

# THE EFFECTS OF FISCAL POLICY ON GDP AND UNEMPLOYMENT IN AUSTRALIA

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7/2017

# Motivation

- There are only few studies on the effects of fiscal policy shocks on Australian economy such as Dungey, M. and R. Fry (2010) using the data until 2007. A VAR model with short-run identifications is employed in their research.
- Mountford & Uhlig (2009) examined the effects of fiscal policy on US economy. They found increasing government spending or decreasing tax revenue will increase GDP.
- This research will apply updated identification methods for VAR models and updated data to analyse the impact of government expenditure and tax revenue shocks on output and unemployment rate in Australia.

# Outline

**1. Model**

**2. Data**

**3. Identification**

**4. Results**

**5. Assessment of the results**

**6. Summary**

# Methodology

- Econometric method: Structural VAR models
- Identification scheme: Sign-restrictions

# Model

**The VAR (p) model: Reduced form**

$$Y_t = A_1 Y_{t-1} + A_2 Y_{t-2} + \cdots + A_p Y_{t-p} + \varepsilon_t$$

**Structural VAR form:**

$$A_0 Y_t = A_1 Y_{t-1} + A_2 Y_{t-2} + \cdots + A_p Y_{t-p} + u_t$$

**$A_0, A_1, A_2, \dots, A_p$  are (n x n) matrices of coefficients.**

$$u_t = A_0 \varepsilon_t$$

$$Y_t = \begin{pmatrix} y_t \\ x_t \\ g_t \\ t_t \\ p_t \\ i_t \end{pmatrix}$$

# Sign restrictions identifications

- The VAR in reduced-form can be written as

$$y_t = a_0 + \sum_{j=1}^p A_j y_{t-j} + \epsilon_t$$

Its moving average representation is:

$$y_t = \epsilon_t + B_1 \epsilon_{t-1} + B_2 \epsilon_{t-2} + \dots + \dots$$

- The moving-average representation of a structural VAR is

$$y_t = \theta_0 u_t + \theta_1 u_{t-1} + \theta_2 u_{t-2} + \dots + \theta_s u_{t-s} + \dots$$

where  $\theta_0 = A_0^{-1}$ ,  $\theta_1 = B_1 A_0^{-1}$ ,  $\theta_2 = B_2 A_0^{-1}$ , ...

- We consider sign restrictions on  $\theta_0$ ,  $\theta_1$ ,  $\theta_2$ ,  $\theta_3$  matrix

# Data

- Following Mountford & Uhlig (2009), we decide to choose 6 Australian economic indicators for the study
- $y_t = [g_t, t_t, y_t, x_t, i_t, p_t]'$ 
  - $y_t$  is real GDP
  - $x_t$  is unemployment rate
  - $g_t$  is real government expenditure
  - $t_t$  is total tax revenue
  - $i_t$  is short-term interest rate
  - $p_t$  is inflation rate

