Fiscal Multipliers and the Labour Market in the Open Economy

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February 2010

Bank of Spain conference on "Interaction between monetary and fiscal policies "

Fiscal interventions in times of crisis

- Romer and Berensten optimistic estimates of fiscal multipliers for US
- Less favorable scenarios in NK models: Cogan, Cwik, Taylor and Wieland 2009, Cwik and Wieland 2009
- Negative multipliers with distortionary taxation in RBC models: Uhlig 2009
- When monetary policy is at zero lower bound fiscal policy becomes effective: Christiano, Eichenbaum and Rebelo 2009

Does raising unemployment call for fiscal expansion?

- Previous studies have neglected unemployment
- Despite that many fiscal interventions are directed toward the labour market
- Measures directed towarrd labour market institutions have short run and long run effects
- Open economy spillovers and free-riding on foreign fiscal epxansions

Our analysis

- Currency area model with labour turnover costs (hiring and firing costs), workers' heterogeneity, right to manage bargaining
- Consider: *pure demand stimulus, consumption tax cut, income tax cut, hiring subsidies, short-time work (German "Kurzarbeit")*
- Compute short run and long run output and employment multipliers

Our results

- Multipliers are:
  1. Nearly zero for cuts in the consumption tax,
  2. Small but positive for government spending
  3. Large for hiring subsidies and cuts in the income tax (for the latter only in the long-run)
  4. Extension of short-time work (kurzarbeit) delivers negative output multipliers: reduces productivty
- We find small spillover effects
- Results are confirmed under: a) announced versus unannounced policies, b) recession scenario.

Model features

- Standard open economy assumptions
- Operating cost of firm/workers relation: follow logistic distribution
- Hiring and Firing cost
- Sticky prices
- Right to manage bargaining
- Timing of events: operating costs realizes, the median insider bargains the wage, firms determine hiring and firing threshold

Domestic economy: household

- Utility function:

$$U_t = \sum_{j=t}^{\infty} \beta^{j-t} E_t \frac{c_j^{1-\sigma}}{1-\sigma},$$

- Budget constraint:

$$\begin{aligned}(1+\tau_t^c)c_t + \frac{b_t^*}{p_t} \quad \leq \quad & (1-\tau_t^n)w_t(1-u_t) + ubu_t + (1-\tau_t^p)\frac{\tilde{\Pi}_{a,t}}{p_t} \\ & -\frac{\tau_t}{p_t} + (1+i_{t-1}^*)\frac{b_{t-1}^*}{p_t}.\end{aligned}$$

- Open economy relations:

$$\frac{p_t}{p_{h,t}} = \left[(1-\alpha) + \alpha {s_t}^{1-\eta}\right]^{\frac{1}{1-\eta}} \equiv g(s_t),$$

The labor market: hiring and firing

- Firms' profits:

$$\tilde{\Pi}_{I,t}(\varepsilon_t) = (1-\tau_t^p)(a_t mc_t - w_t g(s_t) - \varepsilon_t) + E_t(\Delta_{t,t+1}\tilde{\Pi}_{I,t+1}(\varepsilon_{t+1}))$$

- where:

$$\begin{aligned} & E_t(\tilde{\Pi}_{I,t+1}(\varepsilon_{t+1})) \\ = \quad & E_t \left\{ \left[\begin{array}{c} (1-\phi_{t+1}) \left(a_{t+1} mc_{t+1} - w_{t+1} - a_{t+1} E_t(\varepsilon_{t+1} \mid (1-\phi_{t+1}) \right. \right. \\ -\phi_{t+1} a_{t+1} f_{t+1} + E_{t+1}(\Delta_{t,t+1}(1-\phi_{t+1})\tilde{\Pi}_{I,t+2}) \end{array} \right. \end{aligned}$$

- Hiring and firing conditions:

$$(1-\tau_t^p)h_t = (1-\tau_t^p)(a_t mc_t - w_t g(s_t) - v_{h,t}) + E_t(\Delta_{t,t+1}\tilde{\Pi}_{I,t+1}(\varepsilon_{t+1})$$

$$-f_t(1-\tau_t^p) = (1-\tau_t^p)(a_t mc_t - g(s_t)w_t - v_{f,t}) + E_t(\Delta_{t,t+1}\tilde{\Pi}_{I,t+1}(\varepsilon_{t+1}))$$

