DYNAMIC EFFECTS OF FISCAL SHOCKS UPON DIVERSE MACROECONOMIC VARIABLES: A STRUCTURAL VAR ANALYSIS FOR ARGENTINA

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Paper´s Goals

To analyze the impact of spending and tax innovations upon:

- *The gross domestic product*

- *The inflation rate, and*

- *The unemployment level in Argentina*

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Some worth mentioning reference papers in the Literature:

Blanchard and Perotti (2002)

Perotti (2004)

Giordano, Momigliano, Neri and Perotti (2005)

Creel, Monperrus-Veroni and Saraceno (2005)

Kamps (2005)

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Quarterly Data 1980:1 – 2005:2

PE, TR and GDP variables deflated with Consumer Price Index and seasonally adjusted with multiplicative Census X12

Public Spending: Public Wages and public purchases of goods and services plus transfers to the private sector. (Public Capital Spending excluded from the first estimation of VAR)

Tax Revenues: All taxes levied by the central government (exclusive of Social Sec. Contribut.)

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Seasonally adjusted Argentine real GDP (1993=100)
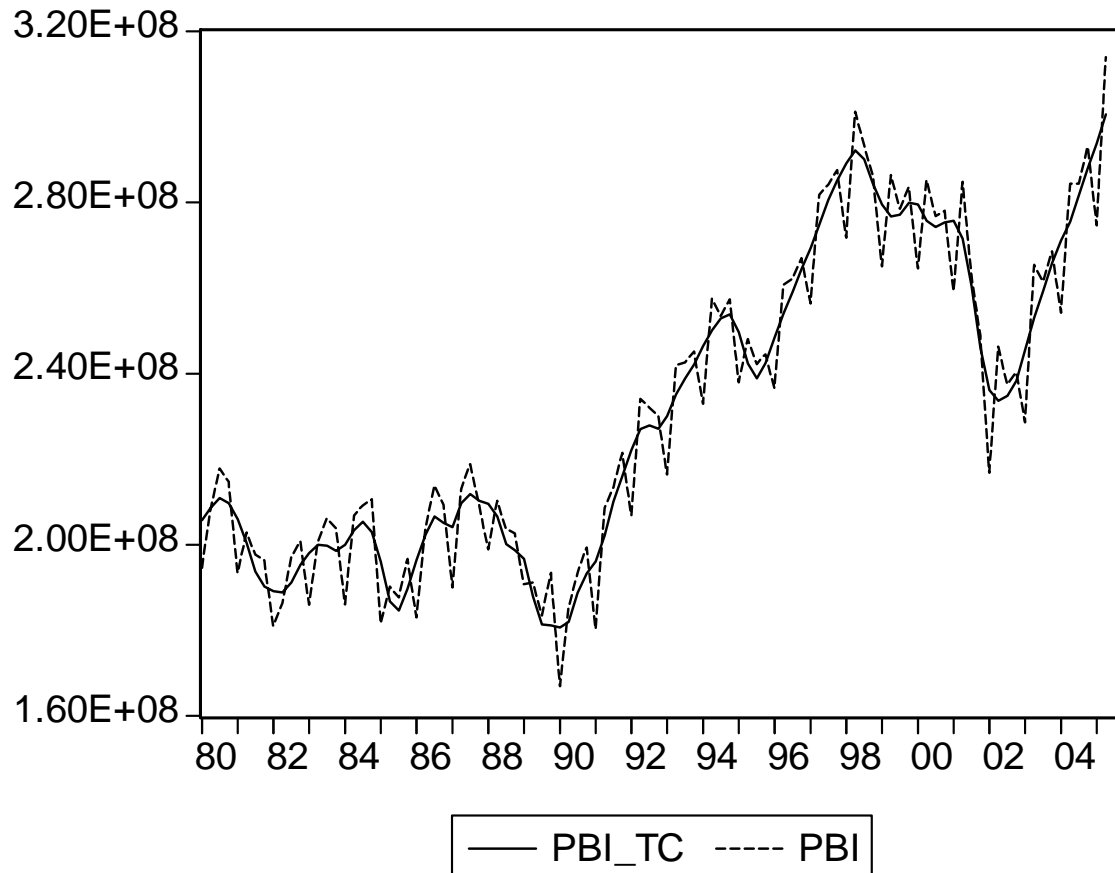
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The Model´s Specification

