

Business Cycle Accounting the U.S. recession in 2008-2009

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Model

- ▶ Households, $N_t = (1 + g_n)^t$

$$\max E \sum_{t=0}^{\infty} \beta^t U(c_t, 1 - l_t) N_t, \quad U(c, l) = \frac{(c(1 - l)^\psi)^{1-\sigma}}{1 - \sigma}$$

$$\text{s.t. } c_t + (1 + \tau_{xt})x_t = r_t k_t + (1 - \tau_{lt})w_t l_t + T_t$$

$$N_{t+1}k_{t+1} = N_t[(1 - \delta)k_t + x_t], \quad c_t, x_t \geq 0$$

- ▶ Firm, $Z_t = z_t(1 + g_z)^t$

$$\max F(K_t, Z_t L_t) - r_t K_t - w_t L_t, \quad F(K, ZL) = K^\theta (ZL)^{1-\theta}$$

- ▶ Government

$$G_t + N_t T_t = N_t(\tau_{lt} w_t l_t + \tau_{xt} x_t)$$

- ▶ Markets clear

$$N_t(c_t + x_t) + G_t = F(K_t, Z_t L_t)$$

$$N_t k_t = K_t$$

$$N_t l_t = L_t$$

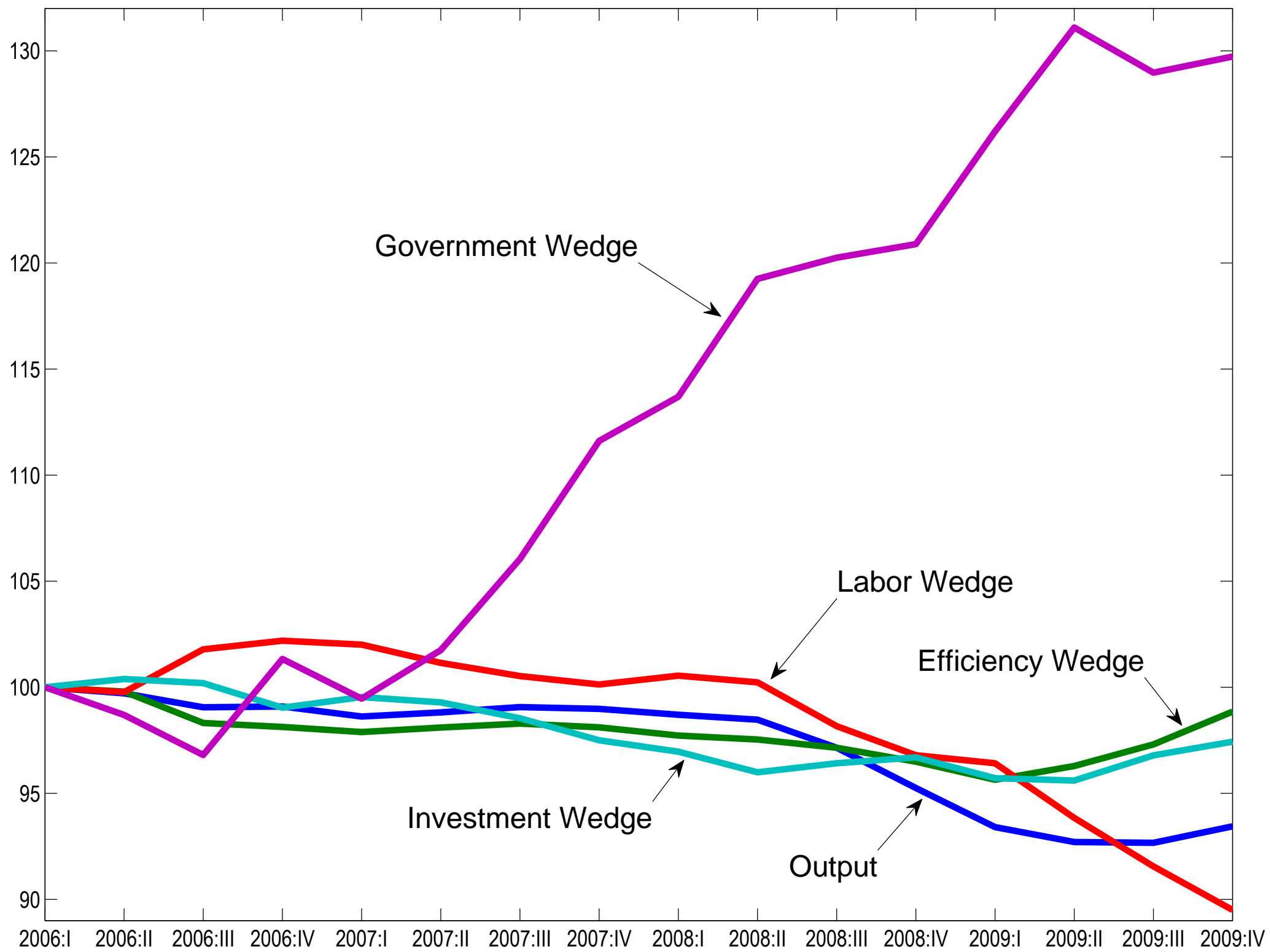
Goal: Estimate 30 parameters of AR(1) process for wedges