The labor market: wage determination

- Under bargaining agreement, the insider receives the real wage w_t and the firm receives the expected profit $(1-\tau_t^p)\left(a_t mc_t - g(s_t)w_t\right)$
- Under disagreement, the insider's fallback income is $g(s_t)ub_t$
- The firm's fallback profit is zero as during disagreement there is no production
- Assuming that disagreement in the current period does not affect future surpluses, workers' surplus is $(1-\tau_t^n)\, g(s_t)w_t - g(s_t)ub_t$ while the firm's surplus is $(1-\tau_t^p)\left(a_t^I mc_t - g(s_t)w_t - \varepsilon^I\right) + s$ where ε^I are the operating costs of the median insider
- Consequently, the Nash-wage is:

$$w_t = \frac{\gamma}{g(s_t)}\left(a_t mc_t - \varepsilon_t^I + \frac{s}{1-\tau_t^p}\right) + (1-\gamma)\frac{ub}{1-\tau_t^n}.$$

Phillips curve and resource constraint

- Phillips curve

$$
\begin{aligned}
0 &= (1-\varepsilon)\beta c_t^{-\sigma} + \varepsilon\beta c_t^{-\sigma} mc_t - \beta c_t^{-\sigma}\Psi\left(\pi_t - \bar{\pi}\right)\pi_t \\
&\quad +\beta E_t\left\{c_{t+1}^{-\sigma}\Psi\left(\pi_{t+1} - \bar{\pi}\right)\frac{y_{t+1}}{y_t}\pi_{t+1}\right\}.
\end{aligned}
$$

Resource constraint:

$$
\begin{aligned}
c_t &= y_t - n_t\phi f_t a_t - (1-n_t)\eta_t h_t - (1-\phi_t)n_t\Xi_t^i - \\
&\quad (1-n_t)\eta_t\Xi_t^e - \frac{\Psi}{2}\left(\pi_t - \bar{\pi}\right)^2 y_t
\end{aligned}
$$

Common monetary policy

- Euro area monetary policy:

$$i_t = \exp\left(\frac{1-\chi}{\beta}\right)\left(V_H \pi_t + V_F \pi_t^*\right)^{b_\pi}$$

Fiscal regimes

$$
\begin{aligned}
& g_t + ubu_t - \tau_t + (1 + r^n_{t-1}) b_{t-1} - \tau^c_t \left(c_{h,t} + c_{f,t}\right) - \tilde{\Pi}_{a,t} \tau^p_t \\
= \quad & \tau^n_t w_t n_t + b_t .
\end{aligned}
$$

1. *A pure demand stimulus and tax cuts:*

$$
\frac{g_t}{g} = \left(\frac{g_{t-1}}{g}\right)^{\rho_g} + \varepsilon^g_t, \frac{\tau^n_t}{\tau^n} = \left(\frac{\tau^n_{t-1}}{\tau^n}\right)^{\rho_{\tau^n}} + \varepsilon^{\tau^n}_t
$$

2. *Hiring subsidies:*

$$
\begin{aligned}
& (1 - \tau^p_t)(h_t - hs_t) \\
= \quad & (1 - \tau^p_t)(a_t mc_t - w_t g(s_t) - v_{h,t}) + E_t(\Delta_{t,t+1} \tilde{\Pi}_{I,t+1}(\varepsilon_{t+1}))
\end{aligned}
$$

3. *Short-time work* ("Kurzarbeit" in Germany): firm is allowed to reduce the working time of this worker by a share $(1 - \Upsilon)$, which is set by the government

$$
\frac{\Upsilon_t}{\Upsilon} = \left(\frac{\Upsilon_{t-1}}{\Upsilon}\right)^{\rho_\Upsilon} + \varepsilon^\Upsilon_t .
$$