*(The main data source is based on ABS)*

# Identifying sign restrictions

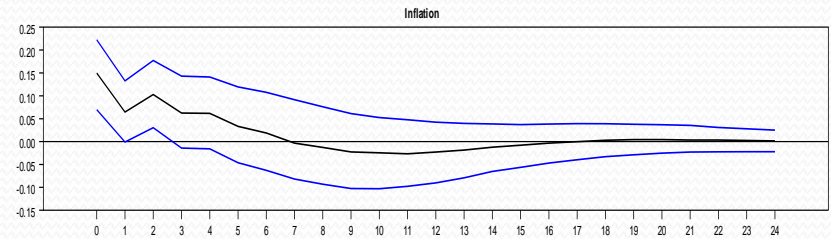
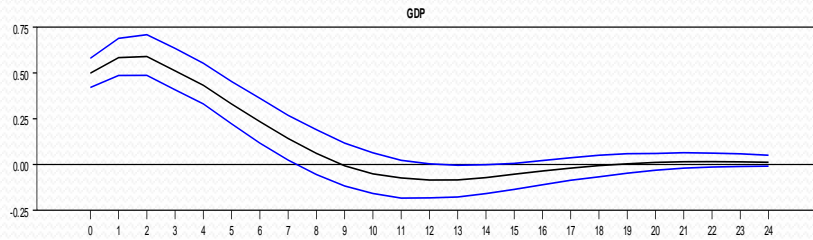
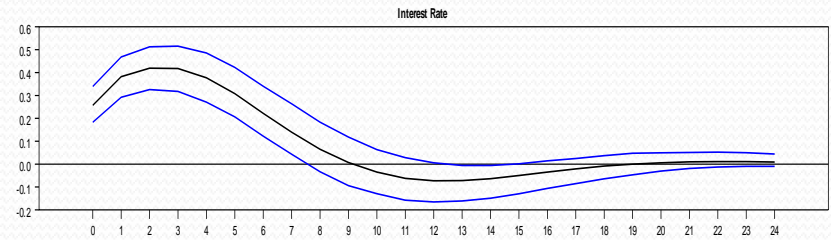
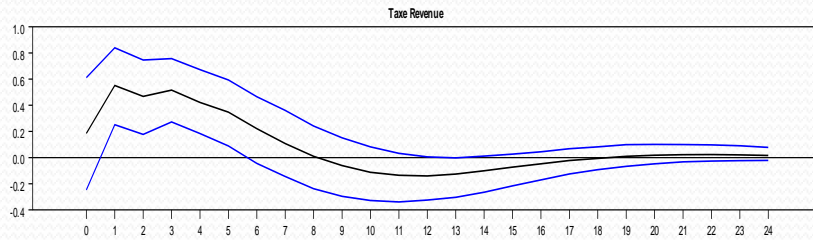
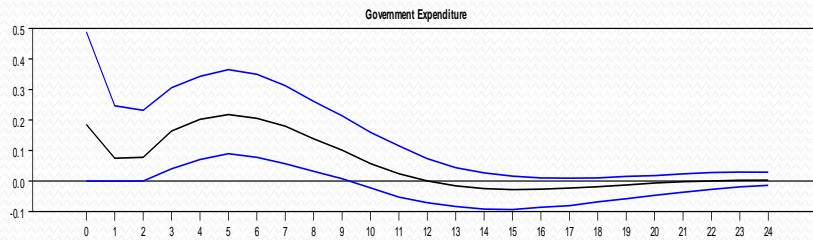
	Dependent variables					
Fiscal policy shocks	G	T	Y	X	I	P
Government expenditure	+	uc	+	-	uc	uc
Tax revenue	uc	+	uc	+	uc	uc

*A '+' means the impulse response of the variable to be restricted as positive for four quarters following the fiscal policy shock including the quarter of impact, a '-' means the impulse response of the variable to be opposite to the fiscal policy shock, a 'uc' indicates unconstrained sign restrictions between variable and the shock.*

