

Understanding the Gains from Wage Flexibility: The Exchange Rate Connection

Jordi Galí Tommaso Monacelli

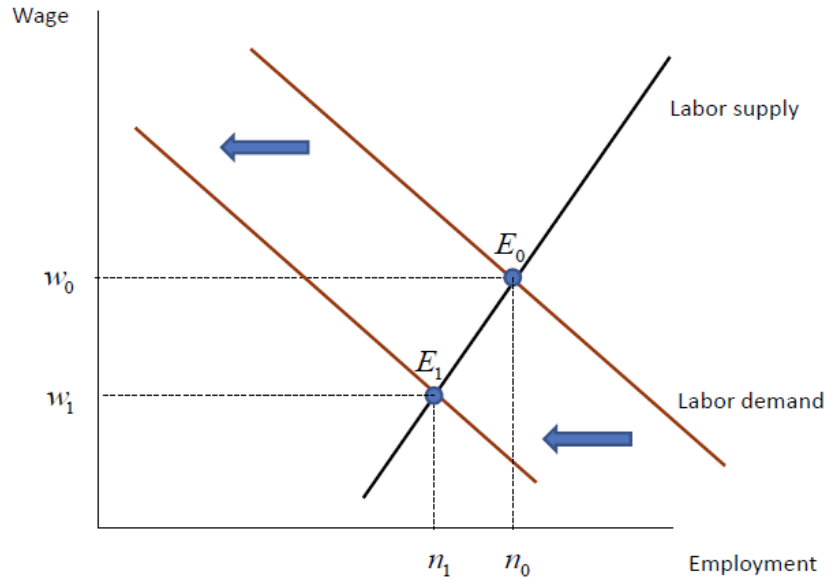
October 2013

Gains from Wage Flexibility: The Conventional Wisdom

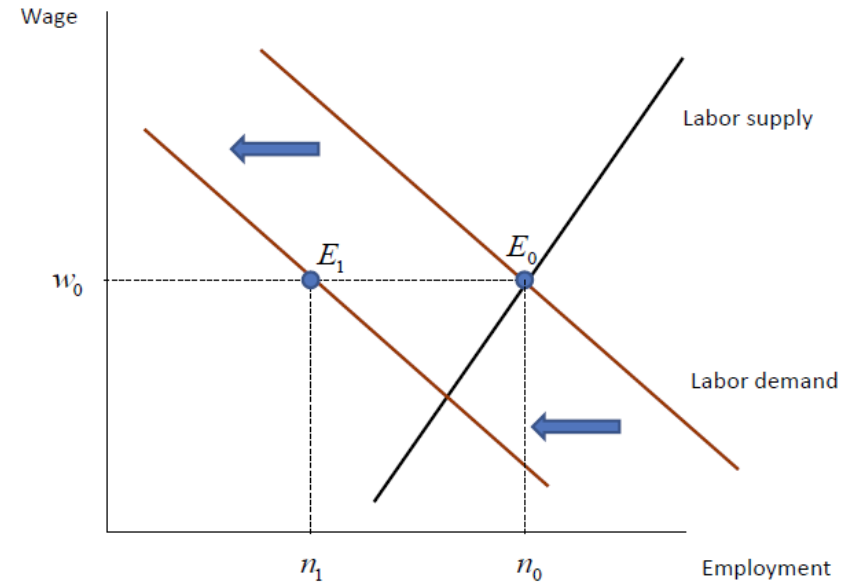
- Conventional wisdom (I):

"Wage flexibility is a good thing"

Wage Flexibility and Employment Stability: The Classical View



a. Wage flexibility



b. Wage rigidity

Gains from Wage Flexibility: The Conventional Wisdom

- Conventional wisdom (I):

"Wage flexibility is a good thing"

- Conventional wisdom (II):

"Wage flexibility is a good thing. More so in a currency union"

Gains from Wage Flexibility: The Conventional Wisdom

- Conventional wisdom (I):

"Wage flexibility is a good thing"

- Conventional wisdom (II):

"Wage flexibility is a good thing. More so in a currency union"

- Recurrent calls for wage moderation and reforms to enhance wage flexibility, aimed at troubled euro area countries

Gains from Wage Flexibility Revisited: The Closed Economy Case (Galí, JEEA 2013)

- Closed economy model with staggered price and wage setting
- Taylor-type interest rate rule: $i_t = \rho + \phi_\pi \pi_t + \phi_y y_t$
- Indirect effect of wages on employment:

$$\downarrow w \Rightarrow \downarrow \pi \Rightarrow \downarrow i \Rightarrow \downarrow r \Rightarrow \uparrow y \Rightarrow \uparrow n$$

\Rightarrow key role for endogenous monetary policy response

- *Main finding*: Increased wage flexibility may be welfare-reducing if ϕ_π is small
 - limited effectiveness at stabilizing employment
 - costly "side effects" (increased volatility in wage and price inflation)

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- *Main finding*: Increased wage flexibility may be welfare-reducing if ϕ_π is small
 - limited effectiveness at stabilizing employment
 - costly "side effects" (increased volatility in wage and price inflation)
- Caveat: closed economy, no room for "competitiveness channel"

Gains from Wage Flexibility Revisited: The Open Economy

- *Framework*: small open economy New Keynesian model
GM 2005 + wage rigidities
- Transmission of wage changes to employment:
 - "endogenous policy channel"
 - "competitiveness channel"
- *Questions*:
 - Is increased wage flexibility always desirable?
 - More so in a currency union?
 - What is the role of the exchange rate policy/regime?
- *The exchange rate connection*: with a more rigid exchange rate, wage flexibility is...