Fiscal multipliers: pure demand stimuli

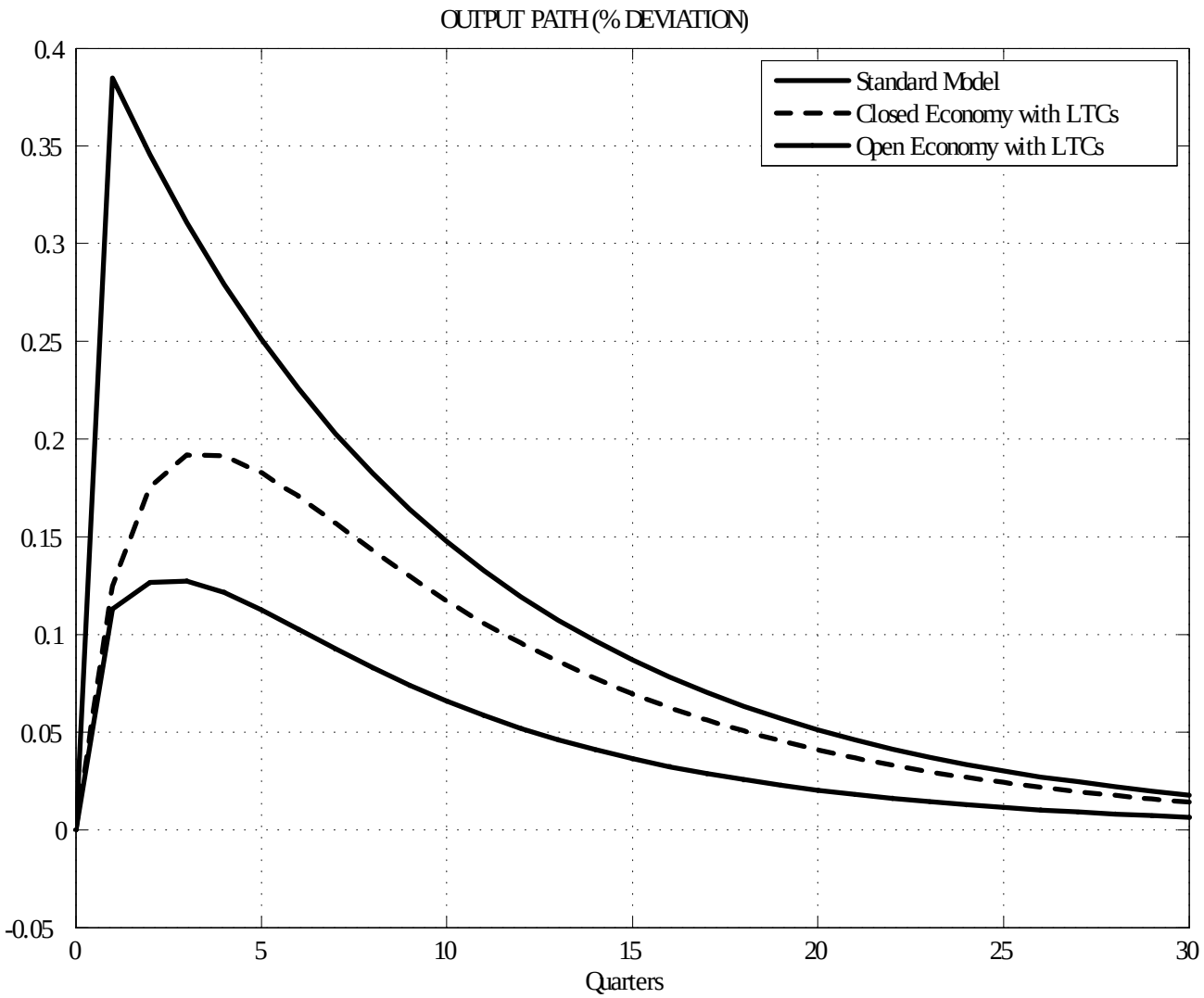


Figure: Model comparison

Overview of fiscal multipliers

Table: Summary of fiscal multipliers and spillovers across countries for different fiscal packages.

	Demand	VAT cut	Inc. tax cut	Hiring subs.	STW
H, short-run	0.23	0.01	0.50	1.85	-0.76
H, long-run	0.31	0.00	1.62	4.83	1.04
F, short-run	-0.01	0.00	0.13	0.53	0.20
F, long-run	0.04	0.01	0.06	0.27	0.12