# Results

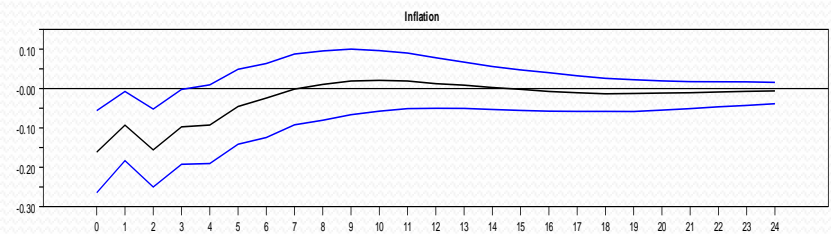
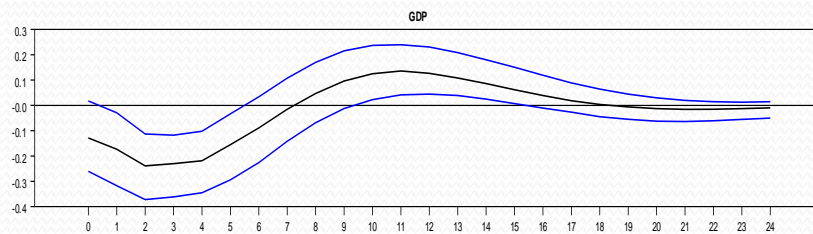
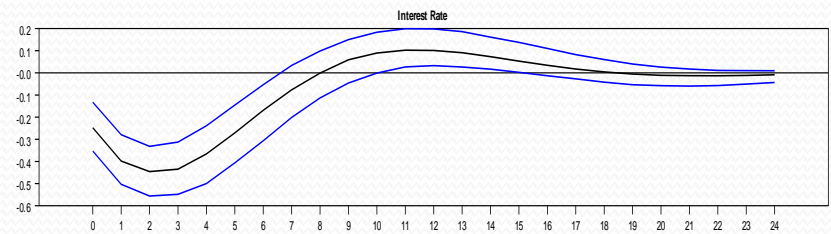
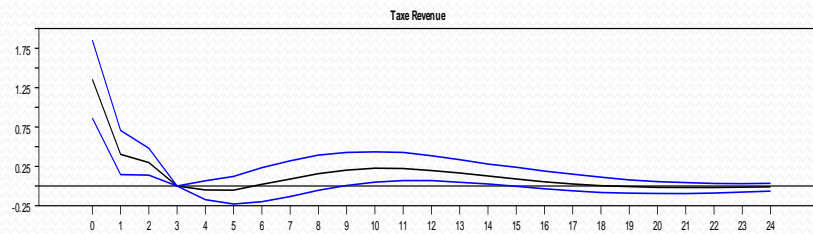
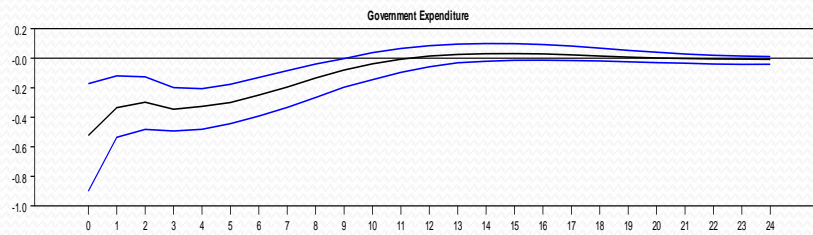
- Government expenditure shocks
- Tax revenue shocks
- Deficit spending fiscal policy scenario
- Deficit tax cut fiscal policy scenario
- Balance budget spending fiscal policy scenario