⇒ more valuable to bring about warranted changes in terms of trade

⇒ less effective due to muted monetary policy response

Basic Framework

- Domestic households

$$E_0 \sum_{t=0}^{\infty} \beta^t U(C_t, N_t; X_t)$$

$$C_t \equiv \left((1 - \nu)^{\frac{1}{\eta}} C_{H,t}^{1 - \frac{1}{\eta}} + \nu^{\frac{1}{\eta}} C_{F,t}^{1 - \frac{1}{\eta}} \right)^{\frac{\eta}{\eta - 1}}$$

$$C_{H,t} \equiv \left(\int_0^1 C_{H,t}(j)^{\frac{\epsilon_p - 1}{\epsilon_p}} dj \right)^{\frac{\epsilon_p}{\epsilon_p - 1}}$$

$$U(C_t, N_t; X_t) = \left(\log C_t - \frac{1}{1 + \varphi} N_t^{1 + \varphi} \right) X_t$$

where $x_t \equiv \log X_t \sim AR(1)$ ("demand shock")

Assumption: access to (complete) international financial markets

Basic Framework

- Domestic firms

$$Y_t = A_t N_t^{1-\alpha}$$

where $a_t \equiv \log A_t \sim AR(1)$ ("technology shock")

- Monopolistic competition in goods and labor markets
- Staggered price and wage setting à la Calvo
- Producer currency pricing (full pass-through)
- Monetary policy

$$i_t = \phi_\pi \pi_{H,t} + \frac{\phi_e}{1 - \phi_e} e_t$$

Limiting case: as $\phi_e \rightarrow 1$, exchange rate peg ($e_t = 0$)

The Impact of Labor Costs on Employment: The Role of Exchange Rate Policy

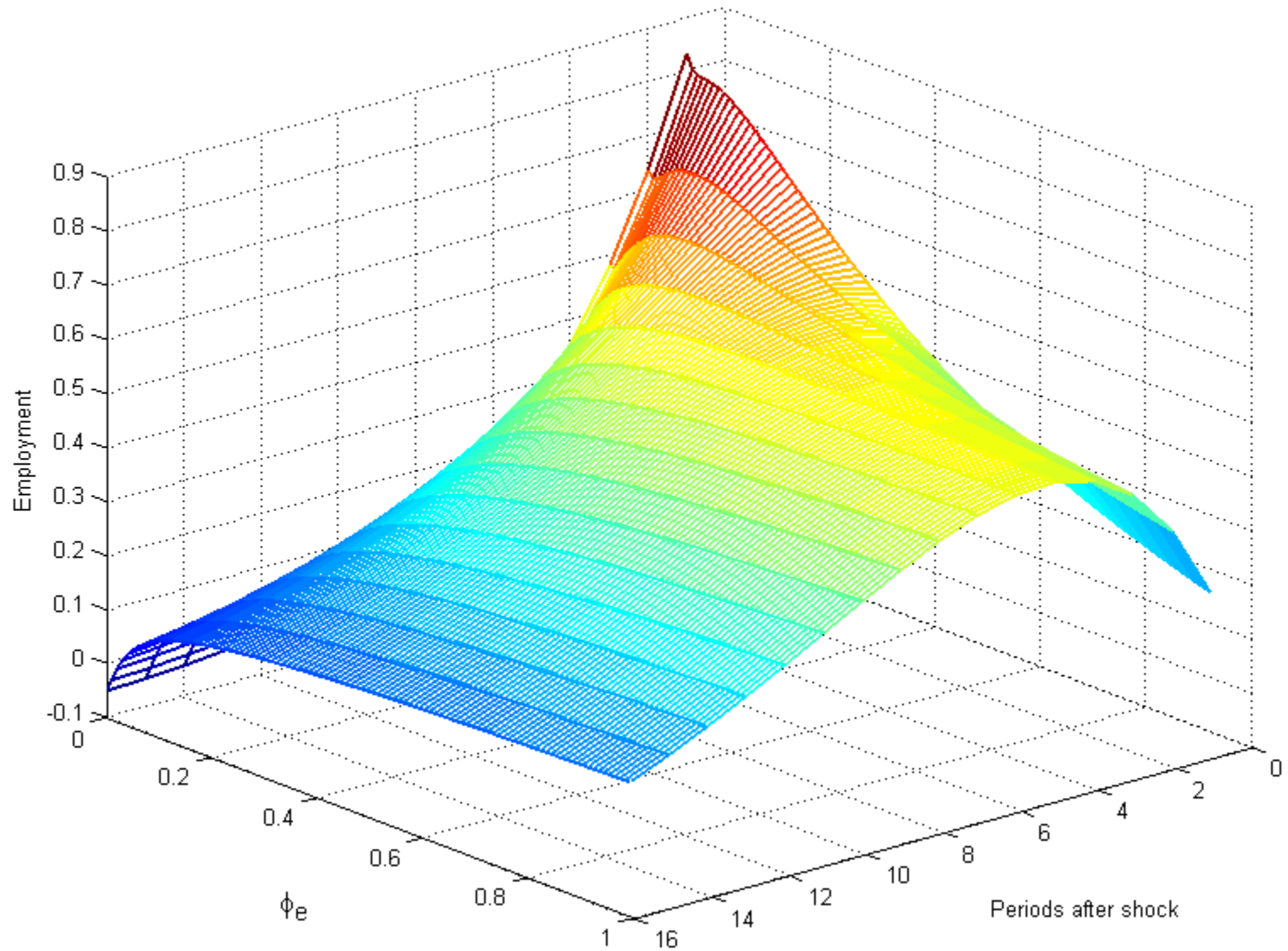
- Exogenous payroll tax process

$$\tau_t = \rho_\tau \tau_{t-1} + \varepsilon_t^\tau$$

- Baseline calibration:

- openness: $\nu = 0.4$
 - elasticity of substitution: $\eta = 1$
 - nominal rigidities: $\theta_p = \theta_w = 0.75$
 - inflation coefficient: $\phi_\pi = 1.5$
- Response of employment to a 1% payroll tax cut, as a function of ϕ_e

Dynamic Response of Employment to a Payroll Tax Cut



The Impact of Labor Costs on Employment: Dissecting the Mechanism

- Labor demand

$$n_t = \frac{1}{1 - \alpha} (y_t - a_t)$$

- Equilibrium output

$$y_t = (1 - \nu)c_t + \eta\nu(2 - \nu)s_t$$

- Equilibrium consumption:

