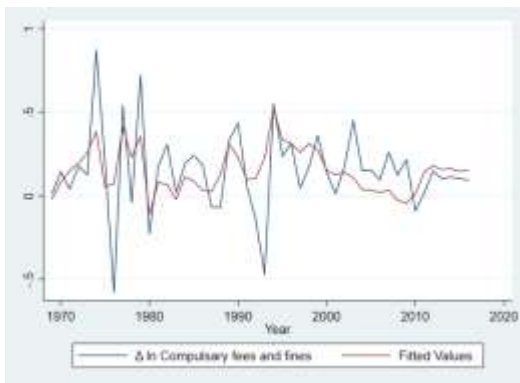
Panel B: Log level
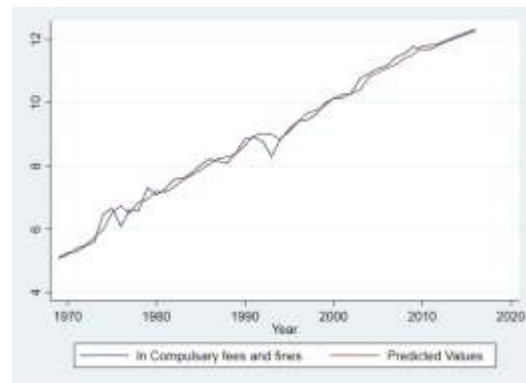
Panel C: Model Residuals
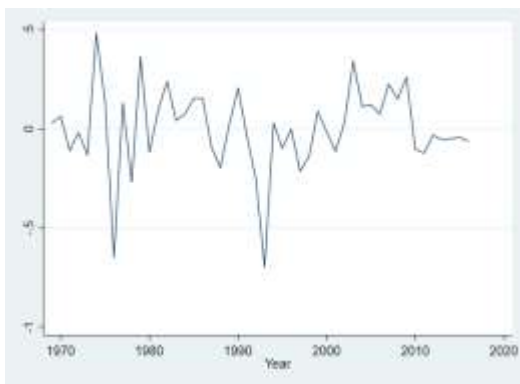
Panel D: Autocorrelation of Residuals
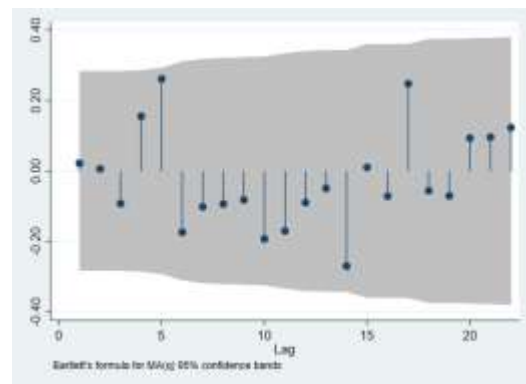
14. Other Current Transfers, Received

Estimation Period: 1950 – 2016

$$\Delta Other\ Current\ Transfers, Received = \underbrace{\frac{-0.241\ Other\ Current\ Transfers, Received_{t-1}}{(0.072)}}_{Adjustment}$$

$$+ \underbrace{\underset{(0.243)}{0.388} + \underset{(0.302)}{2.150\ USD\ Nominal\ Exchange\ Rate_{t-1}}}_{Long-run}$$

$$+ \underbrace{\underset{(0.146)}{0.519\ \Delta USD\ Nominal\ Exchange\ Rate}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2$ (65)	Portmanteau Q-Statistic $\chi 2$ (33)	MAE	RMSE	R^2
6.406	-3.341	0.462	25.405	0.524	0.707	0.166
[0.019, 0.036]	[0.016, 0.043]	[0.496]	[0.824]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Other Current Transfers, Received are 0.123, 0.750, -2.335, and 2.358 respectively.

Figure 1. Actual v. Predicted Other Current Transfers, along with residuals

Panel A: Log first-difference
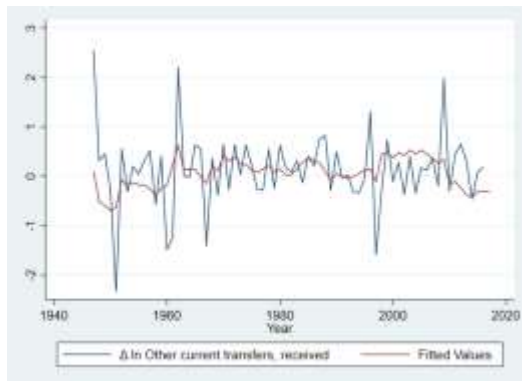
Panel B: Log level
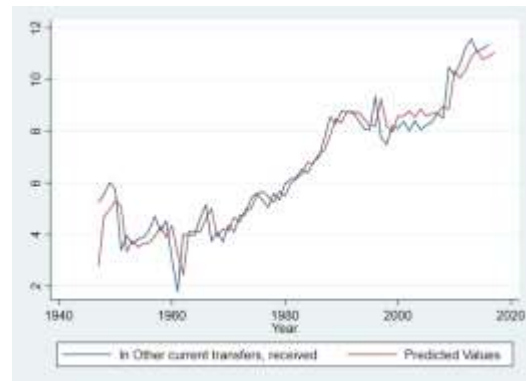
Panel C: Model Residuals
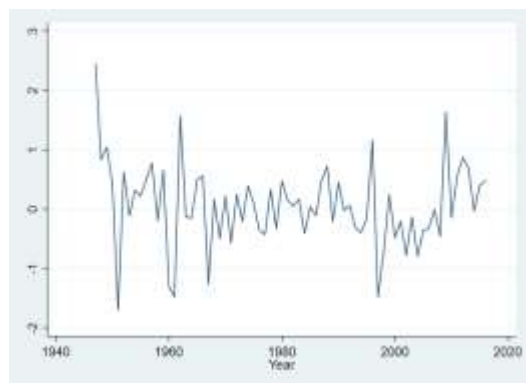
Panel D: Autocorrelation of Residuals
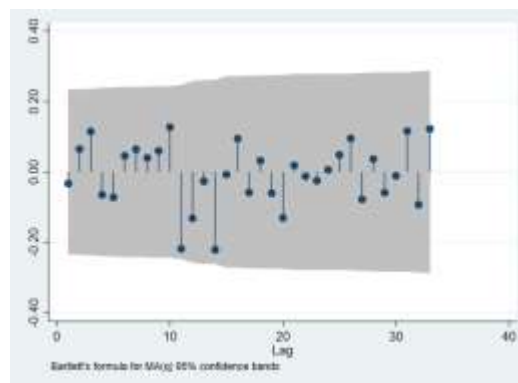
15. Government Property Income
Estimation Period: 1971 – 2016

$$\Delta Government\ Property\ Income = \underbrace{\frac{-0.352\ Government\ Property\ Income_{t-1}}{(0.101)}}_{Adjustment}$$

$$\underbrace{-\ 4.372\ +1.114\ World\ GDP, Nominal_{t-1} +0.005\ 91day\ TBill\ Rate_{t-1}}_{Long-run}$$
$$\quad\ \ (1.655)\qquad\qquad (0.074)\qquad\qquad\qquad (0.018)$$

$$\underbrace{+0.392\ \Delta World\ GDP, Nominal -0.007\ \Delta 91day\ TBill\ Rate -0.006\ \Delta 91day\ TBill\ Rate_{t-1} -0.040\ \Delta 91day\ TBill\ Rate_{t-2}}_{Short-run}$$
$$\quad (0.130)\qquad\qquad\quad (0.009)\qquad\qquad\qquad (0.008)\qquad\qquad\qquad\qquad (0.009)$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2\ (44)$	Portmanteau Q-Statistic $\chi 2\ (22)$	MAE	RMSE	R^2
7.883	-3.466	0.142	25.385	0.140	0.187	0.525
[0.001, 0.006]	[0.013, 0.063]	[0.706]	[0.279]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Government Property Income are 0.148, 0.276 -0.534, and 0.888 respectively.

Figure 1. Actual v. Predicted Government Property Income, along with residuals

Panel A: Log first-difference
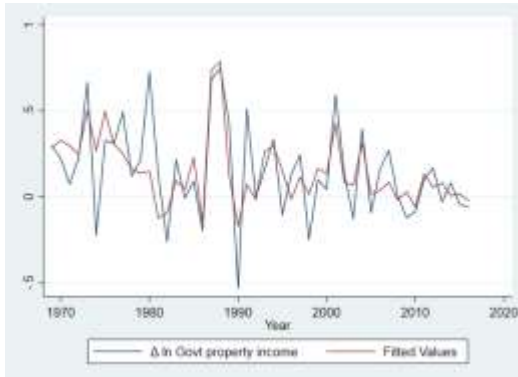


Panel B: Log level
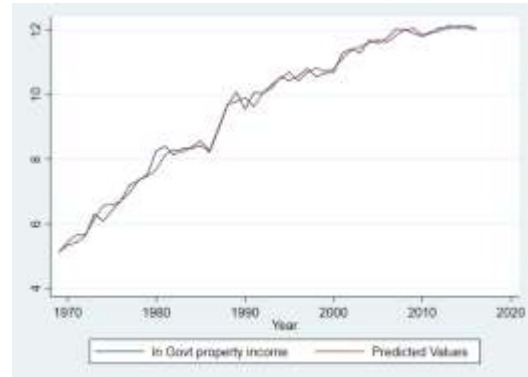
Panel C: Model Residuals
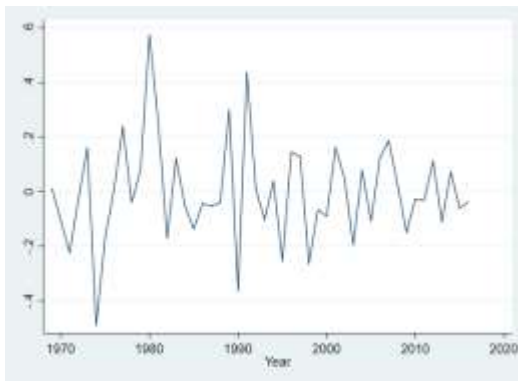
Panel D: Autocorrelation of Residuals
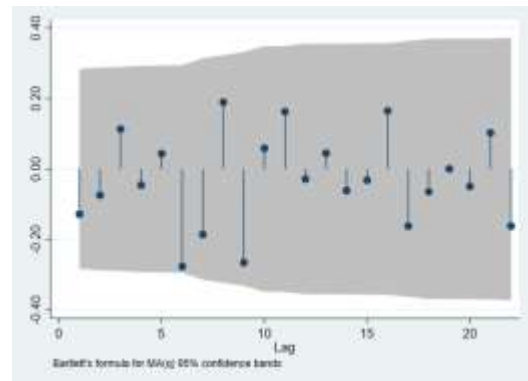
16. Social Security Contributions

Estimation Period: 1981 – 2016

$$\Delta Social\ Security\ Contributions = \underbrace{\frac{-0.496\ Social\ Security\ Contributions_{t-1}}{(0.112)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} +\ 5.098\ +1.036\ Social\ Security\ Benefits_{t-1} -0.973\ Employment\ in\ Industry \\ (2.797) \qquad\qquad (0.088) \qquad\qquad\qquad (0.448) \\ +0.118\ Employment\ in\ Service -0.356\ Employment\ in\ Agriculture \\ (0.252) \qquad\qquad\qquad (0.463) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} +0.416\ \Delta Social\ Security\ Contributions_{t-1} +0.358\ \Delta Social\ Security\ Contributions_{t-2} +0.176\ \Delta Social\ Security\ Benefits \\ (0.113) \qquad\qquad\qquad (0.140) \qquad\qquad\qquad (0.176) \\ -0.386\ \Delta Social\ Security\ Benefits_{t-1} -0.302\ \Delta Social\ Security\ Benefits_{t-2} -0.755\ \Delta Employment\ in\ Agriculture \\ (0.144) \qquad\qquad\qquad (0.157) \qquad\qquad\qquad (0.291) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2$ (34)	Portmanteau Q-Statistic $\chi2$ (17)	MAE	RMSE	R^2
7.548	-4.394	0.199	10.533	0.037	0.064	0.836
[0.001, 0.005]	[0.002, 0.028]	[0.655]	[0.879]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Social Security Contributions are 0.139, 0.097, -0.050, and 0.369 respectively.

Figure 1. Actual v. Predicted Social Security Contributions, along with residuals

Panel A: Log first-difference
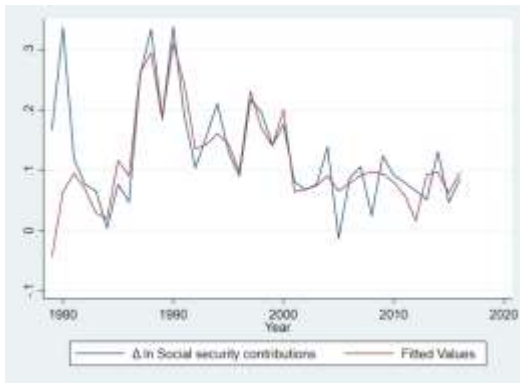
Panel B: Log level
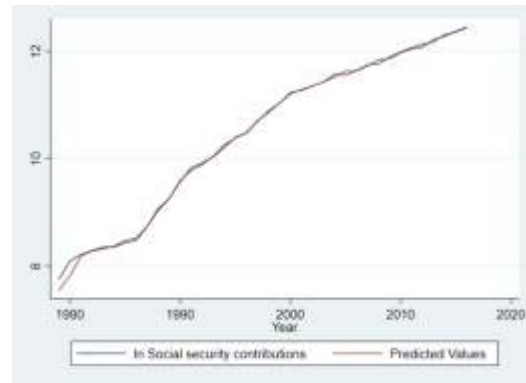
Panel C: Model Residuals
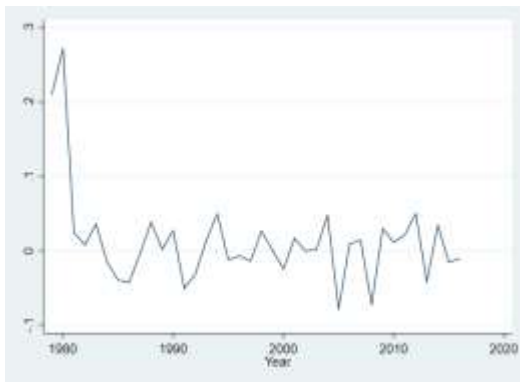
Panel D: Autocorrelation of Residuals
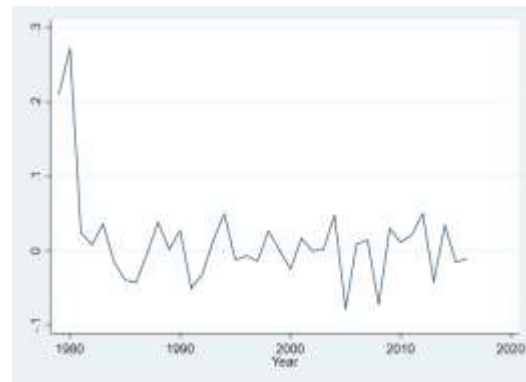
17. Other Current Transfers, Paid

Estimation Period: 1974 – 2016

$$\Delta Other\ Current\ Transfers, Paid = \underbrace{\frac{-0.584\ Other\ Current\ Tranafers, Paid_{t-1}}{(0.133)}}_{Adjustment}$$

$$\underbrace{+\ 0.708\ +0.584\ World\ GDP, Nominal}_{\substack{(3.920) \qquad\quad (0.303)}}$$
$$\underbrace{-0.985\ USD\ Nominal\ Exchange\ Rate +0.826\ JPY\ Nominal\ Exchange\ Rate}_{(0.641) \qquad\qquad\qquad\qquad (0.518)}$$
$$\underbrace{\qquad\qquad\qquad\qquad\qquad\qquad}_{Long-run}$$

$$\underbrace{+\ \Delta\ +\ \Delta}_{\substack{(\quad)\ (\quad) \\ Short-run}}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2$ (41)	Portmanteau Q-Statistic $\chi2$ (21)	MAE	RMSE	R^2
5.135	-4.386	1.365	20.241	0.207	0.256	0.350
[0.008, 0.034]	[0.001, 0.016]	[0.242]	[0.506]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Other Current Transfers, Paid are 0.105, 0.326, -0.673, and 1.410 respectively.

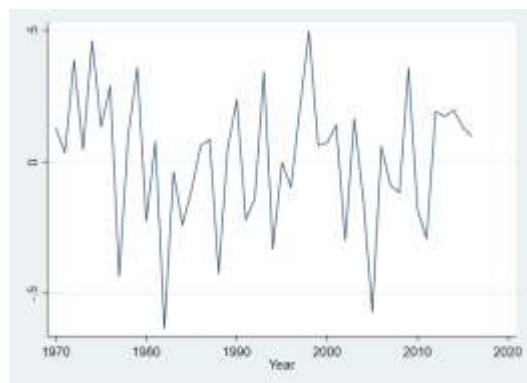Figure 1. Actual v. Predicted Other Current Transfers, along with residuals
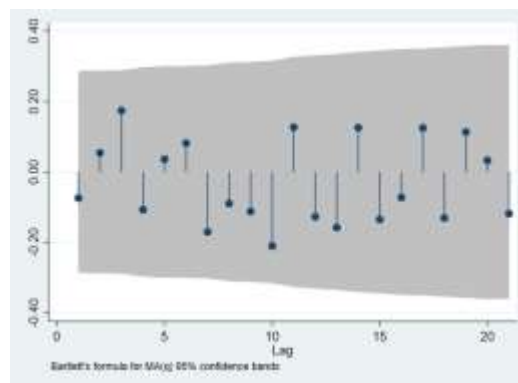
Panel A: Log first-difference
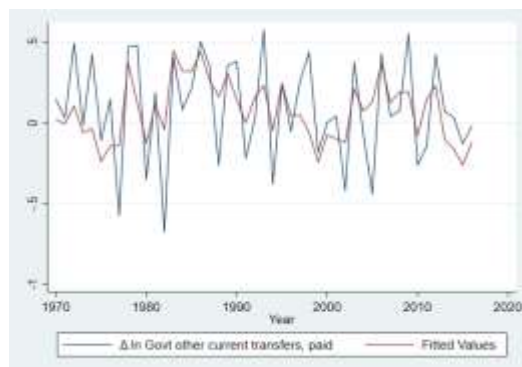
Panel B: Log level
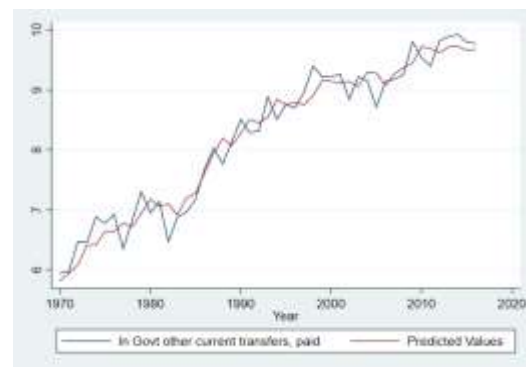
Panel C: Model Residuals   Panel D: Autocorrelation of Residuals

18. Government Property Expenditure
Estimation Period: 1969 – 2016

$$\Delta Government\ Property\ Expenditure = \underbrace{\frac{-0.377\ Government\ Property\ Expenditure_{t-1}}{(0.086)}}_{Adjustment}$$

$$\underbrace{-\ 7.660\ \underset{(1.933)}{} +1.507\ \underset{(0.042)}{World\ GDP, Nominal_{t-1}} +0.061\ \underset{(0.012)}{91day\ TBill\ Rate_{t-1}}}_{Long-run}$$

$$\underbrace{+0.569\ \underset{(0.138)}{\Delta World\ GDP, Nominal} +0.023\ \underset{(0.004)}{\Delta 91day\ TBill\ Rate}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (46)	Portmanteau Q-Statistic χ2 (23)	MAE	RMSE	R^2
14.111	-4.363	1.390	18.434	0.111	0.166	0.490
[0.000, 0.000]	[0.001, 0.008]	[0.238]	[0.733]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Government Property Expenditure are 0.173, 0.227, -0.350, and 0.743 respectively.
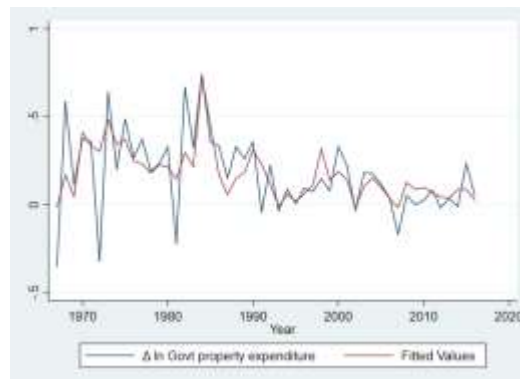
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Figure 1. Actual v. Predicted Government Property Expenditure, along with residuals
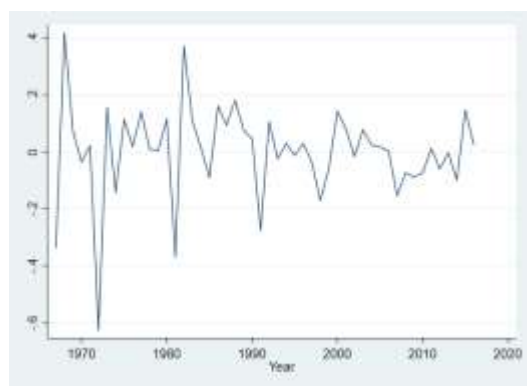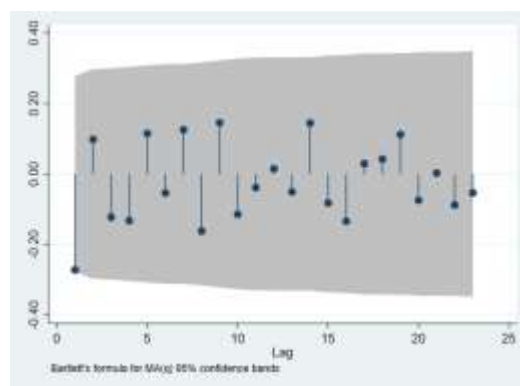
Panel A: Log first-difference
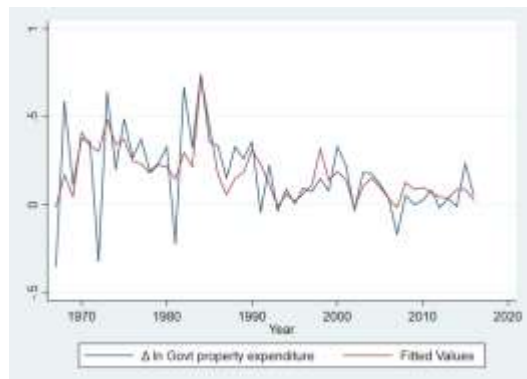
Panel B: Log level

Panel C: Model Residuals

Panel D: Autocorrelation of Residuals

19. Social Security Benefits

Estimation Period: 1981 – 2016

$$\Delta Social\ Security\ Benefits = \underbrace{\frac{-0.334\ Social\ Security\ Benefits_{t-1}}{(0.067)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -\ 4.530\ +0.389\ Compensation\ of\ Residents +2.256\ Employment\ in\ Industry \\ (1.536) \qquad\qquad (0.133) \qquad\qquad\qquad (0.632) \\ +0.393\ JPY\ Nominal\ Exchange\ Rate +0.242\ USD\ Nominal\ Exchange\ Rate \\ (0.169) \qquad\qquad\qquad\qquad (0.224) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} +0.288\ \Delta Social\ Security\ Benefits +0.415\ \Delta Compensation\ of\ Residents \\ (0.141) \qquad\qquad\qquad (0.175) \\ +0.121\ \Delta Compensation\ of\ Residents_{t-1} +0.332\ \Delta Compensation\ of\ Residents_{t-2} \\ (0.132) \qquad\qquad\qquad\qquad (0.128) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2$ (34)	Portmanteau Q-Statistic $\chi 2$ (17)	MAE	RMSE	R^2
5.805	-4.939	1.814	23.404	0.040	0.054	0.664
[0.003, 0.019]	[0.000, 0.010]	[0.177]	[0.136]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Social Security Benefits are 0.185, 0.110, 0.016, and 0.606 respectively.

Figure 1. Actual v. Predicted Social Security Benefits, along with residuals
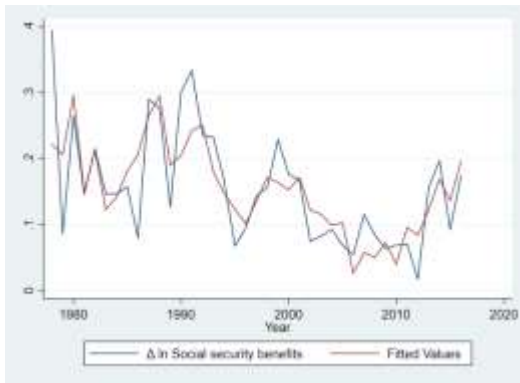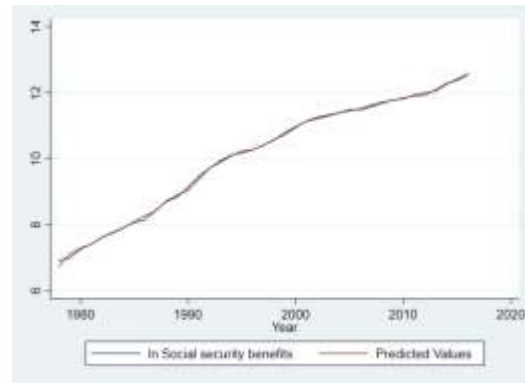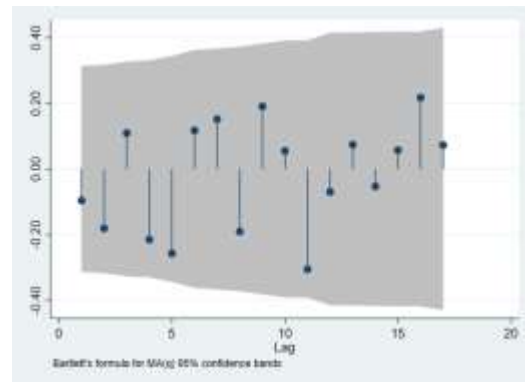
Panel A: Log first-difference

Panel B: Log level

Panel C: Model Residuals

Panel D: Autocorrelation of Residuals

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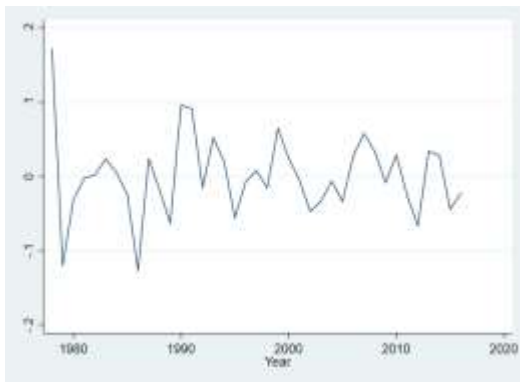
20. Implicit Price Index, Government Spending

Estimation Period: 1981 – 2016

$$\Delta IPIN, Government\ Spending = \underbrace{\frac{-0.376\ IPIN, Government\ Spending_{t-1}}{(0.090)}}_{Adjustment}$$

$$\underbrace{-\ 2.264\ +0.291\ Wage\ Index, Private\ Service_{t-1} + 1.007\ CPI_{t-1}}_{Long-run}$$
$$\quad (0.591) \qquad\qquad (0.075) \qquad\qquad\qquad (0.036)$$

$$\underbrace{+0.493\ \Delta IPIN, Government\ Spending_{t-1} + 0.110\ \Delta Wage\ Index, Private\ Service}_{}$$
$$\quad\quad (0.118) \qquad\qquad\qquad\qquad\qquad (0.042)$$
$$\underbrace{+0.704\ \Delta CPI - 0.406\ \Delta CPI_{t-1}}_{Short-run}$$
$$\quad (0.073) \qquad\quad (0.104)$$

Table A1. Summary of model tests

| Bounds Tests		Heteroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2\ (34)$	Portmanteau Q-Statistic $\chi2\ (16)$	MAE	RMSE	R^2
7.277	-4.185	0.030	23.819	0.015	0.020	0.894
[0.004, 0.013]	[0.002, 0.016]	[0.860]	[0.093]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Implicit Price Index, Government Spending are 0.069, 0.074, -0.256, and 0.326 respectively.

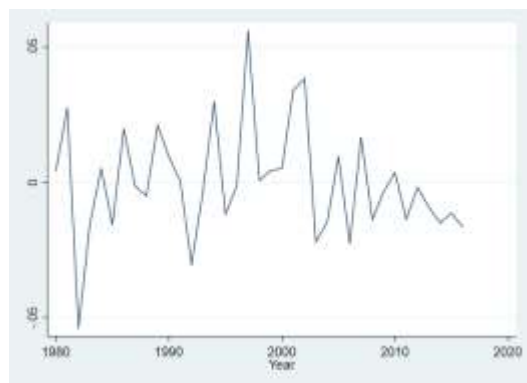Figure 1. Actual v. Predicted Implicit Price Index, Government Spending, along with residuals
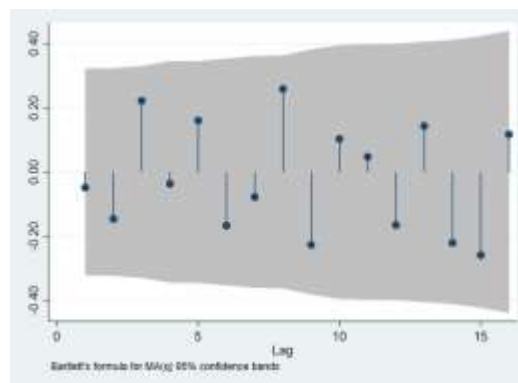
Panel A: Log first-difference
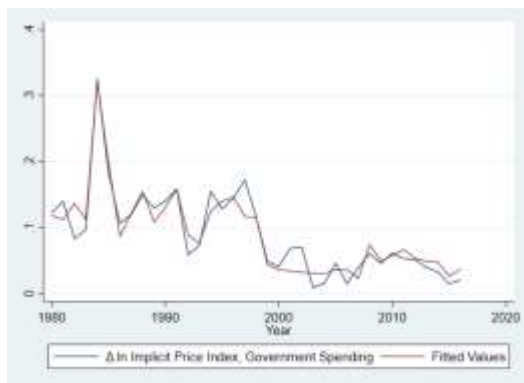
Panel B: Log level
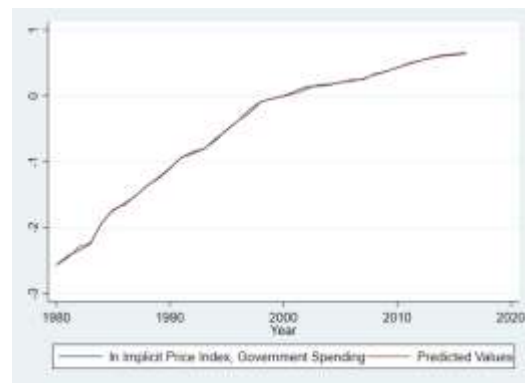
Panel C: Model Residuals

Panel D: Autocorrelation of Residuals

Trade Sector

1. Implicit Price Index – Agricultural Imports
 Estimation Period: 1974 – 2017

$$\Delta IPIN, Agricultural\ Imports = \underbrace{\frac{-0.788\ IPIN, Agricultural\ Imports_{t-1}}{(0.119)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -\ 5.041\ \ +0.964\ Foreign\ IPIN, Agricultural\ Imports +1.178\ USD\ Nominal\ Exchange\ Rate \\ (2.016) \qquad\qquad (0.193) \qquad\qquad\qquad (0.387) \\ -0.048\ JPY\ Nominal\ Exchange\ Rate -0.208\ CNY\ Nominal\ Exchange\ Rate \\ (0.218) \qquad\qquad\qquad (0.149) \\ -0.499\ Tariff, Agricultural\ Imports -0.227\ Philippine\ Retail\ Price\ Index \\ (0.140) \qquad\qquad\qquad (0.165) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} +0.210\ \Delta Import\ Duties \\ (0.126) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

| Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2\ (42)$	Portmanteau Q-Statistic $\chi2\ (22)$	MAE	RMSE	R^2
6.711	-6.574	1.685	15.655	0.087	0.114	0.579
[0.000, 0.003]	[0.000, 0.001]	[0.194]	[0.832]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN – Agricultural Imports are 0.074, 0.169, -0.301, and 0.487 respectively.

