Developing Macroeconomic Stabilization Policies for Low-Income Economies.

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- A second challenge is structural changes in developing economies

The broader agenda: A structural framework for policy analysis in Ghana

- We can't simply adopt models as specified for advanced small open economies

- What are the relevant shocks?

- What are the relevant frictions?

- We provide evidence on the role of various shocks in this paper using VARs

- We are using time varying parameter econometric models to partially address the issue of structural change

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  - We are still missing data to run the nowcast on longer time period (prior 2000)

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   - The prior contains information about what we think the Ghana economy is moving towards

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  - We also investigate time variation in the VARs

Outline

1. Methodology

2. Empirical Results

3. Conclusion

Model

- We estimate a series of *VAR models*

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$$Y_t = B_0 + B_1 Y_{t-1} + ... + B_p Y_{t-p} + \mu_t, \qquad (1)$$

- We estimate Eq. 1 using Bayesian methods on quarterly data

- Ghana, South Africa and the G7 countries: $1985:1 - 2010:3$; 3 lags

- We use priors to handle the size of the VAR (Bandura et al., 2010)

- G7-block and commodity prices are exogenous to Ghana and South Africa: SOE (e.g. Cushman and Zha, 1997)

Identification

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  2. Sign restrictions: credit shocks and productivity shocks (Uhlig, 2005, Meeks, 2012, Helbling, Otrok, Kose, 2011)

Sign Restrictions

N°	Indicators	G7-aggregate		Domestic (SA or GHA)	
		Credit	Productivity	Credit	Productivity
1	G7-Real GDP		−	0	0
2	G7-Inflation		+	0	0
3	G7-Real Credit	−	−	0	0
4	G7-Tbil			0	0
5	US-Credit Spread	+	+	0	0
6	US-Default	−	+	0	0
7	(SA/GHA)-Real GDP				−
8	(SA/GHA)-Inflation				+
9	(SA/GHA)-Real Credit			−	−
10	(SA/GHA)-Tbil				
11	SA-Credit Spread			+	+
12	SA-Default			−	+
13	(SA/GHA)-Real Com. Price			0	0
14	REER of the rand or for GHS				
15	(SA/GHA)-Export				
16	(SA/GHA)-Import				

Metrics of Assessment

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  3. Counterfactual Analysis

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Nowcasting Quarterly RGDP growth for Ghana (YoY)
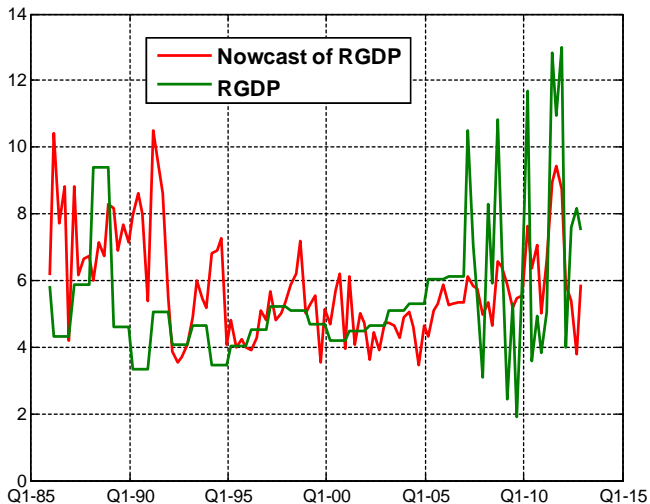
Common Component Growth for Ghana (YoY)
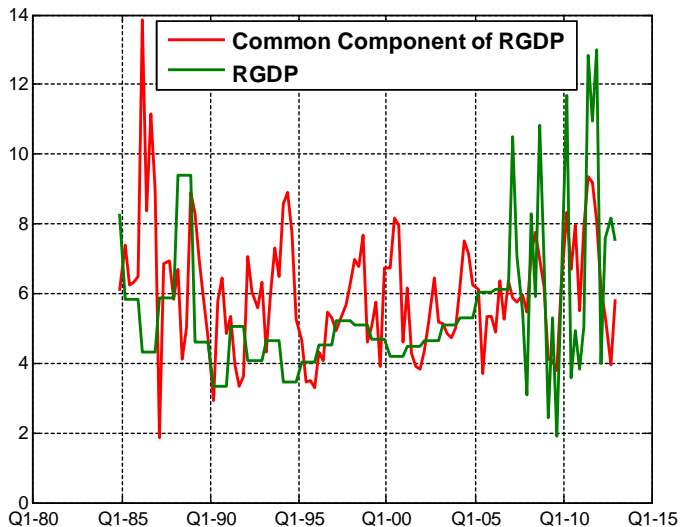
Part I