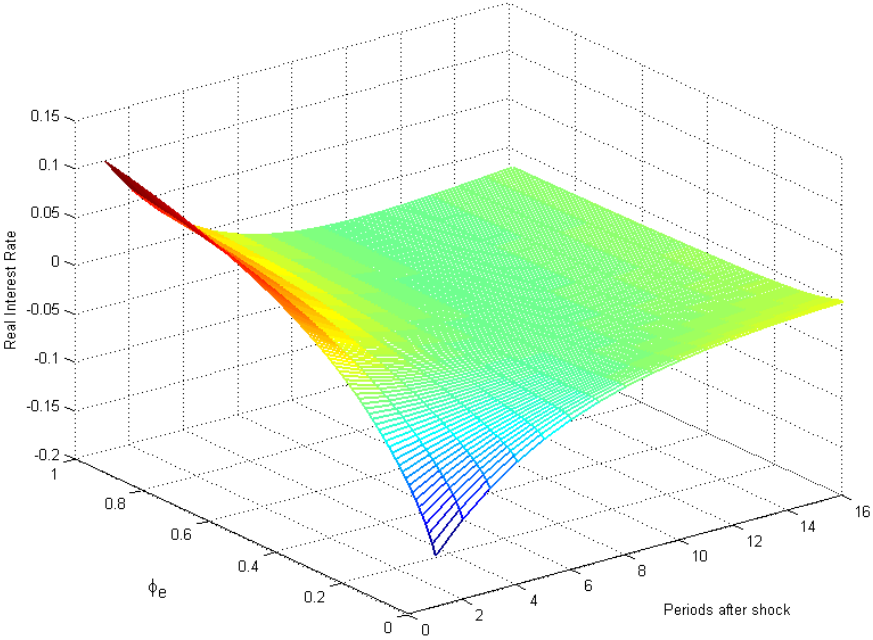
$$c_t = x_t - (1 - \nu)E_t \left\{ \sum_{k=0}^{\infty} (i_{t+k} - E_t\{\pi_{H,t+1+k}\}) \right\}$$

- Equilibrium terms of trade:

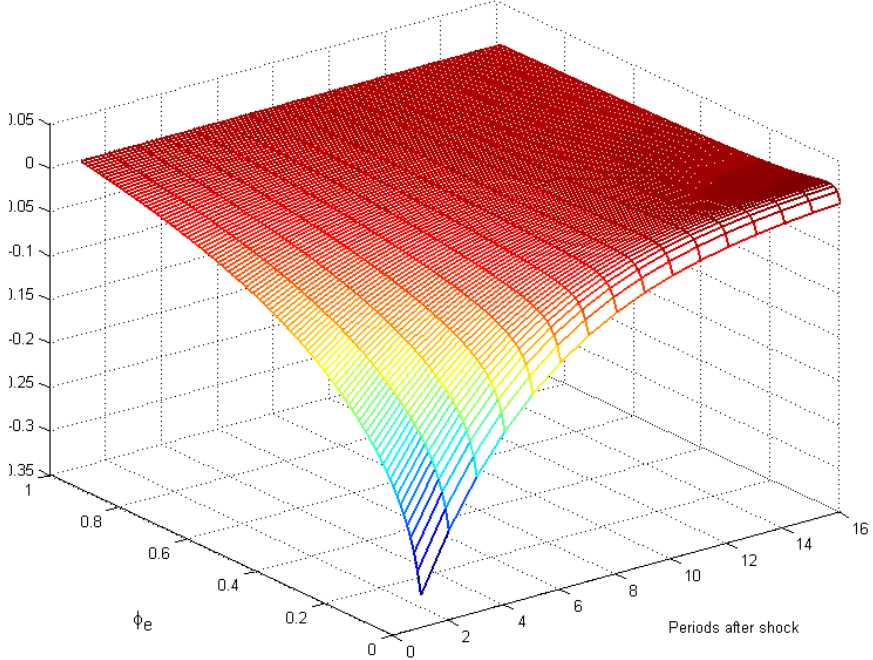
$$s_t = -E_t \left\{ \sum_{k=0}^{\infty} (i_{t+k} - E_t\{\pi_{H,t+1+k}\}) \right\}$$

⇒ key role for monetary policy response, shaped by exchange rate policy

Dynamic Responses to a Payroll Tax Cut: Interest Rates



Real interest rate



Nominal interest rate

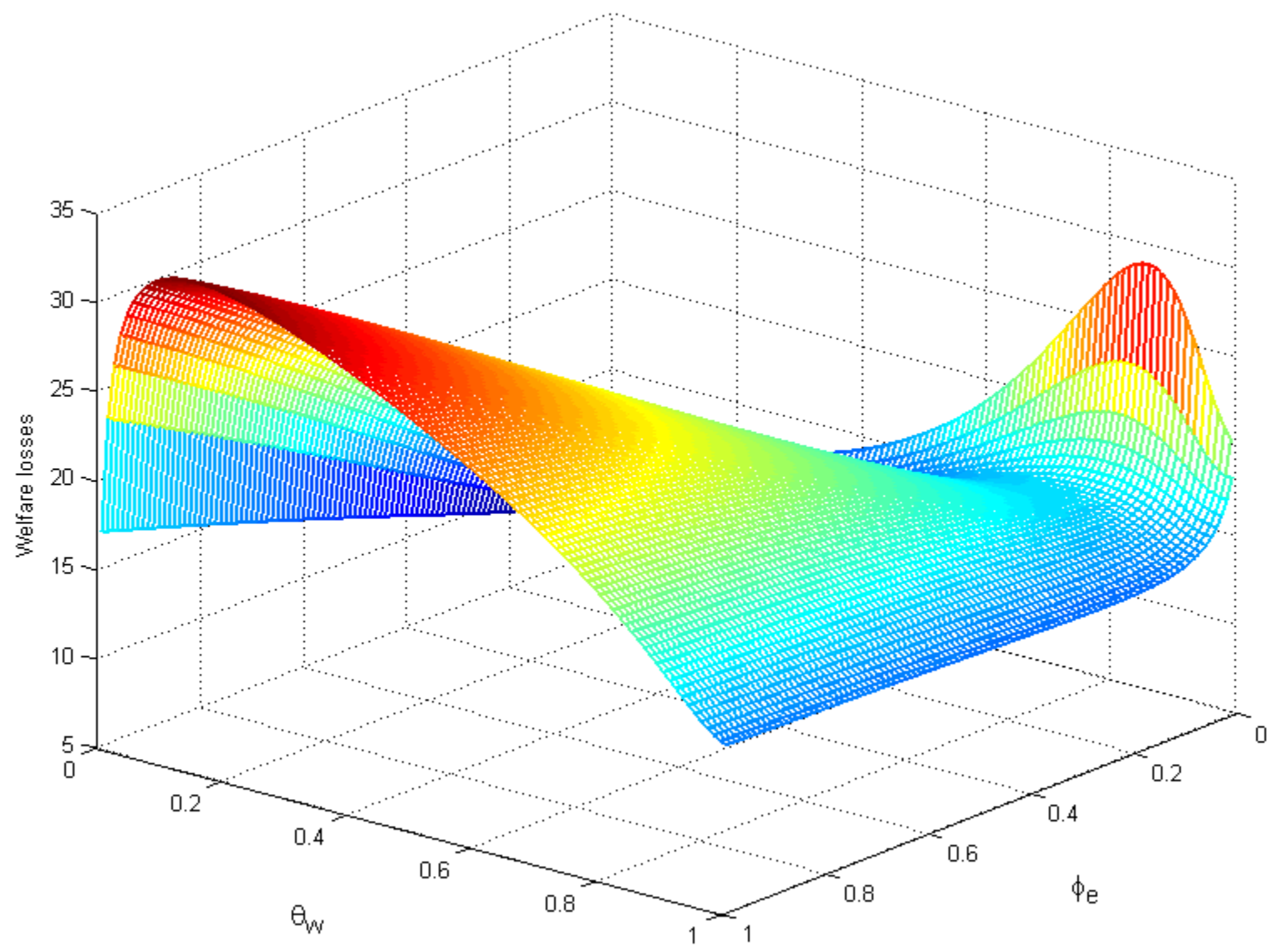
Welfare Gains from Increased Wage Flexibility: The Exchange Rate Connection