Figure 1. Actual v. Predicted IPIN – Agricultural Imports, along with residuals
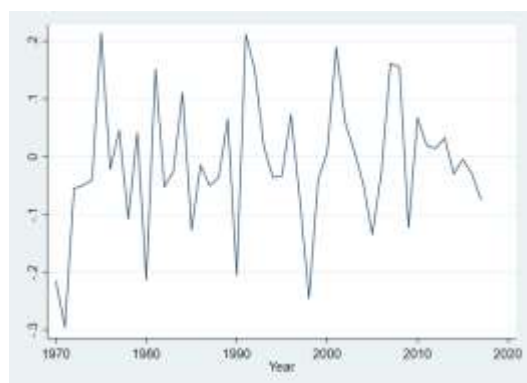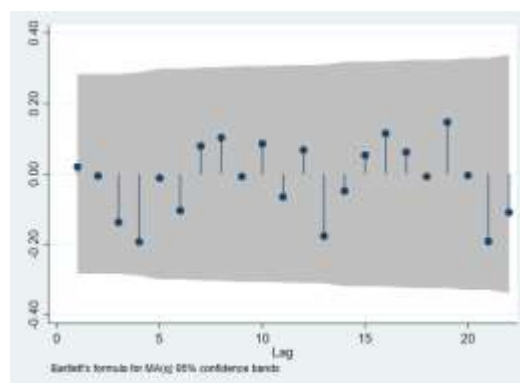
Panel A: Log first-difference
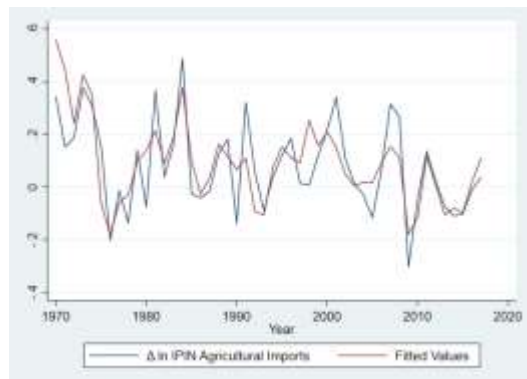
Panel B: Log level
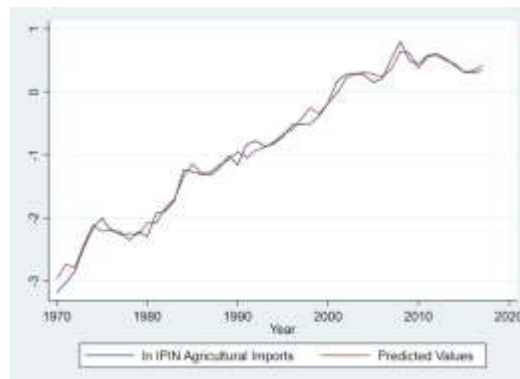
Panel C: Model Residuals

Panel D: Autocorrelation of Residuals

2. Implicit Price Index – Fuel Imports
Estimation Period: 1974 – 2017

$$\Delta IPIN, Fuel\ Imports = \underbrace{\frac{-0.828\ IPIN, Fuel\ Imports_{t-1}}{(0.051)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -\ 6.361\ +1.014\ Foreign\ IPIN, Fuel\ Imports +1.593\ USD\ Nominal\ Exchange\ Rate \\ (0.830) \qquad\qquad (0.071) \qquad\qquad\qquad (0.235) \\ -0.250\ JPY\ Nominal\ Exchange\ Rate -0.461\ CNY\ Nominal\ Exchange\ Rate \\ (0.138) \qquad\qquad\qquad (0.164) \\ -0.282\ Tariff, Fuel\ Imports -0.166\ Philippine\ Retail\ Price\ Index \\ (0.061) \qquad\qquad\qquad (0.126) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} +0.268\ \Delta JPY\ Nominal\ Exchange\ Rate +0.267\ \Delta Tariff, Fuel\ Imports +0.489\ \Delta Tariff, Fuel\ Imports_{t-1} \\ (0.137) \qquad\qquad\qquad (0.178) \qquad\qquad\qquad (0.177) \\ +0.260\ \Delta Tariff, Fuel\ Imports_{t-2} +0.489\ \Delta Tariff, Fuel\ Imports_{t-3} \\ (0.169) \qquad\qquad\qquad (0.161) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2$ (42)	Portmanteau Q-Statistic $\chi 2$ (20)	MAE	RMSE	R^2
55.252	-16.205	0.943	14.587	0.053	0.070	0.930
[0.000, 0.000]	[0.000, 0.000]	[0.331]	[0.799]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN – Fuel Imports are 0.120, 0.261, -0.476, and 1.083 respectively.

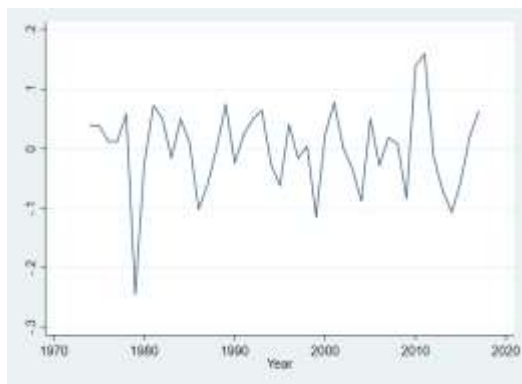Figure 1. Actual v. Predicted IPIN – Fuel Imports, along with residuals
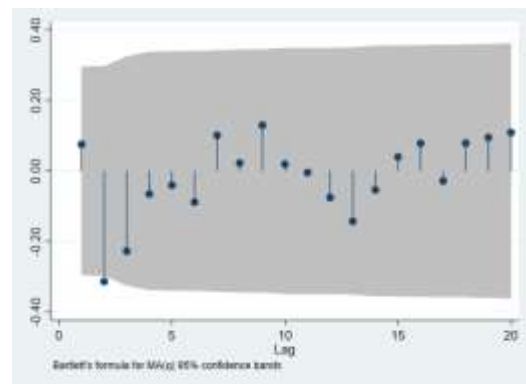
Panel A: Log first-difference
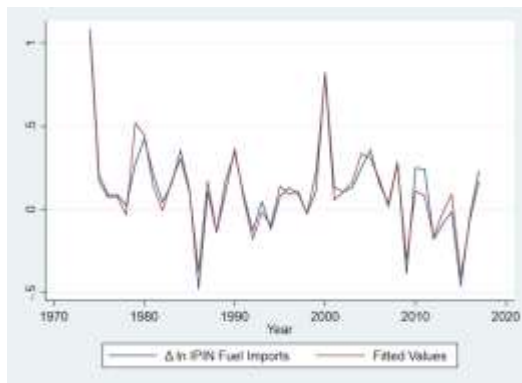
Panel B: Log level
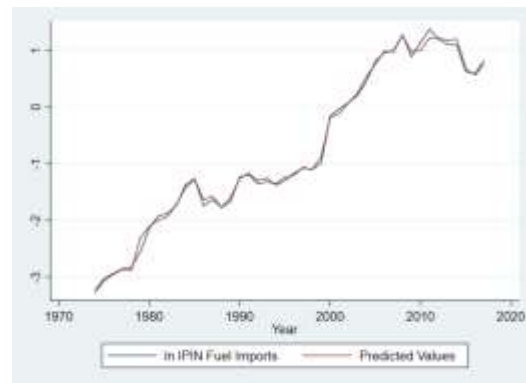
Panel C: Model Residuals

Panel D: Autocorrelation of Residuals

3. Implicit Price Index – Machinery Imports
Estimation Period: 1974 – 2017

$$\Delta IPIN, Machinery\ Imports = \underbrace{\frac{-0.547\ IPIN, Machinery\ Imports_{t-1}}{(0.112)}}_{Adjustment}$$

$$\underbrace{-\ 1.688\ +1.243\ USD\ Nominal\ Exchange\ Rate -0.879\ CNY\ Nominal\ Exchange\ Rate +0.139\ IPIN, Fuel\ Imports}_{Long-run}$$
$$\ \ \ (0.443)\qquad\quad (0.101)\qquad\qquad\qquad\qquad (0.200)\qquad\qquad\qquad\qquad (0.065)$$

$$\underbrace{+0.411\ \Delta CNY\ Nominal\ Exchange\ Rate +0.615\ \Delta CNY\ Nominal\ Exchange\ Rate_{t-1} +0.192\ \Delta IPIN, Fuel\ Imports}_{Short-run}$$
$$\qquad\quad (0.157)\qquad\qquad\qquad\qquad (0.157)\qquad\qquad\qquad\qquad (0.066)$$

Table A1. Summary of model tests

| Bounds Tests		Heteroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2\ (42)$	Portmanteau Q-Statistic $\chi2\ (21)$	MAE	RMSE	R^2
8.908	-4.851	2.636	17.410	0.085	0.127	0.619
[0.000, 0.001]	[0.000, 0.005]	[0.104]	[0.685]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN – Machinery Imports are 0.073, 0.168, -0.573, and 0.168 respectively.

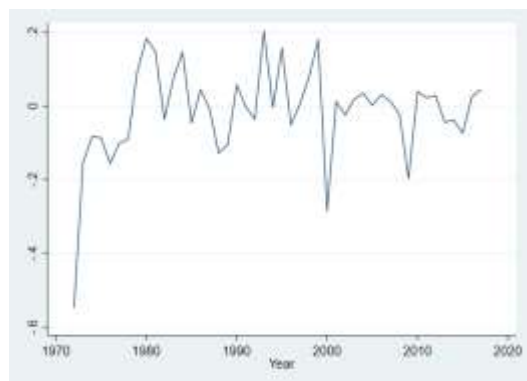Figure 1. Actual v. Predicted IPIN – Machinery Imports, along with residuals
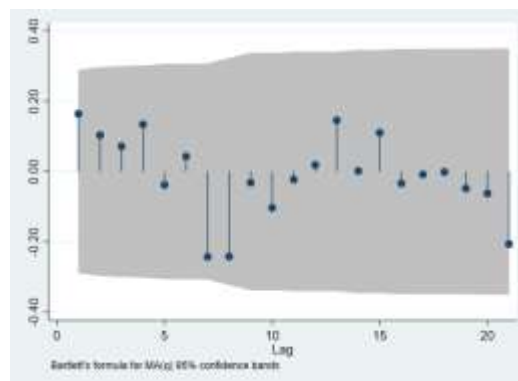
Panel A: Log first-difference
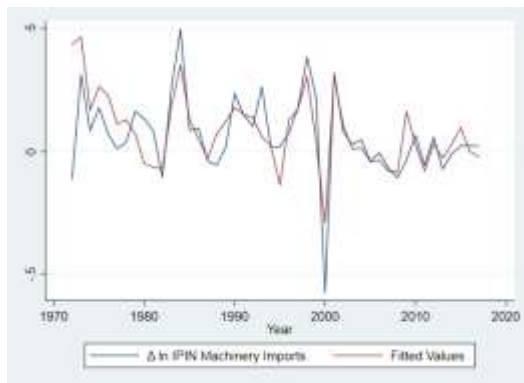
Panel B: Log level
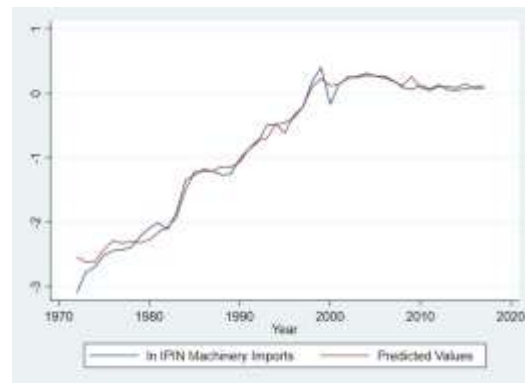
Panel C: Model Residuals

Panel D: Autocorrelation of Residuals

4. Implicit Price Index – Materials Imports

Estimation Period: 1990 – 2016

$$\Delta IPIN, Materials\ Imports = \underbrace{\begin{array}{c} -0.355\ IPIN, Materials\ Imports_{t-1} \\ (0.086) \end{array}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} +\ \underset{(1.474)}{5.126} \ \underset{(0.800)}{-2.223\ Foreign\ IPIN, Materials\ Imports} \underset{(0.103)}{-2.087\ USD\ Nominal\ Exchange\ Rate} \\ \underset{(0.502)}{+1.554\ JPY\ Nominal\ Exchange\ Rate} \underset{(0.171)}{+0.140\ CNY\ Nominal\ Exchange\ Rate} \\ \underset{(0.135)}{-0.242\ Tariff, Materials\ Imports} \underset{(0.543)}{+1.112\ Philippine\ Retail\ Price\ Indez} \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} +0.430\ \Delta Foreign\ IPIN, Materials\ Imports \underset{(0.122)}{+0.357\ \Delta Foreign\ IPIN, Materials\ Imports_{t-1}} \\ \underset{(0.178)}{} \\ \underset{(0.214)}{+0.869\ \Delta USD\ Nominal\ Exchange\ Rate} \underset{(0.122)}{-0.210\ \Delta JPY\ Nominal\ Exchange\ Rate} \\ \underset{(0.172)}{+0.357\ \Delta Philippine\ Retail\ Price\ Index} \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (42)	Portmanteau Q-Statistic χ2 (21)	MAE	RMSE	R^2
6.776	-4.105	0.048	10.318	0.054	0.088	0.858
[0.000, 0.003]	[0.003, 0.082]	[0.826]	[0.974]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN – Materials Imports are 0.070, 0.150, -0.143, and 0.541 respectively.
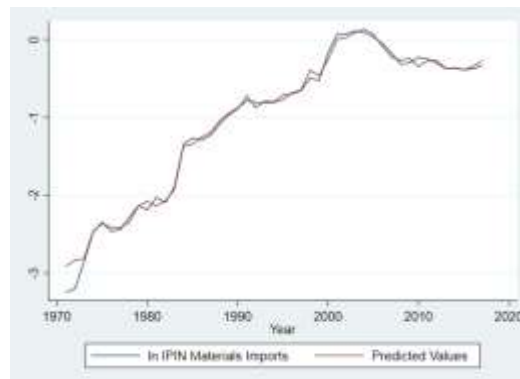
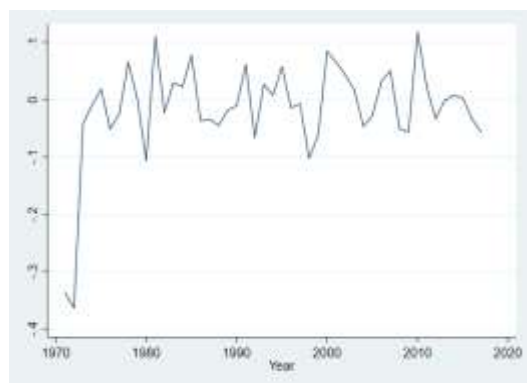Figure 1. Actual v. Predicted IPIN – Materials Imports, along with residuals
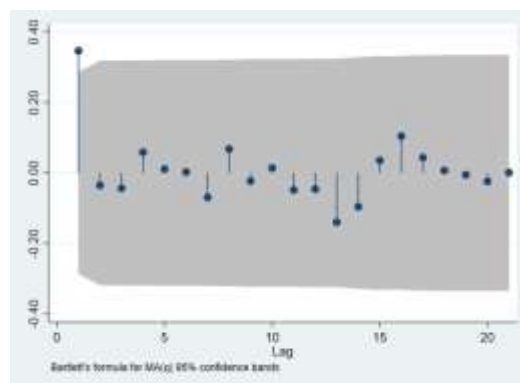
Panel A: Log first-difference
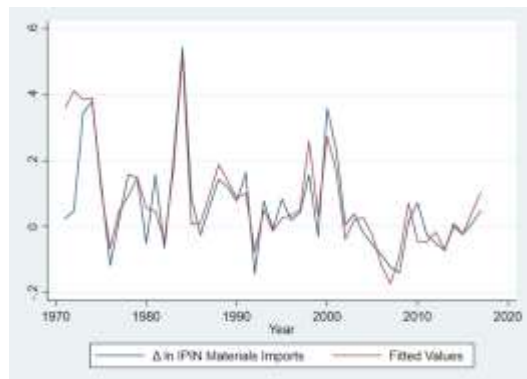
Panel B: Log level

Panel C: Model Residuals

Panel D: Autocorrelation of Residuals

5. Implicit Price Index – Other Good Imports
Estimation Period: 1974 – 2017

$$\Delta IPIN, Other\ Good\ Imports = \underbrace{-0.563\ IPIN, Other\ Good\ Imports_{t-1}}_{Adjustment}$$
$$(0.089)$$

$$\underbrace{\begin{matrix} -\ 7.565\ +0.841\ Foreign\ IPIN, Other\ Good\ Imports +2.565\ USD\ Nominal\ Exchange\ Rate \\ (1.424) \qquad\qquad (0.208) \qquad\qquad\qquad (0.450) \\ -0.988\ JPY\ Nominal\ Exchange\ Rate -0.680\ CNY\ Nominal\ Exchange\ Rate \\ (0.325) \qquad\qquad\qquad (0.180) \end{matrix}}_{Long-run}$$

$$\underbrace{+0.341\ \Delta CNY\ Nominal\ Exchange\ Rate}_{Short-run}$$
$$(0.149)$$

Table A1. Summary of model tests

| Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2$ (42)	Portmanteau Q-Statistic $\chi 2$ (21)	MAE	RMSE	R^2
10.962	-6.288	0.132	18.453	0.077	0.102	0.622
[0.000, 0.000]	[0.000, 0.000]	[0.715]	[0.620]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN – Other Good Imports are 0.078, 0.201, -0.312, and 0.948 respectively.

Figure 1. Actual v. Predicted IPIN – Other Good Imports, along with residuals
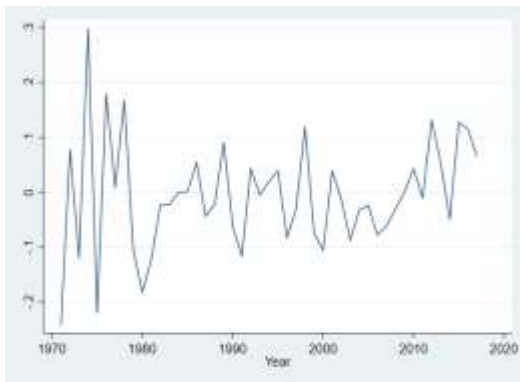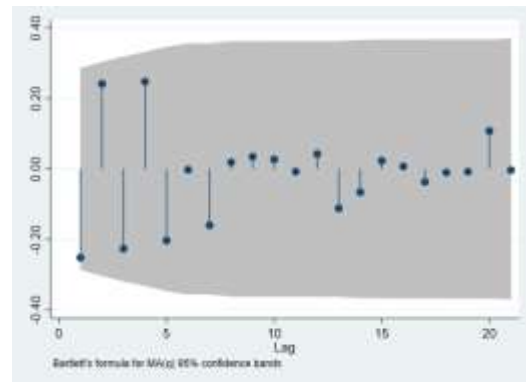
Panel A: Log first-difference
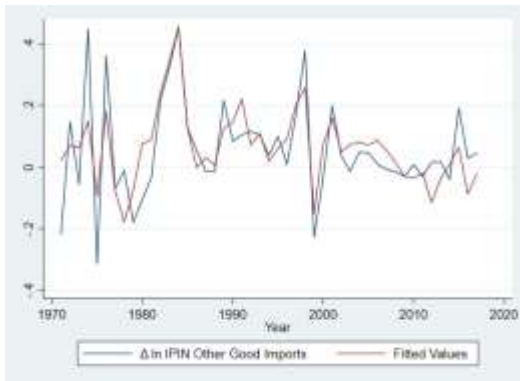
Panel B: Log level
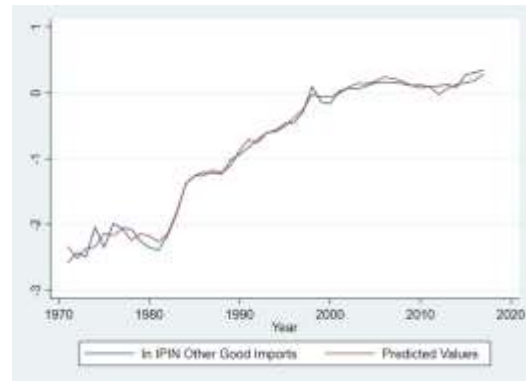
Panel C: Model Residuals

Panel D: Autocorrelation of Residuals

6. Implicit Price Index – Electronics Exports

Estimation Period: 1977 – 2017

$$\Delta IPIN, Electronics\ Exports = \underbrace{\frac{-0.624\ IPIN, Electronics\ Exports_{t-1}}{(0.082)}}_{Adjustment}$$

$$\underbrace{-\underset{(1.062)}{0.666} \underset{(0.189)}{-0.045}\ Philippine\ Retail\ Price\ Index + \underset{(0.368)}{1.140}\ USD\ Nominal\ Exchange\ Rate}_{} $$
$$\underbrace{+ \underset{(0.284)}{0.310}\ JPY\ Nominal\ Exchange\ Rate - \underset{(0.209)}{1.672}\ CNY\ Nominal\ Exchange\ Rate}_{Long-run}$$

$$\underbrace{+ \underset{(0.196)}{1.179}\ \Delta CNY\ Nominal\ Exchange\ Rate + \underset{(0.229)}{0.768}\ \Delta CNY\ Nominal\ Exchange\ Rate_{t-1}}_{}$$
$$\underbrace{+ \underset{(0.203)}{0.803}\ \Delta CNY\ Nominal\ Exchange\ Rate_{t-2}}_{Short-run}$$

Table A1. Summary of model tests

| Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2\ (39)$	Portmanteau Q-Statistic $\chi2\ (20)$	MAE	RMSE	R^2
17.470	-7.957	0.019	12.856	0.120	0.197	0.750
[0.000, 0.000]	[0.000, 0.000]	[0.890]	[0.883]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN – Electronics Exports are 0.059, 0.222, -0.600, and 0.819 respectively.

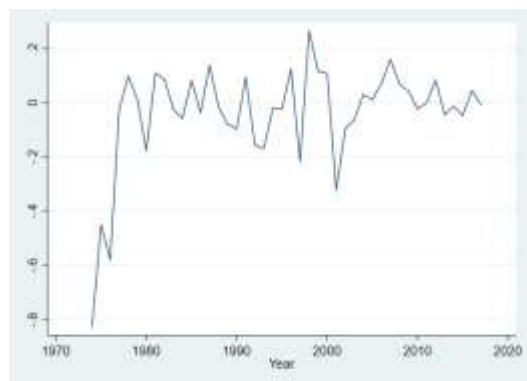Figure 1. Actual v. Predicted IPIN – Electronics Exports, along with residuals
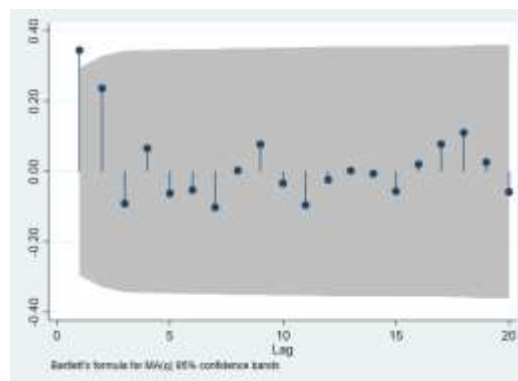
Panel A: Log first-difference
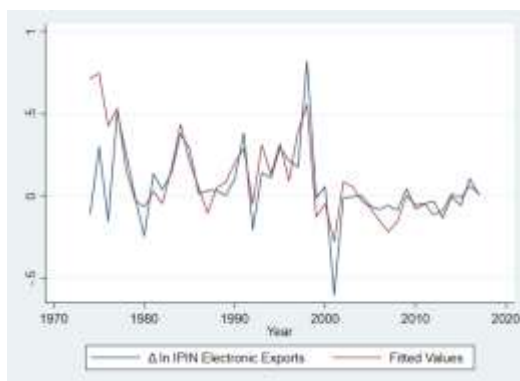
Panel B: Log level
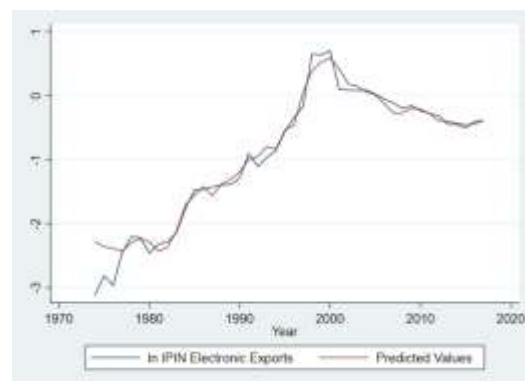
Panel C: Model Residuals

Panel D: Autocorrelation of Residuals

7. Implicit Price Index – Agricultural Exports
Estimation Period: 1974 – 2017

$$\Delta IPIN, Agricultural\ Exports = \underbrace{\frac{-0.546\ IPIN, Agricultural\ Exports_{t-1}}{(0.134)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -\ 4.158\ \underset{(1.127)}{}\ +\underset{(0.107)}{0.764}\ World\ Wholesale\ Price\ Index_{t-1}+\underset{(0.509)}{0.813}\ USD\ Nominal\ Exchange\ Rate_{t-1} \\ +\underset{(0.240)}{0.502}\ CNY\ Nominal\ Exchange\ Rate_{t-1}-\underset{(0.367)}{0.529}\ JPY\ Nominal\ Exhange\ Rate_{t-1} \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} +\underset{(0.537)}{1.173}\ \Delta World\ Wholesale\ Price\ Index -\underset{(0.507)}{0.322}\ \Delta World\ Wholesale\ Price\ Index_{t-1} \\ -\underset{(0.558)}{1.936}\ \Delta World\ Wholesale\ Price\ Index_{t-2}-\underset{(0.487)}{0.960}\ \Delta World\ Wholesale\ Price\ Index_{t-3} \\ +\underset{(0.234)}{0.444}\ \Delta USD\ Nominal\ Exchange\ Rate +\underset{(0.233)}{0.343}\ \Delta CNY\ Nominal\ Exchange\ Rate \\ -\underset{(0.226)}{0.063}\ \Delta CNY\ Nominal\ Exchange\ Rate_{t-1}-\underset{(0.)}{0.680}\ \Delta CNY\ Nominal\ Exchange\ Rate_{t-2} \\ -\underset{(0.)}{0.289}\ \Delta JPY\ Nominal\ Exchange\ Rate \end{array}}_{Short-run}$$

Table A1. Summary of model tests

| Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2\ (42)$	Portmanteau Q-Statistic $\chi 2\ (20)$	MAE	RMSE	R^2
5.435	-4.063	0.053	11.110	0.087	0.112	0.704
[0.003, 0.022]	[0.003, 0.046]	[0.817]	[0.943]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN – Agricultural Exports are 0.092, 0.193, -0.273, and 0.692 respectively.

Figure 1. Actual v. Predicted IPIN – Agricultural Exports, along with residuals
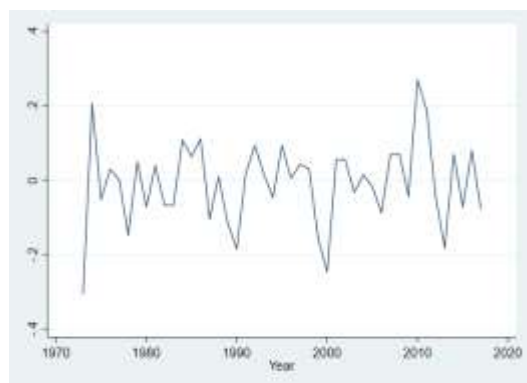
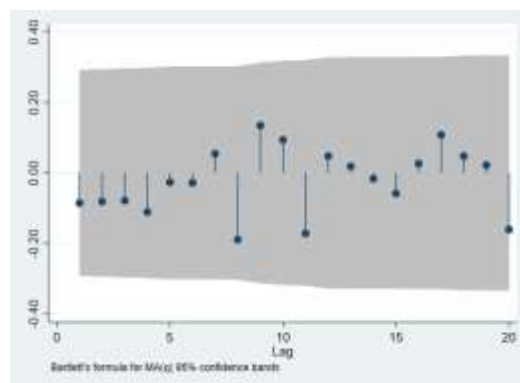Panel A: Log first-difference
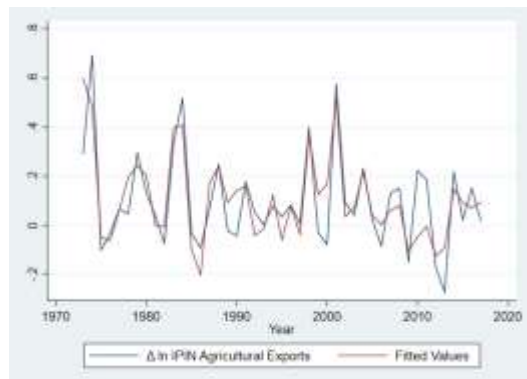
Panel B: Log level
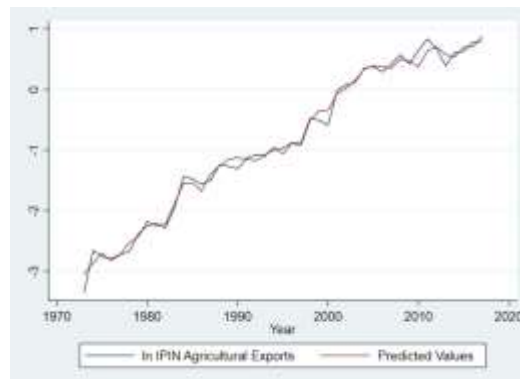
Panel C: Model Residuals

Panel D: Autocorrelation of Residuals

8. Implicit Price Index – Mineral Exports
Estimation Period: 1971 – 2017

$$\Delta IPIN, Mineral\ Exports = \underbrace{\frac{-0.522\ IPIN, Mineral\ Exports_{t-1}}{(0.093)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -\ 4.665\ \underset{(0.954)}{} +1.199\ \underset{(0.145)}{Foreign\ IPIN, Mineral\ Exports} \\ +1.139\ \underset{(0.070)}{Nominal\ Effective\ Exchange\ Rate} +0.032\ \underset{(0.013)}{Total\ Natural\ Disasters} \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} +0.282\ \underset{(0.090)}{\Delta IPIN, Mineral\ Exports_{t-1}} +0.016\ \underset{(0.081)}{\Delta IPIN, Mineral\ Exports_{t-2}} \\ +0.262\ \underset{(0.078)}{\Delta IPIN, Mineral\ Exports_{t-3}} +0.229\ \underset{(0.129)}{\Delta Foreign\ IPIN, Mineral\ Exports} \\ -0.006\ \underset{(0.005)}{\Delta Total\ Natural\ Disasters} -0.015\ \underset{(0.004)}{\Delta Total\ Natural\ Disasters_{t-1}} \end{array}}_{Short-run}$$

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Table A1. Summary of model tests

| Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2\ (45)$	Portmanteau Q-Statistic $\chi 2\ (21)$	MAE	RMSE	R^2
9.062	-5.574	1.848	17.007	0.079	0.110	0.767
[0.000, 0.001]	[0.000, 0.001]	[0.173]	[0.710]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN – Mineral Exports are 0.084, 0.257, -0.584, and 0.953 respectively.