Empirical Results: Credit annd Productivity Shocks

G7 Credit Shocks on Output
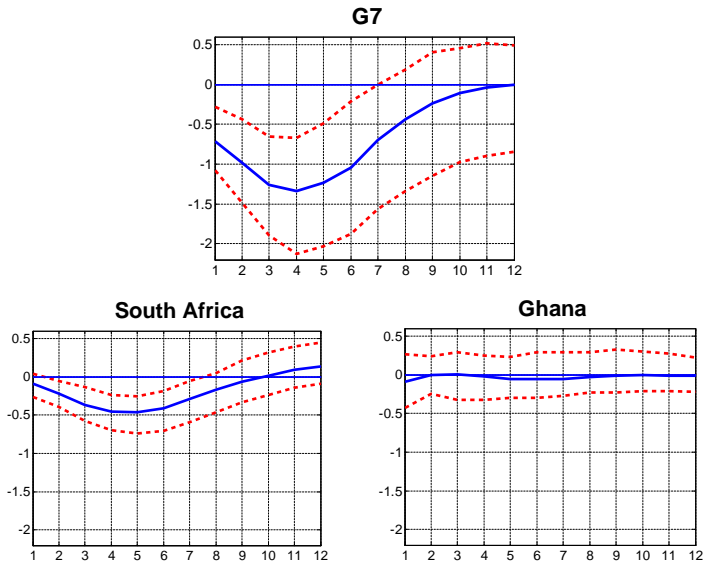
G7 Credit Shocks on Inflation
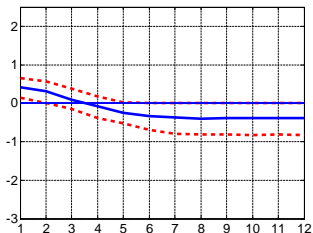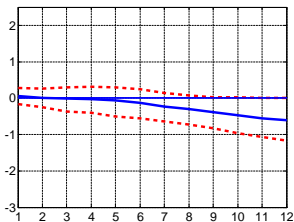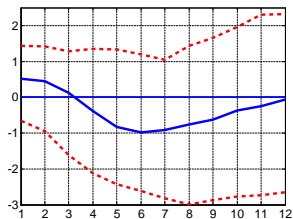
Monetary Policy Response to G7 Credit Shocks
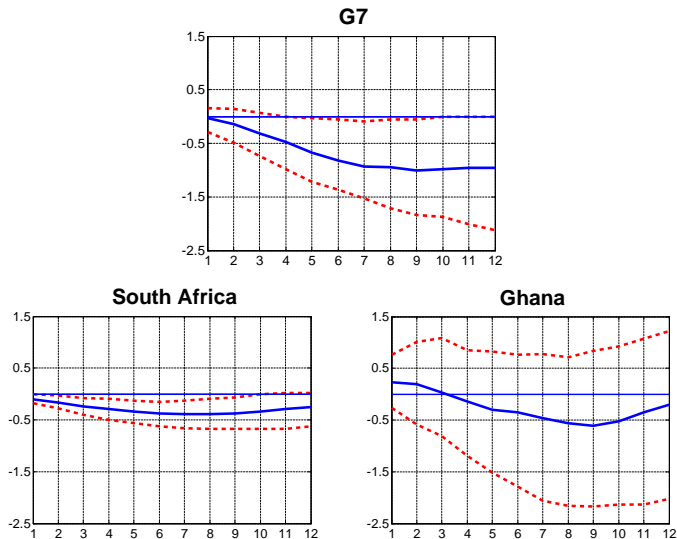
G7 Productivity Shocks on Output
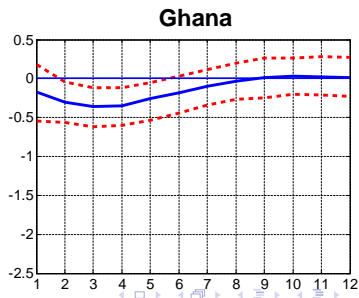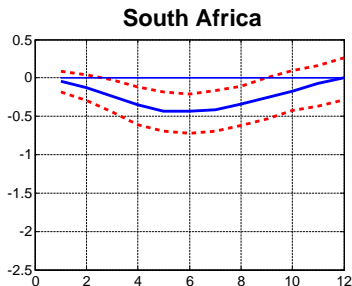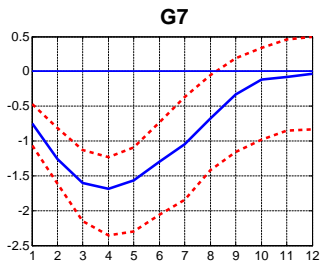
G7 Productivity Shocks on Output on Inflation
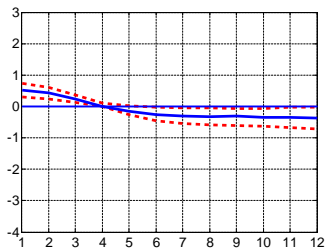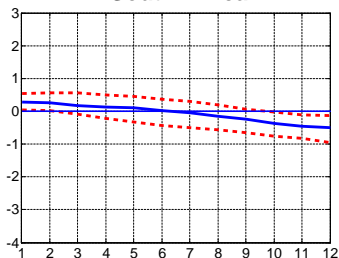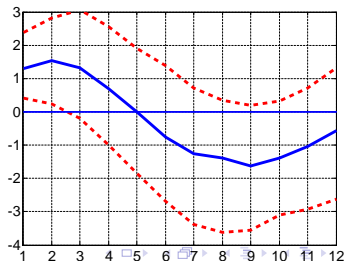
Monetary Policy Response to G7 Productivity Shocks
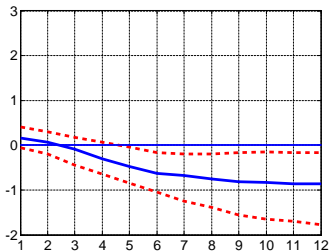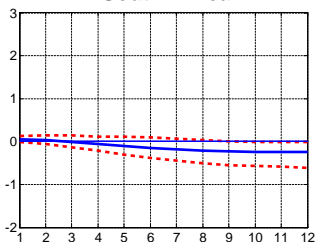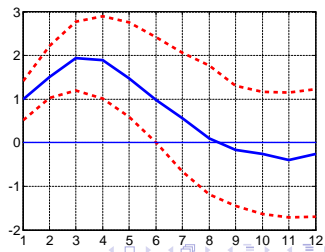
G7 Credit Shocks: Trade