- Interaction between:
 - wage stickiness: $\theta_w \in [0, 1]$
 - exchange rate stability: $\phi_e \in [0, 1]$
- Welfare loss in the unit-elasticity case ($\eta = 1$)

$$\mathbb{L} \sim (1 + \varphi) \text{var}(\tilde{n}_t) + \left(\frac{\epsilon_p}{\lambda_p(1 - \alpha)} \right) \text{var}(\pi_t^p) + \left(\frac{\epsilon_w}{\lambda_w} \right) \text{var}(\pi_t^w)$$

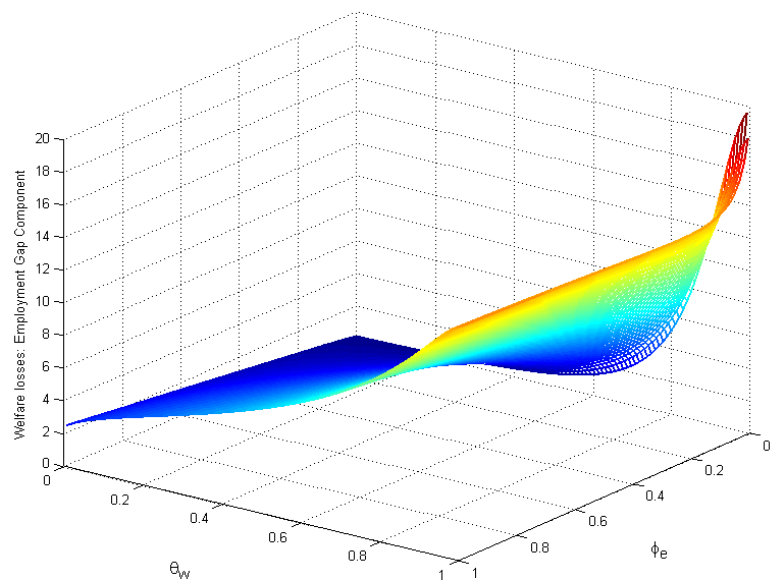
- Conditional analysis:
 - (i) demand shocks
 - (ii) technology shocks

Wage Flexibility, Exchange Rate Policy and Welfare: Demand Shocks

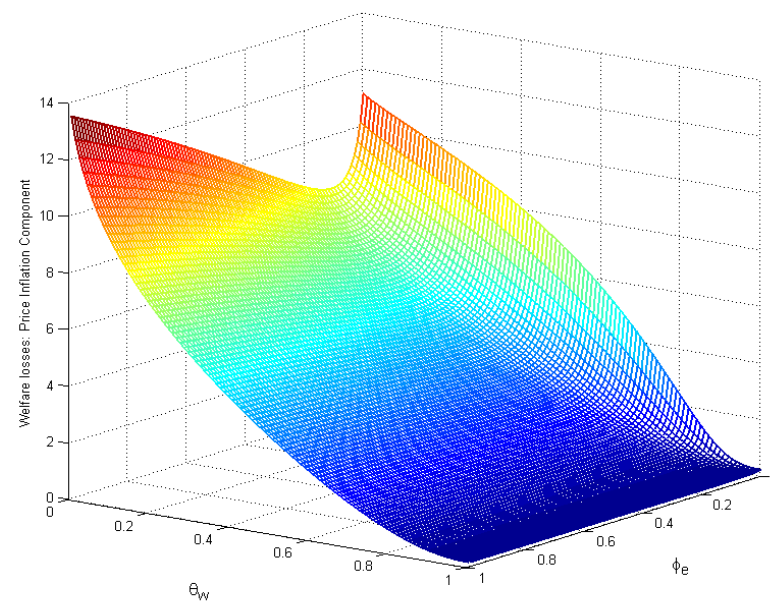


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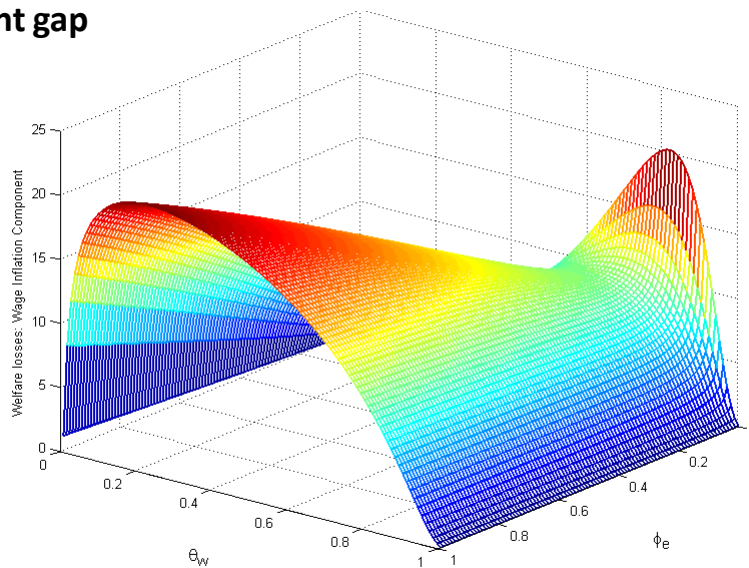
Welfare Loss Components