Overview of fiscal multipliers

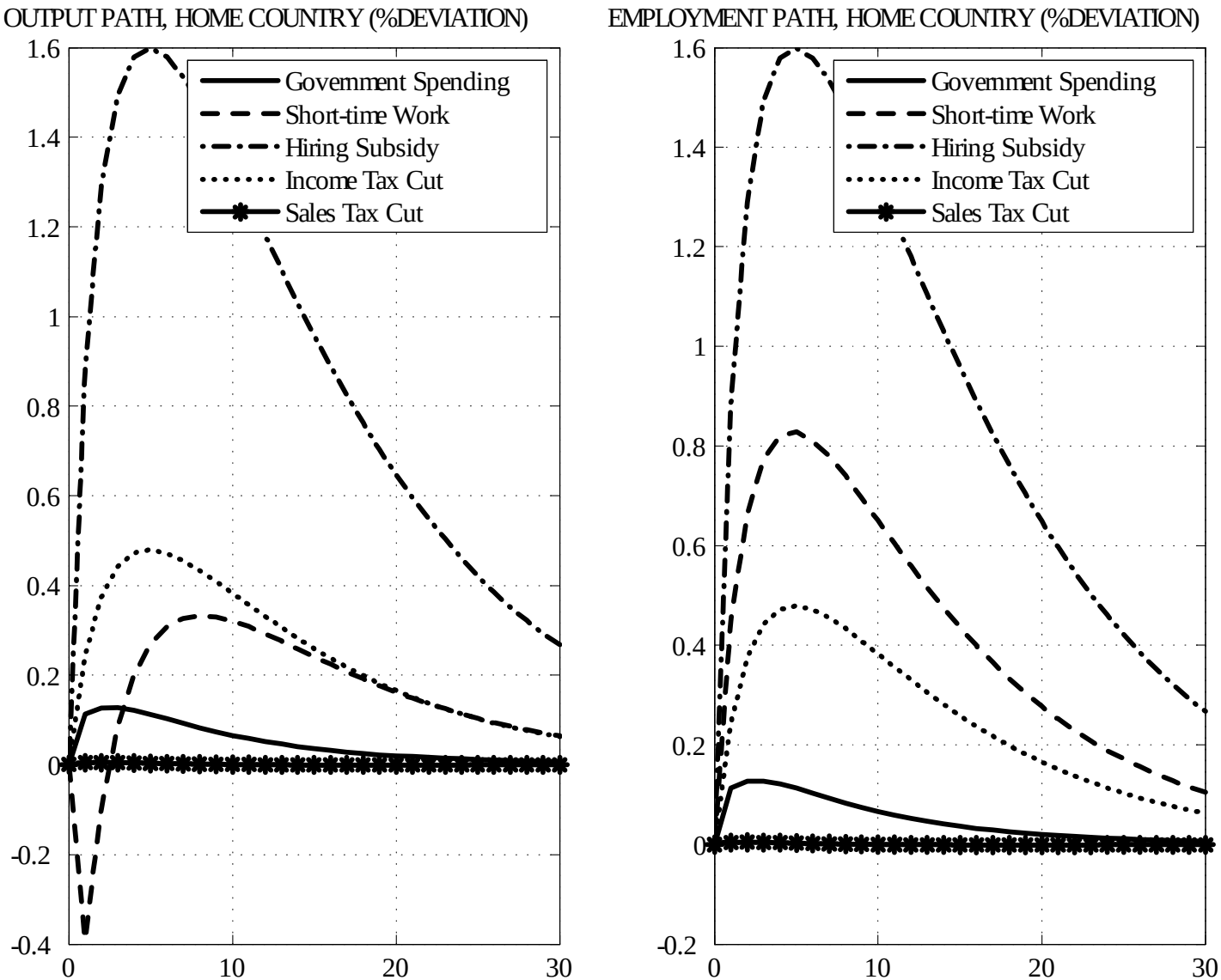
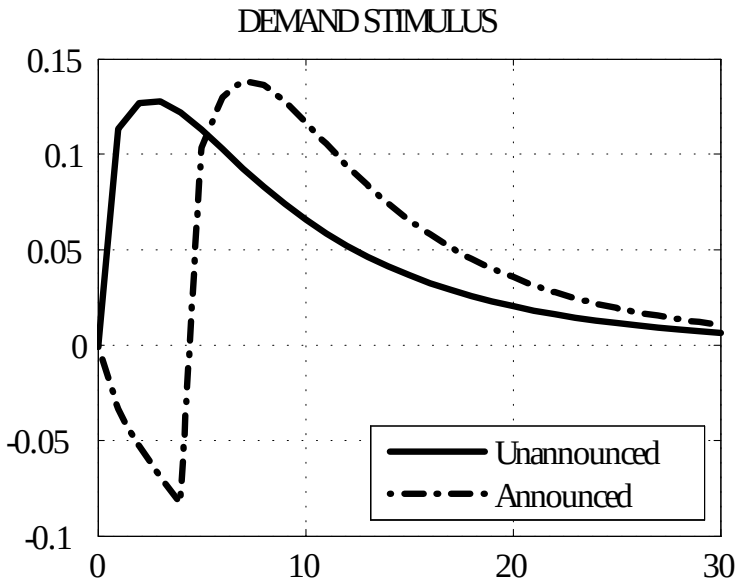
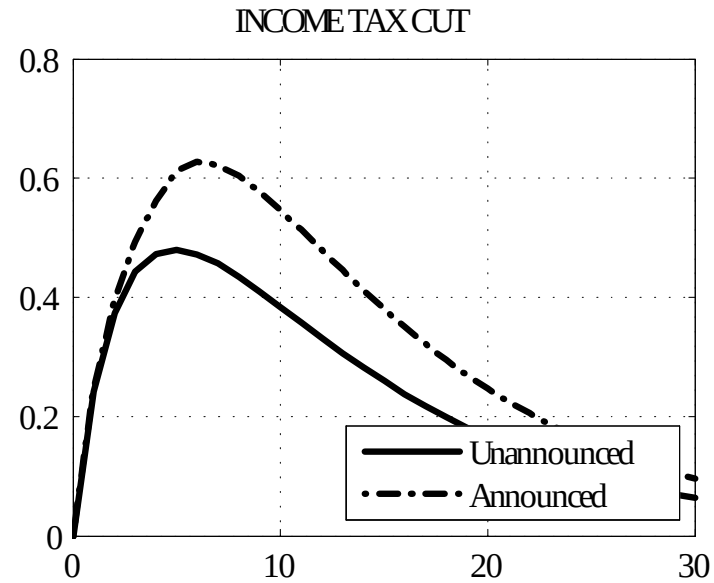
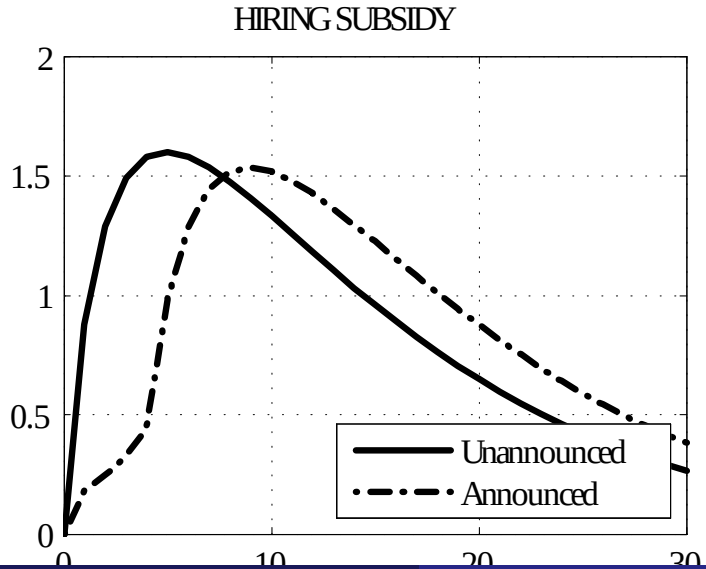