South Africa
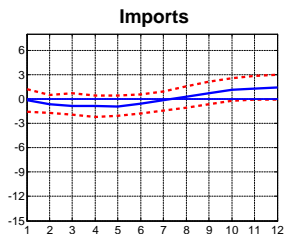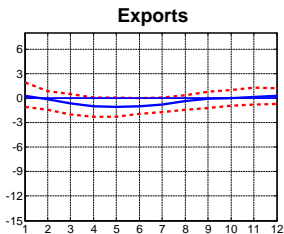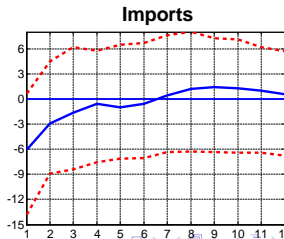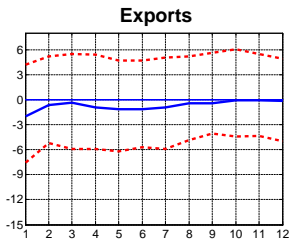
Ghana

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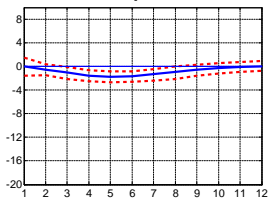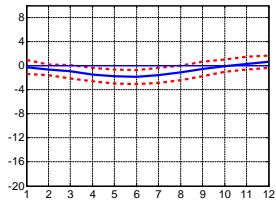
Ghana
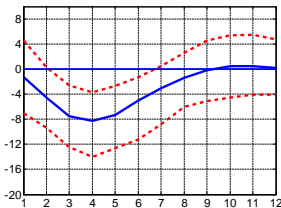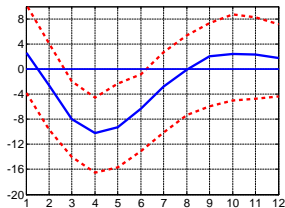
G7 Shocks: Credit Channel
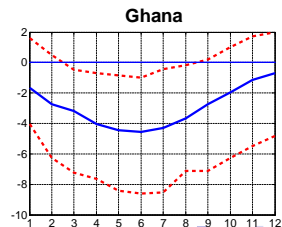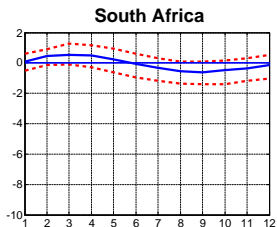
G7 Credit Shocks