$$X_t = A\,(L)\,X_{t-1} + U_t$$

$$X_t = [PE_t,\ TR_t,\ GDP_t,\ UNE_t,\ INFL_t]´$$

$$U_t = [u_t{}^{pe}\ u_t{}^{tr}\ u_t{}^{gdp}\ u_t{}^{une}\ u_t{}^{infl}]´$$

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	PE (exclusive of public capital)	TR	GDP	UNE	INFL
R Squared	0.903	0.802	0.882	0.466	0.656
R Squared Adjusted	0.868	0.731	0.840	0.276	0.533
F-Statistic	26.077	11.334	20.936	2.445	5.335
Akaike AIC	- 5.145	- 2.574	- 6.502	- 6.589	3.029
Schwarz SC	- 4.445	- 1.880	- 5.808	- 5.894	3.723

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	PEK (inclusive of public capital)	TR	GDP	UNE	INFL
R Squared	0.904	0.800	0.878	0.457	0.693
R Squared Adjusted	0.870	0.729	0.834	0.263	0.583
F-Statistic	26.453	11.210	20.195	2.353	6.318
Akaike AIC	- 4.796	- 2.565	- 6.467	- 6.571	2.914
Schwarz SC	- 4.410	- 1.871	- 5.773	- 5.877	3.609

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Residuals in the reduced form (vector U_t) can be interpreted as a linear combination of:

* *the "automatic" or "no anticipated response" of variables to shocks to other variables*

* *the "sistematic discretionary response" of the policymaker to innovations in other variables*

* *of "random discretionary shocks" or fiscal policy "structural shocks" $\rightarrow$ estimation of impulse-response functions*

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CHOLESKI DECOMPOSITION OF THE COVARIANCE MATRIX OF RESIDUALS

$$
\begin{bmatrix}
1 & 0 & 0 & 0 & 0 \\
a_{21} & 1 & 0 & 0 & 0 \\
a_{31} & a_{32} & 1 & 0 & 0 \\
a_{41} & a_{42} & a_{43} & 1 & 0 \\
a_{51} & a_{52} & a_{53} & a_{54} & 1
\end{bmatrix}
\begin{bmatrix}
u_t^{pe} \\
u_t^{tr} \\
u_t^{gdp} \\
u_t^{une} \\
u_t^{infl}
\end{bmatrix}
=
\begin{bmatrix}
1 & 0 & 0 & 0 & 0 \\
0 & 1 & 0 & 0 & 0 \\
0 & 0 & 1 & 0 & 0 \\
0 & 0 & 0 & 1 & 0 \\
0 & 0 & 0 & 0 & 1
\end{bmatrix}
\begin{bmatrix}
\varepsilon_t^{pe} \\
\varepsilon_t^{tr} \\
\varepsilon_t^{gdp} \\
\varepsilon_t^{une} \\
\varepsilon_t^{infl}
\end{bmatrix}
$$

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PUBLIC EXPENDITURE:

• *it does not react contemporaneously to innovations in the model´s rest of variables*

TAX REVENUES:

• *they do not react contemporaneously to shocks to other variables except for public expenditure innovations*

• *GROSS DOMESTIC PRODUCT:*

• *It only reacts to contemporaneous innovations in public spending and tax revenues*

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UNEMPLOYMENT:

• *it reacts to contemporaneous shocks to other variables except for inflation*

INFLATION:

• *it is contemporaneously affected by innovations in all variables in the model*