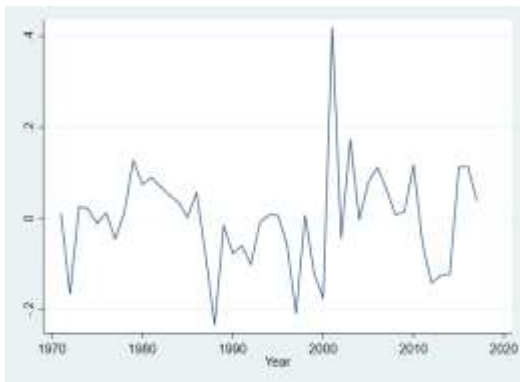Figure 1. Actual v. Predicted IPIN – Mineral Exports, along with residuals
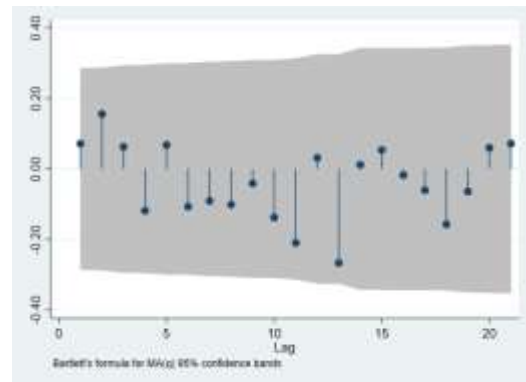
Panel A: Log first-difference
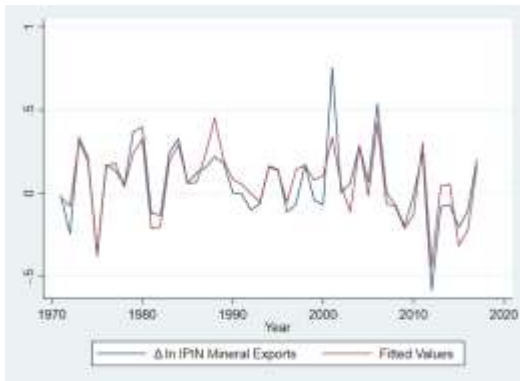
Panel B: Log level
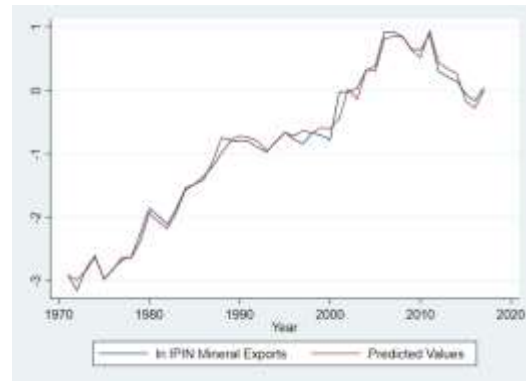
Panel C: Model Residuals

Panel D: Autocorrelation of Residuals

9. Implicit Price Index – Other Good Exports

Estimation Period: 1974 – 2017

$$\Delta IPIN, Other\ Good\ Exports = \underbrace{\frac{-0.459\ IPIN, Other\ Good\ Exports_{t-1}}{(0.087)}}_{Adjustment}$$

$$\underbrace{\begin{array}{l} -\ 3.131\ -0.268\ Philippine\ Retail\ Price\ Index + 2.261\ USD\ Nominal\ Exchange\ Rate \\ \quad (1.059) \qquad\qquad (0.266) \qquad\qquad\qquad\qquad (0.548) \\ \quad\quad -0.263\ JPY\ Nominal\ Exchange\ Rate - 0.428\ CNY\ Nominal\ Exchange\ Rate \\ \qquad\qquad (0.438) \qquad\qquad\qquad\qquad\qquad (0.267) \end{array}}_{Long-run}$$

Table A1. Summary of model tests

| Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2$ (42)	Portmanteau Q-Statistic $\chi2$ (22)	MAE	RMSE	R^2
8.266	-5.271	2.127	17.171	0.123	0.178	0.521
[0.000, 0.001]	[0.000, 0.004]	[0.144]	[0.753]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN – Other Good Exports are 0.074, 0.268, -0.499, and 1.289 respectively.

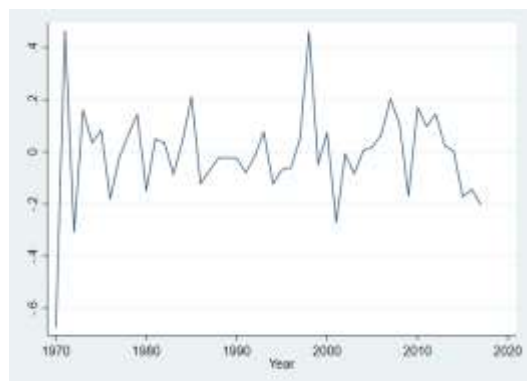Figure 1. Actual v. Predicted , along with residuals
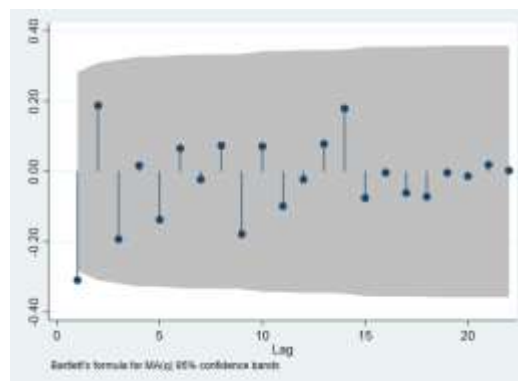
Panel A: Log first-difference

Panel B: Log level

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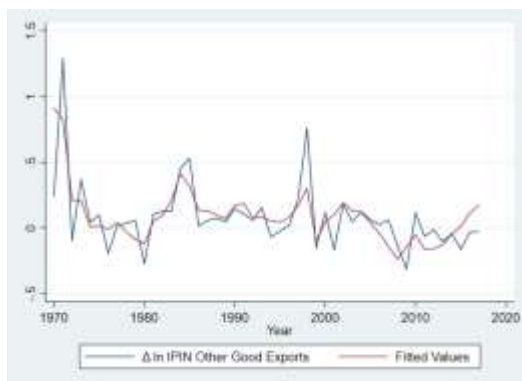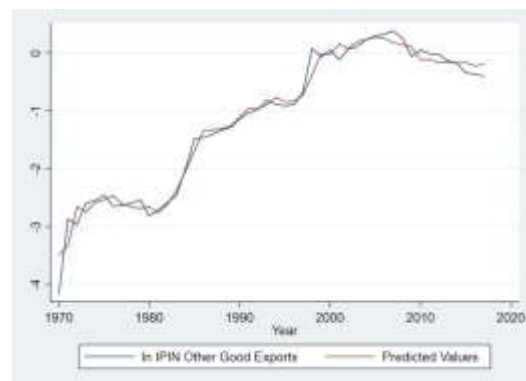
Panel C: Model Residuals

Panel D: Autocorrelation of Residuals

10. Implicit Price Index – Service Imports
Estimation Period: 1984 – 2017

$$\Delta IPIN, Service\ Imports = \underbrace{\frac{-0.604\ IPIN, Service\ Imports_{t-1}}{(0.123)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -\ 2.206\ +0.554\ Philippine\ Retail\ Price\ Index \\ (0.630) \qquad\qquad (0.105) \\ +0.613\ USD\ Nominal\ Exchange\ Rate -0.643\ CNY\ Nominal\ Exchange\ Rate \\ (0.152) \qquad\qquad\qquad (0.101) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} +0.256\ \Delta CNY\ Nominal\ Exchange\ Rate \\ (0.116) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2$ (32)	Portmanteau Q-Statistic $\chi2$ (16)	MAE	RMSE	R^2
14.691	-4.896	0.807	11.805	0.064	0.085	0.680
[0.000, 0.000]	[0.000, 0.006]	[0.368]	[0.757]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN – Service Imports are 0.069, 0.125, -0.252, and 0.424 respectively.
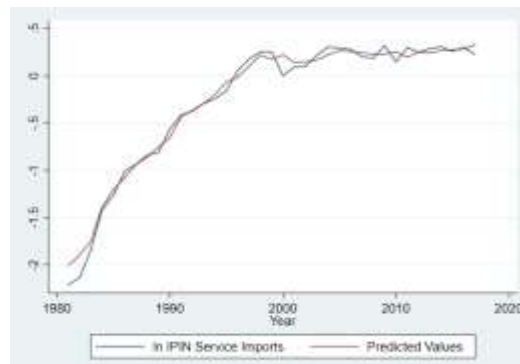
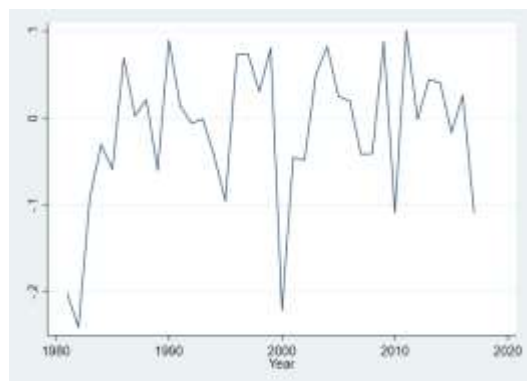Figure 1. Actual v. Predicted IPIN – Service Imports, along with residuals
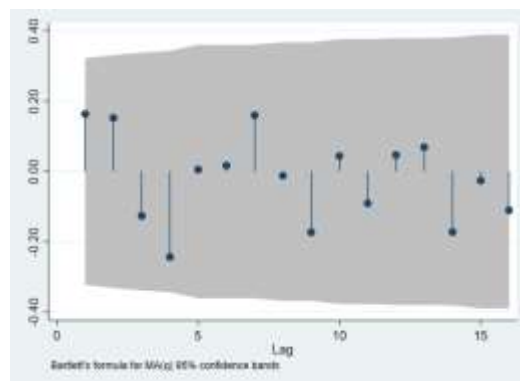
Panel A: Log first-difference
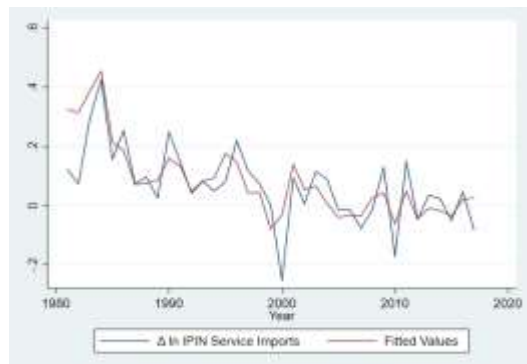
Panel B: Log level

Panel C: Model Residuals

Panel D: Autocorrelation of Residuals

11. Implicit Price Index – BPO Service Exports

Estimation Period: 1984 – 2017

$$\Delta IPIN, BPO\ Service\ Exports = \underbrace{\frac{-0.798\ IPIN, BPO\ Service\ Exports_{t-1}}{(0.149)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -\ 1.073\ +0.683\ Foreign\ IPIN, BPO\ Service\ Exports\ +2.024\ USD\ Nominal\ Exchange\ Rate \\ (3.166)\qquad\qquad (0.182)\qquad\qquad\qquad\qquad (0.732) \\ +1.713\ IPIN, Materials\ Imports +0.321\ IPIN, Fuel\ Imports \\ (0.583)\qquad\qquad\qquad (0.126) \end{array}}_{Long-run}$$

$$\underbrace{+0.239\ \Delta IPIN, BPO\ Service\ Exports_{t-1} +0.364\ \Delta IPIN, BPO\ Service\ Exports_{t-2} -0.307\ \Delta\ IPIN, Fuel\ Imports}_{Short-run}$$
$$(0.150)\qquad\qquad\qquad (0.156)\qquad\qquad\qquad (0.176)$$

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Table A1. Summary of model tests

| Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2$ (32)	Portmanteau Q-Statistic $\chi 2$ (15)	MAE	RMSE	R^2
10.067	-5.355	0.580	14.808	0.118	0.164	0.683
[0.000, 0.001]	[0.000, 0.005]	[0.445]	[0.465]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN – BPO Service Exports are 0.084, 0.272, -0.767, and 1.271 respectively.

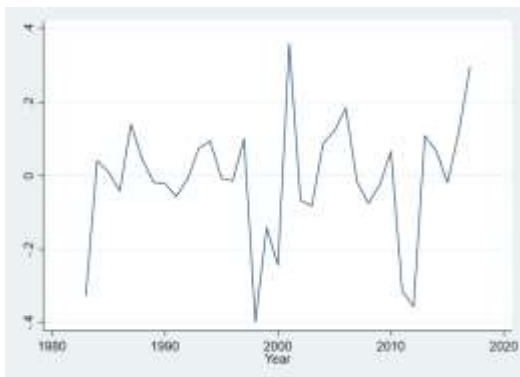Figure 1. Actual v. Predicted IPIN – BPO Service Exports, along with residuals
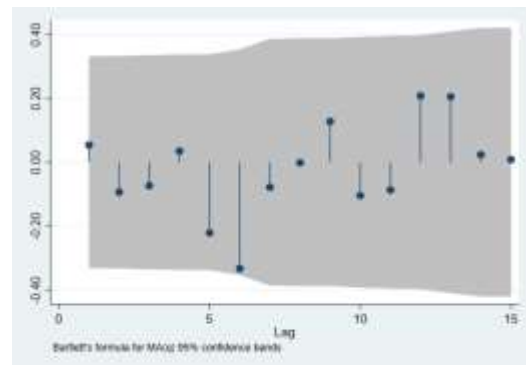
Panel A: Log first-difference

Panel B: Log level
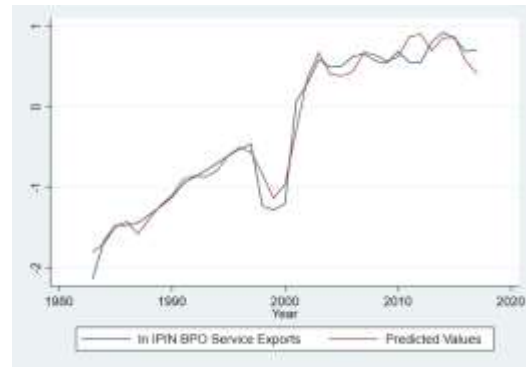
Panel C: Model Residuals

Panel D: Autocorrelation of Residuals

12. Implicit Price Index – Tourism Service Exports

Estimation Period: 1984 – 2017

$$\Delta IPIN, Tourism\ Service\ Exports = \underbrace{\dfrac{-0.590\ IPIN, Tourism\ Service\ Exports_{t-1}}{(0.163)}}_{Adjustment}$$

$$\underbrace{+\ \underset{(4.616)}{2.650}\ \underset{(0.042)}{-1.338\ Foreign\ IPIN, Tourism\ Service\ Exports}}$$

$$\underbrace{\underset{(0.401)}{-0.407\ Nominal\ Effective\ Exchange\ Rate} \underset{(0.248)}{+2.939\ Philippine\ Wholesale\ Price\ Index}}_{Long-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2\ (32)$	Portmanteau Q-Statistic $\chi2\ (16)$	MAE	RMSE	R^2
4.113	-3.616	1.236	14.355	0.206	0.310	0.362
[0.030, 0.098]	[0.011, 0.078]	[0.266]	[0.572]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN – Tourism Service Exports are 0.084, 0.0342, -0.900, and 1.256 respectively.

Figure 1. Actual v. Predicted IPIN – Tourism Service Exports, along with residuals

Panel A: Log first-difference
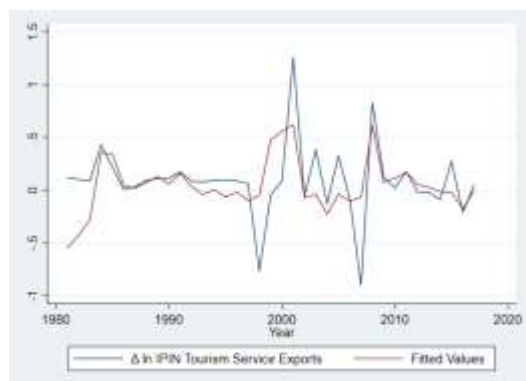
Panel B: Log level
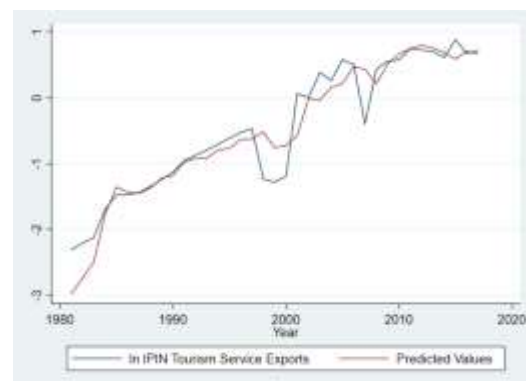
Panel C: Model Residuals
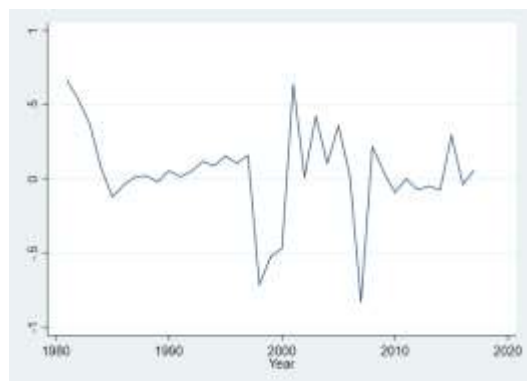
Panel D: Autocorrelation of Residuals
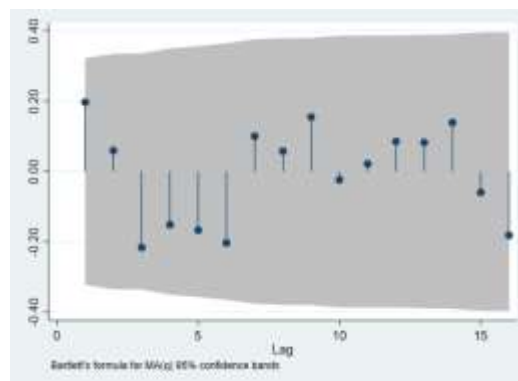
13. Implicit Price Index – Other Service Exports
Estimation Period: 1984 – 2017

$$\Delta IPIN, Other\ Service\ Exports = \underbrace{\frac{-0.727\ IPIN, Other\ Service\ Exports_{t-1}}{(0.150)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -15.905 + 2.616\ Philippine\ Retail\ Price\ Index + 1.503\ USD\ Nominal\ Exchange\ Rate \\ (3.752) \qquad\qquad (0.497) \qquad\qquad\qquad (0.777) \\ -1.631\ JPY\ Nominal\ Exchange\ Rate + 1.218\ CNY\ Nominal\ Exchange\ Rate \\ (0.712) \qquad\qquad\qquad (0.303) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} +0.336\ \Delta IPIN, Other\ Service\ Exports_{t-1} + 0.407\ \Delta IPIN, Other\ Service\ Exports_{t-2} + 0.036\ \Delta USD\ Nominal\ Exchange\ Rate \\ (0.151) \qquad\qquad\qquad (0.152) \qquad\qquad\qquad\qquad (0.730) \\ -0.031\ \Delta USD\ Nominal\ Exchange\ Rate_{t-1} - 2.761\ \Delta USD\ Nominal\ Exchange\ Rate_{t-2} \\ (0.730) \qquad\qquad\qquad\qquad (0.617) \\ +0.787\ \Delta USD\ Nominal\ Exchange\ Rate_{t-3} + 0.329\ \Delta JPY\ Nominal\ Exchange\ Rate \\ (0.398) \qquad\qquad\qquad (0.469) \\ +0.644\ \Delta JPY\ Nominal\ Exchange\ Rate_{t-1} + 1.566\ \Delta JPY\ Nominal\ Exchange\ Rate_{t-2} \\ (0.424) \qquad\qquad\qquad (0.474) \\ -0.326\ \Delta CNY\ Nominal\ Exchange\ Rate - 1.027\ \Delta CNY\ Nominal\ Exchange\ Rate_{t-1} \\ (0.414) \qquad\qquad\qquad (0.407) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Heteroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ^2 (32)	Portmanteau Q-Statistic χ^2 (15)	MAE	RMSE	R^2
6.933	-4.829	0.353	5.256	0.103	0.159	0.804
[0.002, 0.013]	[0.001, 0.014]	[0.552]	[0.989]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) IPIN – Other Service Exports are 0.089, 0.253, -0.155, and 1.380 respectively.

Figure 1. Actual v. Predicted IPIN – Other Service Exports, along with residuals

Panel A: Log first-difference
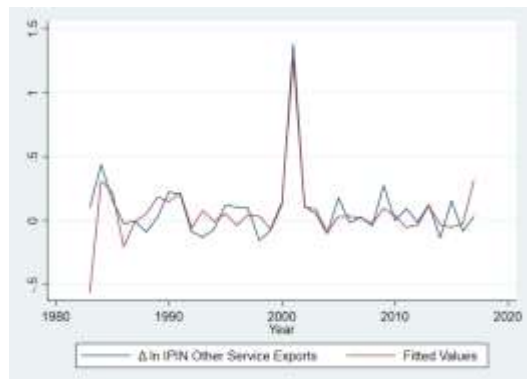
Panel B: Log level
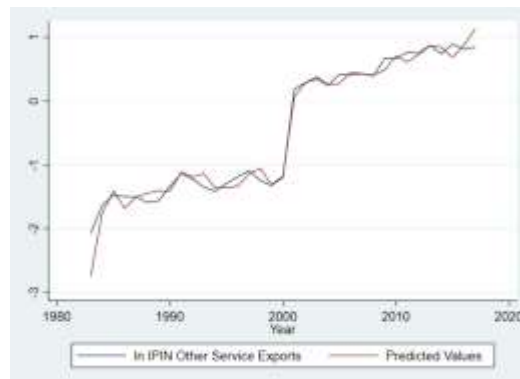
Panel C: Model Residuals
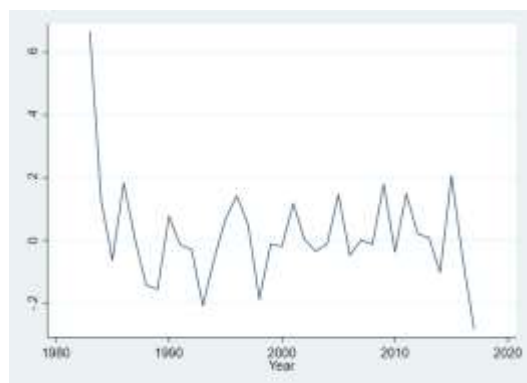
Panel D: Autocorrelation of Residuals
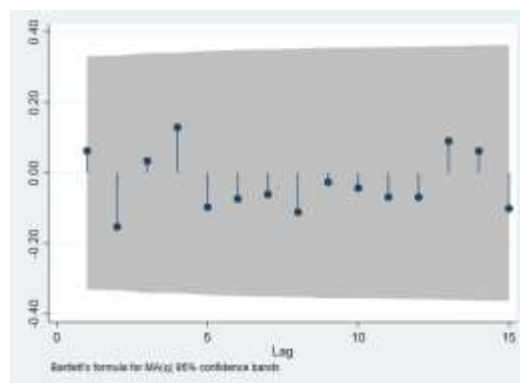
14. Electronics Exports, Real

Estimation Period: 1977 – 2016

$$\Delta Electronics\ Exports, Real = \underbrace{\frac{-0.303\ Electronics\ Exports, Real_{t-1}}{(0.060)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -\ 1.108\ -0.900\ IPIN, Electronics\ Exports \\ (1.497)\qquad\quad (0.467) \\ +3.241\ Consumer\ Price\ Index, China +1.284\ Real\ Effective\ Exchange\ Rate \\ (0.767)\qquad\qquad\qquad\qquad (0.635) \end{array}}_{Long-run}$$

$$\underbrace{-0.636\ \Delta IPIN, Electronics\ Exports -0.653\ \Delta Consumer\ Price\ Index, China -1.447\ \Delta Consumer\ Price\ Index, China_{t-1}}_{Short-run}$$
$$(0.129)\qquad\qquad\qquad (0.679)\qquad\qquad\qquad\qquad (0.781)$$

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Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2$ (38)	Portmanteau Q-Statistic $\chi2$ (19)	MAE	RMSE	R^2
8.528	-5.014	0.771	16.463	0.113	0.149	0.625
[0.000, 0.002]	[0.000, 0.004]	[0.379]	[0.626]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Electronics Exports, Real are 0.163, 0.273, -0.429, and 0.937 respectively.

Figure 1. Actual v. Predicted , along with residuals

Panel A: Log first-difference
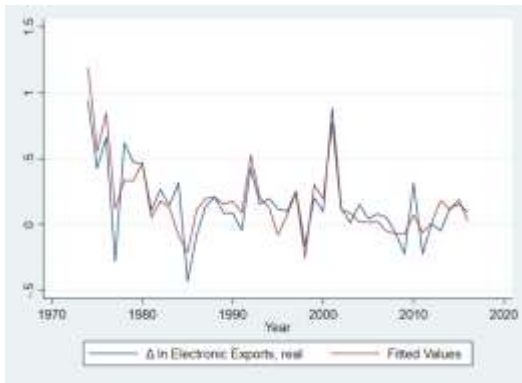
Panel B: Log level
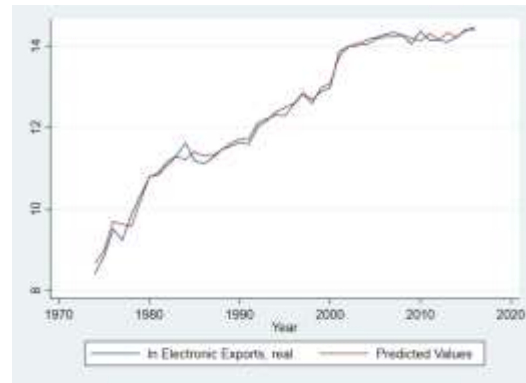
Panel C: Model Residuals
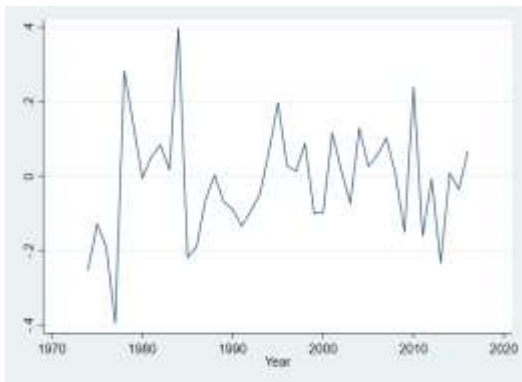
Panel D: Autocorrelation of Residuals
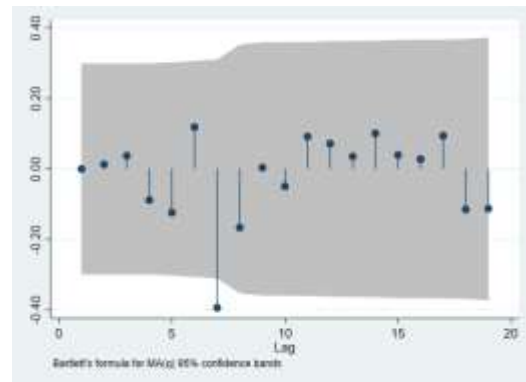
15. Agricultural Exports, Real

Estimation Period: 1971 – 2016

$$\Delta Agricultural\ Exports, Real = \underbrace{\frac{-0.719\ Agricultural\ Exports, Real_{t-1}}{(0.105)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -\ 6.258\ +0.486\ World\ GDP, Real -0.672\ IPIN, Agricultural\ Exports \\ (4.025) \qquad\quad (0.195) \qquad\qquad\qquad (0.169) \\ +1.431\ Foreign\ IPIN, Agricultural\ Exports +0.689\ USD\ Real\ Exchange\ Rate \\ (0.324) \qquad\qquad\qquad\qquad (0.255) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} +0.384\ \Delta World\ GDP, Real -0.822\ \Delta World\ GDP, Real_{t-1} \\ (0.267) \qquad\qquad (0.186) \\ -0.807\ \Delta Foreign\ IPIN, Agricultural\ Exports -0.413\ \Delta Foreign\ IPIN, Agricultural\ Exports_{t-1} \\ (0.196) \qquad\qquad\qquad\qquad (0.145) \\ -0.366\ \Delta Foreign\ IPIN, Agricultural\ Exports_{t-2} -0.556\ \Delta USD\ Real\ Exchange\ Rate \\ (0.146) \qquad\qquad\qquad\qquad (0.300) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2\ (44)$	Portmanteau Q-Statistic $\chi 2\ (22)$	MAE	RMSE	R^2
16.168	-6.820	1.525	26.778	0.056	0.072	0.779
[0.000, 0.000]	[0.000, 0.000]	[0.216]	[0.219]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Agricultural Exports, Real are -0.013, 0.159, -0.330, and 0.423 respectively.