G7 Shocks: Commodity Price Channel

G7 Credit Shocks

Gold

Other Mining for SA

Cocoa for Ghana

G7 productivity

Gold

Other Mining for SA

Cocoa for Ghana
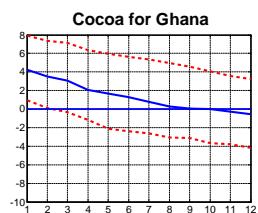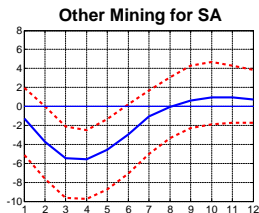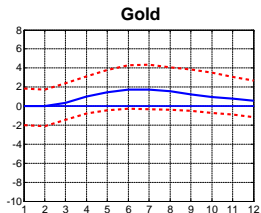
Domestic Credit Shocks

Output Growth
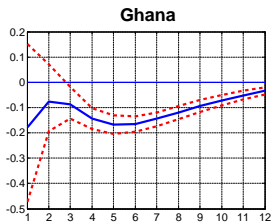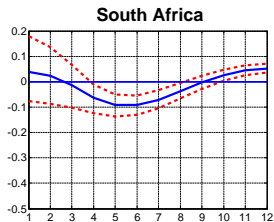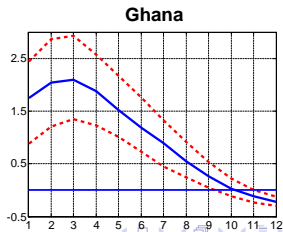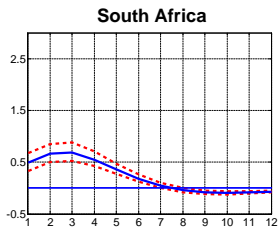
CPI-Inflation

Domestic Productivity Shocks

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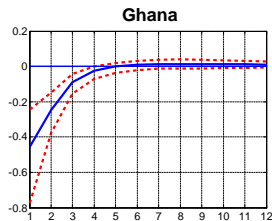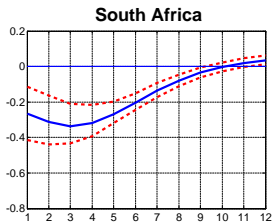
CPI-Inflation
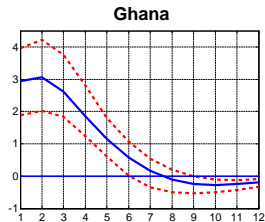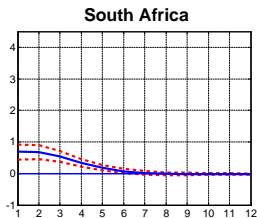
Monetary Policy Response to Dom Shocks

Credit shocks
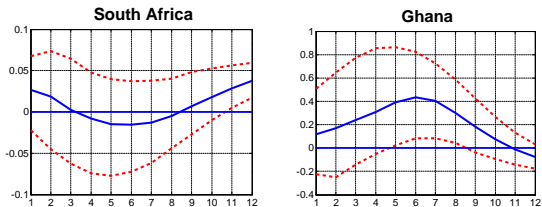
Productivity shocks
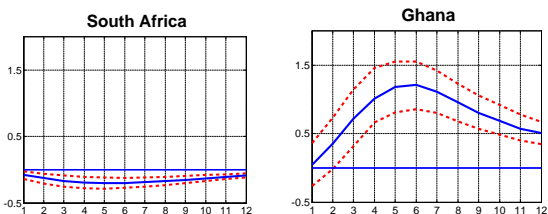
G7-shocks contribution to G7 and commodity prices

Horizon	G7-GDP	G7-CPI	G7-Credit	G7-SIR	Gold price	Cocoa price	Oth. Mining price
G7-Credit Shocks							
1	13.1	15.0	23.5	5.4	3.2	3.9	5.1
4	13.9	14.3	22.8	7.0	5.1	6.0	8.3
8	14.4	14.0	19.8	9.6	7.8	8.0	10.1
12	14.5	14.4	18.9	10.9	8.8	9.3	11.1
G7-Productivity Shocks							
1	14.2	22.9	5.6	6.0	3.4	2.6	5.8
4	15.9	19.8	8.3	6.9	5.5	4.5	9.4
8	16.6	17.1	11.9	8.9	8.3	7.1	11.7
12	16.5	15.9	12.9	9.9	9.2	8.1	12.0