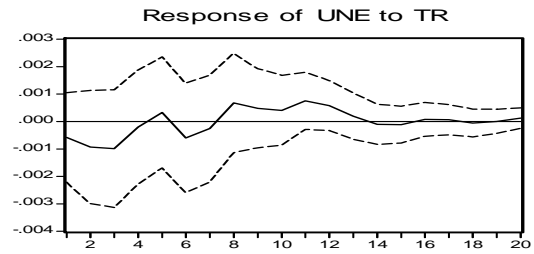*Restrictions only apply to the initial period and variables freely interact among them thereafter*
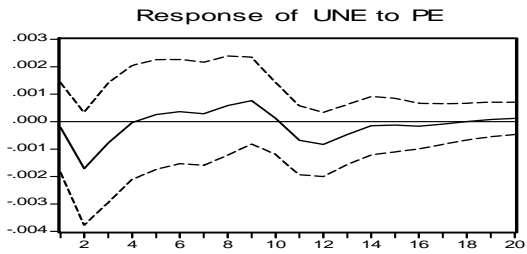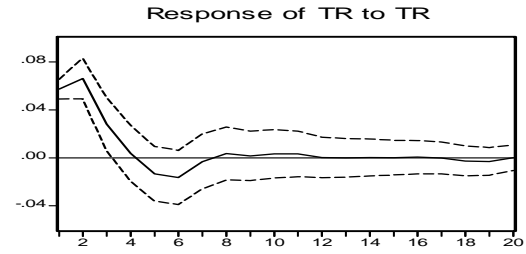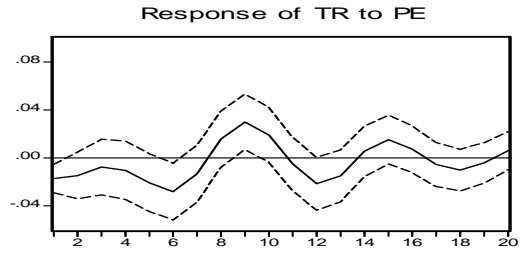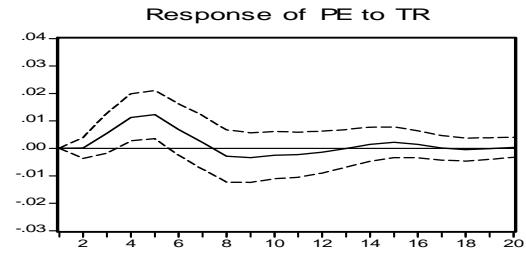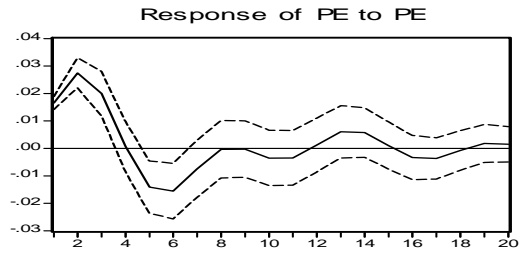
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| Lag	FPE	AIC	SC	HQ
0	1.88e-12	- 12.81	- 12.68	- 12.76
1	1.58e-13	- 15.29	- 14.49	- 14.96
2	1.49e-14	- 17.65	- 16.19*	- 17.06*
3	1.233-14	- 17.86	- 15.72	- 16.99
4	9.34e-16	- 18.15	- 15.35	- 17.02
5	9.19e-15*	- 18.20*	- 14.73	- 16.80

DYNAMIC EFFECTS OF FISCAL SHOCKS UPON DIVERSE MACROECONOMIC VARIABLES: A STRUCTURAL VAR ANALYSIS FOR ARGENTINA

DINAMYC IMPACT OF SHOCKS, ROBUSTNESS AND REVERSE CAUSATION

- *dinamyc impact of fiscal spending and tax shocks upon product, unemployment and inflation for a time horizon of 20 quarters*

- *positive (negative) innovations in public spending ant taxes*

- *graphs depict point estimations of impulse response functions and 95% confidence intervals*