# Government expenditure shock and the response from other variables



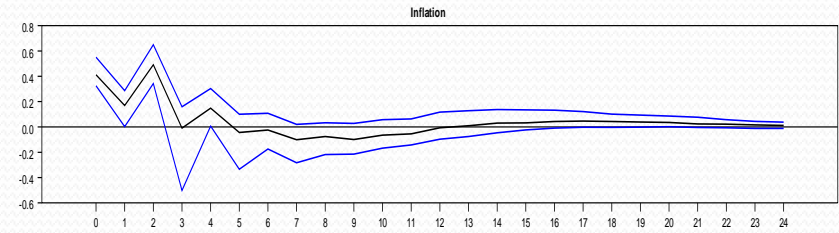
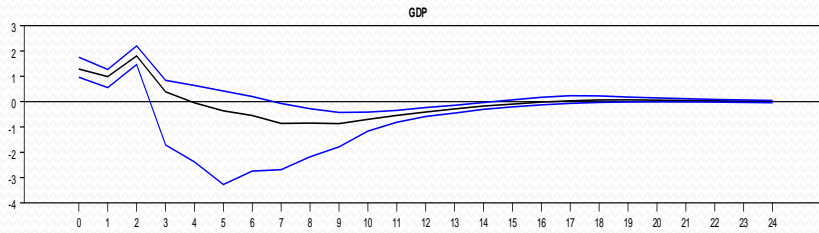
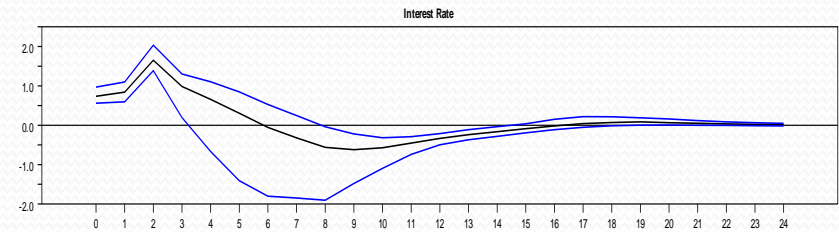
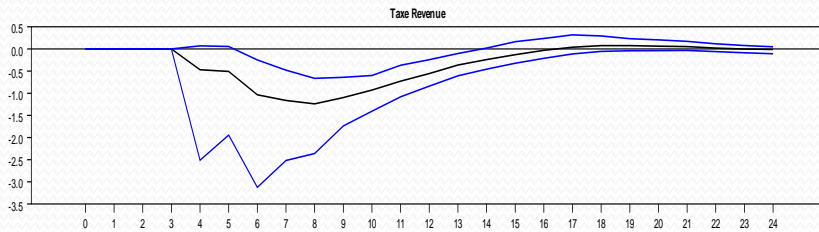
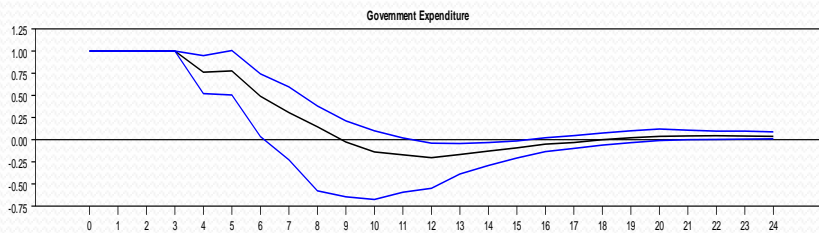
Responses to Government Expenditure