Contribution of Credit Shocks on SA and GHA

	Horizon	GDP	CPI	credit	SIR	spreads	Export	Import	REER
					G7 Shocks				
	1	3.08	3.02	2.39	3.82	2.48	2.32	2.38	5.11
South	4	6.65	4.06	5.09	5.54	4.42	5.56	5.37	6.38
Africa	8	9.38	6.24	7.41	8.59	6.95	7.42	7.55	8.03
	12	10.10	8.62	8.74	9.79	8.45	8.22	8.97	9.39
	1	2.86	3.13	3.34	4.05	3.16	2.69	3.00	3.10
Ghana	4	5.43	4.07	5.78	6.45	5.87	5.20	5.42	4.77
	8	6.84	6.92	8.29	8.30	7.69	6.71	7.07	7.02
	12	7.81	8.48	9.27	8.99	8.91	7.43	8.30	8.26
					Domestic Shocks				
	1	0.68	11.50	16.38	1.21	19.42	2.85	1.96	2.25
South	4	1.32	9.36	12.72	1.54	15.68	2.14	1.77	2.34
Africa	8	1.47	5.96	9.32	1.41	10.67	1.76	1.50	2.07
	12	1.26	3.86	7.66	1.15	8.29	1.59	1.34	1.79
	1	1.24	7.21	12.25	1.46	19.40	2.36	2.02	1.90
Ghana	4	1.13	6.95	9.01	2.51	14.16	1.97	1.98	1.83
	8	1.50	4.83	6.41	3.40	10.02	2.11	1.82	2.05
	12	1.41	3.72	5.37	3.18	7.69	1.92	1.68	1.98

Contribution of Credit Productivity on SA and GHA

	Horizon	GDP	CPI	Credit	SIR	spreads	Export	Import	REER
						G7-Shocks			
	1	2.25	3.20	2.27	4.03	2.13	2.31	1.72	5.97
	4	6.46	4.02	5.65	5.74	4.28	5.47	4.95	6.32
South	8	10.40	6.08	8.09	8.80	6.32	7.68	8.05	7.57
Africa	12	11.24	8.08	9.41	10.28	7.64	8.27	9.48	8.58
	1	2.78	3.28	2.28	4.81	2.93	2.10	2.57	3.25
	4	6.16	4.56	4.53	8.61	5.80	5.71	5.67	4.59
Ghana	8	7.32	6.83	7.79	8.85	7.43	7.65	7.83	6.36
	12	8.04	8.00	8.78	9.55	8.63	8.46	8.57	7.77
						Domestic Shocks			
	1	8.35	18.37	6.71	1.46	6.99	2.62	7.84	2.25
	4	5.73	14.46	5.53	2.03	5.37	2.03	5.19	2.32
South	8	3.97	8.76	4.44	1.81	3.58	1.65	3.95	2.09
Africa	12	3.07	5.58	3.96	1.38	2.94	1.49	3.46	1.80
	1	4.41	19.70	1.74	0.84	5.83	2.64	8.39	2.49
	4	3.51	16.41	2.57	2.24	4.28	2.32	6.43	2.39
Ghana	8	3.10	9.50	2.47	2.76	3.30	2.48	5.37	2.77
	12	2.98	7.58	2.12	2.25	2.65	2.38	4.68	2.56

Part II

Empirical Results: G7 Uncertainty Shocks

G7- Uncertainty shocks

Output Growth
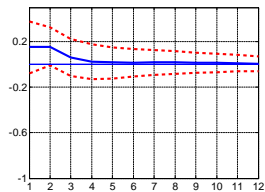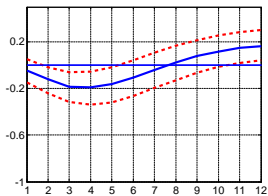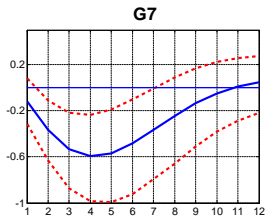
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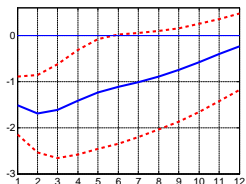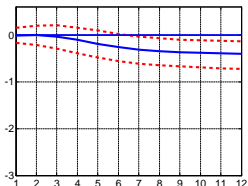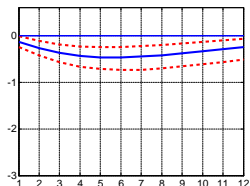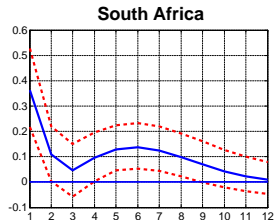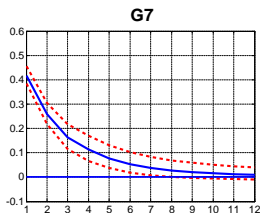
G7-uncertainty shocks
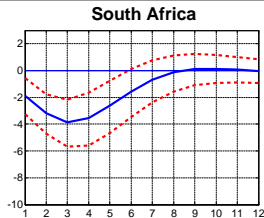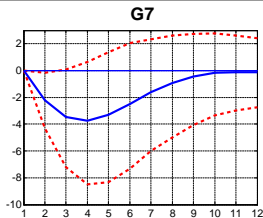
G7-uncertainty shocks