Figure 1. Actual v. Predicted Agricultural Exports, Real, along with residuals

Panel A: Log first-difference
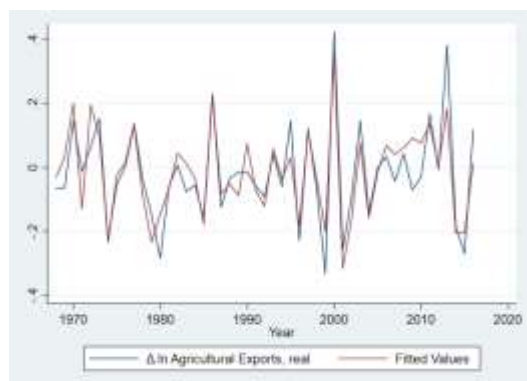
Panel B: Log level
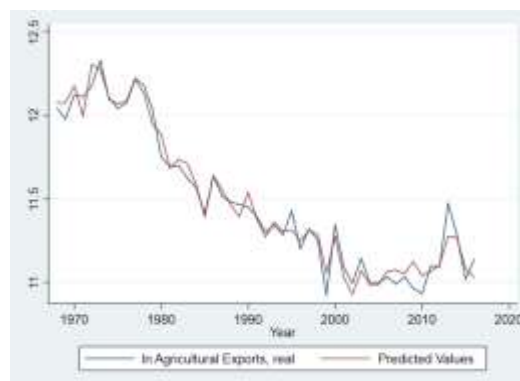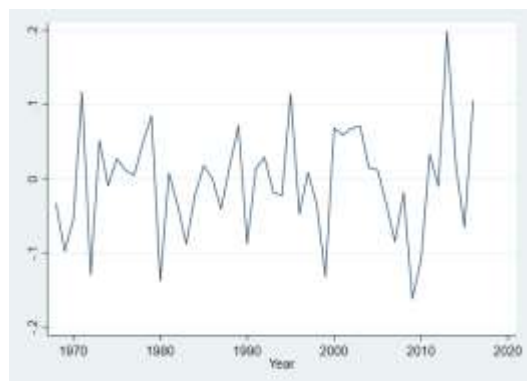
Panel C: Model Residuals   Panel D: Autocorrelation of Residuals
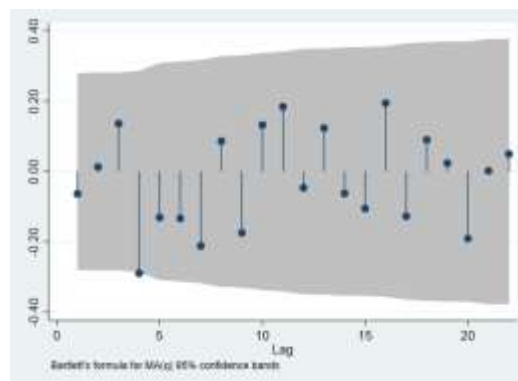
16. Mineral Exports, Real

Estimation Period: 1974 – 2016

$$\Delta Mineral\ Exports, Real = \underbrace{\frac{-1.158\ Mineral\ Exports, Real_{t-1}}{(0.148)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -\ 5.537\ +0.856\ World\ GDP, Real -0.656\ IPIN, Mineral\ Exports \\ (2.207) \qquad (0.092) \qquad\qquad (0.073) \\ -1.195\ USD\ Real\ Exchange\ Rate +0.920\ CNY\ Real\ Exchange\ Rate \\ (0.156) \qquad\qquad\qquad (0.113) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} +0.378\ \Delta Mineral\ Exports, Real_{t-1} +0.289\ \Delta Mineral\ Exports, Real_{t-2} -0.085\ \Delta World\ GDP, Real \\ (0.122) \qquad\qquad (0.111) \qquad\qquad (0.346) \\ -0.788\ \Delta World\ GDP, Real_{t-1} -1.191\ \Delta USD\ Real\ Exchange\ Rate \\ (0.273) \qquad\qquad (0.402) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (41)	Portmanteau Q-Statistic χ2 (21)	MAE	RMSE	R^2
15.407	-7.814	0.756	11.730	0.097	0.140	0.745
[0.000, 0.000]	[0.000, 0.000]	[0.384]	[0.946]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Mineral Exports, Real are 0.023, 0.215, -0.747, and 0.784 respectively.

Figure 1. Actual v. Predicted Mineral Exports, Real, along with residuals

Panel A: Log first-difference
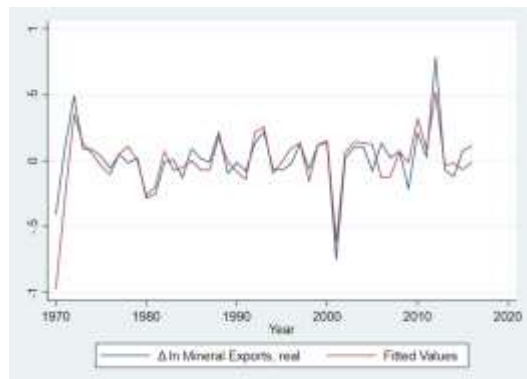
Panel B: Log level

Panel C: Model Residuals

Panel D: Autocorrelation of Residuals
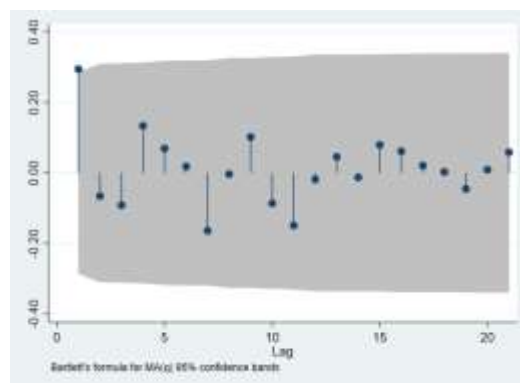
17. Other Good Exports, Real
Estimation Period: 1973 – 2016

$$\Delta Other\ Good\ Exports, Real = \underbrace{\frac{-0.879\ Other\ Good\ Exports, Real_{t-1}}{(0.139)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -\ 0.054\ +1.008\ World\ GDP, Real - 0.568\ IPIN, Other\ Good\ Exports \\ (2.149) \qquad\quad (0.085) \qquad\qquad\qquad (0.085) \\ -2.053\ USD\ Real\ Exchange\ Rate + 0.519\ JPY\ Real\ Exchange\ Rate \\ (0.255) \qquad\qquad\qquad\qquad (0.139) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} +0.263\ \Delta Other\ Good\ Exports, Real_{t-1} + 0.009\ \Delta World\ GDP, Real - 0.869\ \Del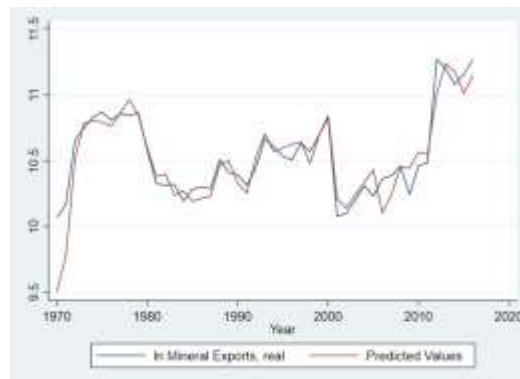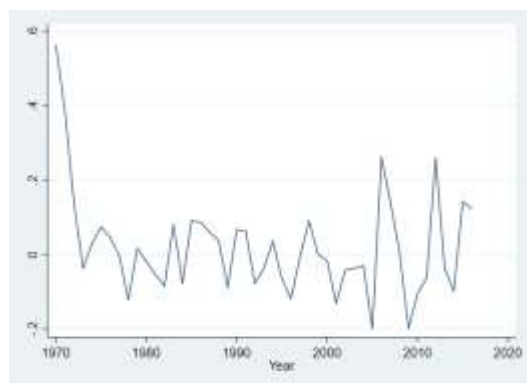ta World\ GDP, Real_{t-1} \\ (0.133) \qquad\qquad\qquad (0.361) \qquad\qquad\qquad (0.339) \\ -0.239\ \Delta IPIN, Other\ Good\ Exports + 0.087\ \Delta IPIN, Other\ Good\ Exports_{t-1} + 0.294\ \Delta IPIN, Other\ Good\ Exports_{t-2} \\ (0.131) \qquad\qquad\qquad (0.131) \qquad\qquad\qquad (0.074) \\ +1.020\ \Delta USD\ Real\ Exchange\ Rate + 1.620\ \Delta USD\ Real\ Exchange\ Rate_{t-1} + 1.305\ \Delta USD\ Real\ Exchange\ Rate_{t-2} \\ (0.441) \qquad\qquad\qquad (0.403) \qquad\qquad\qquad (0.325) \\ -0.438\ \Delta JPY\ Real\ Exchange\ Rate - 0.463\ \Delta JPY\ Real\ Exchange\ Rate_{t-1} - 0.389\ \Delta JPY\ Real\ Exchange\ Rate_{t-2} \\ (0.223) \qquad\qquad\qquad (0.213) \qquad\qquad\qquad (0.195) \end{array}}_{Short-run}$$

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Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2$ (42)	Portmanteau Q-Statistic $\chi2$ (20)	MAE	RMSE	R^2
11.210	-6.316	0.000	23.324	0.059	0.076	0.838
[0.000, 0.000]	[0.000, 0.001]	[0.987]	[0.273]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Other Good Exports, Real are 0.072, 0.218, -0.534, and 0.634 respectively.

Figure 1. Actual v. Predicted Other Good Exports, Real, along with residuals

Panel A: Log first-difference
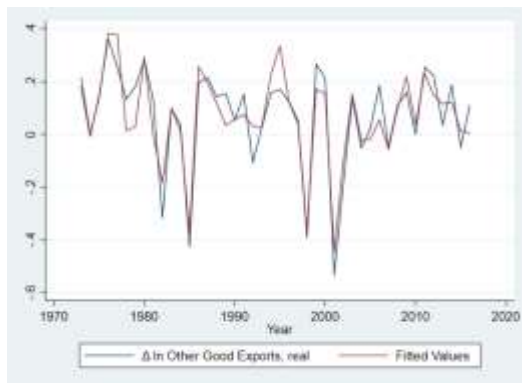
Panel B: Log level
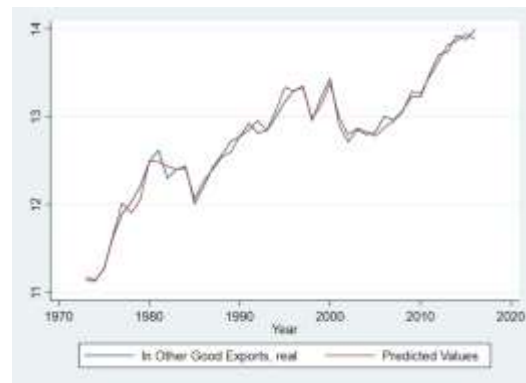
Panel C: Model Residuals
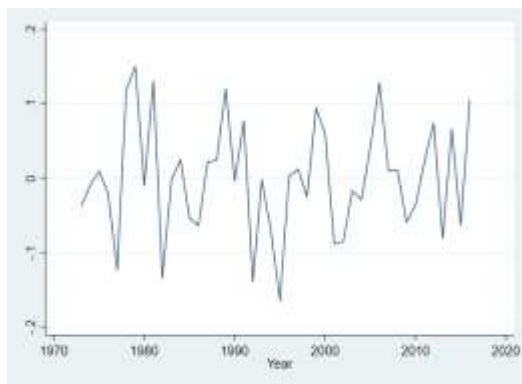
Panel D: Autocorrelation of Residuals
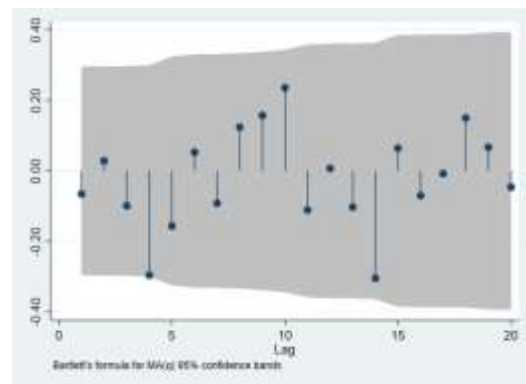
18. BPO Service Exports, Real

Estimation Period: 1984 – 2016

$$\Delta BPO\ Service\ Exports, Real = \underbrace{\frac{-0.994\ BPO\ Service\ Exports, Real_{t-1}}{(0.154)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} +\ 29.808 - 0.129\ World\ GDP, Real + 0.614\ IPIN, BPO\ Service\ Exports \\ (4.567) \qquad\qquad (0.177) \qquad\qquad\qquad (0.174) \\ -0.328\ GVA\ Service, Real - 2.999\ USD\ Real\ Exchange\ Rate \\ (0.250) \qquad\qquad\qquad (0.236) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} -0.819\ \Delta IPIN, BPO\ Service\ Exports - 0.546\ \Delta IPIN, BPO\ Service\ Exports_{t-1} \\ (0.119) \qquad\qquad\qquad\qquad (0.154) \\ -0.546\ \Delta IPIN, BPO\ Service\ Exports_{t-2} + 1.615\ \Delta USD\ Real\ Exchange\ Rate \\ (0.133) \qquad\qquad\qquad\qquad (0.628) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2\ (31)$	Portmanteau Q-Statistic $\chi 2\ (15)$	MAE	RMSE	R^2
11.287	-6.428	1.781	10.960	0.113	0.153	0.843
[0.000, 0.000]	[0.000, 0.001]	[0.181]	[0.755]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) BPO Service Exports, Real are 0.072, 0.297, -1.125, and 0.444 respectively.

Figure 1. Actual v. Predicted BPO Service Exports, Real, along with residuals

Panel A: Log first-difference
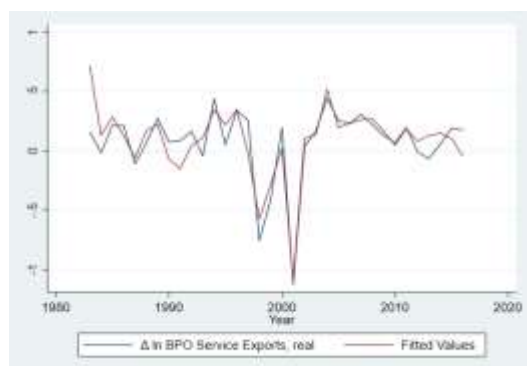
Panel B: Log level
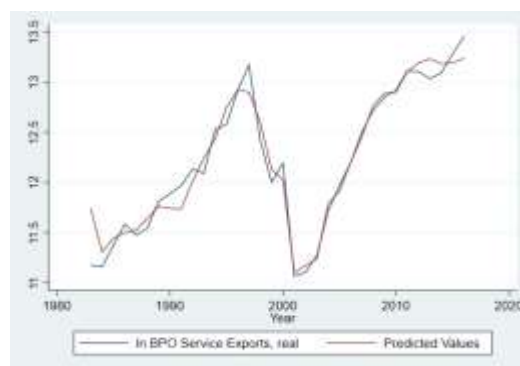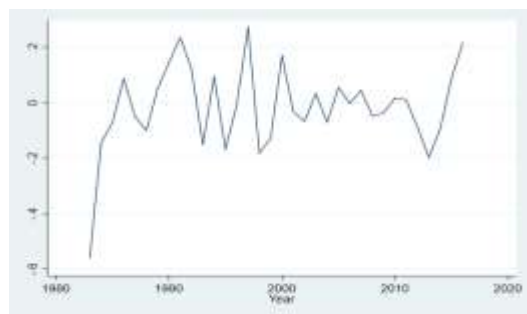
Panel C: Model Residuals   Panel D: Autocorrelation of Residuals
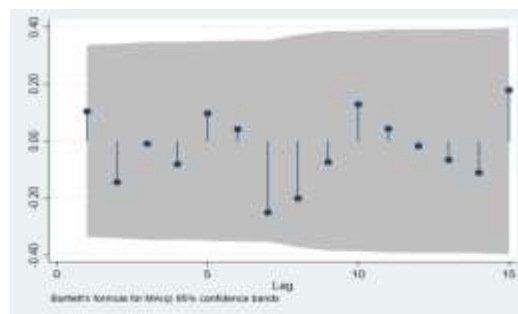
19. Tourism Service Exports, Real

Estimation Period: 1984 – 2016

$$\Delta Tourism\ Service\ Exports, Real = \underbrace{\begin{matrix} -0.838\ Tourism\ Service\ Exports, Real_{t-1} \\ (0.172) \end{matrix}}_{Adjustment}$$

$$\underbrace{\begin{matrix} -\ 1.932\ +0.646\ World\ GDP, Real \\ (2.798)\qquad (0.150) \\ -0.458\ IPIN, Tourism\ Service\ Exports +0.212\ Real\ Effective\ Exchange\ Rate \\ (0.149)\qquad\qquad\qquad (0.182) \end{matrix}}_{Long-run}$$

$$\underbrace{\begin{matrix} +0.361\ \Delta Tourism\ Service\ Exports +0.188\ \Delta Tourism\ Service\ Exports -1.494\ \Delta World\ GDP, Real \\ (0.088)\qquad\qquad (0.094)\qquad\qquad (0.502) \\ -1.031\ \Delta World\ GDP, Real -0.325\ \Delta IPIN, Tourism\ Service\ Exports +1.195\ \Delta Real\ Effective\ Exchange\ Rate \\ (0.498)\qquad\qquad (0.153)\qquad\qquad (0.279) \\ +1.084\ \Delta Real\ Effective\ Exchange\ Rate +0.504\ \Delta Real\ Effective\ Exchange\ Rate \\ (0.330)\qquad\qquad\qquad (0.202) \end{matrix}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2\ (31)$	Portmanteau Q-Statistic $\chi2\ (15)$	MAE	RMSE	R^2
8.852	-4.863	0.208	12.230	0.088	0.129	0.922
[0.001, 0.004]	[0.001, 0.008]	[0.647]	[0.661]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Tourism Service Exports, Real are 0.035, 0.330, -1.319, and 0.958 respectively.

Figure 1. Actual v. Predicted Tourism Service Exports, Real, along with residuals

Panel A: Log first-difference
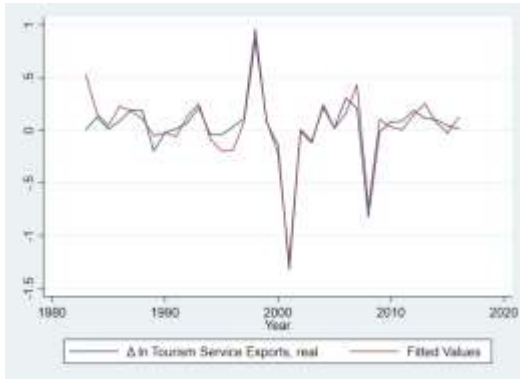
Panel B: Log level
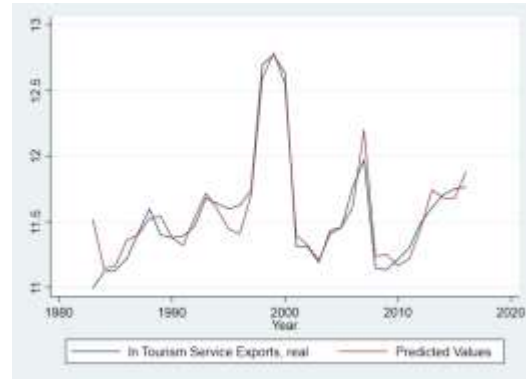
Panel C: Model Residuals
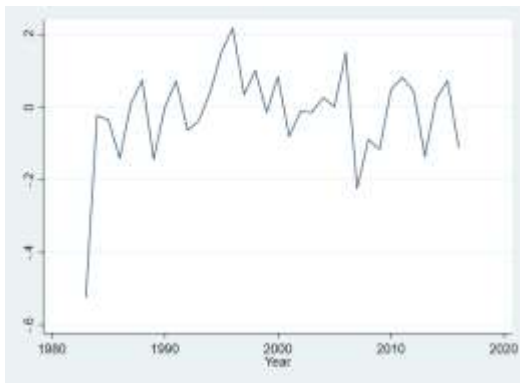
Panel D: Autocorrelation of Residuals
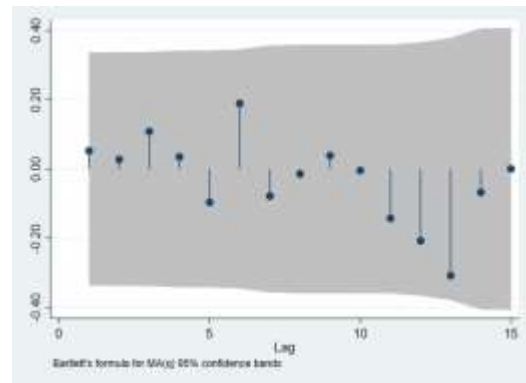
20. Other Service Exports

Estimation Period: $1984 - 2016$

$$\Delta Other\ Service\ Exports = \underbrace{\frac{-Other\ Service\ Exports_{t-1}}{(0.916)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -\ 3.774\ -0.425\ World\ GDP, Real - 0.595\ IPIN, Other\ Service\ Exports \\ (2.353) \qquad (0.132) \qquad\qquad (0.091) \\ +\ 2.144\ GVA\ Service, Real + 0.982\ Real\ Effective\ Exchange\ Rate \\ (0.402) \qquad\qquad (0.222) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} -0.047\ \Delta IPIN, Other\ Service\ Exports + 0.209\ \Delta IPIN, Other\ Service\ Exports_{t-1} \\ (0.916) \qquad\qquad (0.099) \\ -1.113\ \Delta Real\ Effective\ Exchange\ Rate - 1.089\ \Delta Real\ Effective\ Exchange\ Rate_{t-1} \\ (0.193) \qquad\qquad\qquad (0.194) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi^2 (31)$	Portmanteau Q-Statistic $\chi^2 (15)$	MAE	RMSE	R^2
15.617	-7.071	1.531	9.662	0.093	0.148	0.899
[0.000, 0.000]	[0.000, 0.000]	[0.251]	[0.840]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Other Service Exports are 0.007, 0.251, -1.056, and 0.489 respectively.

Figure 1. Actual v. Predicted Other Service Exports, along with residuals
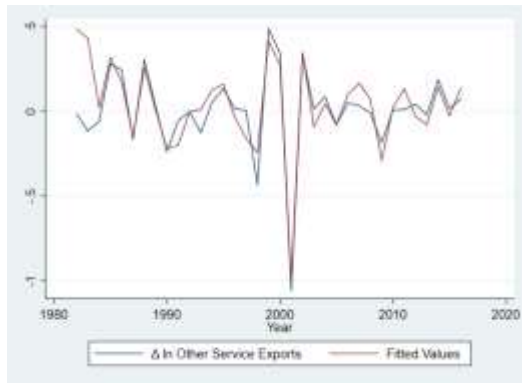
Panel A: Log first-difference

Panel B: Log level

Panel C: Model Residuals

Panel D: Autocorrelation of Residuals

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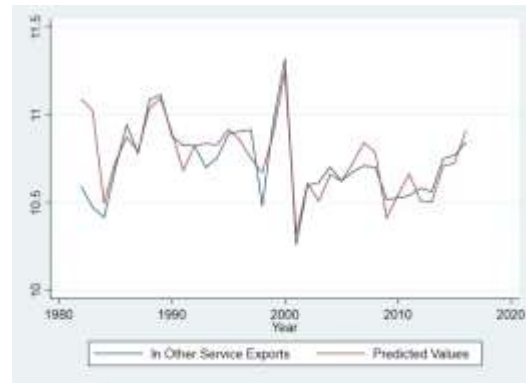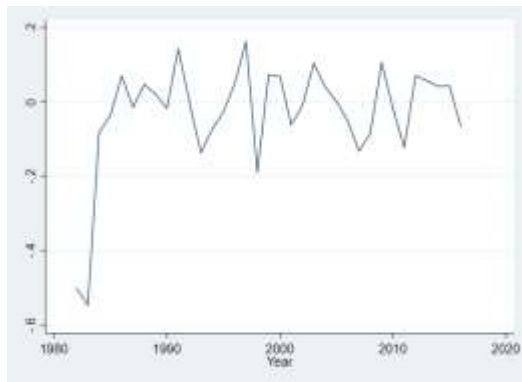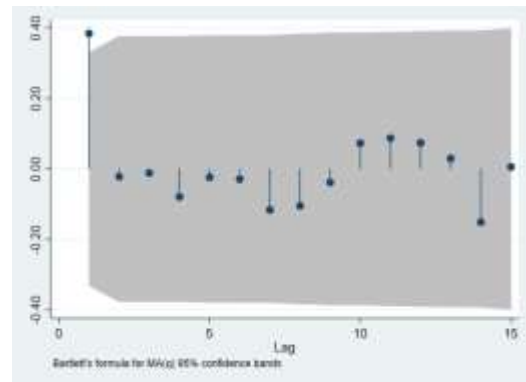
21. Balance of Payments – Total Goods Exports, Nominal

Estimation Period: 1981 – 2016

$$\Delta Total\ Goods\ Exports, Nominal = \underbrace{\frac{-0.387\ Total\ Goods\ Exports, Nominal_{t-1}}{(0.097)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -\ \underset{(2.780)}{3.803} + \underset{(0.240)}{1.253}\ World\ GDP, Nominal - \underset{(0.581)}{1.334}\ USD\ Nominal\ Exchange\ Rate \\ + \underset{(0.474)}{0.135}\ JPY\ Nominal\ Exchange\ Rate - \underset{(0.\ )}{0.914}\ CNY\ Nominal\ Exchange\ Rate \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} -\underset{(0.122)}{0.142}\ \Delta Total\ Goods\ Exports, Nominal_{t-1} + \underset{(0.116)}{0.027}\ \Delta Total\ Goods\ Exports, Nominal_{t-2} \\ -\underset{(0.111)}{0.334}\ \Delta Total\ Goods\ Exports, Nominal_{t-3} + \underset{(0.302)}{0.884}\ \Delta World\ GDP, Nominal - \underset{(0.217)}{0.383}\ \Delta World\ GDP, Nominal_{t-1} \\ -\underset{(0.183)}{0.481}\ \Delta JPY\ Nominal\ Exchange\ Rate + \underset{(0.177)}{0.358}\ \Delta CNY\ Nominal\ Exchange\ Rate \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2$ (34)	Portmanteau Q-Statistic $\chi2$ (16)	MAE	RMSE	R^2
8.765	-3.998	0.228	11.624	0.050	0.064	0.800
[0.000, 0.002]	[0.004, 0.055]	[0.632]	[0.769]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) BOP – Total Goods Exports, Nominal are 0.066, 0.147, -0.471, and 0.295 respectively.

Figure 1. Actual v. Predicted BOP – Total Goods Exports, Nominal, along with residuals

Panel A: Log first-difference   Panel B: Log level
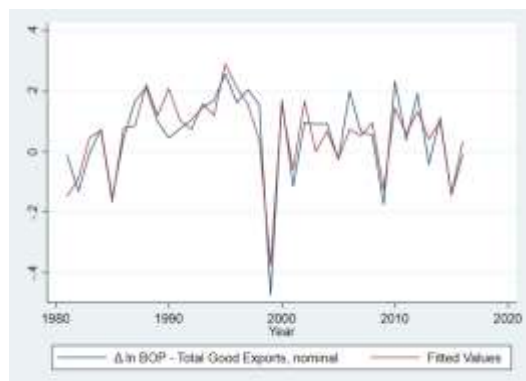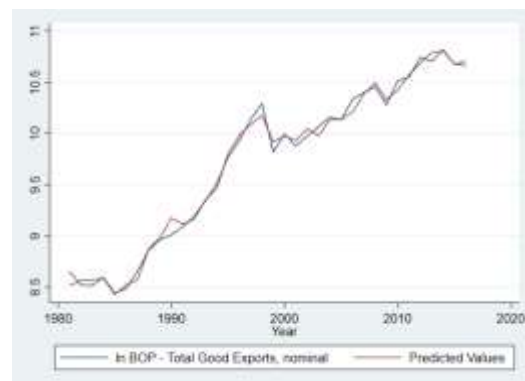
Panel C: Model Residuals
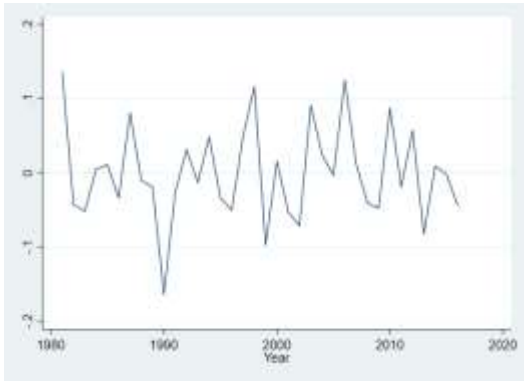
Panel D: Autocorrelation of Residuals
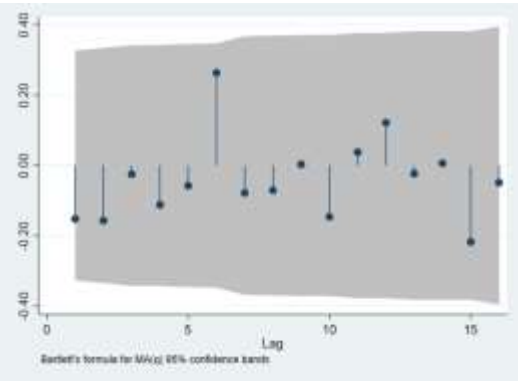
22. Balance of Payments - Total Service Exports, Nominal

Estimation Period: 1990 – 2016

$$\Delta Total\ Service\ Exports, Nominal = \underbrace{\frac{-Total\ Service\ Exports, Nominal_{t-1}}{(0.104)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -11.650 + 1.996\ World\ GDP, Nominal - 2.510\ USD\ Nominal\ Exchange\ Rate \\ (4.603) \qquad\qquad (0.276) \qquad\qquad\qquad (0.449) \\ -0.711\ JPY\ Nominal\ Exchange\ Rate - 1.680\ CNY\ Nominal\ Exchange\ Rate + 0.688\ IPIN, Total\ Service\ Exports \\ (0.333) \qquad\qquad\qquad (0.262) \qquad\qquad\qquad (0.203) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} -0.551\ \Delta World\ GDP, Nominal + 0.352\ \Delta World\ GDP, Nominal_{t-1} \\ (0.437) \qquad\qquad\qquad (0.278) \\ +1.287\ \Delta World\ GDP, Nominal_{t-2} + 1.064\ \Delta USD\ Nominal\ Exchange\ Rate \\ (0.275) \qquad\qquad\qquad (0.488) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

| Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (32)	Portmanteau Q-Statistic χ2 (16)	MAE	RMSE	R^2
14.183	-5.074	0.006	11.581	0.079	0.107	0.845
[0.000, 0.000]	[0.000, 0.013]	[0.934]	[0.772]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) BOP - Total Service Exports, Nominal are 0.096, 0.205, -0.705, and 0.370 respectively.

