- Evaluate if / how imposing a ceiling to the Deficit to GDP ratio would affect the conduction of monetary and fiscal policies and the dynamics of the economy

- Fiscal constraints limit the ability of the government to react to fluctuations on the economy

  - How fiscal and monetary policies respond to shocks in this environment?

  - What are the implications for the behavior of aggregate variables over the business cycle?

- annual budget deficit cannot be higher than 3% of GDP, except in sharp recessions

- debt-to-GDP ratio cannot be higher than 60%

- Excessive deficit not corrected after recommended period might imply a non-interest bearing deposit, later converted to fine if imbalances persist

- Viewed as a mean to obtain fiscal discipline in the Eurozone and enhance the credibility of the European Central Bank

BANCO CENTRAL DO BRASIL
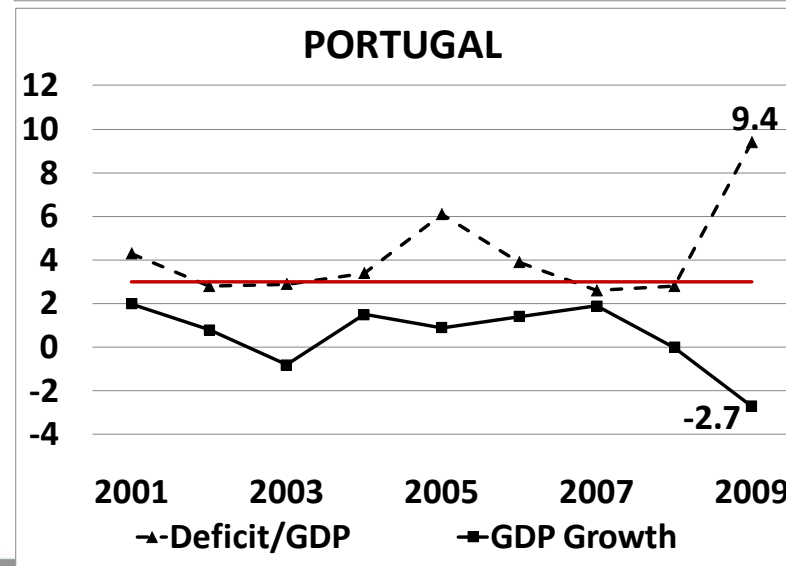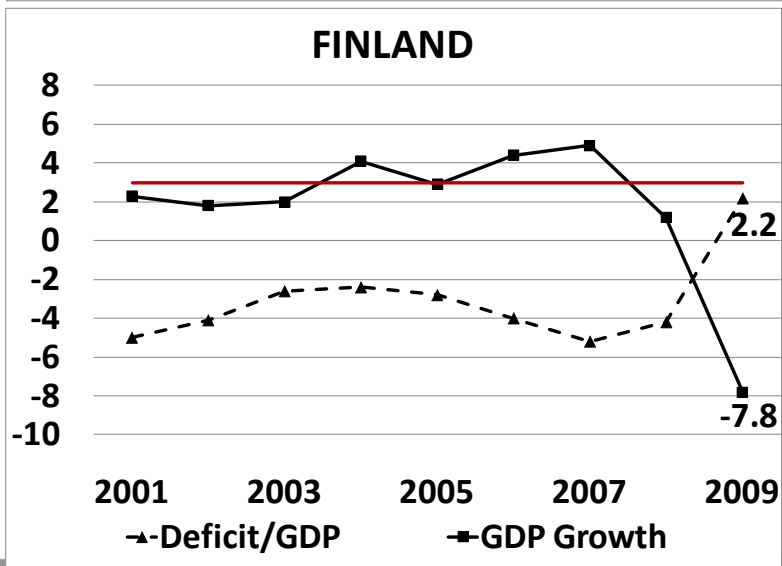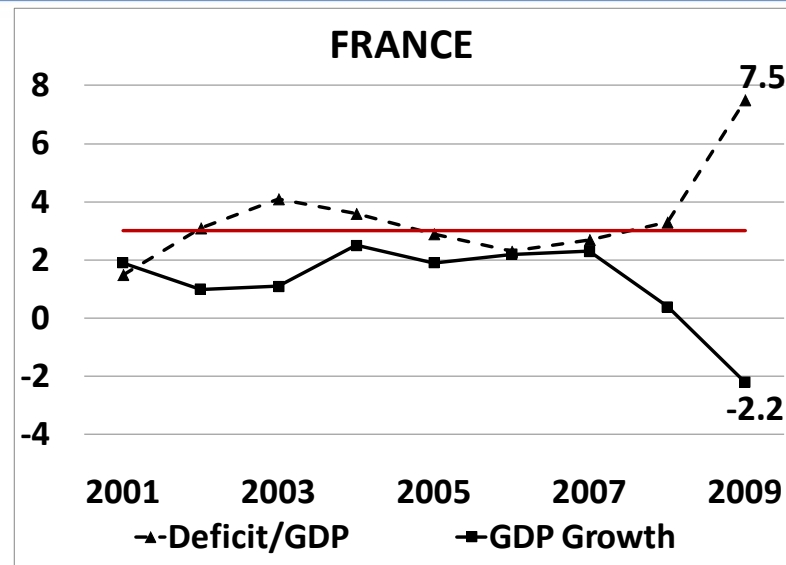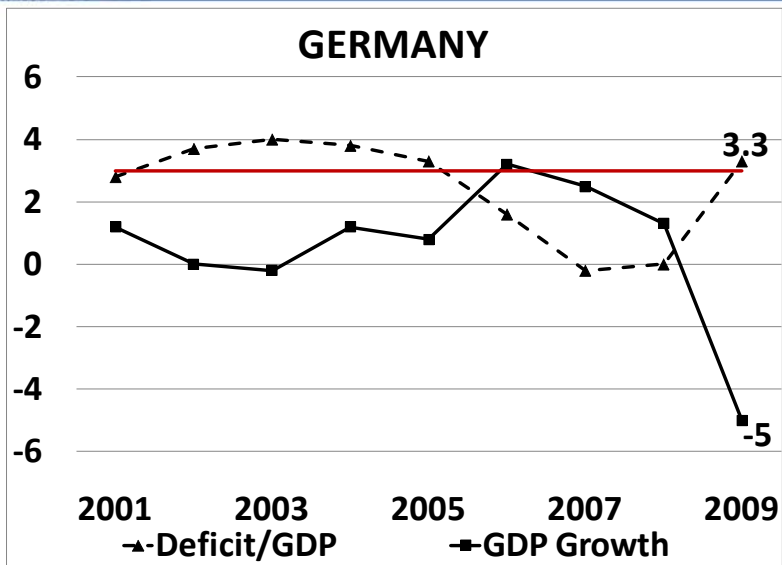
Introduction
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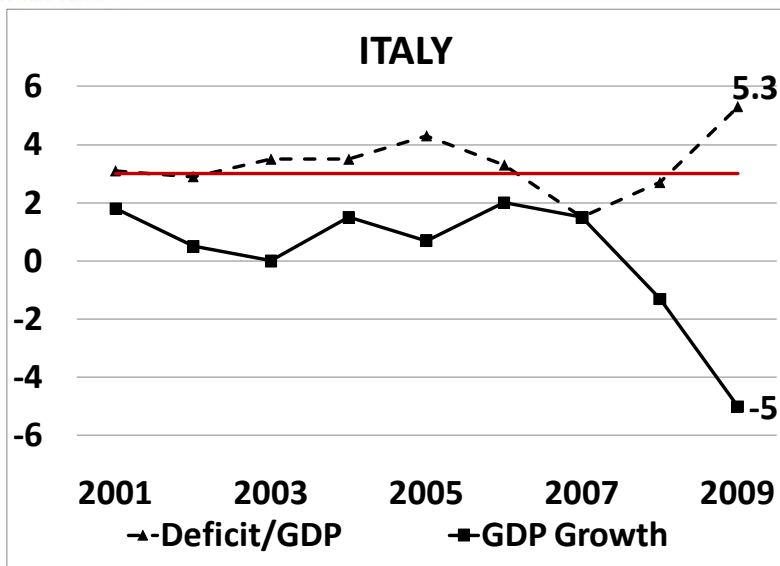
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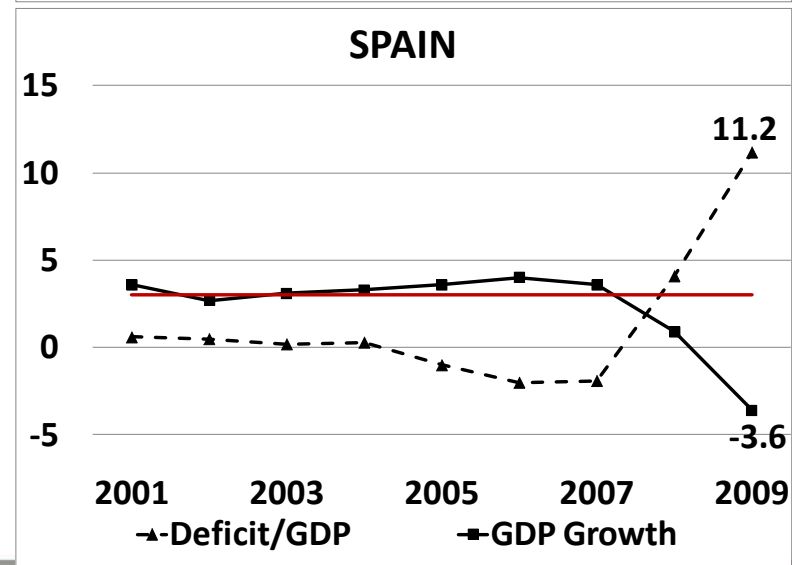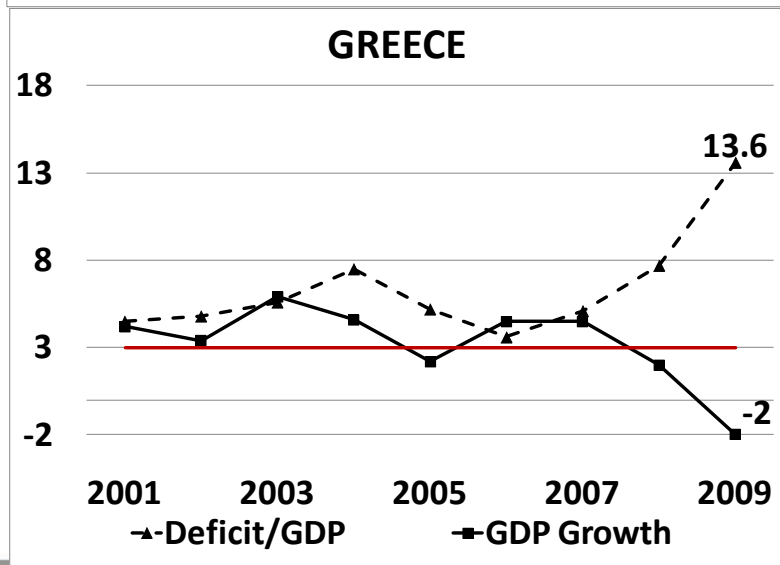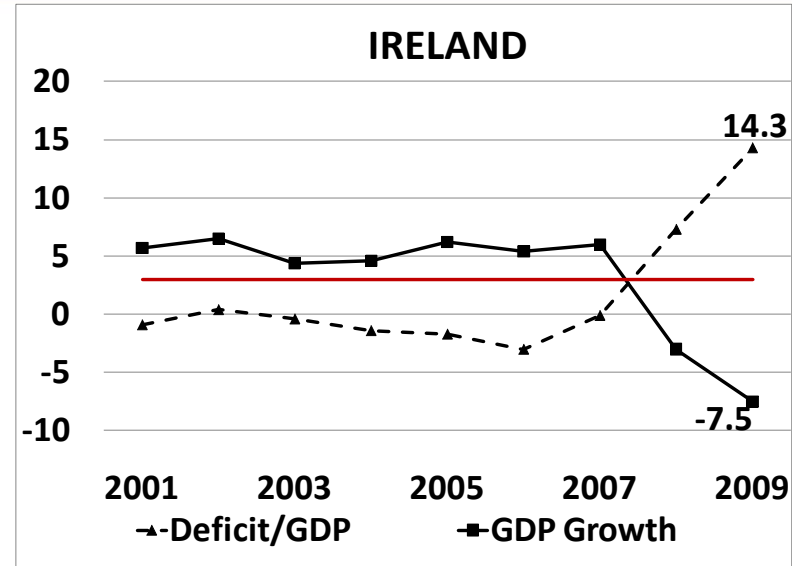## Motivation – Excessive Deficit Procedure