Gold
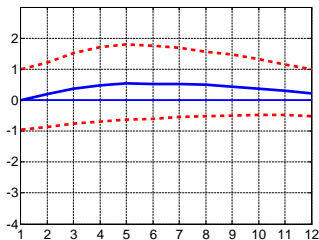
Other Mining for SA
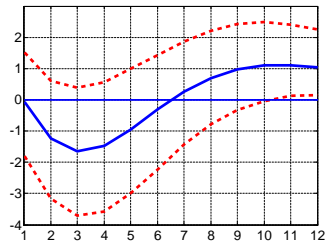
Cocoa for Ghana
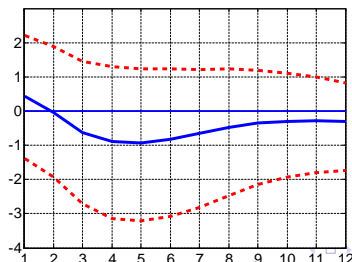
Monetary Policy Response to G7-uncertainty shocks
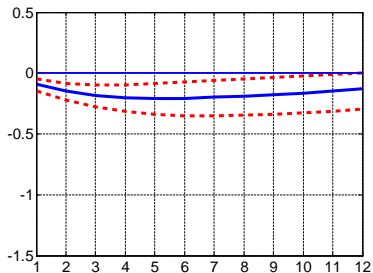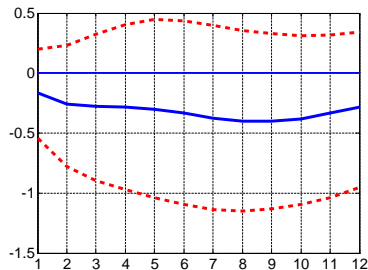
Contribution of G7-Uncertainty

	Horizon	Gdp	CPI
	1	0.91	1.70
G7	4	4.69	7.82
	8	6.63	12.55
	12	6.87	13.76
	1	0.91	0.68
South	4	4.23	1.52
Africa	8	4.78	3.88
	12	6.62	6.08
	1	1.09	8.56
Ghana	4	2.59	7.48
	8	3.25	7.59
	12	3.57	7.90

Horizon	Gold	Oth. Mining	Cocoa
1	0.71	0.56	0.76
4	1.74	2.18	1.93
8	2.89	3.14	2.99
12	3.58	4.05	3.59

Part III

Empirical Results: Commodity Price Shocks

Gold Price on Output

Full Sample   **Before IT**
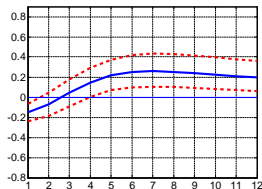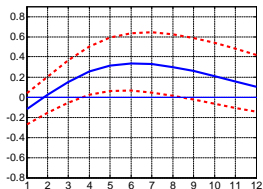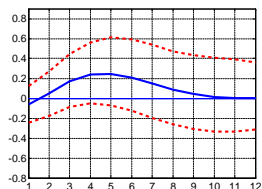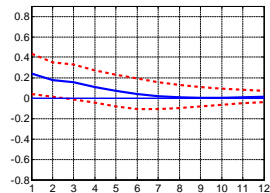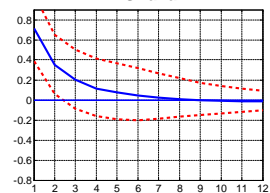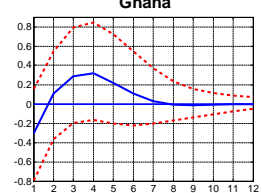
Gold Price on Inflation