Figure 1. Actual v. Predicted BOP - Total Service Exports, Nominal, along with residuals

Panel A: Log first-difference
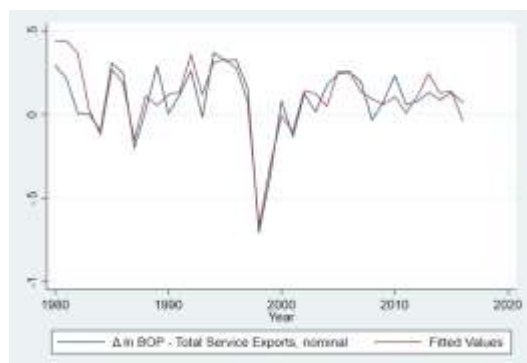
Panel B: Log level
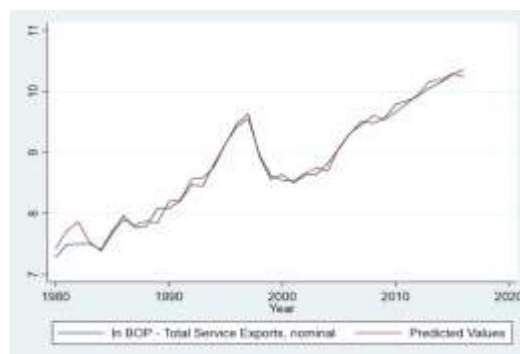
Panel C: Model Residuals
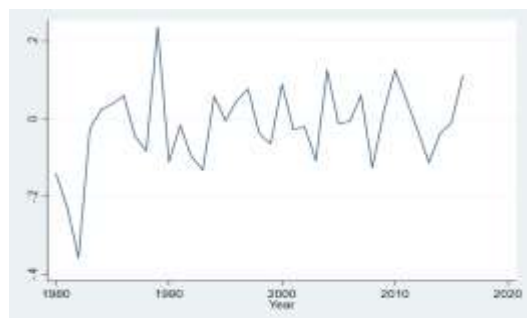
Panel D: Autocorrelation of Residuals
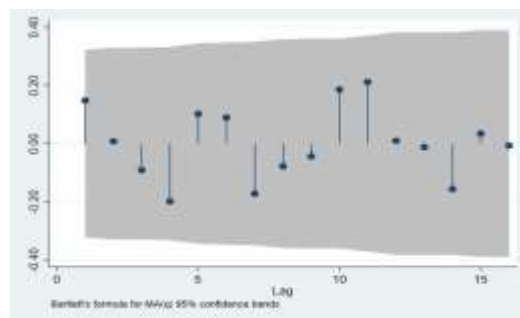
23. Agricultural Imports, Real

Estimation Period: 1974 – 2016

$$\Delta Agricultural\ Imports, Real = \underbrace{\frac{-0.740\ Agricultural\ Imports, Real_{t-1}}{(0.134)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} +\ 9.111\ -0.325\ GDP, Real - 0.752\ IPIN, Agricultural\ Imports - 0.345\ Real\ Effective\ Exchange\ Rate \\ (5.860)\quad (0.461)\qquad\qquad (0.177)\qquad\qquad\qquad (0.280) \\ +1.140\ Philippine\ Retail\ Price\ Index - 0.282\ Tariff, Agricultural\ Imports \\ (0.144)\qquad\qquad\qquad\qquad (0.\ ) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} +0.027\ \Delta GDP, Real + 1.849\ \Delta GDP, Real_{t-1} \\ (0.905)\qquad\qquad (0.920) \\ +1.508\ \Delta GDP, Real_{t-2} - 0.429\ \Delta IPIN, Agricultural\ Imports \\ (0.832)\qquad\qquad\qquad (0.160) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2$ (41)	Portmanteau Q-Statistic $\chi2$ (21)	MAE	RMSE	R^2
5.747	-5.496	1.764	19.737	0.102	0.135	0.701
[0.001, 0.012]	[0.000, 0.004]	[0.184]	[0.537]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Agricultural Imports, Real are 0.041, 0.205, -0.528, and 0.453 respectively.

Figure 1. Actual v. Predicted Agricultural Imports, Real, along with residuals

Panel A: Log first-difference
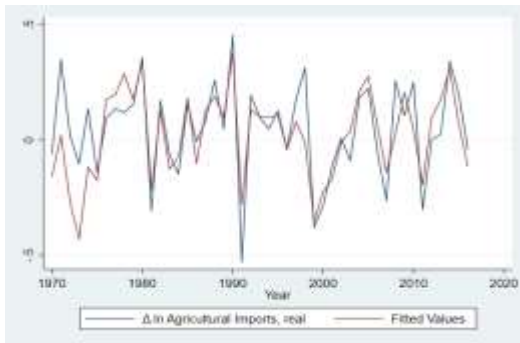
Panel B: Log level
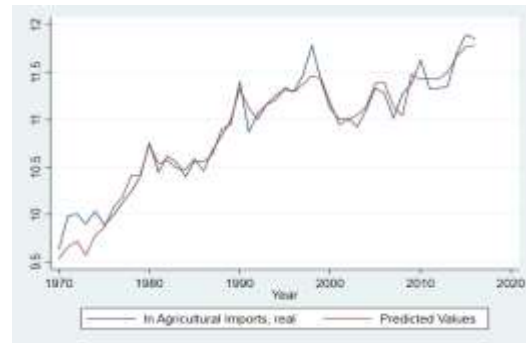
Panel C: Model Residuals
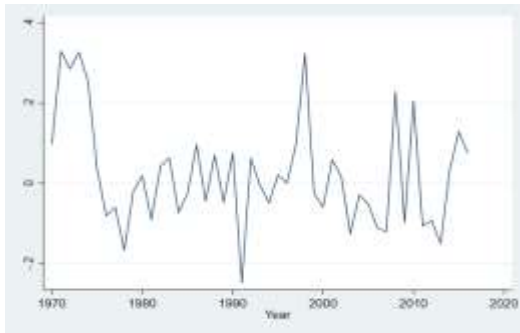
Panel D: Autocorrelation of Residuals
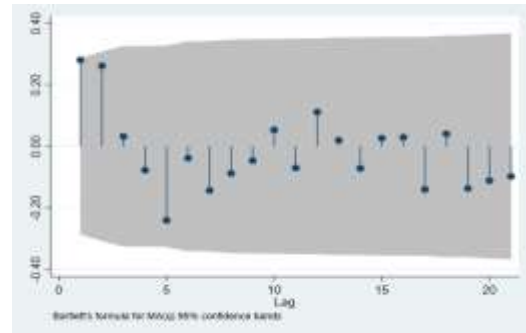
24. Fuel Imports, Real

Estimation Period: 1974 – 2016

$$\Delta Fuel\ Imports, Real\ =\ \underbrace{\frac{-0.484\ Fuel\ Imports, Real\ _{t-1}}{(0.063)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -\ 2.791\ +1.261\ GDP, Real - 0.471\ IPIN, Fuel\ Imports \\ (1.390)\qquad (0.197)\qquad\qquad (0.060) \\ -0.515\ CNY\ Real\ Exchange\ Rate + 0.468\ JPY\ Real\ Exchange\ Rate \\ (0.131)\qquad\qquad\qquad (0.171) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} +0.286\ \Delta CNY\ Real\ Exchange\ Rate - 0.366\ \Delta JPY\ Real\ Exchange\ Rate \\ (0.119)\qquad\qquad\qquad (0.103) \\ -0.083\ \Delta JPY\ Real\ Exchange\ Rate_{t-1} - 0.243\ \Delta JPY\ Real\ Exchange\ Rate_{t-2} \\ (0.098)\qquad\qquad\qquad (0.091) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

| Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2$ (41)	Portmanteau Q-Statistic $\chi2$ (20)	MAE	RMSE	R^2
15.015	-7.688	0.755	26.433	0.043	0.059	0.709
[0.000, 0.000]	[0.000, 0.000]	[0.384]	[0.151]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Fuel Imports, Real are 0.020, 0.104, -0.304, and 0.264 respectively.

Figure 1. Actual v. Predicted Fuel Imports, Real, along with residuals

Panel A: Log first-difference
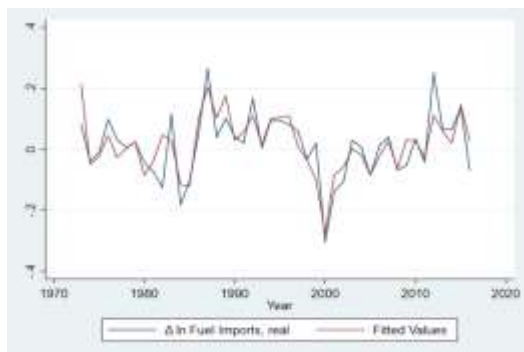
Panel B: Log level
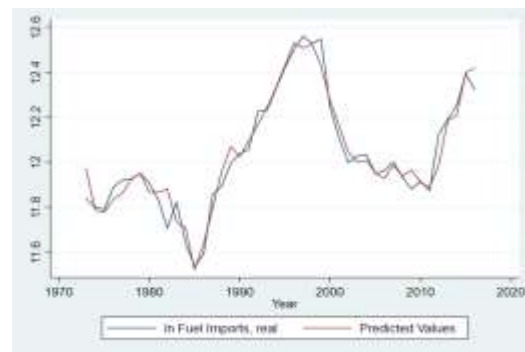
Panel C: Model Residuals
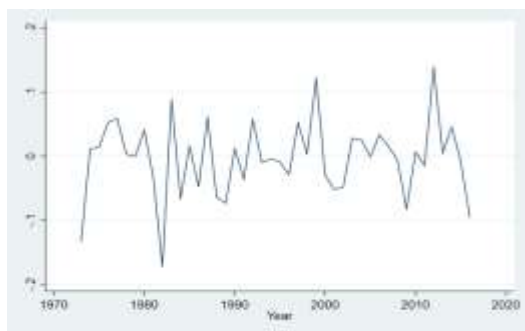
Panel D: Autocorrelation of Residuals
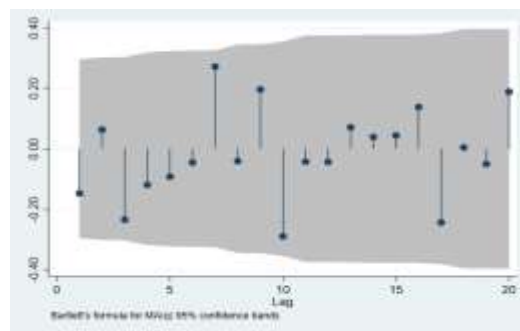
25. Machinery Imports, Real

Estimation Period: 1974 – 2016

$$\Delta Machinery\ Imports, Real = \underbrace{\frac{-0.360\ Machinery\ Imports, Real_{t-1}}{(0.060)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -\ 7.806\ +2.548\ GDP, Real +0.572\ IPIN, Machinery\ Imports -0.971\ Foreign\ IPIN, Machinery\ Imports \\ (3.850)\qquad (0.712)\qquad\qquad (0.179)\qquad\qquad\qquad (0.170) \\ -1.124\ Real\ Effective\ Exchange\ Rate +1.078\ Tariff, Machinery\ Imports \\ (0.389)\qquad\qquad\qquad (0.339) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} +0.305\ \Delta Machinery\ Imports, Real_{t-1} +1.663\ \Delta GDP, Real \\ (0.104)\qquad\qquad (0.805) \\ +0.190\ \Delta Foreign\ IPIN, Machinery\ Imports -0.435\ \Delta Tariff, Machinery\ Imports \\ (0.074)\qquad\qquad\qquad (0.173) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (41)	Portmanteau Q-Statistic χ2 (21)	MAE	RMSE	R²
8.536	-5.920	0.725	10.085	0.094	0.140	0.792
[0.000, 0.001]	[0.000, 0.002]	[0.394]	[0.977]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Machinery Imports, Real are 0.053, 0.207, -0.512, and 0.441 respectively.

Figure 1. Actual v. Predicted Machinery Imports, Real, along with residuals

Panel A: Log first-difference
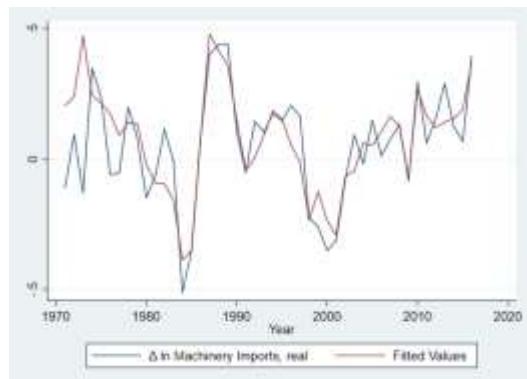
Panel B: Log level
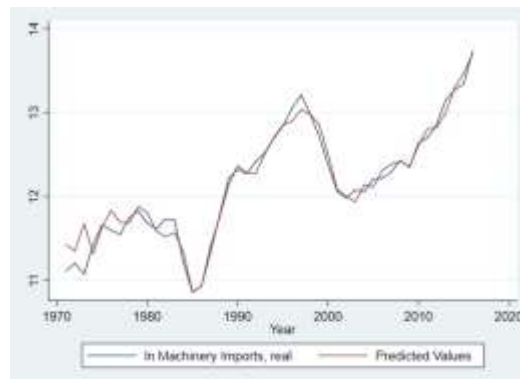
Panel C: Model Residuals
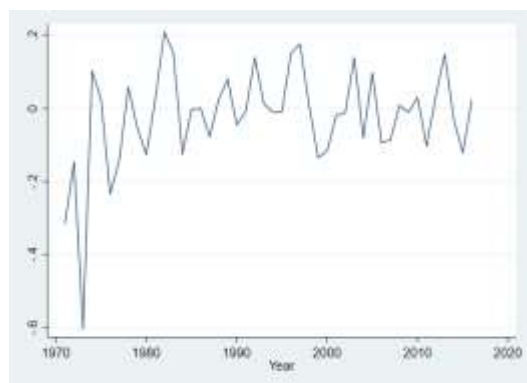
Panel D: Autocorrelation of Residuals
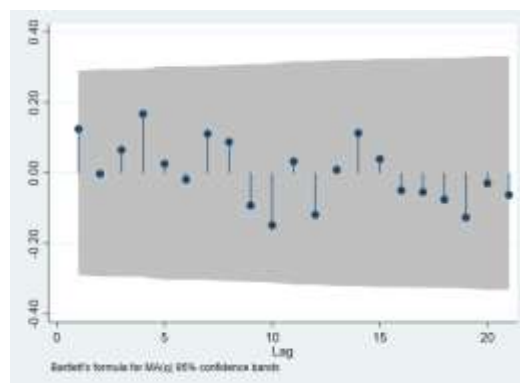
26. Materials Imports, Real

Estimation Period: 1974 – 2017

$$\Delta Materials\ Imports, Real = \underbrace{\frac{-0.693\ Materials\ Imports, Real_{\,t-1}}{(0.109)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} -\ 5.254\ +1.592\ GDP, Real -0.653\ Foreign\ IPIN, Materials\ Imports \\ (2.032)\quad (0.212)\quad\quad\quad (0.216) \\ -0.853\ Tariff, Materials\ Imports +0.130\ IPIN, Machinery\ Imports \\ (0.160)\quad\quad\quad (0.127) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} +0.332\ \Delta Materials\ Imports_{t-1} +0.333\ \Delta Materials\ Imports_{t-2} +1.849\ \Delta GDP, Real \\ (0.131)\quad\quad\quad (0.114)\quad\quad\quad (0.806) \\ -1.945\ \Delta GDP, Real_{t-1} -1.451\ \Delta GDP, Rea_{t-2}l +3.612\ \Delta GDP, Real_{t-3} \\ (0.973)\quad\quad (0.154)\quad\quad (0.985) \\ +0.597\ \Delta Foreign\ IPIN, Material\ Imports +0.830\ \Delta Foreign\ IPIN, Material\ Imports_{t-1} \\ (0.227)\quad\quad\quad (0.239) \\ -0.833\ \Delta IPIN, Machinery\ Imports -0.352\ \Delta IPIN, Machinery\ Imports_{t-1} \\ (0.150)\quad\quad\quad (0.201) \end{array}}_{Short-run}$$

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Table A1. Summary of model tests

| Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ^2 (42)	Portmanteau Q-Statistic χ^2 (22)	MAE	RMSE	R^2
9.647	-6.313	0.029	10.412	0.076	0.101	0.863
[0.000, 0.001]	[0.000, 0.000]	[0.864]	[0.982]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Materials Imports, Real are 0.077, 0.230, -0.562, and 1.154 respectively.

Figure 1. Actual v. Predicted Materials Imports, Real, along with residuals

Panel A: Log first-difference
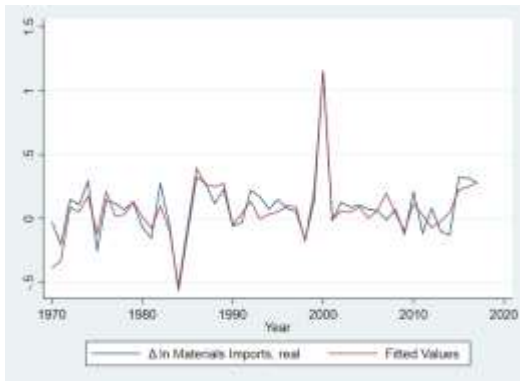
Panel B: Log level
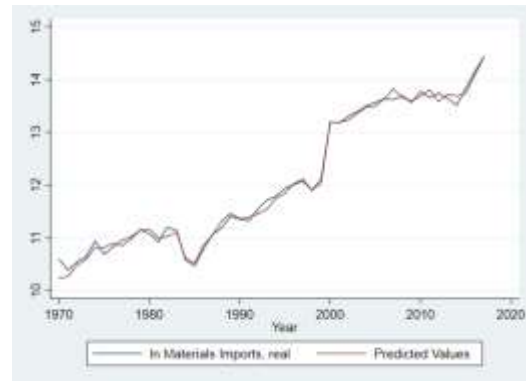
Panel C: Model Residuals
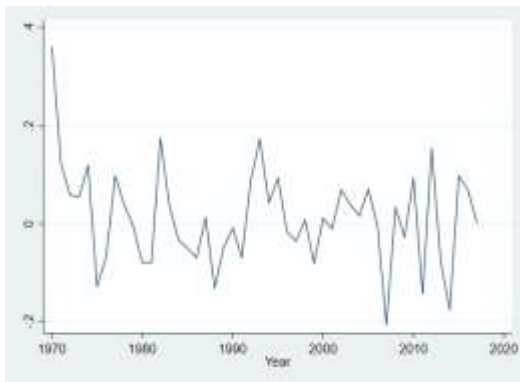
Panel D: Autocorrelation of Residuals
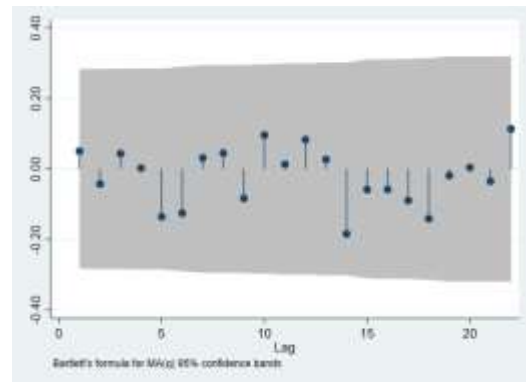
27. Other Goods Imports, Real

Estimation Period: 1971 – 2016

$$\Delta Other\ Goods\ Imports, Real = \underbrace{\frac{-0.319\ Other\ Goods\ Imports, Real_{t-1}}{(0.085)}}_{Adjustment}$$

$$\underbrace{+\ 11.368 - 1.567\ GDP, Real + 0.323\ IPIN, Other\ Goods\ Imports}_{}$$
$$(3.155)\qquad (0.824)\qquad\qquad\quad (0.246)$$
$$\underbrace{+0.839\ Philippine\ Wholesale\ Price\ Index - 0.870\ Real\ Effective\ Exchange\ Rate}_{Long-run}$$
$$(0.238)\qquad\qquad\qquad\qquad\qquad (0.558)$$

$$+1.933\ \Delta GDP, Real - 0.748\ \Delta IPIN, Other\ Goods\ Imports - 0.106\ \Delta IPIN, Other\ Goods\ Imports_{t-1}$$
$$(0.966)\qquad\qquad (0.135)\qquad\qquad\qquad\qquad (0.134)$$
$$+0.411\ \Delta IPIN, Other\ Goods\ Imports_{t-2} - 0.363\ \Delta IPIN, Other\ Goods\ Imports_{t-3}$$
$$(0.129)\qquad\qquad\qquad\qquad (0.113)$$
$$+0.481\Delta Philippine\ Wholesale\ Price\ Index - 0631\ \Delta Philippine\ Wholesale\ Price\ Index_{t-1}$$
$$(0.242)\qquad\qquad\qquad\qquad (0.245)$$
$$+0.249\ \Delta Real\ Effective\ Exchange\ Rate + 0.274\ \Delta Real\ Effective\ Exchange\ Rate_{t-1}$$
$$(0.199)\qquad\qquad\qquad\qquad (0.167)$$
$$\underbrace{+0.703\ \Delta Real\ Effective\ Exchange\ Rate_{t-2} + 0.368\ \Delta Real\ Effective\ Exchange\ Rate_{t-3}}_{Short-run}$$
$$(0.154)\qquad\qquad\qquad\qquad (0.153)$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (44)	Portmanteau Q-Statistic χ2 (21)	MAE	RMSE	R^2
7.346	-3.719	1.377	25.455	0.055	0.067	0.838
[0.000, 0.004]	[0.007, 0.079]	[0.240]	[0.227]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Other Goods Imports, Real are 0.064, 0.192, -0.618, and 0.404 respectively.

Figure 1. Actual v. Predicted Other Goods Imports, Real, along with residuals

Panel A: Log first-difference
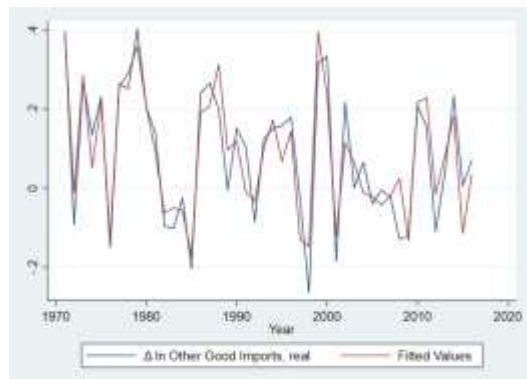
Panel B: Log level
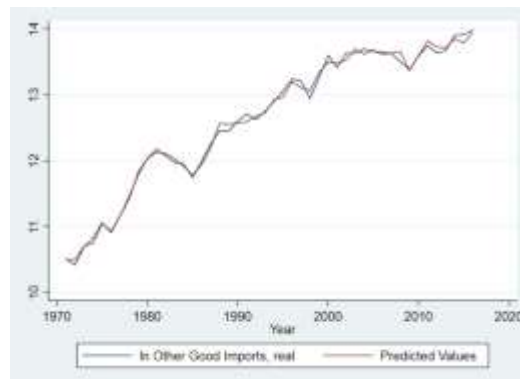
Panel C: Model Residuals
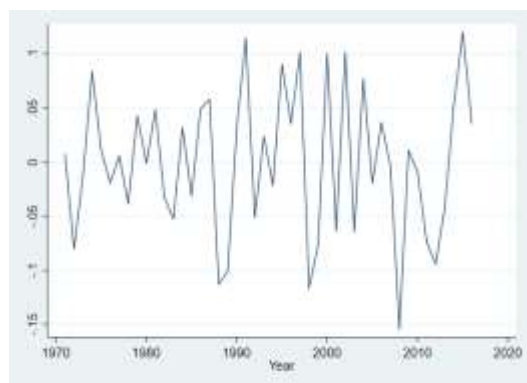
Panel D: Autocorrelation of Residuals
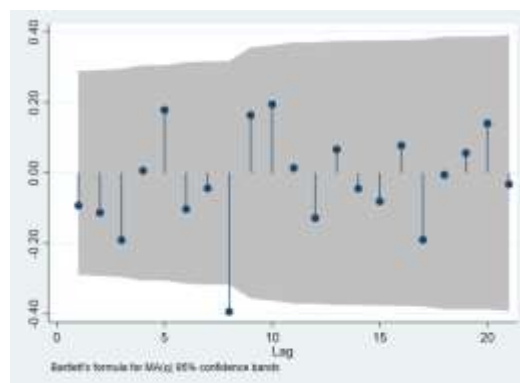
28. Total Service Imports, Real
Estimation Period: 1984 – 2016

$$\Delta Total\ Service\ Imports, Real = \underbrace{\frac{-0.936\ Total\ Service\ Imports, Real_{t-1}}{(0.115)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} +\ 13.243 - 0.878\ IPIN, Service\ Imports - 0.334\ World\ GDP, Real \\ (2.063) \qquad\qquad (0.095) \qquad\qquad\qquad (0.105) \\ +1.440\ World\ Wholesale\ Price\ Index - 0.281\ Real\ Effective\ Exchange\ Rate \\ (0.089) \qquad\qquad\qquad\qquad (0.080) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} -0.044\ \Delta IPIN, Service\ Imports + 0.281\ \Delta IPIN, Service\ Imports_{t-1} \\ (0.131) \qquad\qquad\qquad\qquad (0.106) \\ -1.912\ \Delta World\ Wholesale\ Price\ Index - 1.933\ \Delta World\ Wholesale\ Price\ Index_{t-1} \\ (0.339) \qquad\qquad\qquad\qquad\qquad (0.337) \\ -1.458\ \Delta World\ Wholesale\ Price\ Index_{t-2} + \Delta Real\ Effective\ Exchange\ Rate \\ (0.359) \qquad\qquad\qquad\qquad (0.107) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi^2 (31)$	Portmanteau Q-Statistic $\chi^2 (15)$	MAE	RMSE	R^2
17.133	-8.091	1.982	7.753	0.057	0.105	0.878
[0.000, 0.000]	[0.000, 0.000]	[0.159]	[0.933]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Total Service Imports, Real are 0.067, 0.123, -0.148, and 0.483 respectively.

Figure 1. Actual v. Predicted Total Service Imports, Real, along with residuals

Panel A: Log first-difference
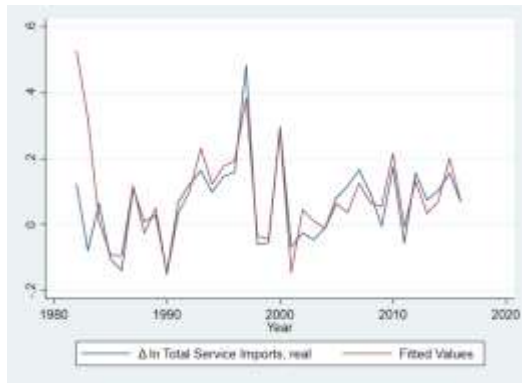
Panel B: Log level
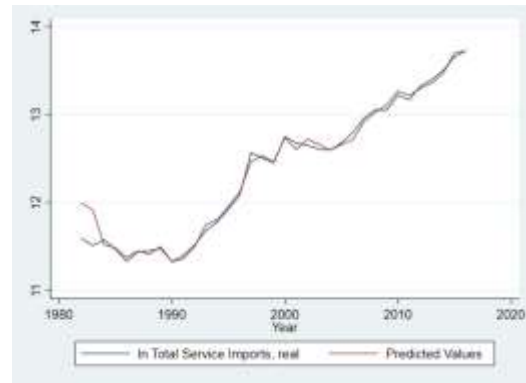
Panel C: Model Residuals
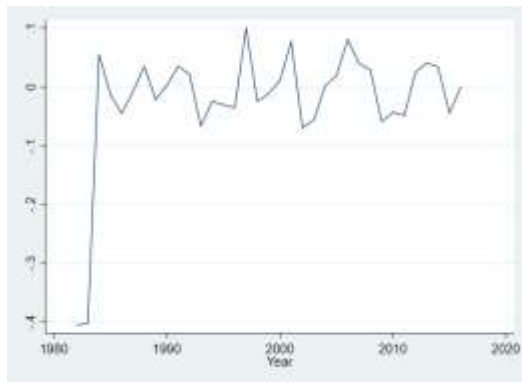
Panel D: Autocorrelation of Residuals
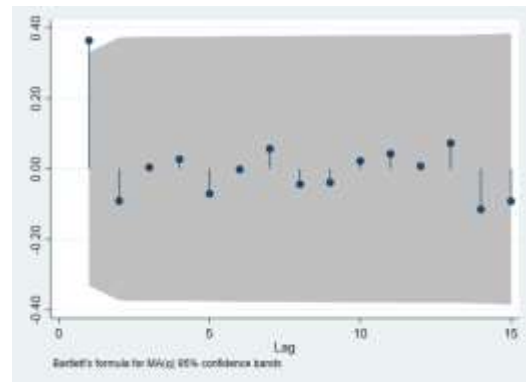
29. Balance of Payments – Total Goods Imports, Nominal

Estimation Period: 1981 – 2016

$$\Delta Total\ Goods\ Imports, Nominal = \underbrace{\frac{-0.564\ Total\ Goods\ Imports, Nominal_{t-1}}{(0.089)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} +\ 7.300\ -0.602\ GDP, Nominal +1.749\ World\ Wholesale\ Price\ Index \\ (1.554)\quad\quad (0.271)\quad\quad\quad\quad\quad (0.315) \\ -0.509\ USD\ Nominal\ Exchange\ Rate +0.254\ CNY\ Nominal\ Exchange\ Rate \\ (0.095)\quad\quad\quad\quad\quad\quad (0.197) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} +0.030\ \Delta Total\ Goods\ Imports, Nominal_{t-1} +0.189\ \Delta Total\ Goods\ Imports, Nominal_{t-2} +0.841\ \Delta GDP, Nominal \\ (0.108)\quad\quad\quad\quad\quad\quad (0.081)\quad\quad\quad\quad\quad\quad (0.260) \\ +0.430\ \Delta GDP, Nominal_{t-1} -0.030\ \Delta World\ Wholesale\ Price\ Index -1.128\ \Delta World\ Wholesale\ Price\ Index_{t-1} \\ (0.267)\quad\quad\quad\quad\quad\quad (0.269)\quad\quad\quad\quad\quad\quad (0.272) \\ -0.427\ \Delta USD\ Nominal\ Exchange\ Rate -0.766\ \Delta USD\ Nominal\ Exchange\ Rate_{t-1} \\ (0.136)\quad\quad\quad\quad\quad\quad (0.146) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

| Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (34)	Portmanteau Q-Statistic χ2 (16)	MAE	RMSE	R^2
12.927	-6.329	0.376	22.388	0.031	0.038	0.915
[0.000, 0.000]	[0.000, 0.001]	[0.539]	[0.131]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) BOP – Total Goods Imports, Nominal are 0.076, 0.137, -0.215, and 0.289 respectively.