Country	Date of the Commission report	Council Decision on existence of excessive deficit	Current deadline for correction
Austria, Czech Republic, Germany, Netherlands, Portugal, Slovenia and Slovakia	7-Oct-09	2-Dec-09	2013
Belgium, Italy	7-Oct-09	2-Dec-09	2012
Poland	13-May-09	7-Jul-09	2012
Romania, Lithuania	13-May-09	7-Jul-09	2011
Malta	13-May-09	7-Jul-09	2010
France, Spain	18-Feb-09	27-Apr-09	2013
Latvia	18-Feb-09	7-Jul-09	2012
Ireland	18-Feb-09	27-Apr-09	2014
Greece	18-Feb-09	27-Apr-09	2010 (2012)
UK	11-Jun-08	8-Jul-08	2014/15
Hungary	12-May-04	5-Jul-04	2011

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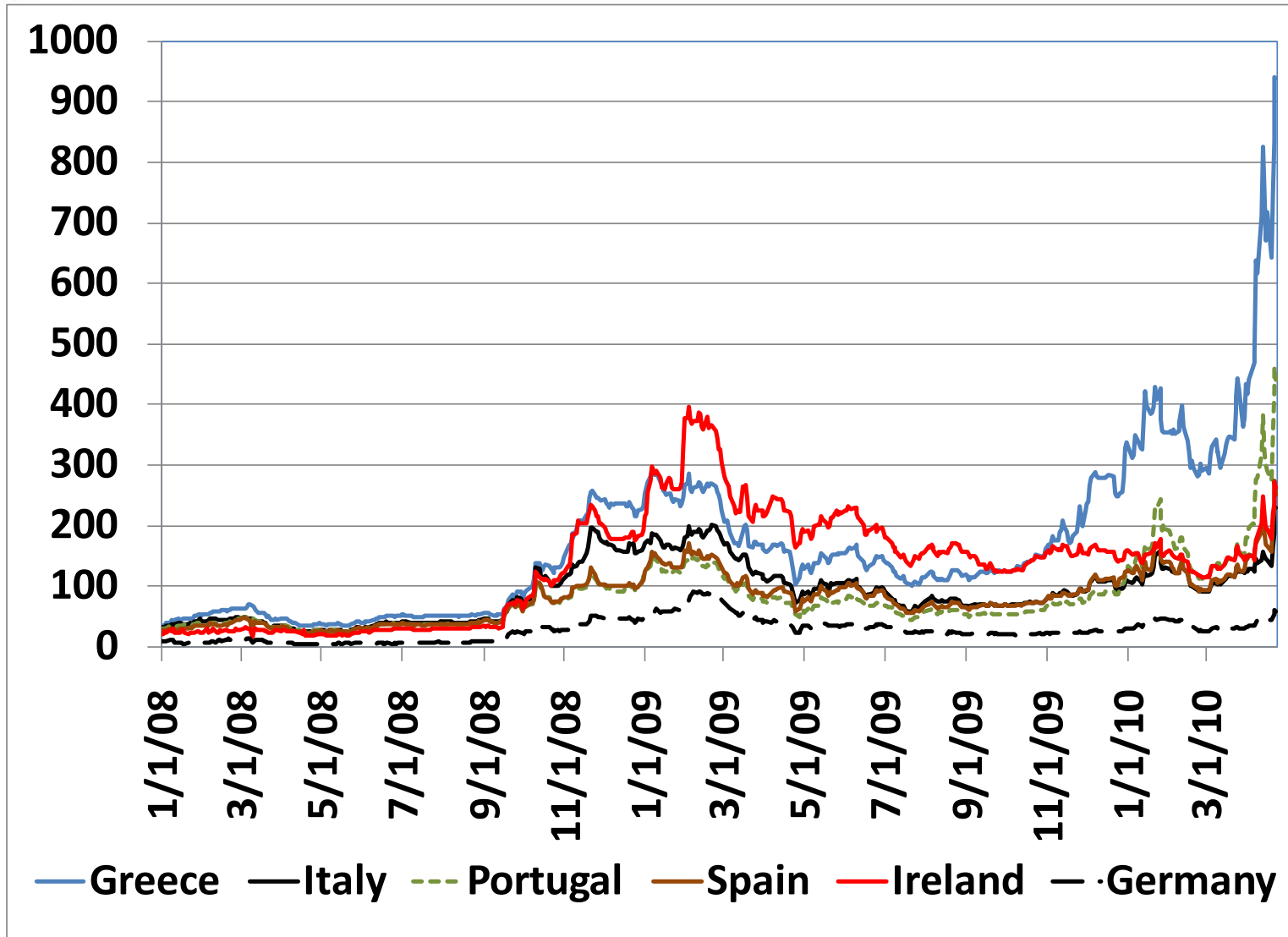
- Brazil – primary surplus/GDP target (3.3% for 2010)

- Chile – primary surplus/GDP target (1% from 2002 to 2007, 0.5% for 2008 and balanced budget for 2009)

- UK – Golden rule (deficit restricted to investment spendings) + debt / GDP limited to 40%

- Sweeden - surplus/GDP target (1%) + ceiling for government spendings

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- Most governments recognize it is important to limit fiscal imbalances

- A lot has been discussed about the best way to design fiscal policy rules

- A big issue is how to make these rules enforceable

- What are the penalties for not complying?