employment gap

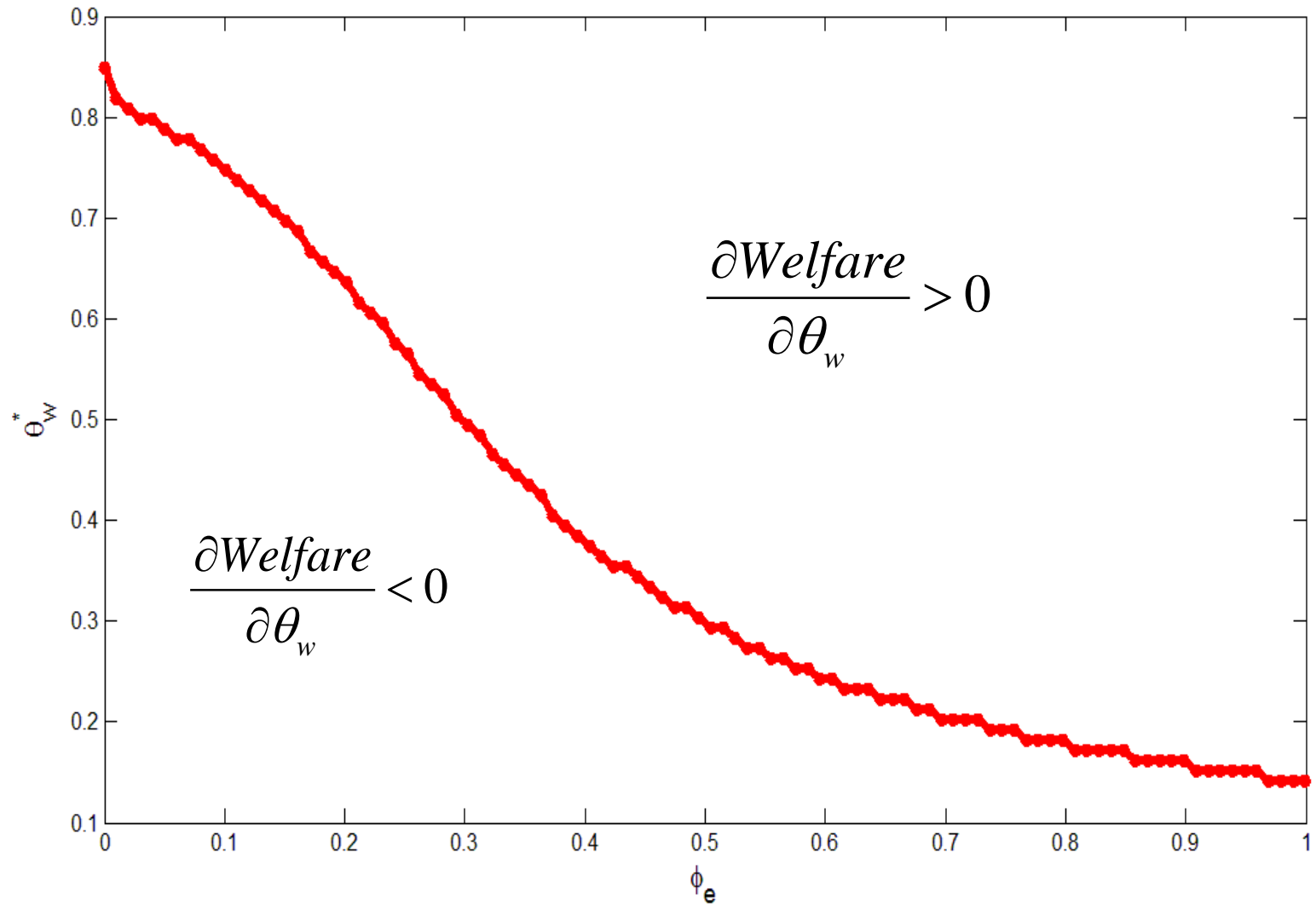


price inflation

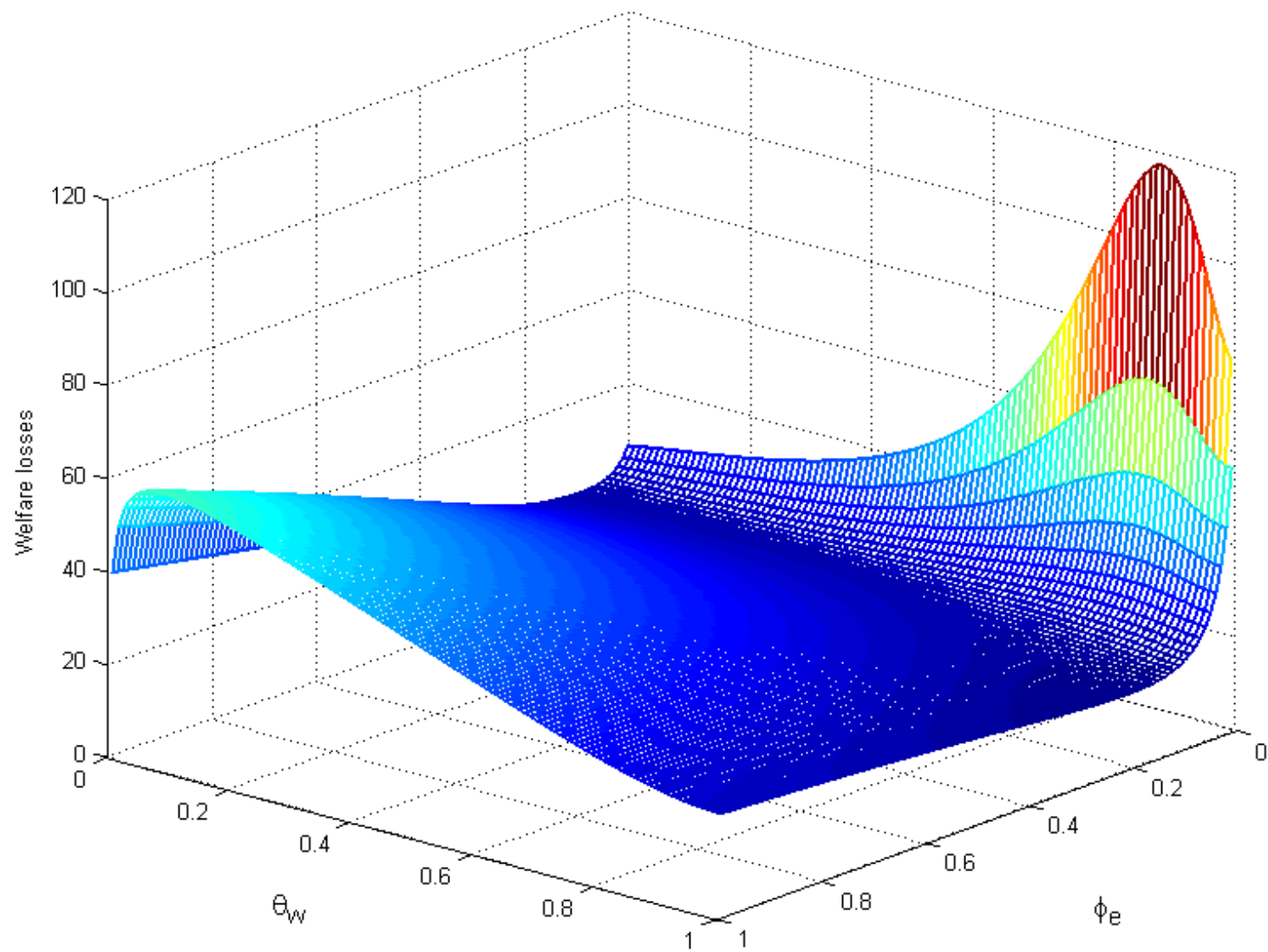


wage inflation

Welfare Impact Regions: Demand Shocks

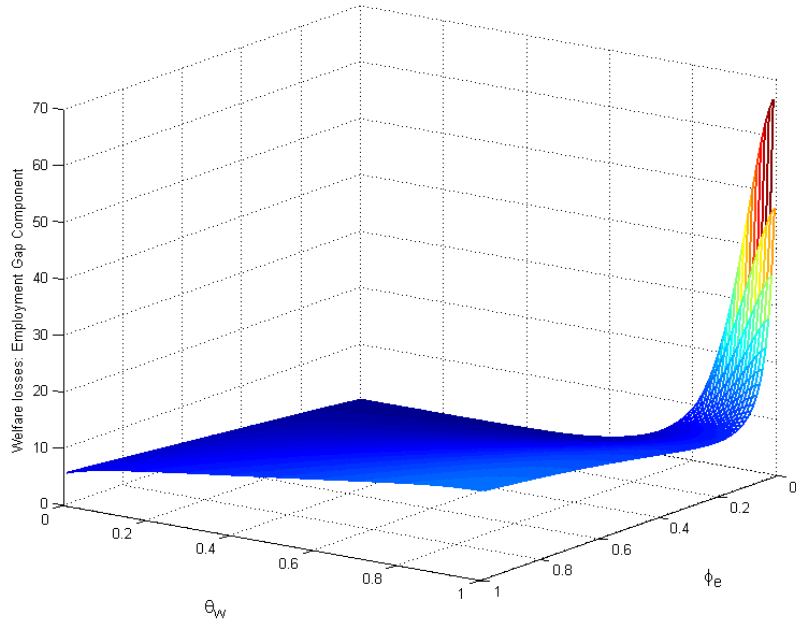


Wage Flexibility, Exchange Rate Policy and Welfare: Technology Shocks

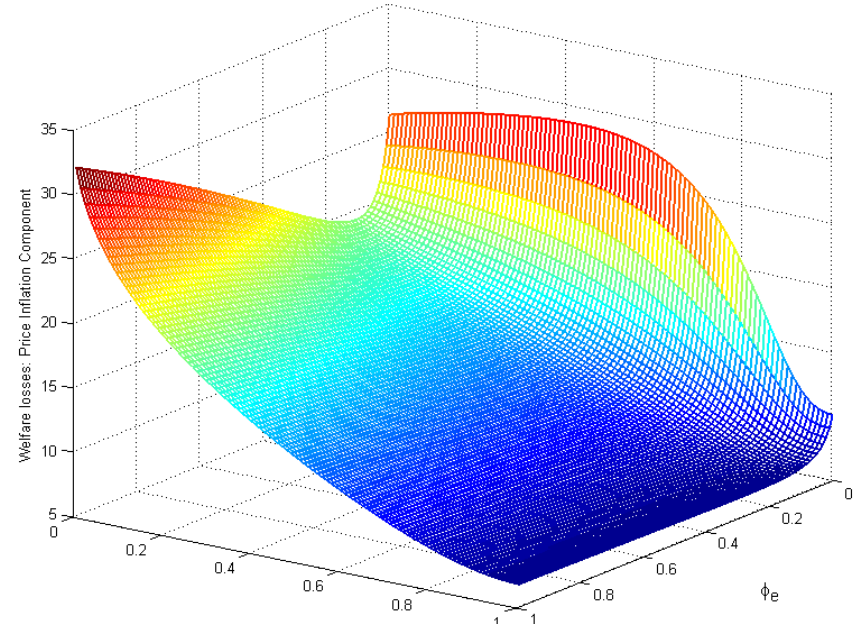


Wage Flexibility, Exchange Rate Policy and Welfare: Technology Shocks