Figure 1. Actual v. Predicted BOP – Total Goods Imports, Nominal, along with residuals

Panel A: Log first-difference
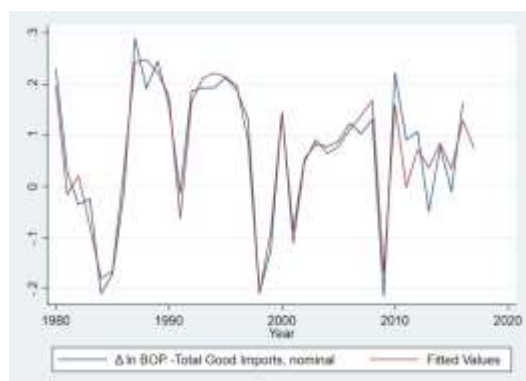
Panel B: Log level
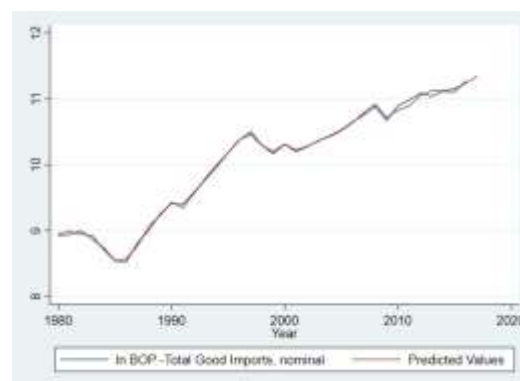
Panel C: Model Residuals
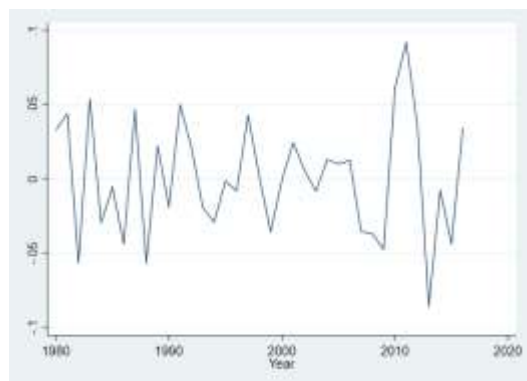
Panel D: Autocorrelation of Residuals
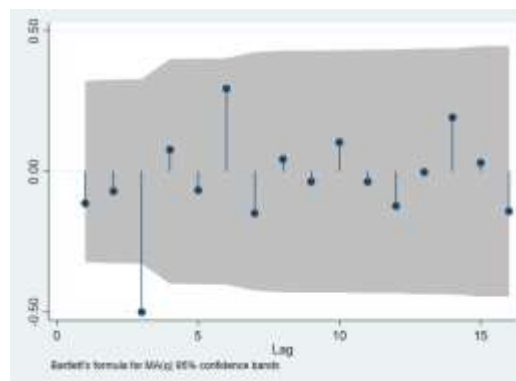
30. Balance of Payments – Total Service Imports, Nominal

Estimation Period: 1981 – 2016

$$\Delta Total\ Service\ Imports, Nominal = \underbrace{\frac{-0.954\ Total\ Service\ Imports, Nominal_{t-1}}{(0.101)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} +\ 18.277 - 1.406\ GDP, Nominal + 2.925\ World\ Wholesale\ Price\ Index \\ (2.062) \qquad (0.117) \qquad\qquad (0.148) \\ -1.092\ Nominal\ Effective\ Exchange\ Rate \\ (0.061) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} +0.332\ \Delta Total\ Service\ Imports, Nominal_{t-1} + 1.101\ \Delta GDP, Nominal \\ (0.081) \qquad\qquad\qquad (0.430) \\ +0.940\ \Delta GDP, Nominal_{t-1} - 1.609\ \Delta World\ Wholesale\ Price\ Index \\ (0.440) \qquad\qquad\qquad (0.492) \\ -2.704\ \Delta World\ Wholesale\ Price\ Index_{t-1} + 0.640\ \Delta Nominal\ Effective\ Exchange\ Rate \\ (0.521) \qquad\qquad\qquad (0.182) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

| Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (34)	Portmanteau Q-Statistic χ2 (17)	MAE	RMSE	R^2
23.367	-9.401	0.093	12.114	0.065	0.082	0.895
[0.000, 0.000]	[0.000, 0.000]	[0.760]	[0.793]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) BOP – Total Service Imports, Nominal are 0.085, 0.226, -0.674, and 0.409 respectively.

Figure 1. Actual v. Predicted BOP – Total Service Imports, Nominal, along with residuals

Panel A: Log first-difference
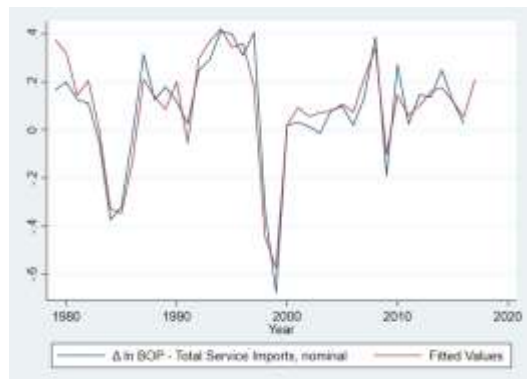
Panel B: Log level
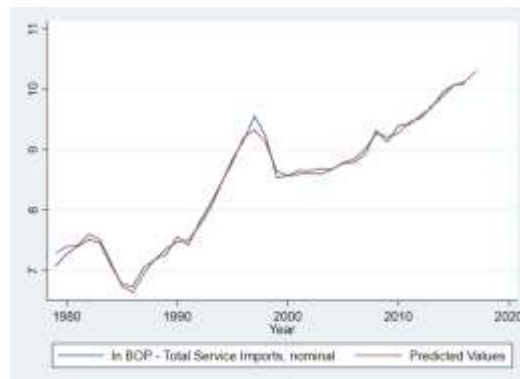
Panel C: Model Residuals
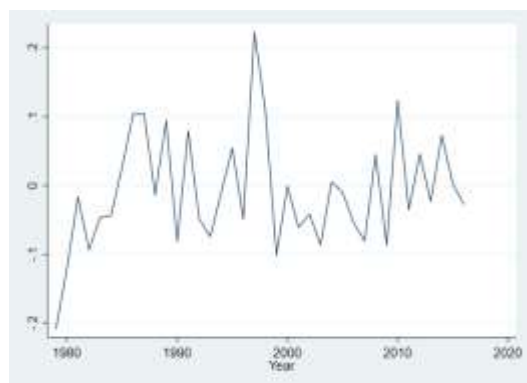
Panel D: Autocorrelation of Residuals
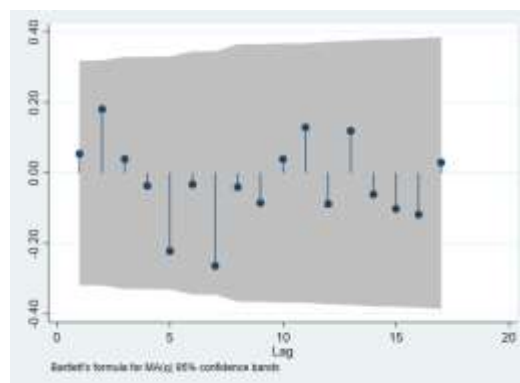
Monetary Sector

1. 91-day T-Bill Rate
Estimation Period: 1990 – 2017

$$\Delta 91day\ TBill\ Rate = \underbrace{\frac{-\ 0.652\ 91day\ TBill\ Rate_{t-1}}{(0.171)}}_{Adjustment}$$

$$\underbrace{-\ 1.160\ +1.716\ Reverse\ Repurchase\ Rate}_{Long-run}$$
$$\quad\ (0.414)\qquad\quad\ (0.227)$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2$ (26)	Portmanteau Q-Statistic $\chi 2$ (14)	MAE	RMSE	R^2
7.243	-3.805	0.033	8.245	0.237	0.376	0.366
[0.016, 0.031]	[0.007, 0.019]	[0.855]	[0.876]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) 91-day T-Bill Rate are -0.021, 0.417, -1.614, and 1.373 respectively.

Figure 1. Actual v. Predicted 91-day T-Bill Rate, along with residuals

Panel A: Log first-difference

Panel B: Log level

Panel C: Model Residuals

Panel D: Autocorrelation of Residuals

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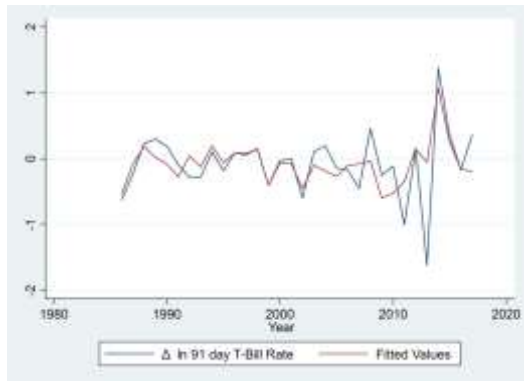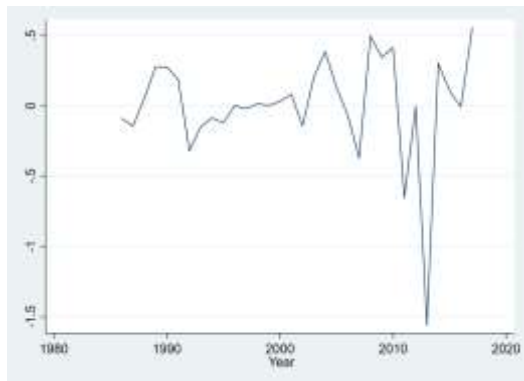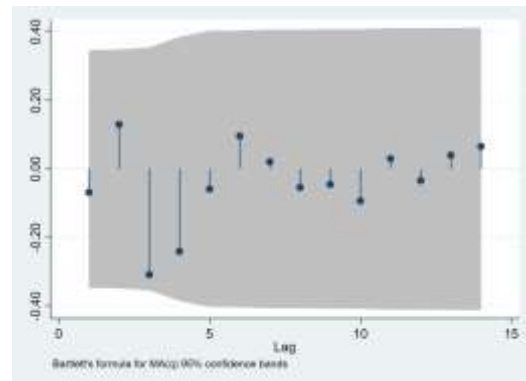
2. 6-month T-Bill Rate

Estimation Period: 1970 – 2017

$$\Delta 6month\ TBill\ Rate = \underbrace{\frac{-0.961\ 6month\ TBill\ Rate_{t-1}}{(0.029)}}_{Adjustment}$$

$$\underbrace{+\ 0.188\ +0.952\ 91day\ TBill\ Rate}_{Long-run}$$
$$\quad (0.031)\quad\quad (0.013)$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (46)	Portmanteau Q-Statistic χ2 (23)	MAE	RMSE	R²
579.207	-32.684	0.939	21.929	0.049	0.073	0.962
[0.000, 0.000]	[0.000, 0.000]	[0.332]	[0.524]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) 6-month T-Bill Rate are -0.019, 0.383, -1.290, and 1.198 respectively.

Figure 1. Actual v. Predicted 6-month T-Bill Rate, along with residuals

Panel A: Log first-difference

Panel B: Log level

178
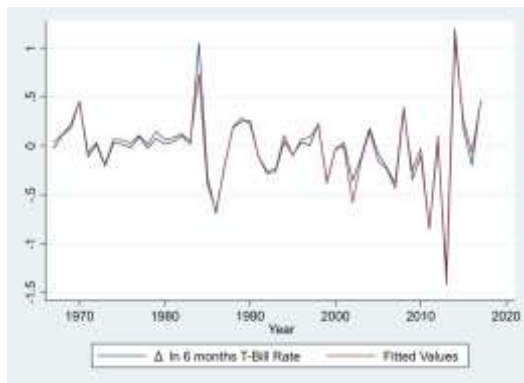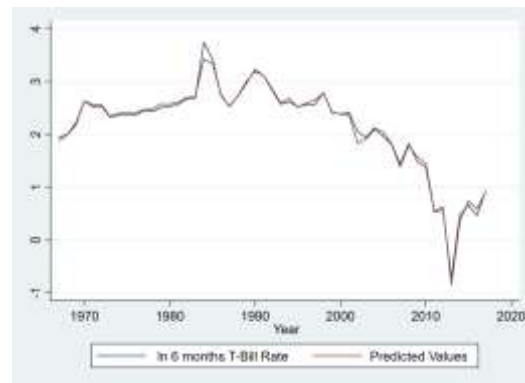
Panel C: Model Residuals
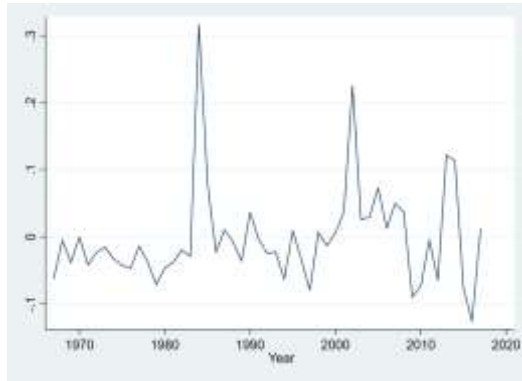
Panel D: Autocorrelation of Residuals
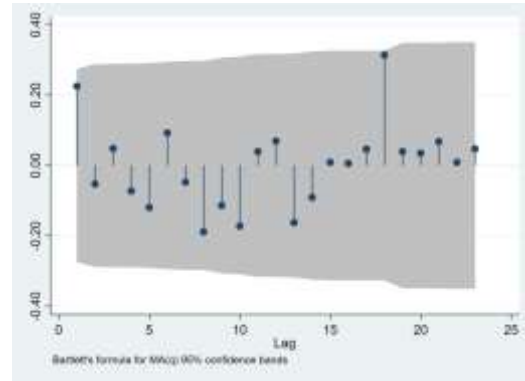
3. 1-year T-Bill Rate

Estimation Period: 1990 – 2017

$$\Delta 1year\ TBill\ Rate = \underbrace{\frac{-\ 0.924\ 1year\ TBill\ Rate_{t-1}}{(0.036)}}_{Adjustment}$$

$$\underbrace{+\ \underset{(0.070)}{0.130}\ +\underset{(0.039)}{0.913}\ 6month\ TBill\ Rate + \underset{(0.070)}{0.055}\ Reverse\ Repurchase\ Rate}_{Long-run}$$

$$\underbrace{+0.172\ \Delta Reverse\ Repurchase\ Rate}_{Short-run}\\(0.087)$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2$ (26)	Portmanteau Q-Statistic $\chi 2$ (13)	MAE	RMSE	R^2
329.441	-25.169	0.805	14.485	0.038	0.050	0.979
[0.000, 0.000]	[0.000, 0.000]	[0.369]	[0.340]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) 1-year T-Bill Rate are , , , and respectively.

Figure 1. Actual v. Predicted 1-year T-Bill Rate, along with residuals

Panel A: Log first-difference
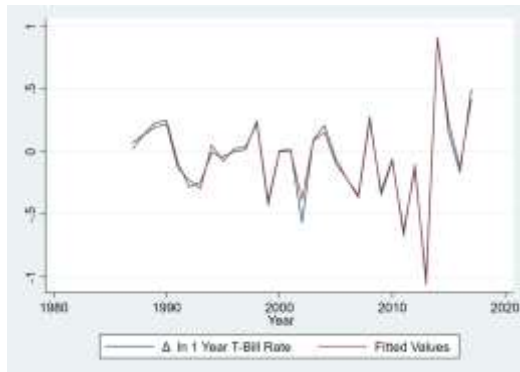

Panel B: Log level
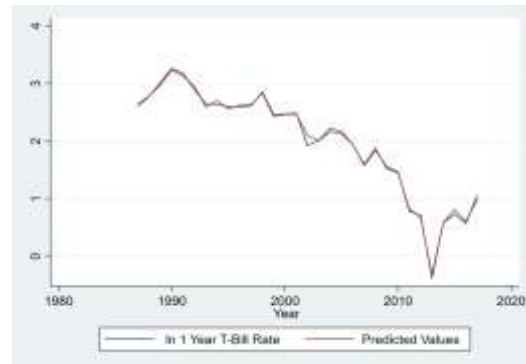
Panel C: Model Residuals
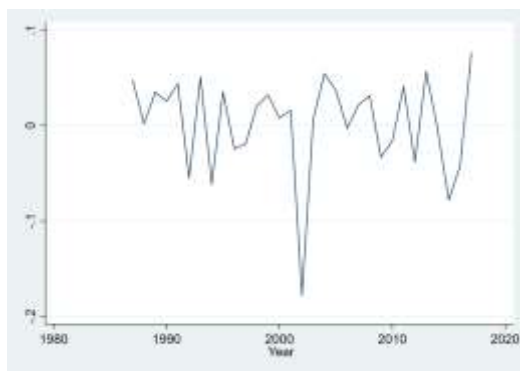
Panel D: Autocorrelation of Residuals
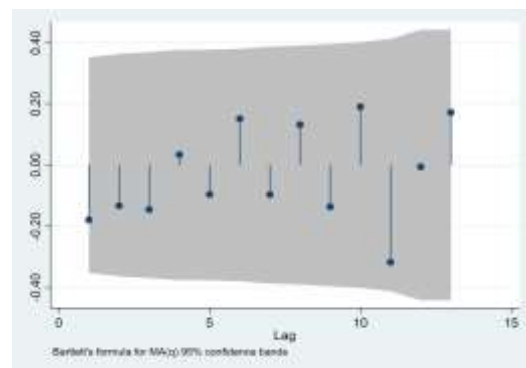
4. 5-year T-Bond Rate

Estimation Period: 1974 – 2017

$$\Delta 5year\ TBond\ Rate = \underbrace{\frac{-0.486\ 5year\ TBond\ Rate_{\,t-1}}{(0.136)}}_{Adjustment}$$

$$\underbrace{+\ 0.369 +0.761\ 1year\ TBill\ Rate}_{Long-run}$$
$$\underbrace{(0.120)\qquad (0.034)}_{}$$

$$\underbrace{+0.295\ \Delta 1year\ TBill\ Rate}_{Short-run}$$
$$(0.105)$$

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Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2$ (42)	Portmanteau Q-Statistic $\chi 2$ (21)	MAE	RMSE	R^2
6.737	-3.564	0.394	13.201	0.057	0.082	0.891
[0.017, 0.033]	[0.010, 0.027]	[0.529]	[0.901]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) 5-year T-Bond Rate are -0.027, 0.252, -0.913, and 0.958 respectively.

Figure 1. Actual v. Predicted 5-year T-Bond Rate, along with residuals

Panel A: Log first-difference
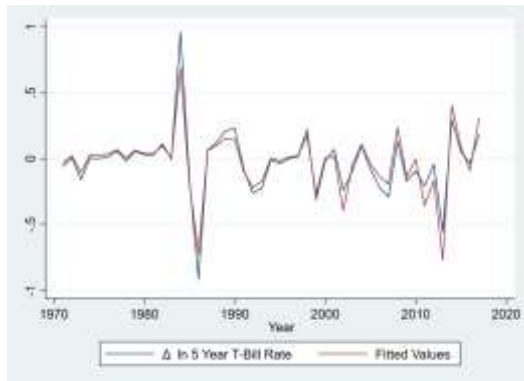
Panel B: Log level

Panel C: Model Residuals
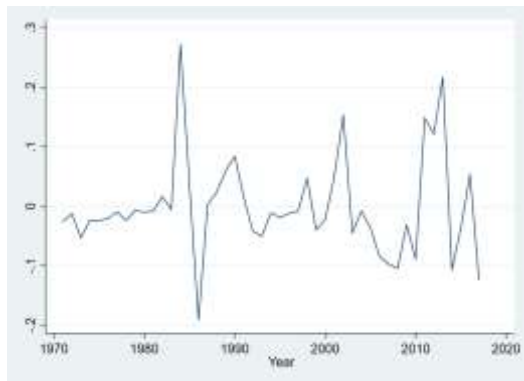
Panel D: Autocorrelation of Residuals
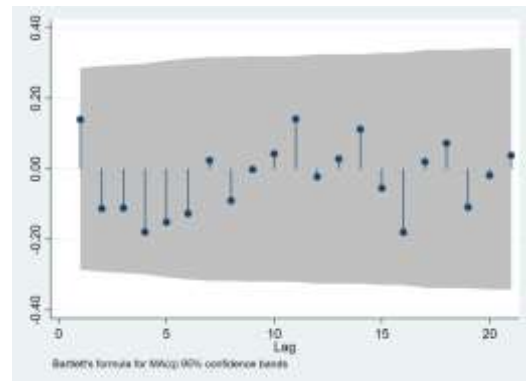
5. 10-year T-Bond Rate

Estimation Period: 1998 – 2017

$$\Delta 10year\ TBond\ Rate = \underbrace{\frac{-\ 0.855\ 10year\ TBond\ Rate_{t-1}}{(0.094)}}_{Adjustment}$$

$$\underbrace{+\ 0.375\ +0.844\ 5year\ TBond\ Rate}_{(0.084)\qquad (0.035)}$$
$$\underbrace{\qquad\qquad}_{Long-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (18)	Portmanteau Q-Statistic χ2 (9)	MAE	RMSE	R^2
41.965	-9.018	2.701	14.563	0.059	0.073	0.831
[0.000, 0.000]	[0.000, 0.000]	[0.100]	[0.103]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) 10-year T-Bond Rate are 0.017, 0.350, -0.379, and 1.435 respectively.

Figure 1. Actual v. Predicted 10-year T-Bond Rate, along with residuals

Panel A: Log first-difference
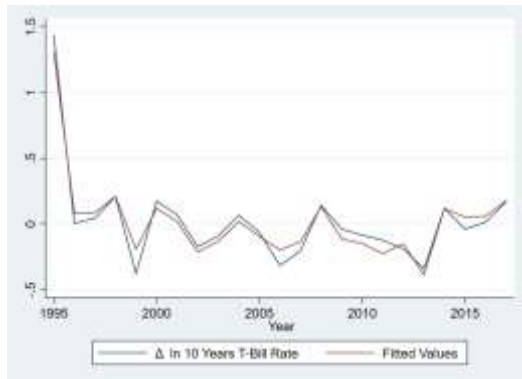
Panel B: Log level
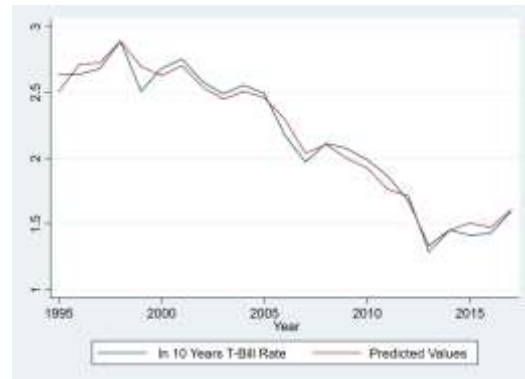
Panel C: Model Residuals
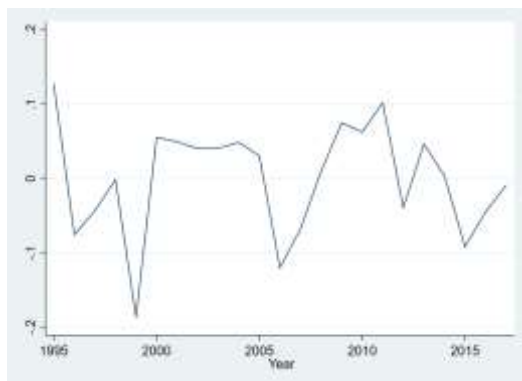
Panel D: Autocorrelation of Residuals
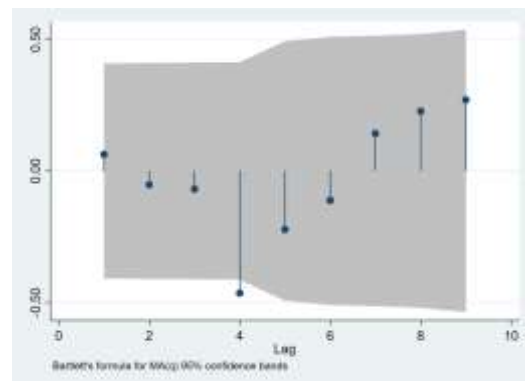
6. Lending Rate

Estimation Period: 1990 – 2017

$$\Delta Lending\ Rate = \underbrace{\frac{-\,0.830\ Lending\ Rate_{t-1}}{(0.138)}}_{Adjustment}$$

$$\underbrace{+\ \underset{(0.165)}{732}\ \underset{(0.118)}{+0.459\ Reverse\ Repurchase\ Rate}}{}$$

$$\underbrace{\underset{(0.343)}{-0.774\ 6month\ TBill\ Rate}\underset{(0.395)}{+1.018\ 1year\ TBill\ Rate}}_{Long-run}$$

$$\underbrace{+0.354\ \Delta 1year\ TBill\ Rate_{t-1}}_{Short-run}$$
$$(0.140)$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2\ (26)$	Portmanteau Q-Statistic $\chi 2\ (14)$	MAE	RMSE	R^2
10.272	-5.997	1.810	17.366	0.069	0.086	0.651
[0.000, 0.001]	[0.000, 0.001]	[0.178]	[0.237]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Lending Rate are -0.017, 0.164, -0.487, and 0.324 respectively.

Figure 1. Actual v. Predicted Lending Rate, along with residuals

Panel A: Log first-difference
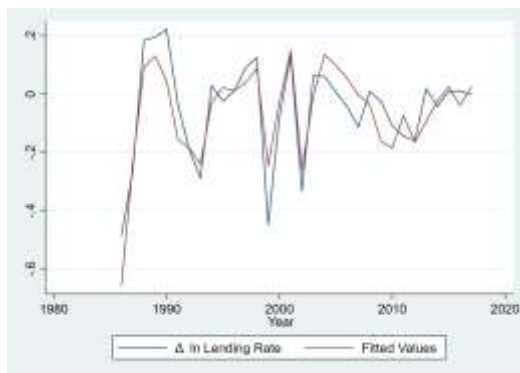
Panel B: Log level

Panel C: Model Residuals   Panel D: Autocorrelation of Residuals
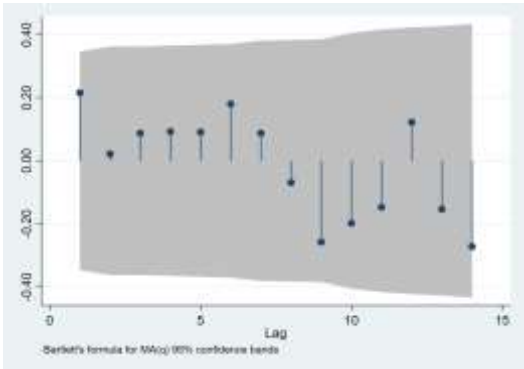
7. Time Deposit Rate
Estimation Period: 1990 – 2017

$$\Delta Time\ Deposit\ Rate = \underbrace{\frac{-0.549\ Time\ Deposit\ Rate_{t-1}}{(0.106)}}_{Adjustment}$$

$$\underbrace{-\ \underset{(0.198)}{0.210}\ +\underset{(0.286)}{0.519}\ Reverse\ Repurchase\ Rate +\underset{(0.159)}{0.560}\ 91day\ TBill\ Rate}_{Long-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan χ2 (26)	Portmanteau Q-Statistic χ2 (14)	MAE	RMSE	R²
13.715	-5.148	1.008	19.652	0.123	0.152	0.631
[0.000, 0.000]	[0.000, 0.002]	[0.315]	[0.141]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Time Deposit Rate are -0.024, 0.209, -0.695, and 0.457 respectively.

Figure 1. Actual v. Predicted Time Deposit Rate, along with residuals

Panel A: Log first-difference   Panel B: Log level
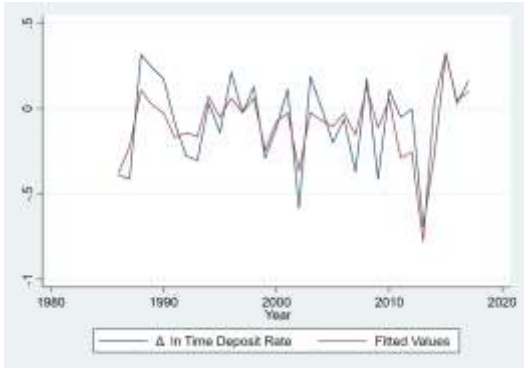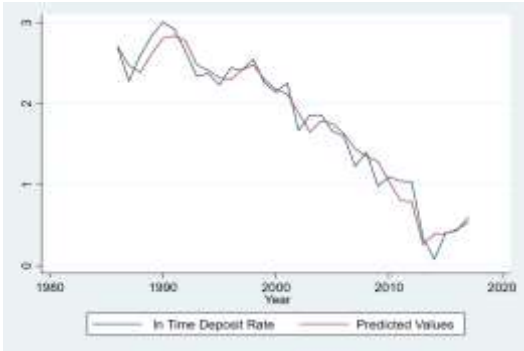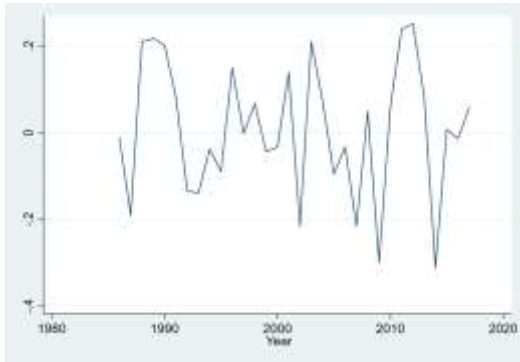
Panel C: Model Residuals   Panel D: Autocorrelation of Residuals
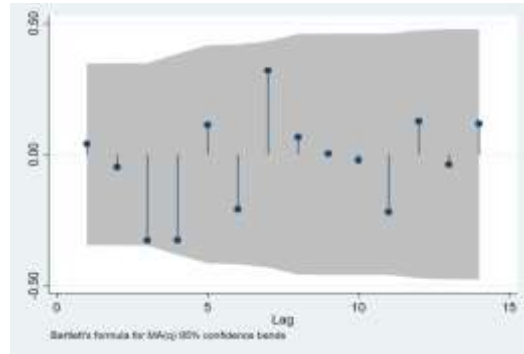
8. Savings Interest Rate
Estimation Period: 1990 – 2017

$$\Delta Savings\ Interest\ Rate = \underbrace{\frac{-0.419\ Savings\ Interest\ Rate_{t-1}}{(0.094)}}_{Adjustment}$$

$$\underbrace{-\ 1.145 \atop (0.214)\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ +1.934\ Reverse\ Repurchase\ Rate \atop (0.160)}_{Long-run}$$

Table A1. Summary of model tests

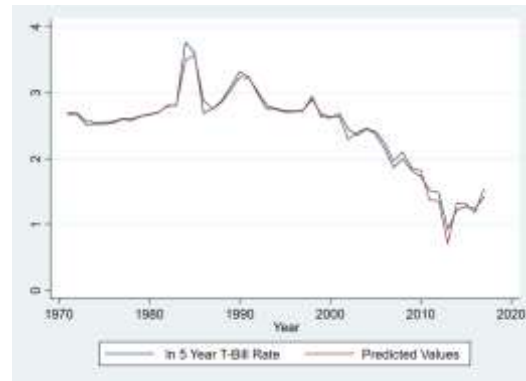| Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2\ (26)$	Portmanteau Q-Statistic $\chi2\ (14)$	MAE	RMSE	R^2
12.795	-4.438	0.169	18.356	0.151	0.200	0.505
[0.001, 0.002]	[0.002, 0.005]	[0.680]	[0.191]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Savings Interest Rate are -0.016, 0.209, -0.573, and 0.560 respectively.