- Focus on the assumption that that the government cares about complying with the 3% nominal deficit to GDP ratio limit

- We are not trying to model escape clauses or other aspects of the Stability and Growth Pact

BANCO CENTRAL DO BRASIL

- Incorporation of deficit limit in the form of a penalty function in the social planner's problem

- This allows to solve the model using perturbation methods (Schmitt-Grohé and Uribe (2004))

- Impose the deficit ceiling in a simple DSGE model to compare the optimal policy under the deficit rule with the unrestricted policies

- Responses to shocks are pretty sensitive to changes in ϕ_1 (the deficit aversion parameter)

- The fiscal limit also makes Debt and Deficit to GDP ratio much less volatile while it increases the volatilities of the other aggregate variables

Related Literature

- Interaction between Monetary and Fiscal Policies
  - Schmitt-Grohé and Uribe (2004, 2006)

- Fiscal Policy in a Monetary Union
  - Lambertini (2005)

- Handling inequality constraint as a penalty function
  - Preston and Roca (2007)

- Simple New Keynesian Model

- Closed economy, without money or capital

- Technology and government spending shocks

- Calvo price rigidity

- Distortionary income taxation

- Limit to Deficit to GDP ratio

- In nominal terms:

$$\frac{B_t^g - B_{t-1}^g}{P_t y_t} \leq 0.03$$

- In real terms:

$$\frac{b_t^g - \dfrac{b_{t-1}^g}{\pi_t}}{y_t} \leq 0.03$$

$$Max\, E_0 \sum_{t=0}^{\infty} \beta^t U\left(c_t, h_t\right)$$

$$s.t.\ \ 0.03 - \frac{b_t^g - \frac{b_{t-1}^g}{\pi_t}}{y_t} \geq 0$$

$$competitive\ \ equilibrium\ conditions$$

$$Max\, E_0 \sum_{t=0}^{\infty} \beta^t U\left(c_t, h_t\right) + \phi_1 \ln\left(0.03 - \frac{b_t^g - \frac{b_{t-1}^g}{\pi_t}}{y_t} + \phi_2\right)$$