# Tax revenue shock and the response from other variables



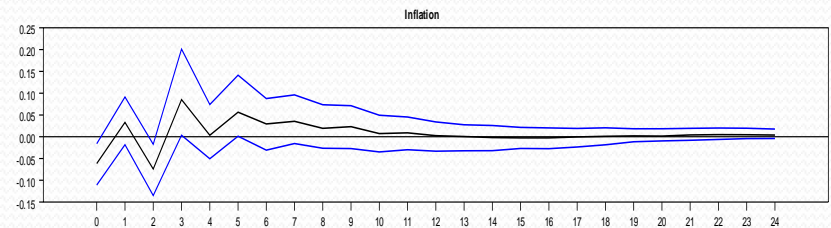
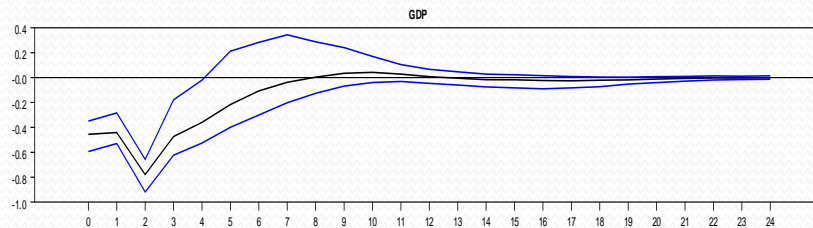
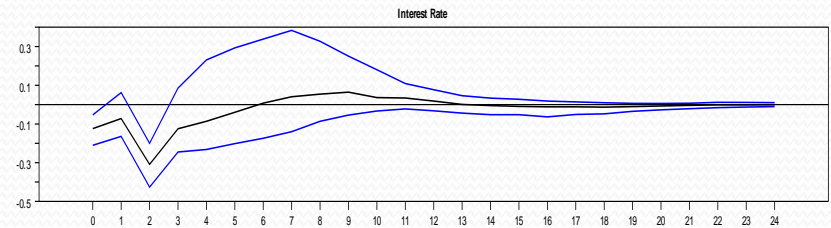
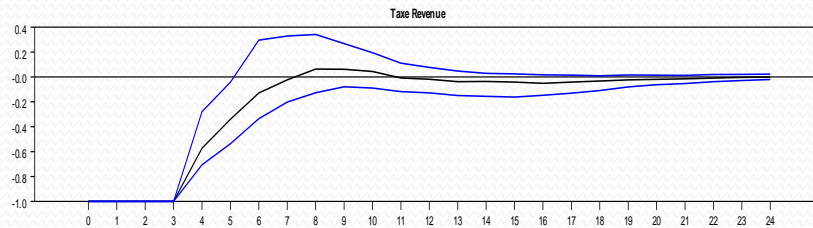
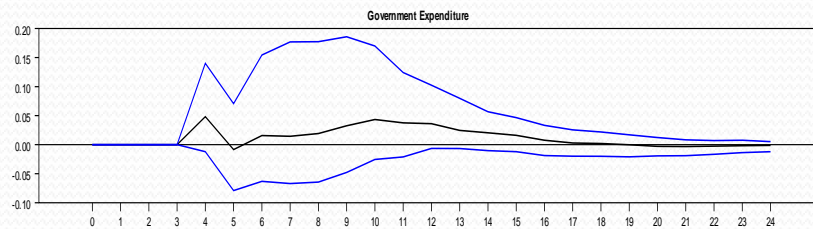
Responses to Tax revenue

# Deficit spending shock and the response from other variables



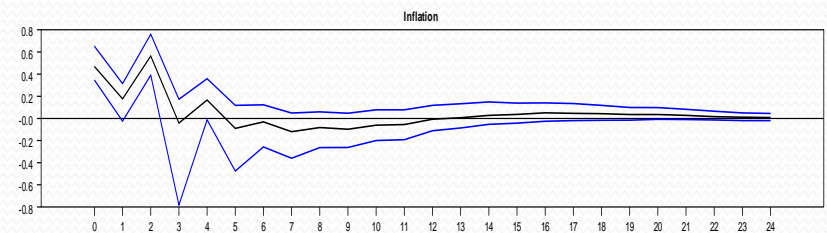
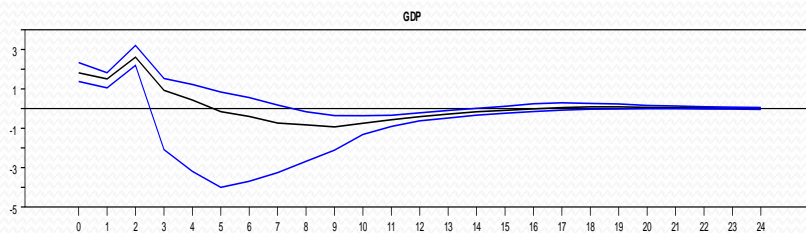
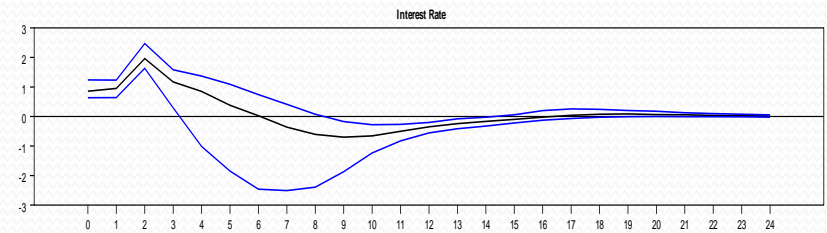
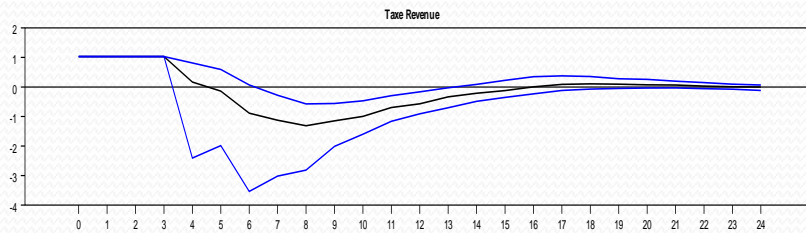
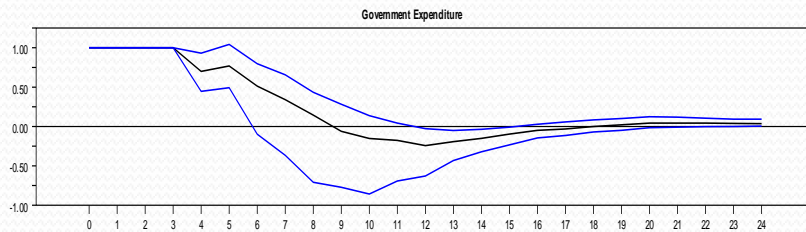
Responses to Deficit Spending