Figure 1. Actual v. Predicted Savings Interest Rate, along with residuals

Panel A: Log first-difference   Panel B: Log level
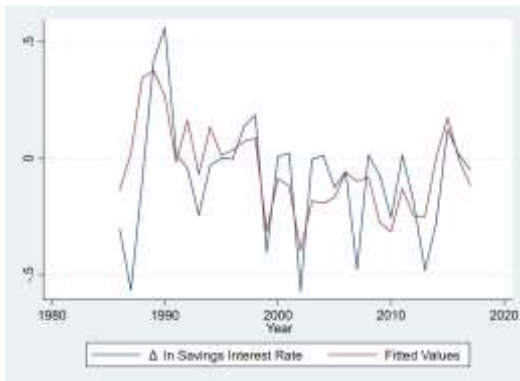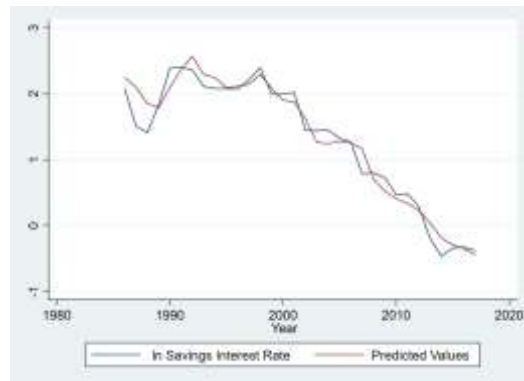
Panel C: Model Residuals
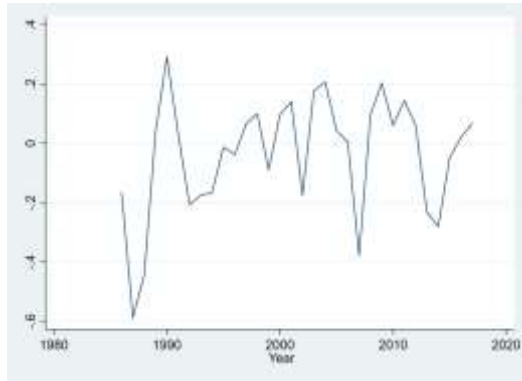
Panel D: Autocorrelation of Residuals
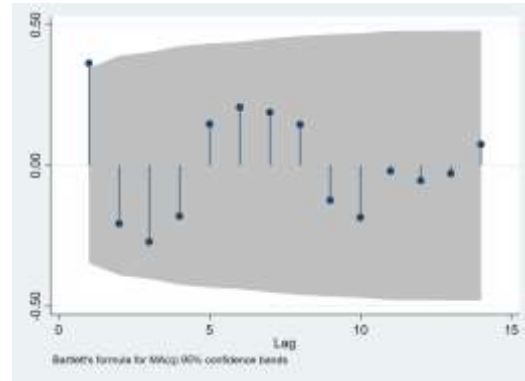
9. Narrow Money

Estimation Period: 1989 – 2017

$$\Delta Narrow\ Money = \underbrace{\frac{-0.884\ Narrow\ Money_{t-1}}{(0.154)}}_{Adjustment}$$

$$\underbrace{\begin{matrix} -\ 6.217\ +1.458\ GDP, Nominal -0.137\ Savings\ Interest\ Rate \\ (1.262) \qquad\quad (0.037) \qquad\qquad\qquad (0.024) \\ -0.214\ Gold\ Price\ PHP -0.268\ USD\ Nominal\ Exchange\ Rate \\ (0.055) \qquad\qquad\qquad (0.071) \end{matrix}}_{Long-run}$$

$$\underbrace{\begin{matrix} -0.108\ \Delta Narrow\ Money_{t-1} +0.400\ \Delta Narrow\ Money_{t-2} +0.157\ \Delta Gold\ Price\ PHP \\ (0.143) \qquad\qquad\qquad (0.171) \qquad\qquad\qquad (0.050) \\ +0.247\ \Delta USD\ Nominal\ Exchange\ Rate +0.140\ \Delta USD\ Nominal\ Exchange\ Rate_{t-1} \\ (0.080) \qquad\qquad\qquad\qquad (0.064) \\ +0.238\ \Delta USD\ Nominal\ Exchange\ Rate_{t-2} \\ (0.078) \end{matrix}}_{Short-run}$$

Table A1. Summary of model tests

| Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2\ (27)$	Portmanteau Q-Statistic $\chi2\ (13)$	MAE	RMSE	R^2
11.415	-5.715	0.369	10.244	0.018	0.024	0.794
[0.000, 0.001]	[0.000, 0.004]	[0.543]	[0.673]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Narrow Money are 0.135, 0.056, -0.072, and 0.262 respectively.

Figure 1. Actual v. Predicted Narrow Money, along with residuals

Panel A: Log first-difference
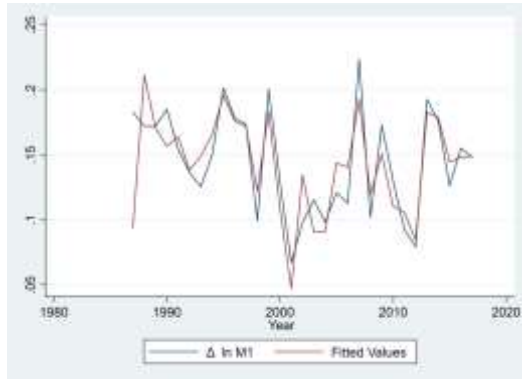
Panel B: Log level
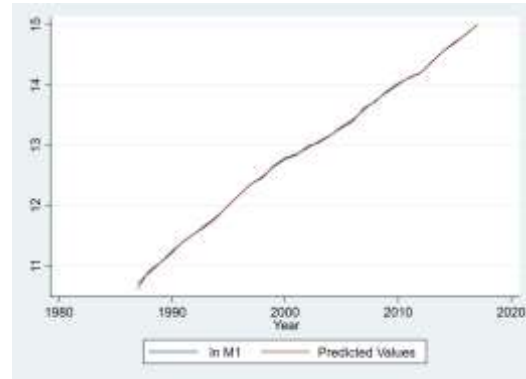
Panel C: Model Residuals
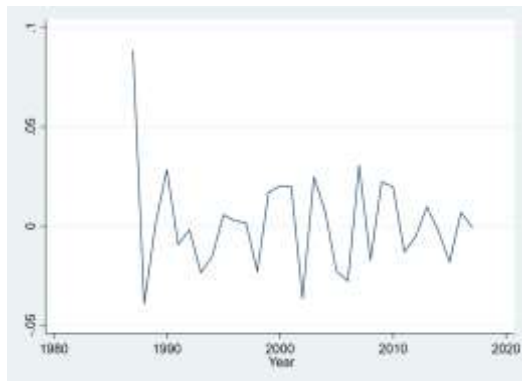
Panel D: Autocorrelation of Residuals
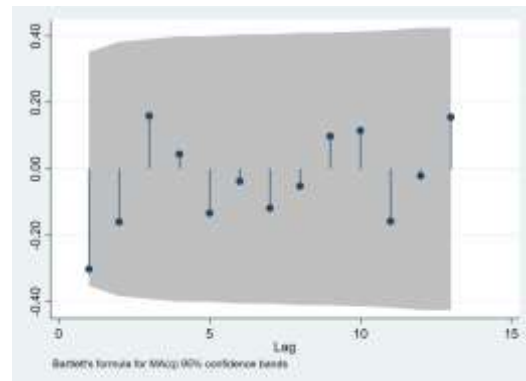
10. Broad Money

Estimation Period: 1984 – 2017

$$\Delta Broad\ Money = \underbrace{\begin{array}{c} -\ 0.596\ Broad\ Money_{t-1} \\ (0.082) \end{array}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} +\ \ 0.912\ \ +0.976\ Narrow\ Money + 0.114\ Money\ Multiplier \\ (0.368)\ \ \ \ \ \ \ \ \ (0.024)\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ (0.050) \\ -0.163\ Lending\ Rate + 0.151\ Savings\ Interest\ Rate \\ (0.128)\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ (0.042) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} -0.373\ \Delta Broad\ Money + 0.136\ \Delta Money\ Multiplier + 0.198\ \Delta Lending\ Rate \\ (0.099)\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ (0.038)\ (0.047) \\ +0.073\ \Delta Lending\ Rate - 0.105\ \Delta Savings\ Interest\ Rate \\ (0.037)\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ (0.029) \end{array}}_{Short-run}$$
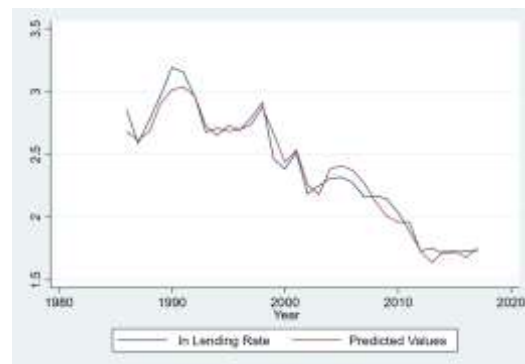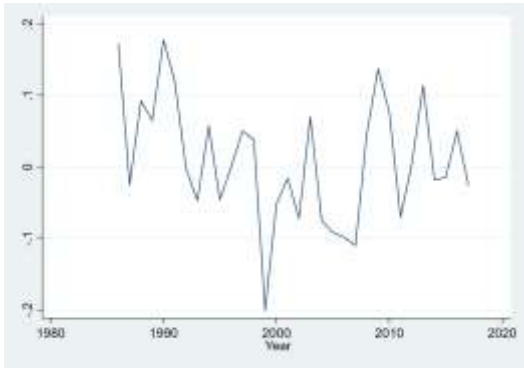
Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2$ (32)	Portmanteau Q-Statistic $\chi 2$ (16)	MAE	RMSE	R^2
11.470	-7.199	0.336	11.383	0.020	0.031	0.870
[0.000, 0.000]	[0.000, 0.000]	[0.561]	[0.785]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Broad Money are 0.143, 0.068, 0.049, and 0.360 respectively.

Figure 1. Actual v. Predicted Broad Money, along with residuals

Panel A: Log first-difference
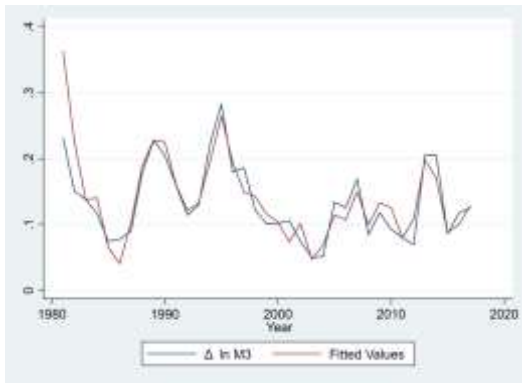
Panel B: Log level
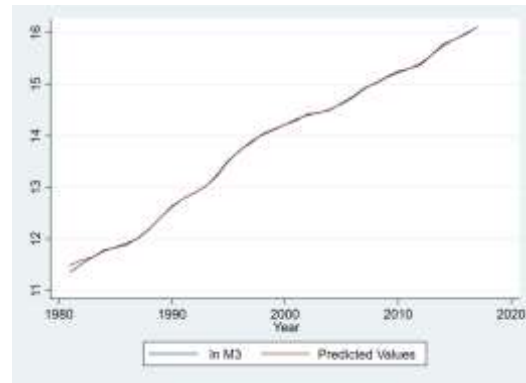
Panel C: Model Residuals
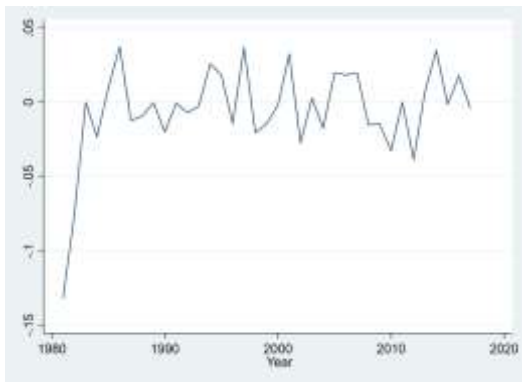
Panel D: Autocorrelation of Residuals
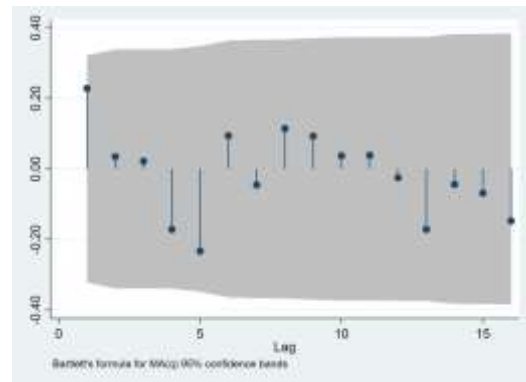
11. Total Loans
Estimation Period: 1995 – 2017

$$\Delta Total\ Loans = \underbrace{\frac{-0.638\ Total\ Loans_{t-1}}{(0.103)}}_{Adjustment}$$

$$\underbrace{+\ \underset{(1.613)}{5.238}\ \underset{(0.155)}{-0.435\ Lending\ Rate}\ \underset{(0.122)}{+1.463\ Broad\ Money}}{\underset{(0.135)}{+0.497\ Money\ Multiplier}\ \underset{(0.756)}{-3.501\ CPI, USA}}_{Long-run}$$

$$\underbrace{\underset{(0.089)}{+0.911\ \Delta Total\ Loans}\ \underset{(0.070)}{+0.257\ \Delta Lending\ Rate}}{\underset{(0.206)}{-0.522\ \Delta Broad\ Money}\ \underset{(0.985)}{+5.373\ \Delta CPI, USA}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2\ (21)$	Portmanteau Q-Statistic $\chi2\ (9)$	MAE	RMSE	R^2
14.787	-6.161	0.092	23.583	0.021	0.025	0.949
[0.000, 0.001]	[0.000, 0.003]	[0.761]	[0.005]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Total Loans are 0.120, 0.115, -0.059, and 0.419 respectively.

Figure 1. Actual v. Predicted Total Loans, along with residuals

Panel A: Log first-difference
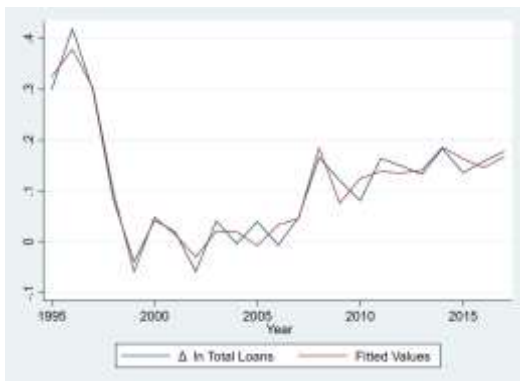
Panel B: Log level
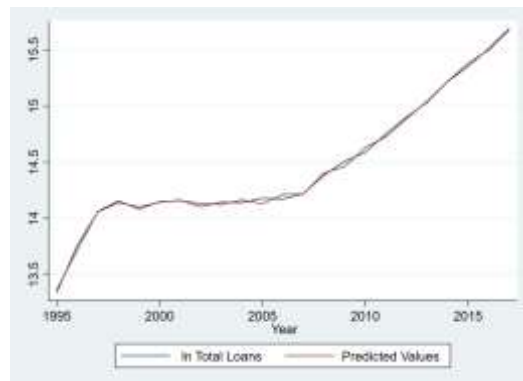
Panel C: Model Residuals
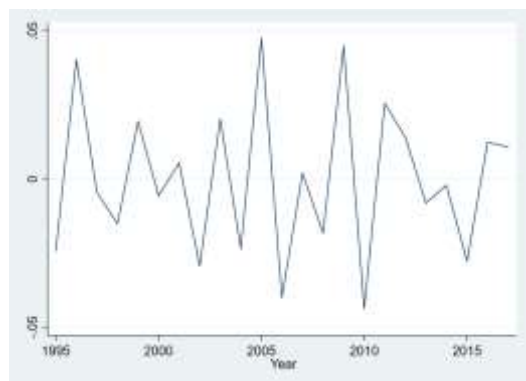
Panel D: Autocorrelation of Residuals
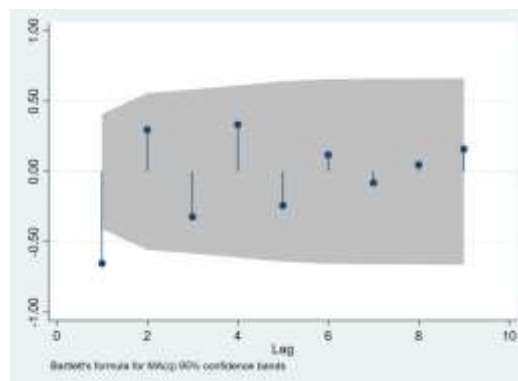
12. Resources of the Financial System
Estimation Period: 1990 – 2016

$$\Delta Resources\ of\ the\ Financial\ System = \underbrace{\frac{-0.643\ Resources\ of\ the\ Financial\ System_{t-1}}{(0.089)}}_{Adjustment}$$

$$\underbrace{+\ 0.061\ \underset{(0.842)}{}\ -0.187\ Savings\ Interest\ Rate\ +0.256\ Total\ Loans}_{}$$
$$\underset{(0.062)}{}\qquad\qquad\underset{(0.060)}{}$$
$$\underbrace{+0.364\ Compensation\ of\ Residents}_{Long-run}$$
$$(0.086)$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2$ (19)	Portmanteau Q-Statistic $\chi 2$ (10)	MAE	RMSE	R^2
17.951	-7.214	0.299	9.453	0.042	0.071	0.817
[0.000, 0.000]	[0.000, 0.000]	[0.584]	[0.489]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Resources of the Financial System are 0.147, 0.106, -0.213, and 0.427 respectively.

Figure 1. Actual v. Predicted Resources of the Financial System, along with residuals

Panel A: Log first-difference
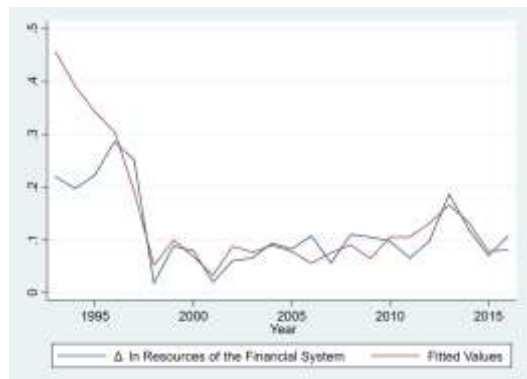
Panel B: Log level
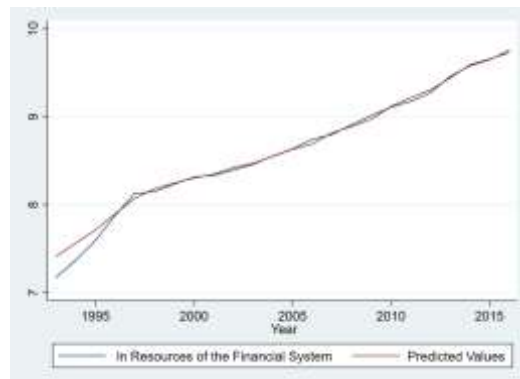
Panel C: Model Residuals
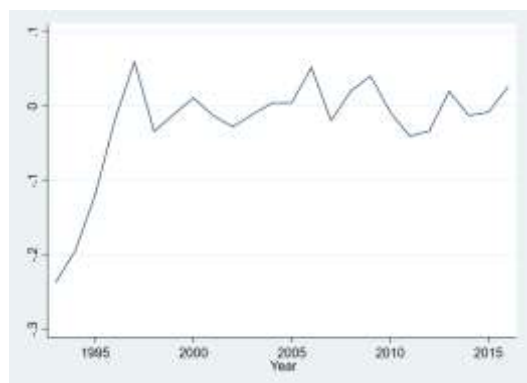
Panel D: Autocorrelation of Residuals
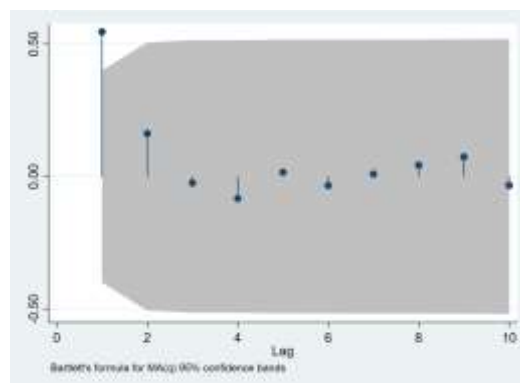
13. Cash Remittances
 Estimation Period: 1974 – 2016

$$\Delta Cash\ Remittances = \underbrace{\frac{-0.275\ Cash\ Remittances_{t-1}}{(0.073)}}_{Adjustment}$$

$$\underbrace{+\ 2.197\ +1.112\ CPI, Philippines - 1.419\ Unemployment\ Rate}_{Long-run}$$
$$\underset{(0.446)}{}\quad \underset{(0.144)}{}\qquad\qquad \underset{(0.388)}{}$$

$$\underbrace{\begin{array}{l} +0.218\ \Delta Cash\ Remittances_{t-1} - 0.203\ \Delta Cash\ Remittances_{t-2} - 1.116\ \Delta CPI, Philippines \\ \quad (0.052) \qquad\qquad\qquad (0.053) \qquad\qquad\qquad (0.312) \\ -0.119\ \Delta CPI, Philippines_{t-1} - 0.911\ \Delta CPI, Philippines_{t-2} + 0.535\ \Delta Unemployment\ Rate \\ \quad (0.305) \qquad\qquad\qquad (0.308) \qquad\qquad\qquad (0.206) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2$ (41)	Portmanteau Q-Statistic $\chi 2$ (20)	MAE	RMSE	R^2
11.358	-3.739	0.000	5.600	0.100	0.194	0.709
[0.000, 0.036]	[0.007, 0.036]	[0.989]	[0.999]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Cash Remittances are 0.168, 0.397, -0.693, and 2.397 respectively.

Figure 1. Actual v. Predicted Cash Remittances, along with residuals

Panel A: Log first-difference
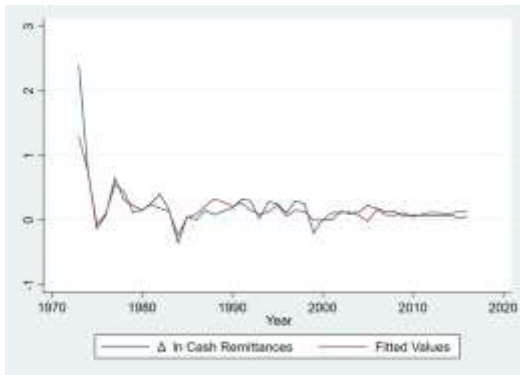
Panel B: Log level
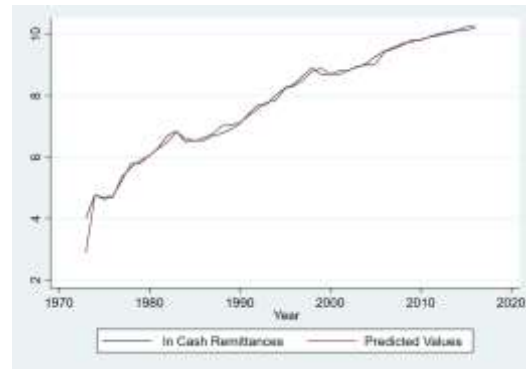
Panel C: Model Residuals
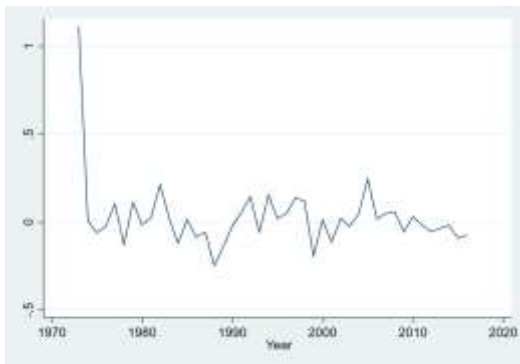
Panel D: Autocorrelation of Residuals
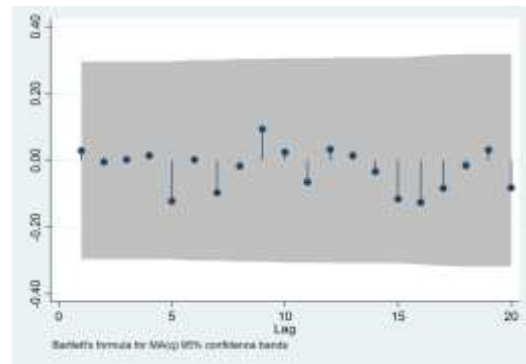
14. USD Nominal Exchange Rate
Estimation Period: 1987 – 2016

$$\Delta USD\ Nominal\ Exchange\ Rate = \underbrace{\frac{-0.382\ USD\ Nominal\ Exchange\ Rate_{t-1}}{(0.084)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} +\ 5.979\ -0.658\ GDP, Real + 0.412\ Narrow\ Money \\ (4.318)\qquad (0.838)\qquad\qquad (0.202) \\ -0.917\ Gold\ Price\ PHP - 0.968\ Reverse\ Repurchase\ Rate \\ (0.262)\qquad\qquad\qquad (0.303) \\ +0.000\ Inflation\ Rate + 0.055\ London\ Interbank\ Overnight\ Rate\ 3\ months \\ (0.077)\qquad\qquad\qquad\qquad (0.) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} -1.846\ \Delta GDP, Real - 0.952\ \Delta Narrow\ Money + 0.204\ \Delta Reverse\ Repurchase\ Rate \\ (0.670)\qquad\qquad (0.335)\qquad\qquad\qquad (0.98) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

| Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2\ (28)$	Portmanteau Q-Statistic $\chi 2\ (13)$	MAE	RMSE	R^2
4.540	-4.517	1.994	9.536	0.035	0.044	0.720
[0.009, 0.056]	[0.002, 0.046]	[0.157]	[0.731]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) USD Nominal Exchange Rate are 0.044, 0.099, -0.106, and 0.429 respectively.

Figure 1. Actual v. Predicted USD Nominal Exchange Rate, along with residuals
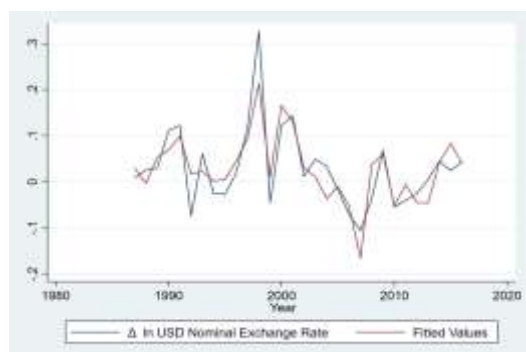
Panel A: Log first-difference

Panel B: Log level
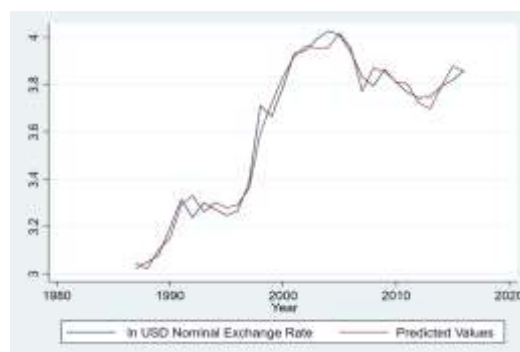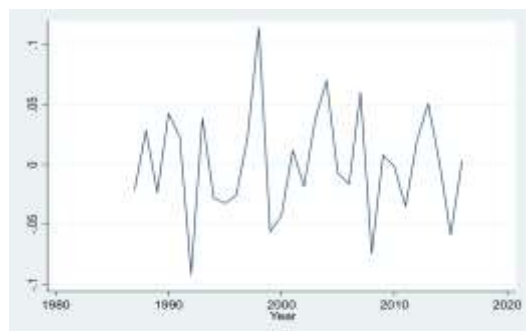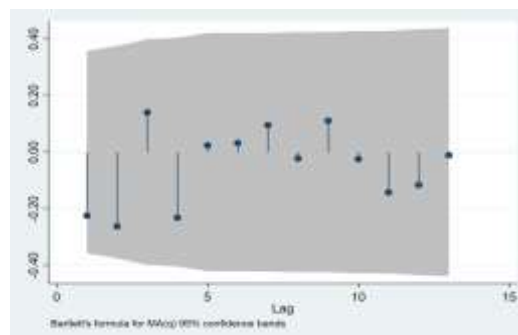
15. JPY Nominal Exchange Rate

Estimation Period: 1987 – 2016

$$\Delta JPY\ Nominal\ Exchange\ Rate = \underbrace{\frac{-0.601\ JPY\ Nominal\ Exchange\ Rate_{t-1}}{(0.101)}}_{Adjustment}$$

$$\underbrace{\begin{array}{c} +\ 16.255 - 0.301\ CPI, Japan - 2.332\ GDP, Real + 0.878\ Narrow\ Money \\ (8.900) \quad\quad (0.814) \quad\quad\quad (0.689) \quad\quad\quad (0.256) \\ -0.271\ Gold\ Price, PHP - 0.558\ Reverse\ Repurchase\ Rate + 0.154\ Inflation\ Rate \\ (0.182) \quad\quad\quad\quad (0.246) \quad\quad\quad\quad\quad (0.057) \end{array}}_{Long-run}$$

$$\underbrace{\begin{array}{c} -0.862\ \Delta Narrow\ Money + 0.405\ \Delta Gold\ Price, PHP \\ (0.345) \quad\quad\quad\quad (0.171) \end{array}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2\ (28)$	Portmanteau Q-Statistic $\chi 2\ (13)$	MAE	RMSE	R^2
9.460	-5.902	0.107	13.701	0.042	0.052	0.779
[0.000, 0.001]	[0.000, 0.005]	[0.743]	[0.395]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) JPY Nominal Exchange Rate are 0.070, 0.132, -0.196, and 0.437 respectively.