$$s.t.\ competitive\ equilibrium\ conditions$$

- The optimal policy is a sequence $\{\tau_t^D, R_t\}$ that implements the competitive equilibrium associated with the maximum level of welfare
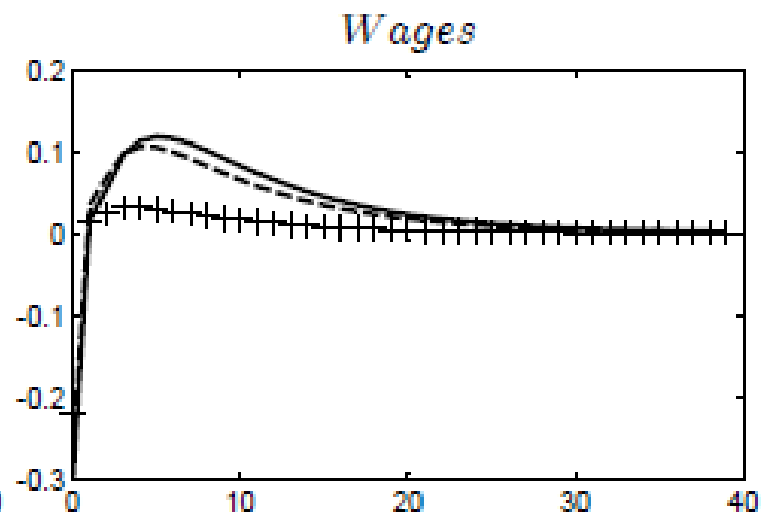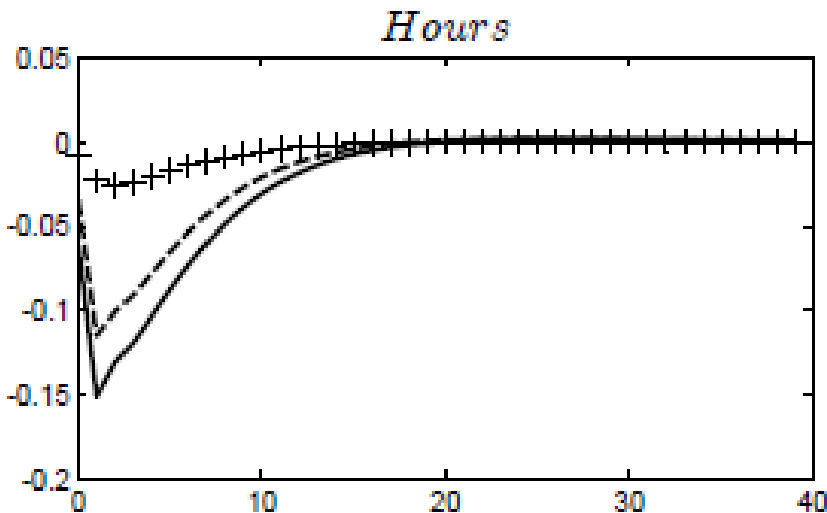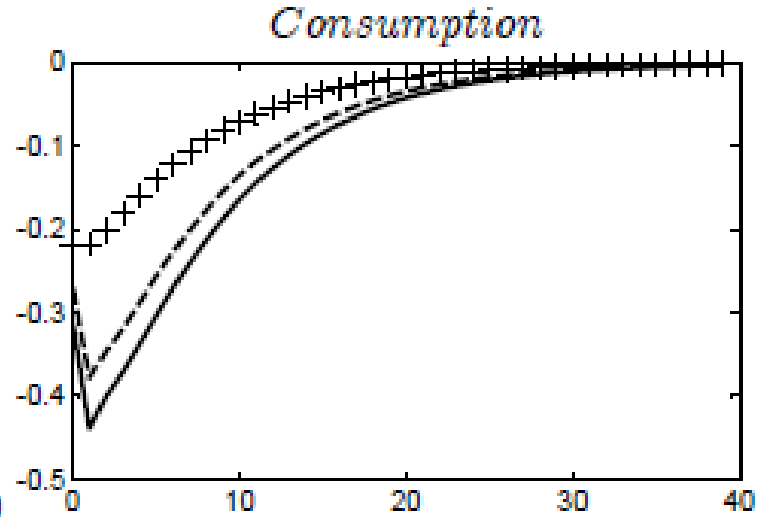
- First order conditions from representative household's utility maximization problem

- First order conditions from firm's profit maximization problem

- Government's budget constraint

- Aggregation equations

- Shocks processes

The Model
Calibration

β	0.99	Subjective discount rate
η	11	Price elasticity of demand
α	1/3	Fraction of firms not allowed to change prices
s_g	0.2	Share of government spending on GDP
s_b	0.6	Debt to GDP ratio
ρ_g	0.88	Serial correlation of G
σ_g	0.015	Std. Dev. of innovation to G
ρ_z	0.9	Serial correlation of productivity shock
σ_z	0.02	Std. Dev. of innovation to productivity
γ	3.8879	Preference parameter
χ	0.0395	Fixed cost parameter

Simulated Volatilities (T = 100 / N = 500)

	$\phi_1 = 0$	$\phi_1 = 0.5$	$\phi_1 = 1$
tax rate	0.0132	0.0281	0.0331
interest rate	0.0029	0.0087	0.0103
inflation	0.0014	0.0032	0.0038
output	0.0060	0.0107	0.0133
consumption	0.0138	0.0215	0.0246
hours	0.0046	0.0072	0.0089
wage	0.0070	0.0115	0.0139
debt	0.0038	0.0016	0.0014
welfare	0.1188	0.2168	0.3165
deficit/GDP	0.0173	0.0125	0.0121

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- Responses to technology and government spending shocks are pretty sensitive to changes in ϕ_1 (the deficit aversion parameter)

- This same parameter also makes Debt and Deficit to GDP ratio much less volatile while it increases the volatilities of the other aggregate variables

Main Problems and Possible Extensions

- Both monetary and fiscal policies are determined optimaly

  $\Rightarrow$ In order to mimic the set up for EU countries, analyze a model with optimal fiscal policy and monetary policy given by a Taylor rule

- Government debt is the only way to transfer income intertemporally

  $\Rightarrow$ Expand the model to include capital

- In reality, adjustments usually occur first through cuts in government spending

  $\Rightarrow$ Endogeneize government spending

THANK YOU!

HAVE A NICE DAY!