# Deficit tax cut shock and the response from other variables



Responses to Deficit Tax Cut

# Balance budget shock and the response from other variables



Responses to Balanced Budget

# Assessment of the results

Impact multipliers of deficit-spending policy scenario

	1 qrt	4 qrts	8 qrts	12 qrts	20 qrts	Maximum
<b>Our study</b>						
<b>GDP</b>	5.37	2.15	-4.29	-3.00	0.00	7.51 (qrt 2)
<b>Gov.expenditure</b>	1.00	1.00	0.30	-0.20	0.00	
<b>Tax revenue</b>	0.00	0.00	-1.20	-0.75	0.00	
<b>Mountford &amp; Uhlig (2009)</b>						
<b>GDP</b>	0.65	0.27	-0.74	-1.19	-2.24	0.65 (qrt 1)
<b>Gov.expenditure</b>	1.00	1.00	0.90	0.37	-0.32	
<b>Tax</b>	0.00	0.00	-0.33	-0.87	-2.04	

## Impact multipliers of deficit-financed tax cut policy scenario

	1 qrt	4 qrts	8 qrts	12 qrts	20 qrts	Maximum
<b>Our study</b>						
<b>GDP</b>	-2.05	-0.68	-0.23	0.18	0.00	0.23 (qrt 10)
<b>Gov.expenditure</b>	0.00	0.00	0.02	0.04	0.00	
<b>Tax</b>	-1.00	-1.00	-0.05	0.00	0.00	
<b>Mountford &amp; Uhlig (2009)</b>						
<b>GDP</b>	0.28	0.93	2.05	3.41	2.59	3.57 (qrt 13)
<b>Gov.expenditure</b>	0.00	0.00	0.27	0.43	0.48	
<b>Tax</b>	-1.00	-1.00	0.06	1.05	1.03	

# Summary

- **Main results:**

1. Positive government expenditure shock creates

- Increasing GDP for the first 9 quarters, The pick of the increase is indicated in quarter 2 with 0.6% increase
- Reducing unemployment rate for the first 8 quarters. At quarter 2, the unemployment rate is affected with the deepest reduction 0.225%.

2. Positive tax revenue shock creates

- Reducing GDP for the first 8 quarters. The biggest reduction on GDP response is at quarter 2 at 0.25%
- Increasing unemployment rate for the first 8 quarters with the highest increase is only 0.17% at quarter 2



# THANK YOU FOR LISTENING

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