- *full lines: variable´s percentage change in response to an innovation of standard deviation one in the fiscal variable*

- *dotted lines: 95% confidence bands*
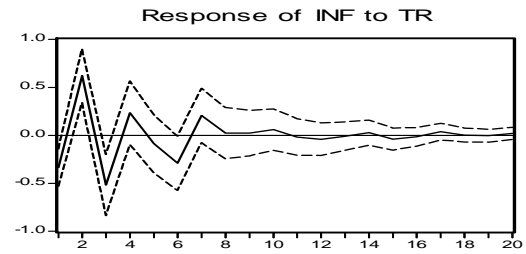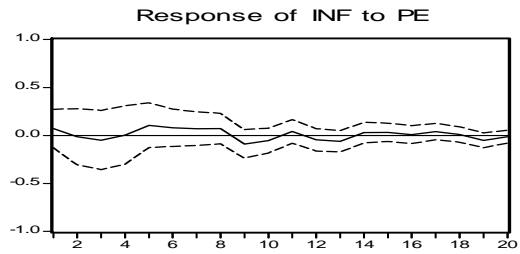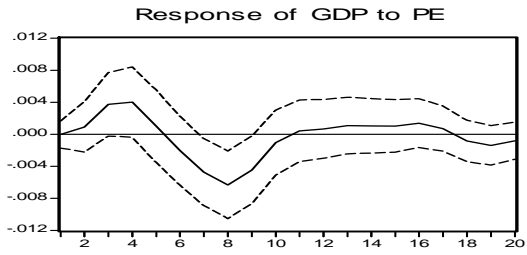
Response of PE to PE | Response of PE to TR

Response of TR to PE | Response of TR to TR

Response of GDP to PE | Response of GDP to TR

Response of UNE to PE | Response of UNE to TR

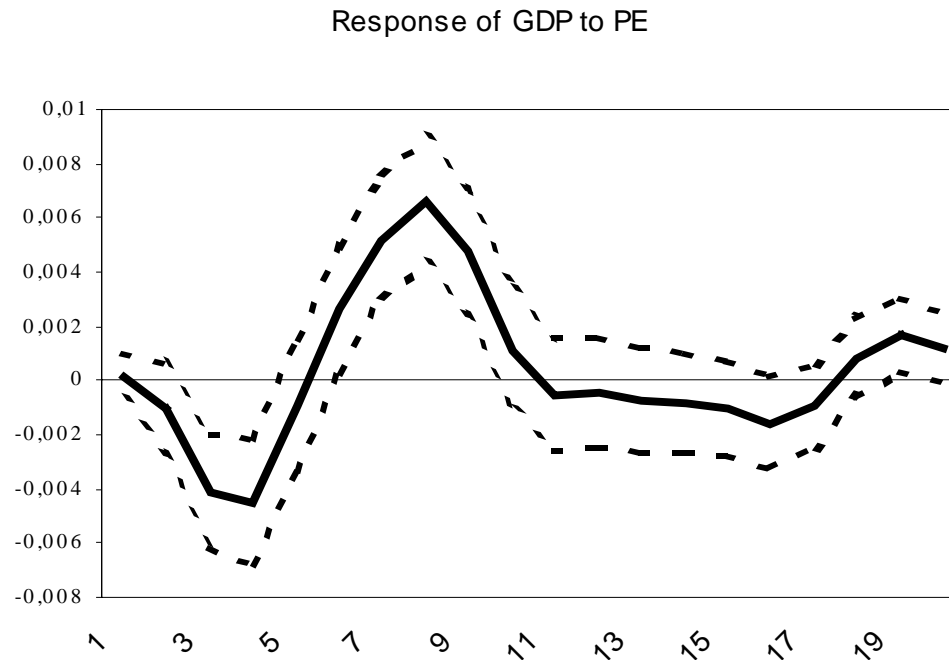Response of INF to PE | Response of INF to TR