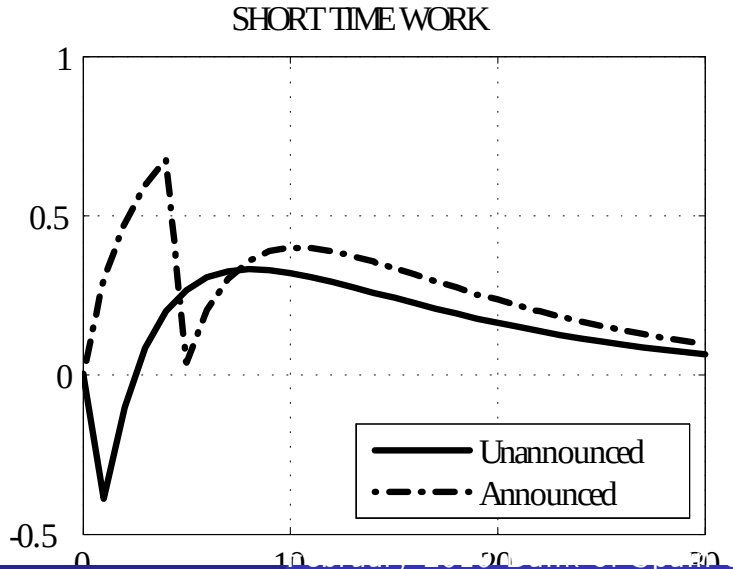
Figure: Employment and output effects for different programmes (all normalised