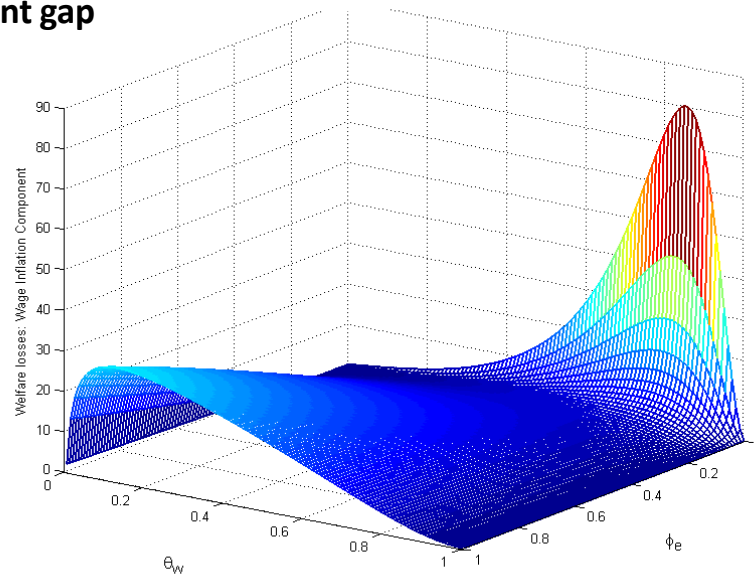
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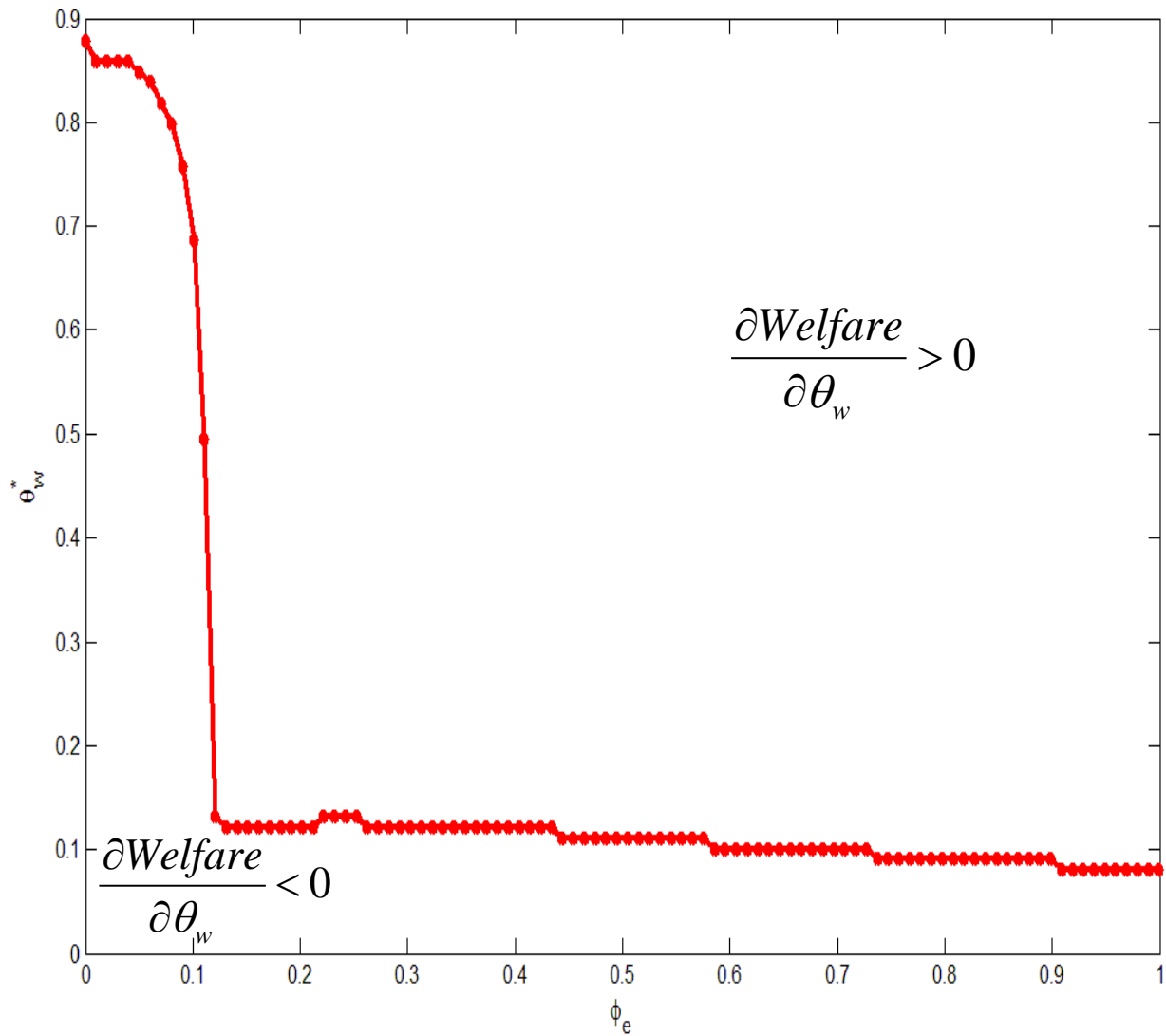


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wage inflation

Welfare Impact Regions: Technology Shocks



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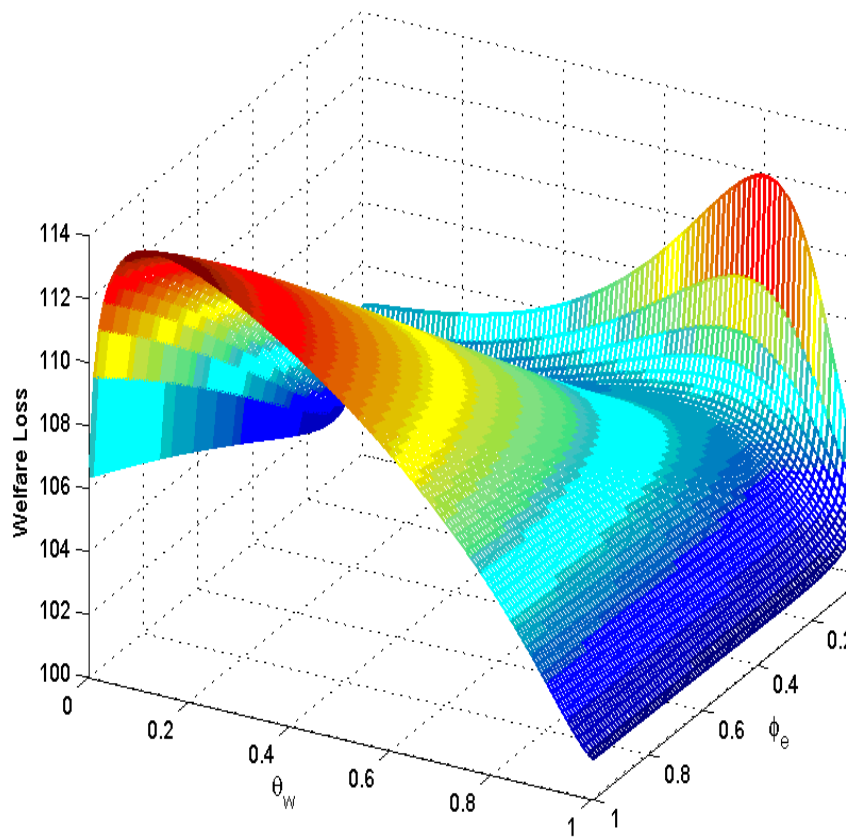
$$\mathbb{L} \sim (1 + \varphi) \text{var}(\tilde{n}_t) + \left(\frac{\epsilon_p}{\lambda_p(1 - \alpha)} \right) \text{var}(\pi_t^p) + \left(\frac{\epsilon_w}{\lambda_w} \right) \text{var}(\pi_t^w)$$

- Conditional analysis:
 - (i) demand shocks
 - (ii) technology shocks
- Robustness to alternative calibrations:
 - trade elasticity, η
 - openness, ν
 - price stickiness, θ_p