Full Sample   Before IT
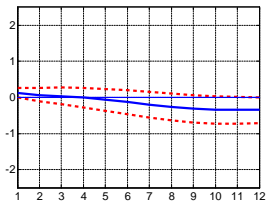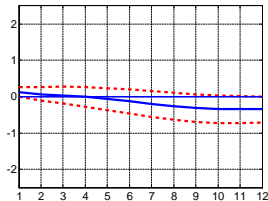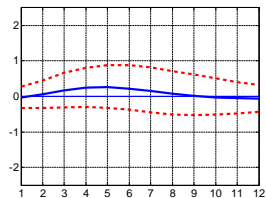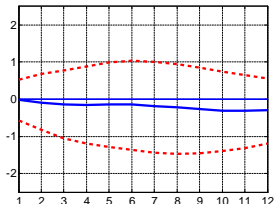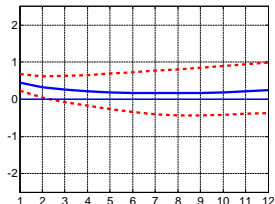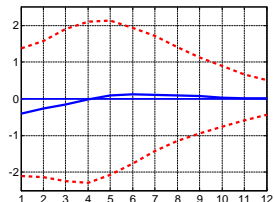
Monetary Policy Response to Gold Price

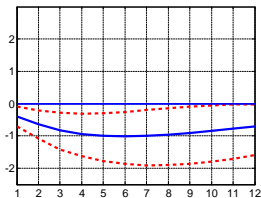|	Full Sample	Before IT
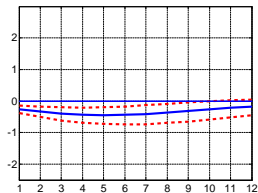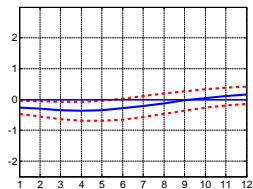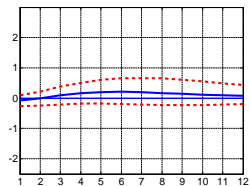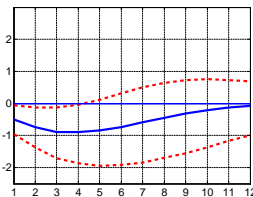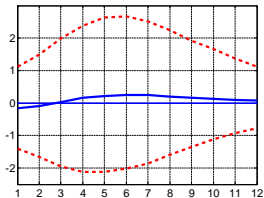
Gold price on credit

	Full Sample	Before IT
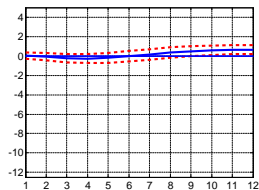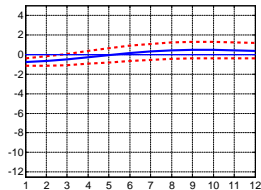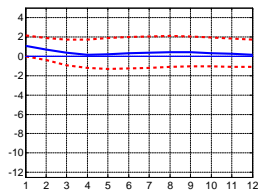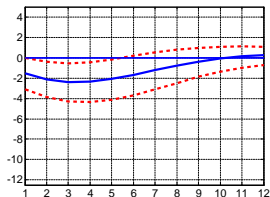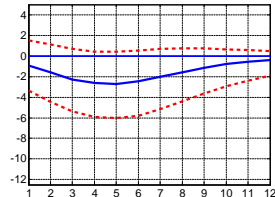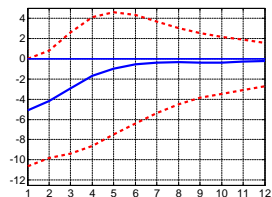
Volatility in Gold Price

Volatility in Inflation

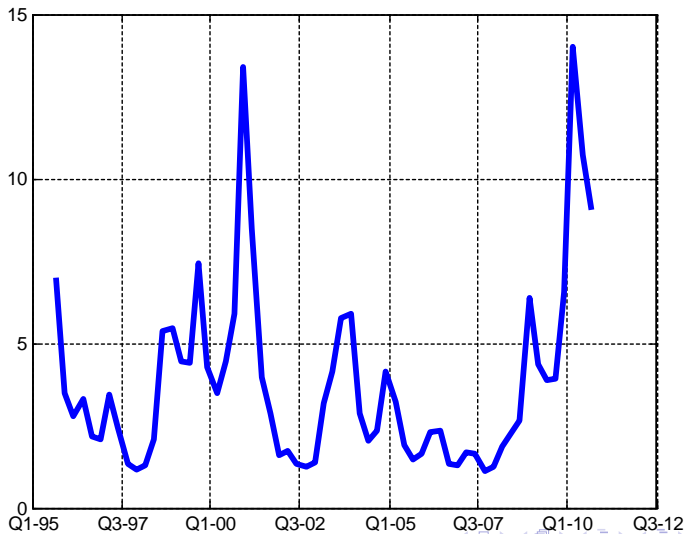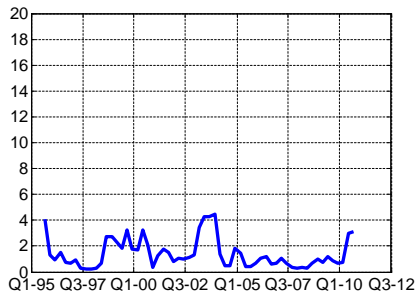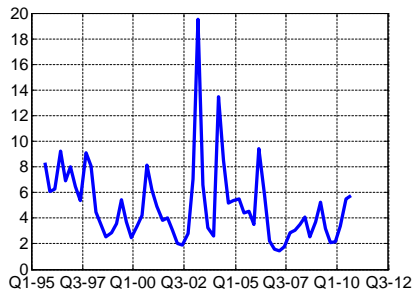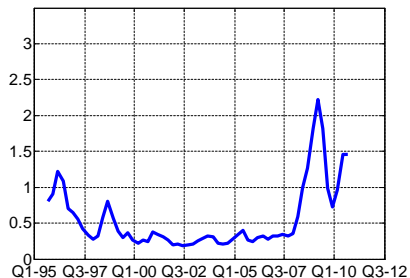South Africa