$$s_t = \{z_t, \tau_{lt}, \tau_{xt}, g_t\}$$

$$s_{t+1} = P_0 + P s_t + \varepsilon_{t+1}$$

using MLE given the quarterly data on y_t, l_t, x_t, g_t from 1947:I to 2009:IV.

U.S. Output and Measured Wedges

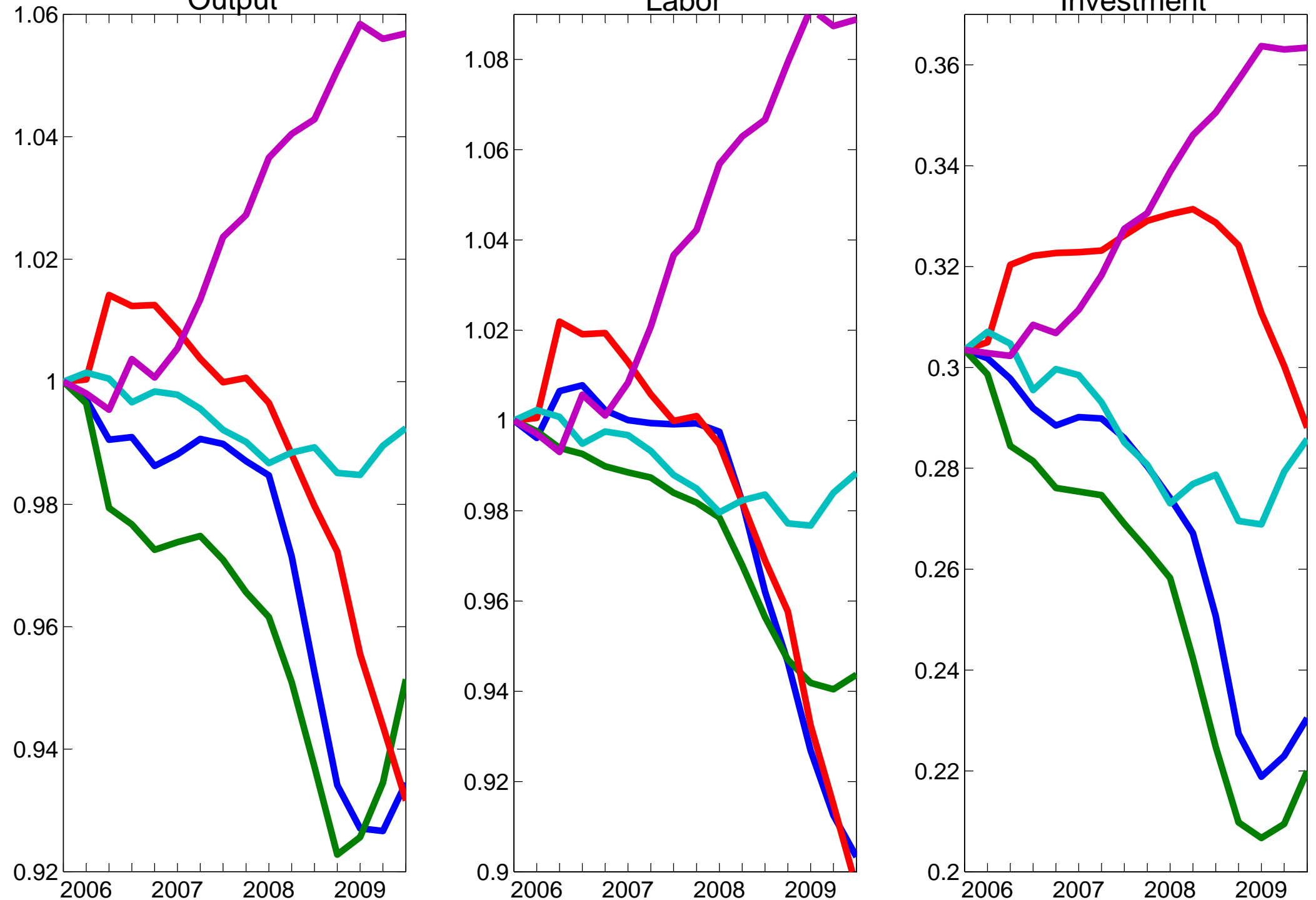


Data and Predictions of a Model with Efficiency, Labor, Investment or Government Wedge