Figure 1. Actual v. Predicted JPY Nominal Exchange Rate, along with residuals

Panel A: Log first-difference
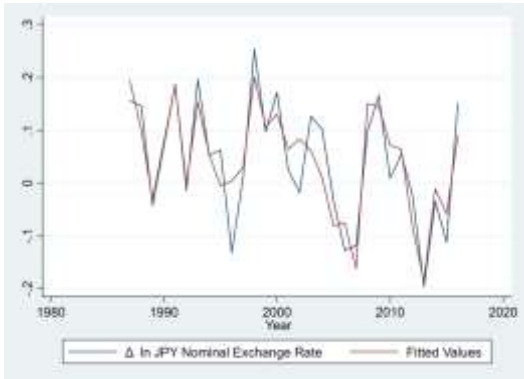

Panel B: Log level
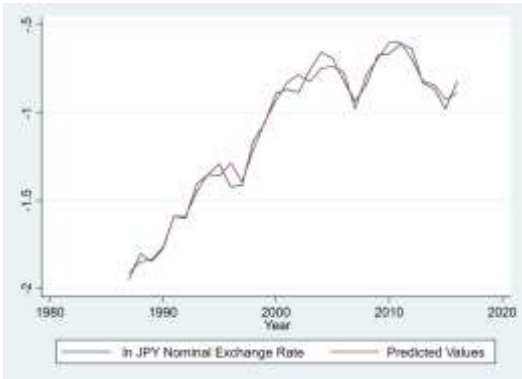
Panel C: Model Residuals
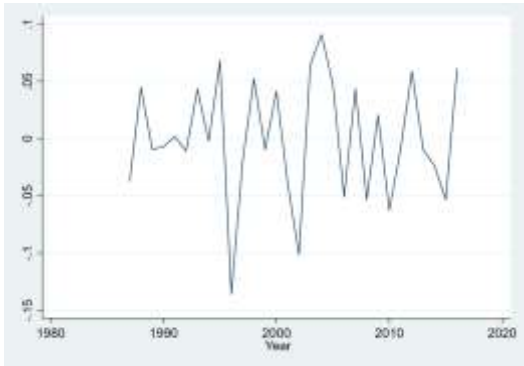
Panel D: Autocorrelation of Residuals
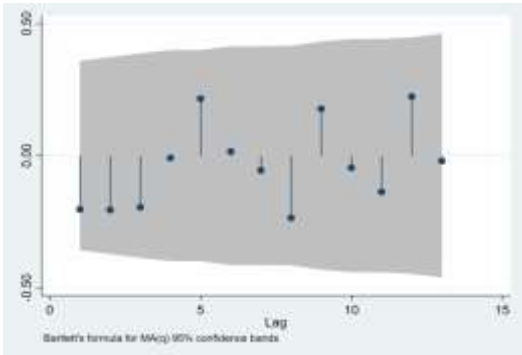
16. CNY Nominal Exchange Rate
Estimation Period: 1990 – 2016

$$\Delta CNY\ Nominal\ Exchange\ Rate = \underbrace{\begin{matrix} -0.261\ CNY\ Nominal\ Exchange\ Rate_{t-1} \\ (0.064) \end{matrix}}_{Adjustment}$$

$$\underbrace{\begin{matrix} +\ 1.384\ +0.472\ USD\ Nominal\ Exchange\ Rate -0.249\ Broad\ Money \\ (0.412) \qquad\qquad (0.283) \qquad\qquad\qquad (0.144) \\ -0.611\ 5year\ TBond\ Rate \\ (0.192) \end{matrix}}_{Long-run}$$

$$\underbrace{+0.751\ \Delta USD\ Nominal\ Exchange\ Rate -0.685\ \Delta Broad\ Money +0.110\ \Delta 5year\ TBond\ Rate \\ (0.148) \qquad\qquad\qquad (0.239) \qquad\qquad\qquad (0.055)}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Hetoroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi2$ (42)	Portmanteau Q-Statistic $\chi2$ (21)	MAE	RMSE	R^2
6.644	-4.070	2.484	9.613	0.051	0.079	0.648
[0.002, 0.009]	[0.003, 0.030]	[0.115]	[0.983]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) CNY Nominal Exchange Rate are 0.023, 0.113, -0.428, and 0.328 respectively.

Figure 1. Actual v. Predicted CNY Nominal Exchange Rate, along with residuals

Panel A: Log first-difference
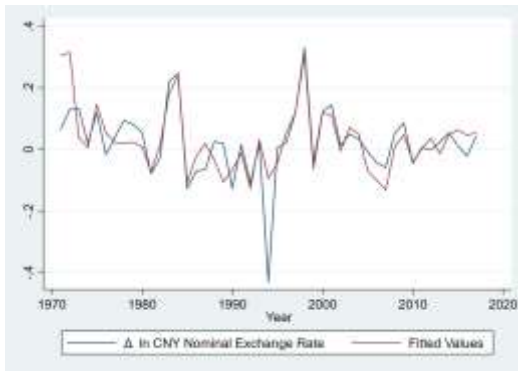
Panel B: Log level

Panel C: Model Residuals
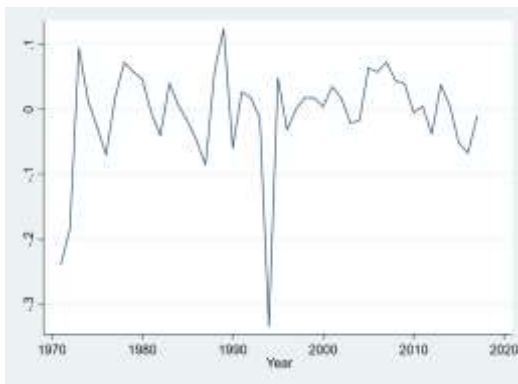
Panel D: Autocorrelation of Residuals
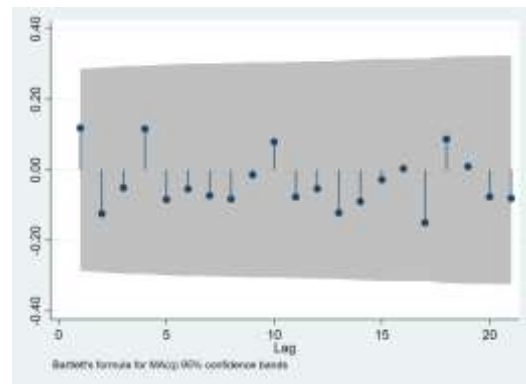
17. Money Multiplier

Estimation Period: 1984 – 2017

$$\Delta Money\ Multiplier = \underbrace{\frac{-0.647\ Money\ Multiplier_{t-1}}{(0.164)}}_{Adjustment}$$

$$+ \underbrace{\underset{(0.426)}{1.592} \underset{(0.035)}{-0.506\ Reserve\ Requirement\ Ratio} \underset{(0.005)}{+0.042\ Savings\ Interest\ Rate}}_{Long-run}$$

$$\underbrace{\frac{-0.159\ \Delta Reserve\ Requirement\ Ratio}{(0.080)}}_{Short-run}$$

Table A1. Summary of model tests

Bounds Tests		Heteroskedasticity Test	Autocorrelation Test	Model Fit		
F-Statistic	t-statistic	Breusch-Pagan $\chi 2\ (32)$	Portmanteau Q-Statistic $\chi 2\ (16)$	MAE	RMSE	R^2
5.577	-3.925	0.013	21.767	0.015	0.017	0.867
[0.015, 0.043]	[0.005, 0.027]	[0.908]	[0.150]			

Figures in [] are p-values. Mean/SD/Min/Max of first-differenced (Δ) Money Multiplier are -0.001, 0.050, -0.155, and 0.127 respectively.

Figure 1. Actual v. Predicted Money Multiplier, along with residuals

Panel A: Log first-difference

Panel B: Log level

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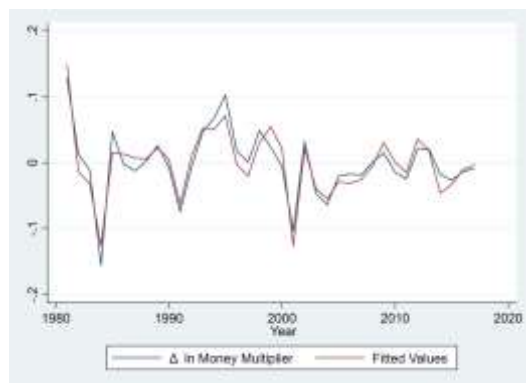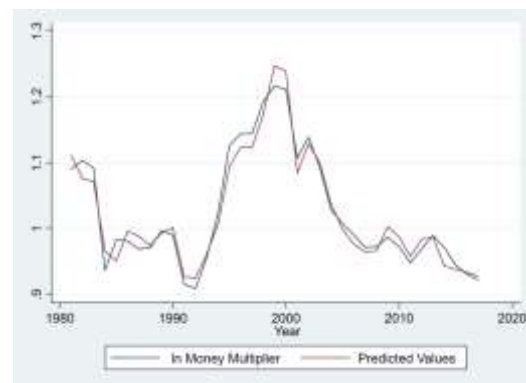
Panel C: Model Residuals
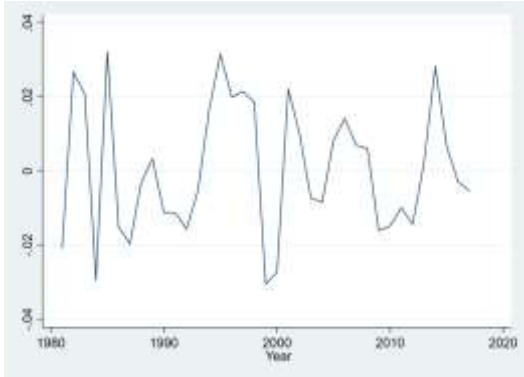
Panel D: Autocorrelation of Residuals
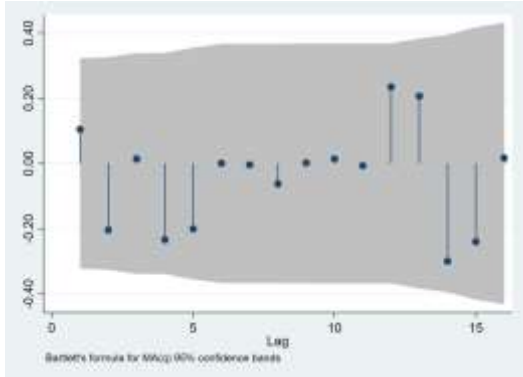
APPENDIX 4: Test of the predictive accuracy

Table 1. Test of the predictive accuracy of forecasts: MAPE

|	In-sample forecast 2002-2016	Out-sample forecast	
		2017	2018
GDP, real	0.021	0.024	0.029
GDP, nominal	0.011	0.005	0.003
Nominal GDP (exp)	0.022	0.019	0.08
GVA Agriculture, real	0.018	0.017	0.006
GVA Agriculture (demand), real	0.008	0.002	0.012
GVA Construction, real	0.059	0.158	0.129
GVA Electricity and Steam, real	0.041	0.069	0.057
GVA Finance, real	0.031	0.01	0.031
GVA Manufacturing, real	0.051	0.078	0.09
GVA Mining, real	0.093	0.057	0.124
GVA Mining, nominal	0.096	0.102	0.148
GVA Other Services, real	0.029	0.031	0.072
GVA Real Estate, real	0.016	0.034	0.067
GVA Trade, real	0.044	0.072	0.088
GVA Transportation, real	0.039	0.088	0.186
GVA Water, real	0.049	0.016	0.018
IPIN GVA Construction	0.052	0.011	0.037
IPIN GVA Electricity and Steam	0.026	0.027	0.072
IPIN GVA Finance	0.03	0.032	0.095
IPIN GVA Manufacturing	0.07	0.031	0.041
IPIN GVA Mining	0.073	0.047	0.027
IPIN GVA Other Services	0.038	0.019	0.035
IPIN GVA Real Estate	0.021	0.024	0.095
IPIN GVA Trade	0.075	0.118	0.156
IPIN GVA Transportation	0.048	0.1	0.114
IPIN GVA Water	0.056	0.016	0.062
HFCE - Alcohol	0.031	0.113	0.435
HFCE - Education	0.031	0.042	0.073
HFCE - Food	0.016	0.015	0.009
HFCE - Medical	0.027	0.085	0.169
HFCE - Housing	0.022	0.125	0.078
HFCE - Non-Alcoholic	0.045	0.084	0.222
HFCE - Miscellaneous	0.017	0.01	0.03
HFCE - Tobacco	0.039	0.014	0.034
HFCE - Transportation and Communication	0.031	0.002	0.004
HFCE - Utilities	0.042	0.047	0.086
IPIN HFCE - Alcohol	0.022	0.072	0.203
IPIN HFCE - Education	0.013	0.03	0.104
IPIN HFCE - Food	0.016	0.033	0.014
IPIN HFCE - Medical	0.026	0.145	0.285
IPIN HFCE - Housing	0.032	0.07	0.065
IPIN HFCE - Non-Alcoholic	0.014	0.005	0.012
IPIN HFCE - Miscellaneous	0.078	0.005	0.012

| | **In-sample forecast** | **Out-sample forecast** | |
	2002-2016	**2017**	**2018**
IPIN HFCE - Tobacco	0.019	0.049	0.05
IPIN HFCE - Transportation and Communication	0.043	0.02	0.027
IPIN HFCE - Utilities	0.022	0.06	0.1
Inflation Rate	0.257	0.048	0.21
GDCF - Fixed - Durables, real	0.176	0.105	0.033
GDCF - Fixed - Private Construction, real	0.077	0.058	0.18
GDCF - Fixed - Construction, real	0.058	0.174	0.154
GDCF - Fixed, real	0.104	0.119	0.071
GDCF, real	0.106	0.107	0.064
GDCF, nominal	0.106	0.049	0.039
Compensation of Residents	0.021	0.075	0.016
Operating Surplus	0.035	0.05	0.037
Net Compensation	0.011	0.021	0.027
Net National Income	0.019	0.003	0.036
Net Disposable Income	0.021	0.007	0.033
Compensation plus Net Operating Surplus from Resident Producers	0.024	0.032	0.012
Domestic Demand, Real	0.069	0.096	0.102
Employment in Agriculture	0.018	0.068	0.009
Employment in Industry	0.012	0.023	0.072
Employment in Service	0.011	0.008	0.005
Total Employment (AIS)	0.009	0.01	0.015
Labor Force	0.007	0.009	0.005
Unemployment Rate	0.041	0.123	0.123
Wage Index Agriculture	0.021	0.011	0.056
Wage Index Construction	0.021	0.023	0.059
Wage Index Electricity and Steam	0.019	0.055	0.083
Wage Index Finance	0.053	0.095	0.092
Wage Index Manufacturing	0.038	0.142	0.226
Wage Index Mining	0.058	0.008	0.001
Wage Index Private Service	0.043	0.003	0.502
Wage Index Real Estate	0.036	0.075	0.12
Wage Index Trade	0.055	0.086	0.121
Wage Index Transportation	0.046	0.062	0.046
HFCE - Education, Nominal	0.025	0.013	0.024
HFCE - Food, Nominal	0.022	0.047	0.024
HFCE - Medical, Nominal	0.018	0.048	0.068
HFCE - Housing, Nominal	0.032	0.063	0.018
HFCE - Non-Alcoholic, Nominal	0.051	0.079	0.231
HFCE - Miscellaneous, Nominal	0.082	0.015	0.042
HFCE - Tobacco, Nominal	0.047	0.032	0.159
HFCE - Transportation and Communication, Nominal	0.048	0.037	0.079
HFCE - Utilities, Nominal	0.044	0.032	0.082
BIR - Excise Taxes	0.053	0.05	0.073
Import Duties and Excise Taxes	0.153	0.051	0.09
Taxes in Business and Occupation	0.12	0.158	0.837
Other Indirect Taxes	0.088	0.019	0.07
BIR - Alcohol Products	0.087	0.006	0.131

	In-sample forecast	Out-sample forecast	
	2002-2016	2017	2018
BIR - Tobacco Products (including inspection fees)	0.07	0.07	0.285
BIR - Petroleum Products	0.042	0.032	0.024
BIR - Mineral Products	0.084	0.099	1.554
Excise Tax on Domestic Product	0.224	0.086	0.21
Income Tax on Business	0.143	0.067	0.202
Income Tax on Individual	0.164	0.093	0.589
Other Direct Taxes	0.236	0.066	0.922
Compulsory fees and fines	0.175	0.061	0.158
Govt property income	0.095	0.06	0.153
Social security contributions	0.067	0.054	0.24
Govt property expenditure	0.099	0.088	0.117
Social security benefits	0.059	0.151	0.236
Total Indirect Taxes	0.139	0.11	0.364
Total Direct Taxes	0.1	0.078	0.181
Total Taxes	0.054	0.027	0.357
Total Govt Income	0.047	0.008	0.23
Total Govt Expenditure	0.021	0.002	0.008
Total Govt Savings	0.291	0.072	2.036
Total Govt Surplus	0.63	0.125	2.149
Total Govt Debt	0.0523	0.0146	0.3634
IPIN Agricultural Imports	0.067	0.227	0.491
IPIN Fuel Imports	0.079	0.02	0.011
IPIN Machinery Imports	0.094	0.196	0.161
IPIN Materials Imports	0.043	0.129	0.219
IPIN Other Good Imports	0.073	0.072	0.123
IPIN Electronic Exports	0.132	0.083	0.24
IPIN Agricultural Exports	0.061	0.107	0.325
IPIN Mineral Exports	0.129	0.203	0.388
IPIN Other Good Exports	0.103	0.236	0.846
IPIN Service Imports	0.073	0.067	0.055
IPIN BPO Service Exports	0.13	0.08	0.277
IPIN Tourism Service Exports	0.257	0.658	2.573
IPIN Other Service Exports	0.129	0.176	1.408
Electronic Exports, real	0.153	0.24	0.413
Agricultural Exports, real	0.068	0.397	0.442
Mineral Exports, real	0.154	0.422	0.607
Other Good Exports, real	0.084	0.269	0.48
BPO Service Exports, real	0.134	0.418	0.553
Tourism Service Exports, real	0.163	0.511	0.737
Other Service Exports	0.064	0.276	0.633
BOP - Total Good Exports, nominal	0.052	0.234	0.194
BOP - Total Service Exports, nominal	0.059	0.149	0.012
Agricultural Imports, real	0.121	0.203	0.406
Fuel Imports, real	0.096	0.11	0.131
Machinery Imports, real	0.182	0.128	0.043
Materials Imports, real	0.13	0.321	0.429
Other Good Imports, real	0.149	0.058	0.016

	In-sample forecast 2002-2016	Out-sample forecast 2017	2018
Total Service Imports, real	0.05	0.035	0.137
BOP -Total Good Imports, nominal	0.042	0.125	0.138
BOP - Total Service Imports, nominal	0.052	0.068	0.239
Total Export of Goods, Real	0.106	0.259	0.442
Total Export of Services, Real	0.108	0.425	0.593
Total Exports, Real	0.086	0.293	0.471
Total Import of Goods, Real	0.095	0.129	0.197
Total Imports, Real	0.084	0.099	0.14
Net Exports(real)	6.862	1.213	1.789
91 day T-Bill Rate	0.47	0.475	0.475
6 months T-Bill Rate	0.378	0.452	0.087
1 Year T-Bill Rate	0.308	0.45	0.016
5 Year T-Bill Rate	0.151	0.229	0.022
10 Years T-Bill Rate	0.158	0.162	0.129
Lending Rate	0.098	0.029	0.066
Time Deposit Rate	0.205	0.234	0.093
Savings Interest Rate	0.186	0.076	0.095
Real Interest Rate	0.388	0.008	3.279
M1	0.022	0.03	0.053
M3	0.034	0.012	0.024
Total Loans	0.031	0.054	0.042
Resources of the Financial System	0.038	0.044	0.127
Cash Remittances	0.094	0.093	0.364
Money Multiplier	0.009	0.004	0.011

APPENDIX 5: Documentation of creating consistent data series

1. Total and sectoral employment (*tot_emp*, *emp_agri, emp_ind, emp_ser*).

Total employment data have the following breaks:

Break 1: Past week reference period and covered household population 10 years old and over (1956-1976 August).

Break 2: Past quarter reference period and covered household population 15 years old and over (1976-1987 first quarter) in thousands

Break 3: Past week reference period (July 1986-2016)

Since there is an overlap in 1986 between breaks 2 and 3, a factor is computed using two overlapping data on total employment. We use this factor to find the total employment data in 1985 that is consistent with the break 3 series. Since there is now an overlap in breaks 2 and 3 in 1985, a factor is computed again, which is used to get the data in 1984. This is done until the series has reached 1956 (the first year of the break 1 series).

In terms of sectoral employment, there is a consistent data series from 1991 to 2016. To get employment shares for the earlier years, Orbeta (2002) has recorded sectoral employment shares in 1978, 1980, 1985, and 1990. A linear extrapolation has been done using this information. This completes the series in sectoral employment shares for 1978-2016. Using this series and the total employment generated above, sectoral employment data (level) are generated.

2. Labor Force (*lf*) and Unemployment Rate (*unemp_rate).

Similar to the employment data, labor force data and unemployment rate data have three breaks. To get data series earlier than 1986, a procedure similar to (1) is followed.

3. Wage index for Agriculture (*wageind_agri*).

These data are derived from the Nominal Agricultural Wage Rates of Farm Workers by Type of Farm Workers published by the PSA. These are divided by the CPI and indexed to 1978 prices to be consistent with the wage index for other sectors, all of which are publicly available.

4. Compensation of Employees, From the Rest of the World (ROW), net and Property Income, Net

The official data for these variables originally contained 4 breaks (1946-1994, 1980-1998, 1995-2009 and 2009-present). Right Side Scaling adjustment using raising factor was utilized in order to harmonize the series.

5. Components of Gross Domestic Capital Formation (Fixed Capital + Change in Inventories) (*gdcf_fc_n* and *gdcf_ci_n*)

These components have two data series due to changes in base years. One series (from 1946 to 2000) at 1985 prices and another series (from 1998 to 2016) at 2000 prices. In order to create a single time-series, the shares of these components are computed using the Total GDCF, which are also available in 2 series. The computed shares are then multiplied by the *Total GDCF* (at 2000 prices), which are available from 1946-2016, to create a series of Fixed Capital and Change in Inventories at 2000 prices from 1946-1997.

6. Components Gross Domestic Capital Formation: Construction, Intellectual Property Product, Durable Equipment, Breeding Stock and Orchard Development (*gdcf_fc_cons_n, gdcf_fc_ipp_n, gdcf_fc_dur_n, gdcf_ci_n* , and *gdcf_fc_breed_n*)

Similar to (5), these components have two data series due to rebasing. A similar procedure done in (5) is also done to create data series at 2000 prices. The computed shares are then multiplied by the *Fixed Capital* generated in (5) to get the data on Construction, Intellectual Property Product, Durable Equipment, Breeding Stock and Orchard Development.

7. Gross Domestic Capital Formation components: Public Construction, Private Construction, (*gdcf_fc_pubcons_n, gdcf_fc_privcons_n*)

Similar to (5), these components have two data series due to rebasing. A similar procedure done in (5) is also done to create data series at 2000 prices. The computed shares are then multiplied by the *Total Construction* (at 2000 prices) to get the data series for Public Construction and Private Construction at 2000 prices.

8. Goods export categories include electric components exports, agricultural exports, mineral components exports, and other manufactured goods exports. Electric components are being modelled as this is a growing export product for the Philippines in recent years. Agricultural exports are a staple as well as with mineral components exports. Other manufactured goods are lumped together.

Services export categories include computer services exports (business process outsourcing), tourism exports, and other services exports. Considering that the Philippines has a growing BPO industry, singling out these services is important for policy analysis. Tourism exports are also a growing sector in the Philippines. Other services exports are lumped together.

Goods import categories include machinery and equipment imports, material inputs imports, fuel imports, rice/agricultural imports, and other imports. Machinery and equipment together with material inputs are important goods for the growth of industry which is why these have been singled out as individual categories. Fuel imports are likewise a staple. With the increased importation of rice, agricultural imports have been singled out as well. Other imports are lumped together.

Services imports are lumped only as total services imports. No breakdown has been made for this.

9. Regrouping of PSA National Income Accounts' Goods Exports Categories

Table 1 PSA National Income Accounts (1967-1991), Goods Exports

Export Categories PSA National Income Accounts (1967-1991)	Regrouped Goods Export Categories			
	Electronics	Agricultural	Mineral	Other Manufactured Goods
1. Semiconductors and electronic microcircuits	■			
2. Garments				■
3. Crude coconut oil		■		
4. Bars, rods of copper			■	
5. Gold from copper ores			■	
6. Banana and plantains		■		
7. Lumbers		■		
8. Copper concentrates			■	
9. Shrimp and prawns		■		
10. Canned pineapple		■		
11. Iron agglomerates			■	
12. Centrifugal sugar		■		
13. Copra oil, cake & meal		■		
14. Coffee, not roasted		■		
15. Plywood, ordinary		■		
16. Prepared tuna		■		
17. Desiccated coconut		■		
18. Logs		■		
19. Others				■
20. Monetization of gold				■

Table 2 PSA National Income Accounts (1991-2000), Goods Exports

Export Categories PSA National Income Accounts (1991-2000)	Regrouped Goods Export Categories			
	Electronics	Agricultural	Mineral	Other Manufactured Goods
1. Garments				■
2. Semiconductors and electric microcircuits	■			
3. Finished electrical machinery	■			
4. Other products manufactured				■
5. Ignition wiring sets	■			
6. Crude coconut oil		■		
7. Bars, rods of copper			■	
8. Shrimps and prawns		■		
9. Gold from copper ores			■	
10. Banana and plantains		■		
11. Transmission apparatus	■			
12. Copper concentrates			■	
13. Canned pineapple		■		

	Electronics	Agricultural	Mineral	Other Manufactured Goods
14. Desiccated coconut		�©		
15. Centrifugal sugar		▓		
16. Liquefied petrol, gas				▓
17. Petroleum naphtha				▓
18. Baskets, basketwares				▓
19. Prepared tuna		▓		
20. Iron agglomerates			▓	
21. Copra oil, cake & meal		▓		
22. Tennis, gym & sports shoes				▓
23. Others				▓
24. Monetization of gold				▓

Table 3 PSA National Income Accounts (1998-2017), Goods Exports

	Regrouped Goods Export Categories			
Export Categories PSA National Income Accounts (1998-2017)	Electronics	Agricultural	Mineral	Other Manufactured Goods
1. Electric components	▓			
2. Principal agricultural products		▓		
3. Principal fishery products		▓		
4. Articles of apparel and clothing accessories				▓
5. Basketworks				▓
6. Cathodes & sections of cathodes and of refined copper			▓	
7. Ignition wiring sets	▓			
8. Metal components			▓	
9. Other products manufactured from materials on consignment basis				▓
10. Petroleum products				▓
11. Others				▓

10. Regrouping of PSA National Income Accounts' Goods Imports Categories

Table 4 PSA National Income Accounts (1967-1999), Goods Imports

	Regrouped Goods Import Categories				
Import Categories PSA National Income Accounts (1967-1999)	Machinery and equipment	Material inputs	Fuel	Rice / Agricultural	Others
1. Mineral fuels, lubricants, and related materials			▓		
2. Machinery other than electrical machinery	▓				
3. Base metals		▓			
4. Electrical machinery, apparatus, & appliances	▓				
5. Cereals & cereal products				▓	
6. Transport equipment	▓				
7. Chemical elements and compounds		▓			
8. Manufacture of metals		▓			
9. Textile yarns					▓
10. Artificial resins and plastic materials					▓
11. Dairy products				▓	
12. Textile fibers					▓
13. Fertilizers manufacturing				▓	

14. Feeding stuff				▓	
15. Paper products					▓
16. Others					▓
17. Imports on consignment					▓

Table 5 PSA National Income Accounts (1998-2017), Goods Imports

Import Categories PSA National Income Accounts (1998-2017)	Regrouped Goods Import Categories				
	Machinery and equipment	Material inputs	Fuel	Rice / Agricultural	Others
1. Electronics		▓			
2. Mineral fuels			▓		
3. Machinery and mechanical appliances	▓				
4. Base metals		▓			
5. Transport equipment	▓				
6. Textile yarns					▓
7. Electrical machinery	▓				
8. Artificial resins					▓
9. Chemical products		▓			
10. Cereals				▓	
11. Dairy products				▓	
12. Medical and pharmaceutical products					▓
13. Paper products					▓
14. Feedstuff				▓	
15. Metalliferous ores and metal scrap		▓			
16. Others					▓
17. Imports on consignment					▓

11. Regrouping of PSA National Income Accounts' Services Exports Categories

Export Categories PSA National Income Accounts (1980-2017)	Regrouped Services Export Categories		
	BPO	Tourism	Others
1. Transportation			▓
2. Insurance			▓
3. Travel		▓	
4. Government			▓
5. Miscellaneous services	▓		

Note: Since there is a lack of data that fully identifies the BPO industry in the PSA National Income Accounts, the bulk of the 'miscellaneous services' was used as a proxy. This decision was made based on a key informant interview with the IT and Business Process Association of the Philippines (IBPAP) in 20 March 2018 where the bulk of the 'miscellaneous services' item is actually the BPO industry. IBPAP also states that the BPO industry has already been in existence since the 1980s. In fact, pioneer firms at the time still operate at present.

12. Bureau of Internal Revenue (BIR) Tax Collections

The BIR has different tax data series, i.e., 1967-1982, 1983-1989, 1990-1993, 2011-2016. Tax collections were aggregated to broader tax groups to have consistent time series.

13.   Effective tax rates

Commodity-specific effective tax rates were calculated using the official tax schedules weighted by actual or proxy measures for each commodity-schedule pair. For example, for the effective individual income tax rate, tax schedules from the different Internal Revenue Codes were applied to the distribution of per capita income from the Family Income and Expenditure Surveys.

14.   Household Final Consumption Expenditure (HFCE)

Older National Accounts HFCE series from NSCB and PSA were harmonized to newer series by using the ratio of the value of the older series to the newer series at series breaks. Some consumption items were aggregated for consistency across time. Others that require more detailed breakdown, e.g. tobacco and alcoholic beverages, were disaggregated from a more aggregated series using ratios derived from the triennial Family Income and Expenditure Surveys.

15.   General Government Income and Outlay Account

The General Government Income and Outlay Account estimates from NSCB and PSA were harmonized using a similar technique employed for HFCE. Older National Accounts HFCE series from NSCB and PSA were harmonized to newer series by using the ratio of the value of the older series to the newer series at series breaks.