Ghana

Volatility in Output

South Africa

Ghana
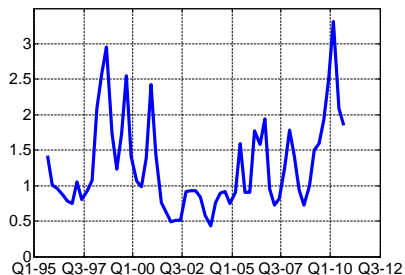
Volatility in Short-term Interest Rates
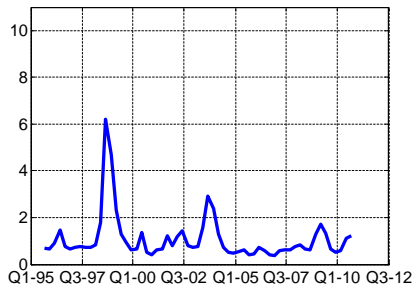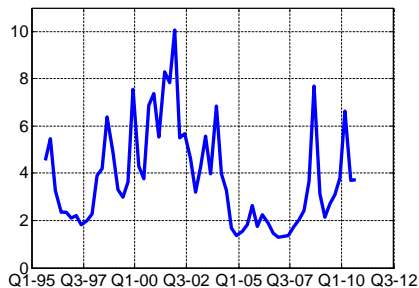
VD gold price

		Full Period	Before IT	During IT
	Horizons		Output Growth	
	1	3.68	2.18	2.58
	4	4.11	6.13	8.43
South Africa	8	10.62	12.61	13.18
	12	13.88	14.66	16.32
	1	2.07	11.01	6.15
Ghana	4	4.62	13.19	19.44
	8	5.99	15.25	25.08
	12	6.37	15.86	25.96
		CPI-Inflation		
	1	1.41	11.36	2.35
	4	1.70	7.26	6.36
South Africa	8	3.66	8.23	12.74
	12	6.22	9.37	16.04
	1	0.59	1.22	4.42
Ghana	4	1.45	3.14	12.45
	8	3.22	7.57	19.02
	12	4.80	9.84	20.83
	8	7.97	9.85	24.39
	12	8.66	11.08	26.13

Vd gold price

	Horizons	Full Period	Before IT	During IT
		Short-term Interest Rates		
	1	5.91	4.01	3.12
	4	9.36	9.15	6.60
South Africa	8	13.54	13.04	12.70
	12	15.14	14.46	16.32
	1	2.27	2.83	4.19
Ghana	4	5.74	6.00	9.86
	8	9.71	8.84	16.11
	12	12.25	11.05	18.08
		Real Credit		
	1	0.57	9.58	5.84
	4	1.97	7.68	9.14
South Africa	8	4.21	10.28	12.72
	12	8.31	12.35	15.35
	1	1.56	1.32	11.13
Ghana	4	5.01	4.90	19.59
	8	7.97	9.85	24.39
	12	8.66	11.08	26.13

DV to gold price

	Horizons	**Full Period**	**Before IT**	**During IT**
		Real Effective Exchange Rates		
South Africa	1	3.66	9.06	2.60
	4	5.26	10.37	7.31
	8	10.60	14.04	12.92
	12	11.76	15.27	14.63
Ghana	1	8.38	11.14	17.43
	4	7.30	13.99	23.81
	8	9.23	16.29	30.10
	12	10.22	17.34	31.23

Conclusion

- Key macroeconomic aggregates of Ghana an South Africa

- Global shocks represent the main driving forces of fluctuations in these economies

- However, these shocks play a more important role in South Africa than in Ghana

- Productivity shocks, whether domestic or external, are more important in South Africa