Output

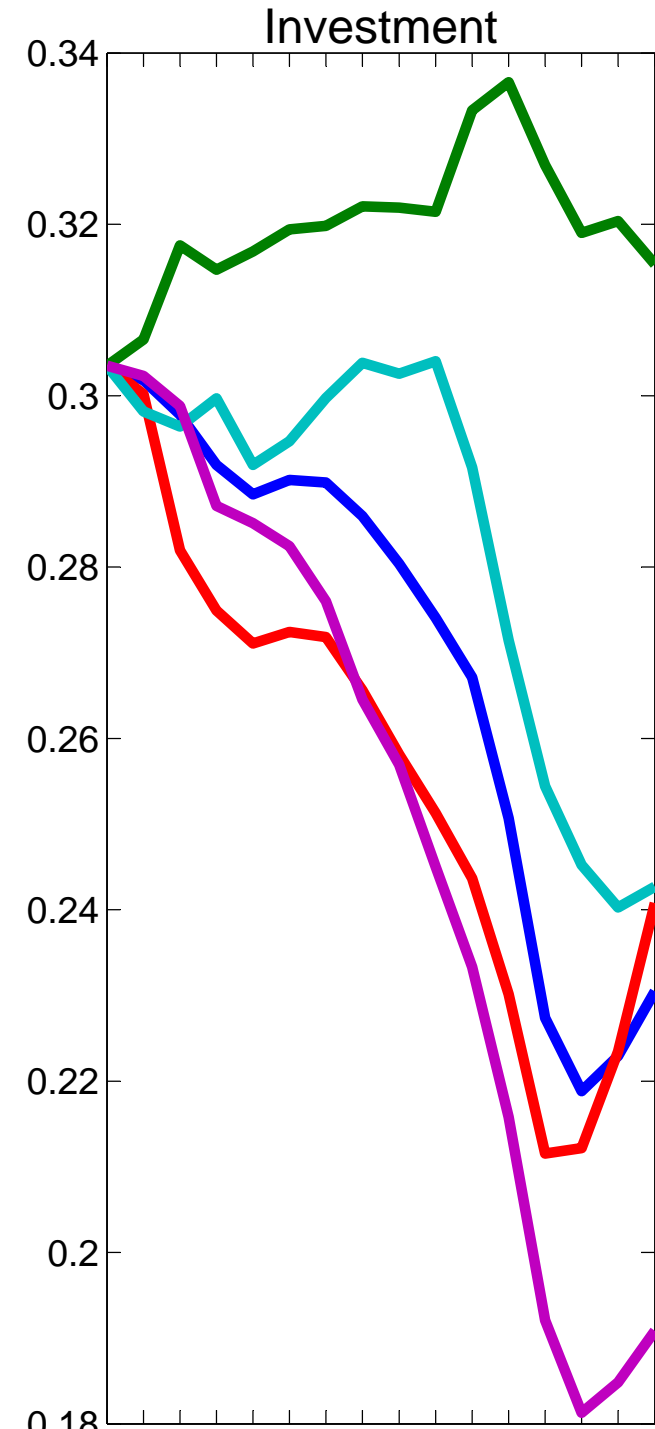
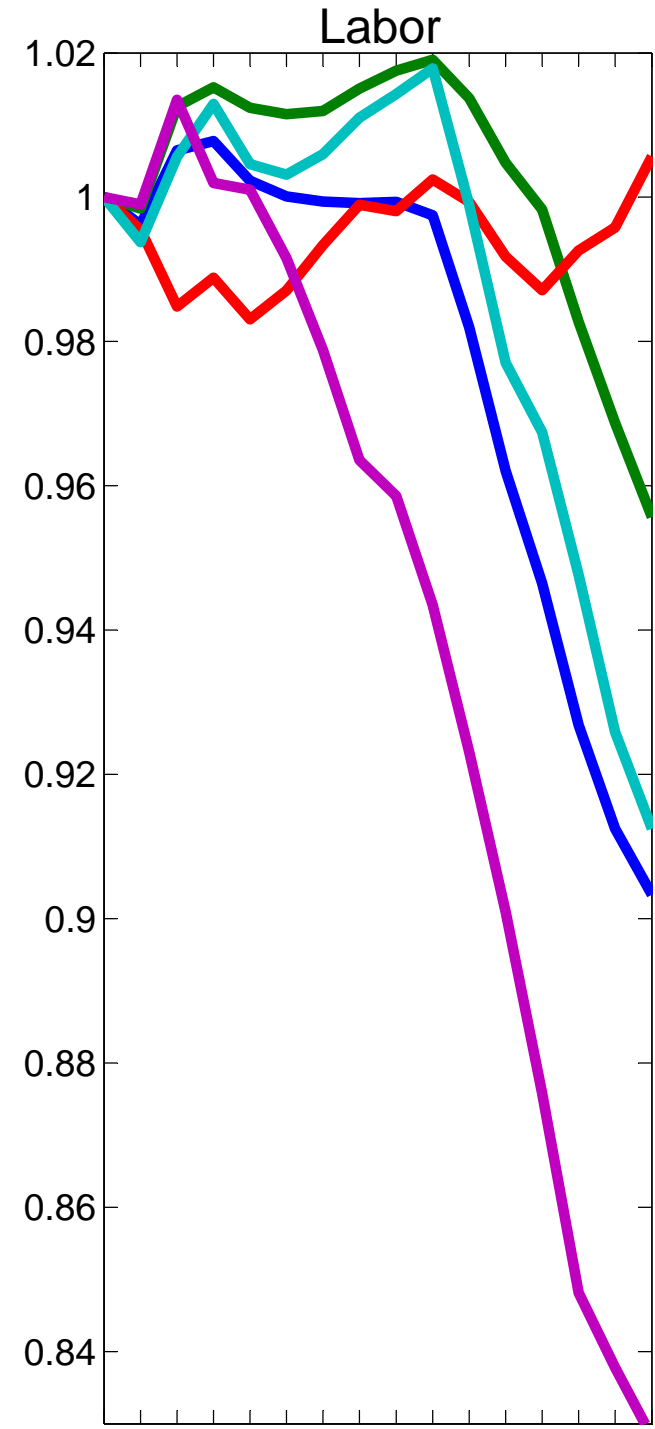
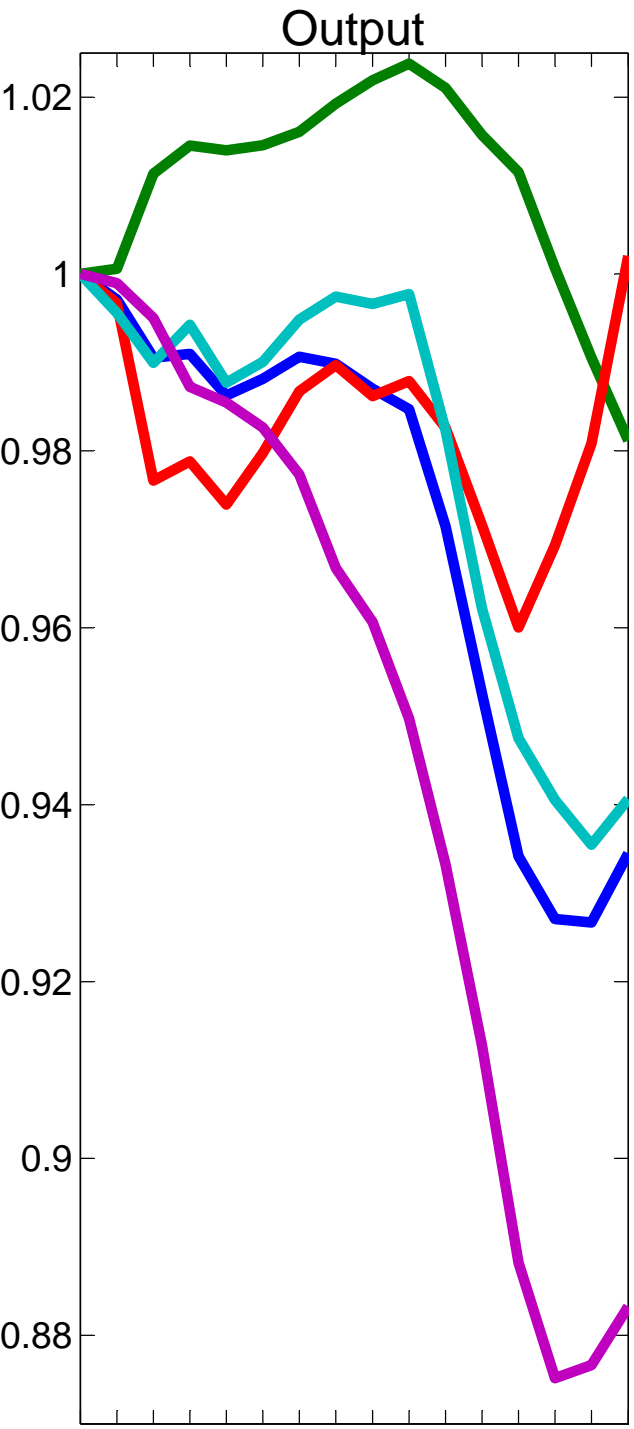
Labor

Investment



— Data
 — Efficiency wedge
 — Labor wedge
 — Investment wedge
 — Government Wedge

Data and Predictions of a Model with all but Investment, Efficiency, Labor or Government Wedge



— Data
 — No efficiency wedge
 — No labor wedge
 — No investment wedge
 — No Government Wedge