DYNAMIC EFFECTS OF FISCAL SHOCKS UPON DIVERSE MACROECONOMIC VARIABLES: A STRUCTURAL VAR ANALYSIS FOR ARGENTINA
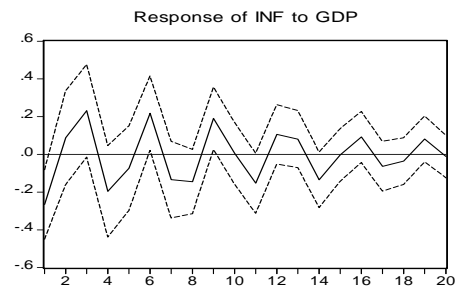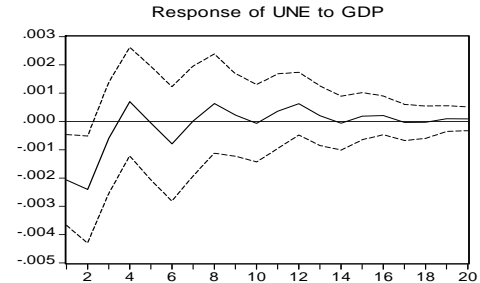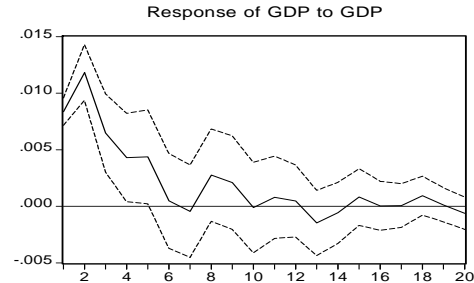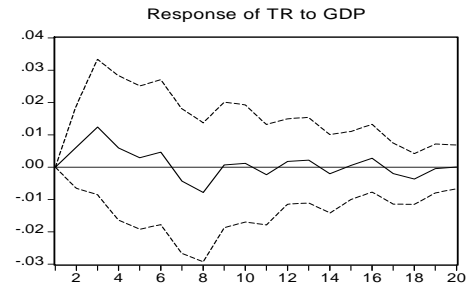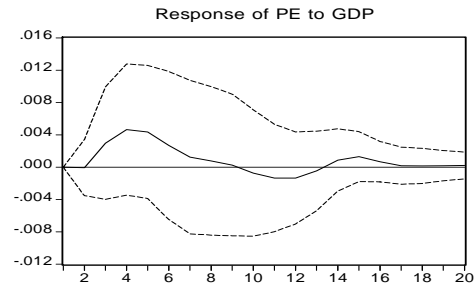
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Response of product to negative spending shocks