Announcement effect

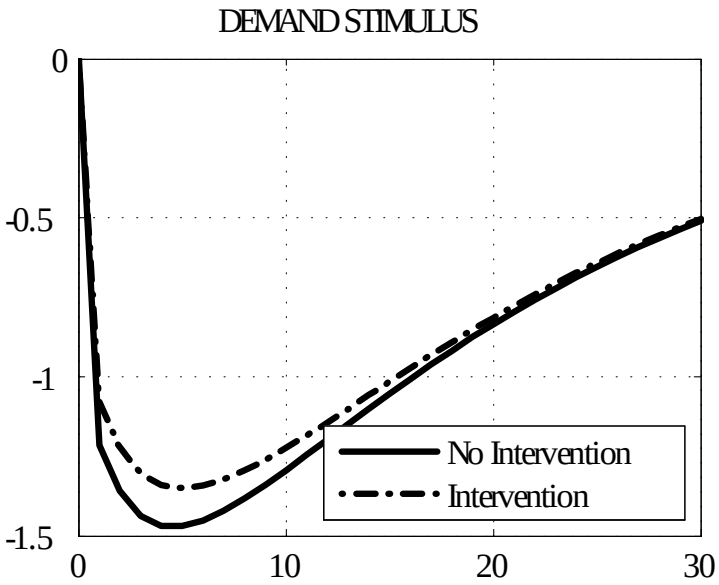


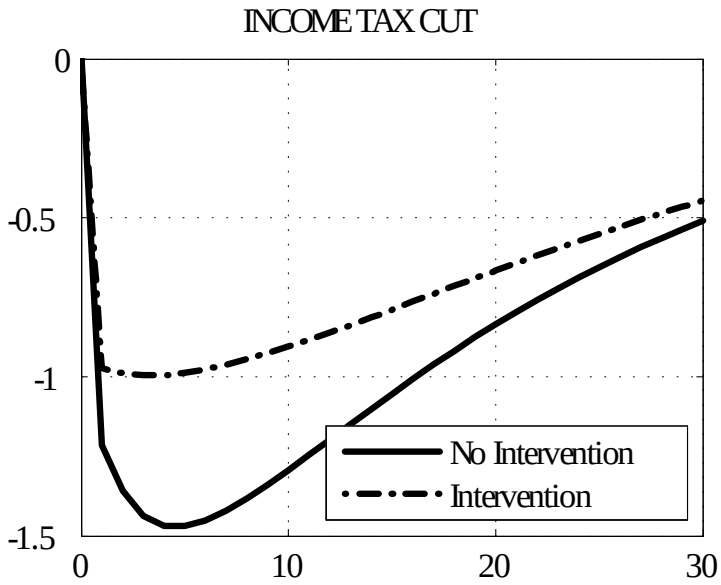


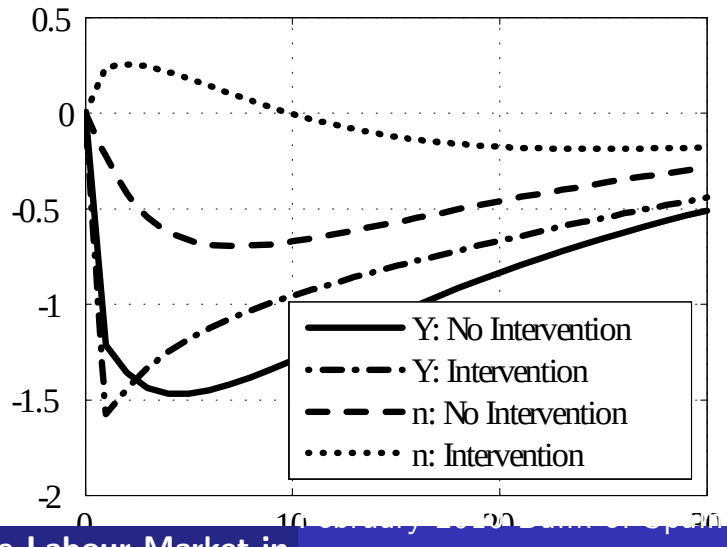




Starting from a recession scenario







Conclusions

- Measures directed toward reducing labour market distortions are associated with large multipliers
- Mixed results emerge under an extension of short-time work
- Novel dimension through which fiscal stimuli can operate, namely a supply side channel that boosts labour demand