Response of GDP to PE

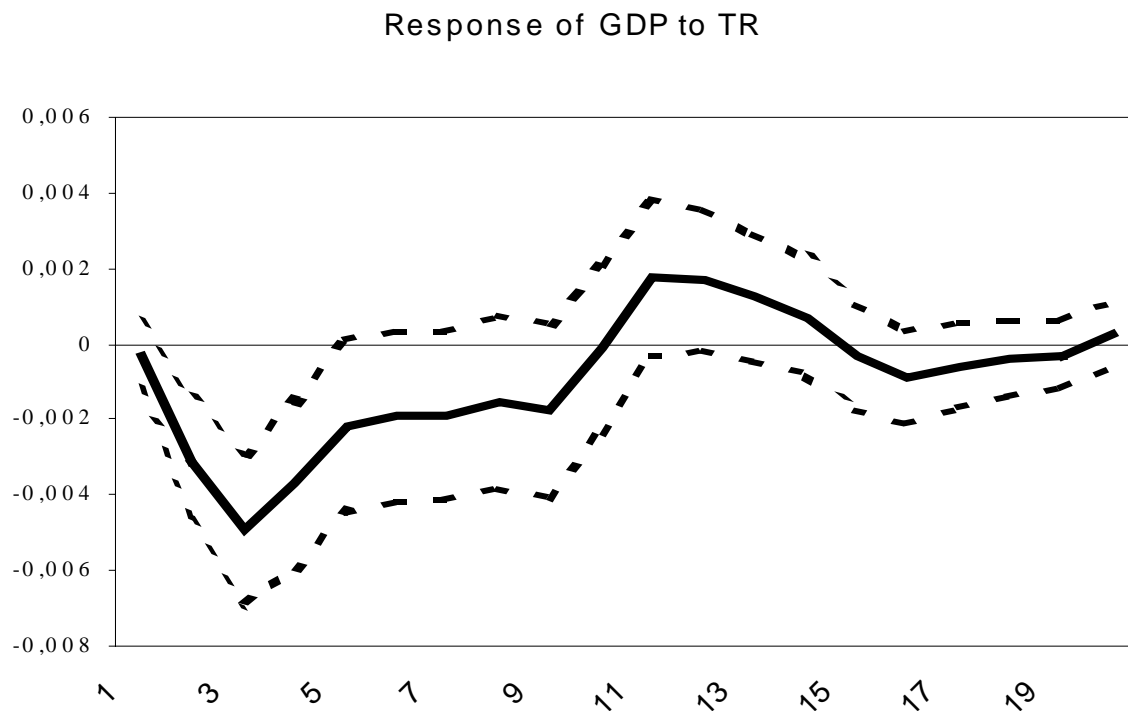# DYNAMIC EFFECTS OF FISCAL SHOCKS UPON DIVERSE MACROECONOMIC VARIABLES: A STRUCTURAL VAR ANALYSIS FOR ARGENTINA

Response of product to negative tax shocks

Response of GDP to TR

DYNAMIC EFFECTS OF FISCAL SHOCKS UPON DIVERSE MACROECONOMIC VARIABLES: A STRUCTURAL VAR ANALYSIS FOR ARGENTINA

CONCLUSIONS

Fiscal Policy Impact of positive shocks

- *Weak and not persistent impact upon GDP*
- *Estimations show crowding-out evidences*
- *Impulse response to tax innovations in line with the low income elasticity of taxes*
- *Tax increases $\rightarrow$ Public spending expands*
- *Public spending increases $\rightarrow$ Negative impact on tax revenues*

DYNAMIC EFFECTS OF FISCAL SHOCKS UPON DIVERSE
MACROECONOMIC VARIABLES: A STRUCTURAL VAR
ANALYSIS FOR ARGENTINA

CONCLUSIONS

Fiscal Policy and Unemployment

- *Short lived and not significant impact of public spending upon unemployment*
- *Negligible statistical effects of positive tax shocks upon unemployment*

Fiscal Policy and Inflation

- *Positive tax innovations → Persistent but cyclical inflation reduction*
- *Positive spending innovations → No impact*

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CONCLUSIONS

Supply shocks: testing reverse causation

- *Persistent but weak public spending increase*
- *Tax revenues´ positive response, limitted in magnitude*
- *Positive but short lived and statistically not signficant unemployment response*
- *Significant, on impact, inflation response. Cyclical pattern all throught the time horizon*

DYNAMIC EFFECTS OF FISCAL SHOCKS UPON DIVERSE
MACROECONOMIC VARIABLES: A STRUCTURAL VAR
ANALYSIS FOR ARGENTINA

CONCLUSIONS
Fiscal Policy Impact of negative fiscal shocks

- *The effect of negative public shocks upon gross domestic product showed both demand and crowding out effects but tended to be weak and statistically not significant*

- *As Perotti (2004) found for OECD countries, impulse response did not rendered evidence that tax cuts were more effective than spending increases to boost product. In fact, low income elasticity of taxes turned the former´s impact rather negligible in Argentina*

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CONCLUSIONS

ROBUSTNESS

- *All variable orderings estimated yielded impulse response estimations (not shown in the paper) which did not substantially differ from those corresponding to the benchmark variable ordering*