Wage Flexibility, Exchange Rate Policy and Welfare: Demand Shocks

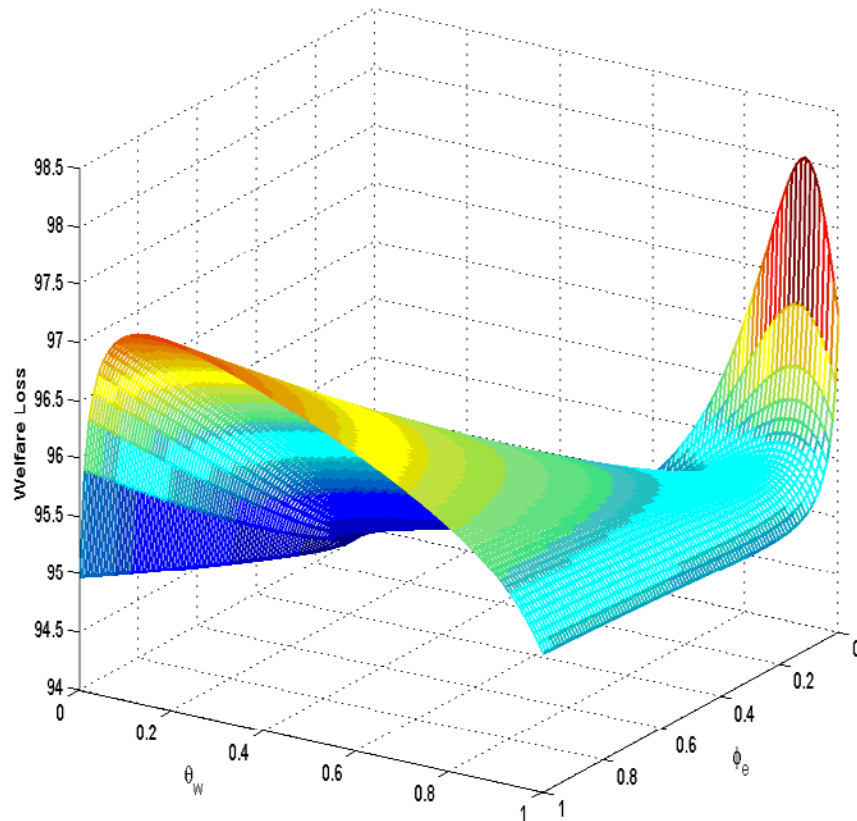
The Case of a Non-Unitary Elasticity of Substitution

$\eta = 1/2$



Low Elasticity

$\eta = 2$



High Elasticity

Figure 5.a Welfare Impact of Enhanced Wage Flexibility: Demand Shocks
The Role of Openness under a High Trade Elasticity ($\eta=2$)

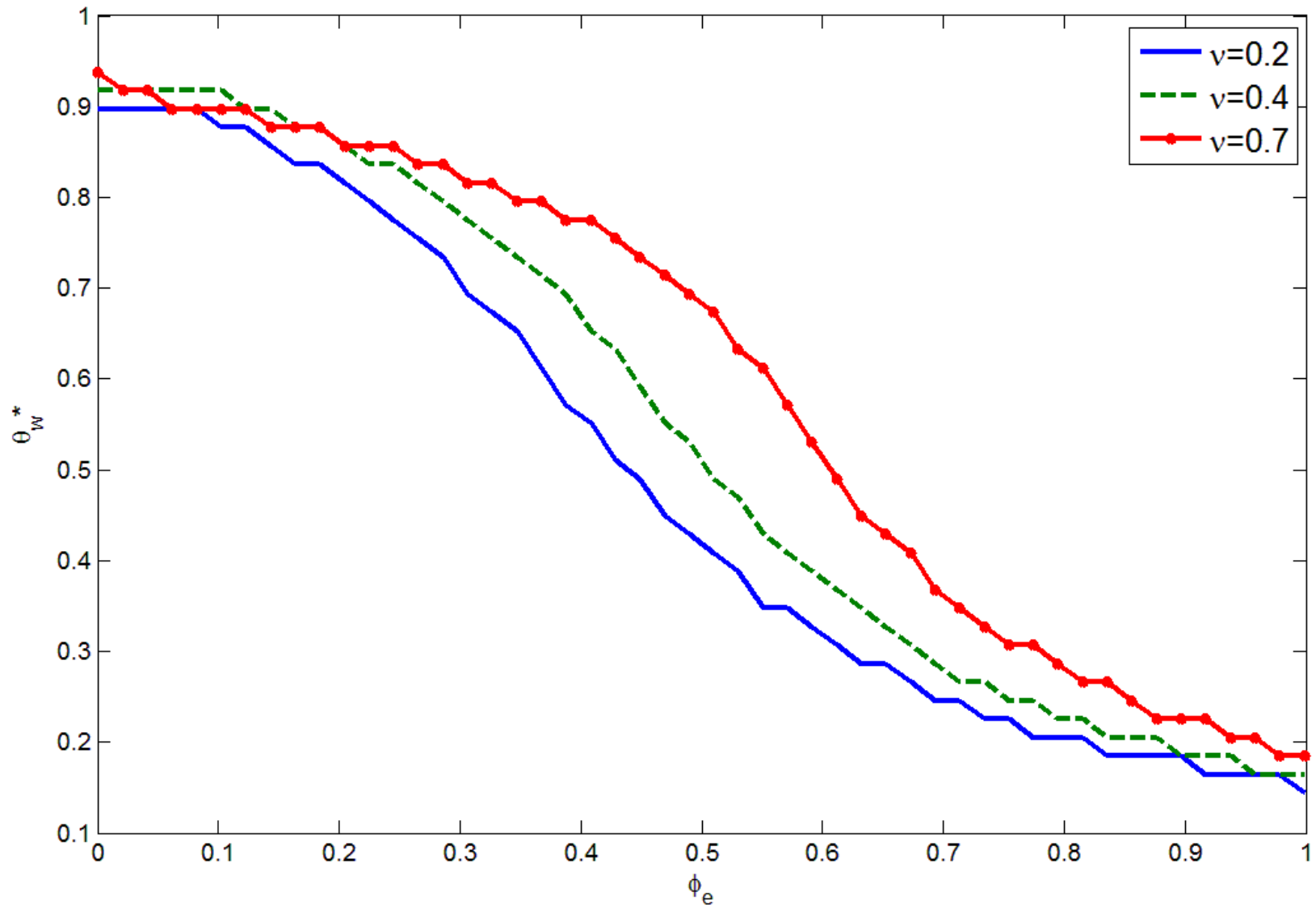
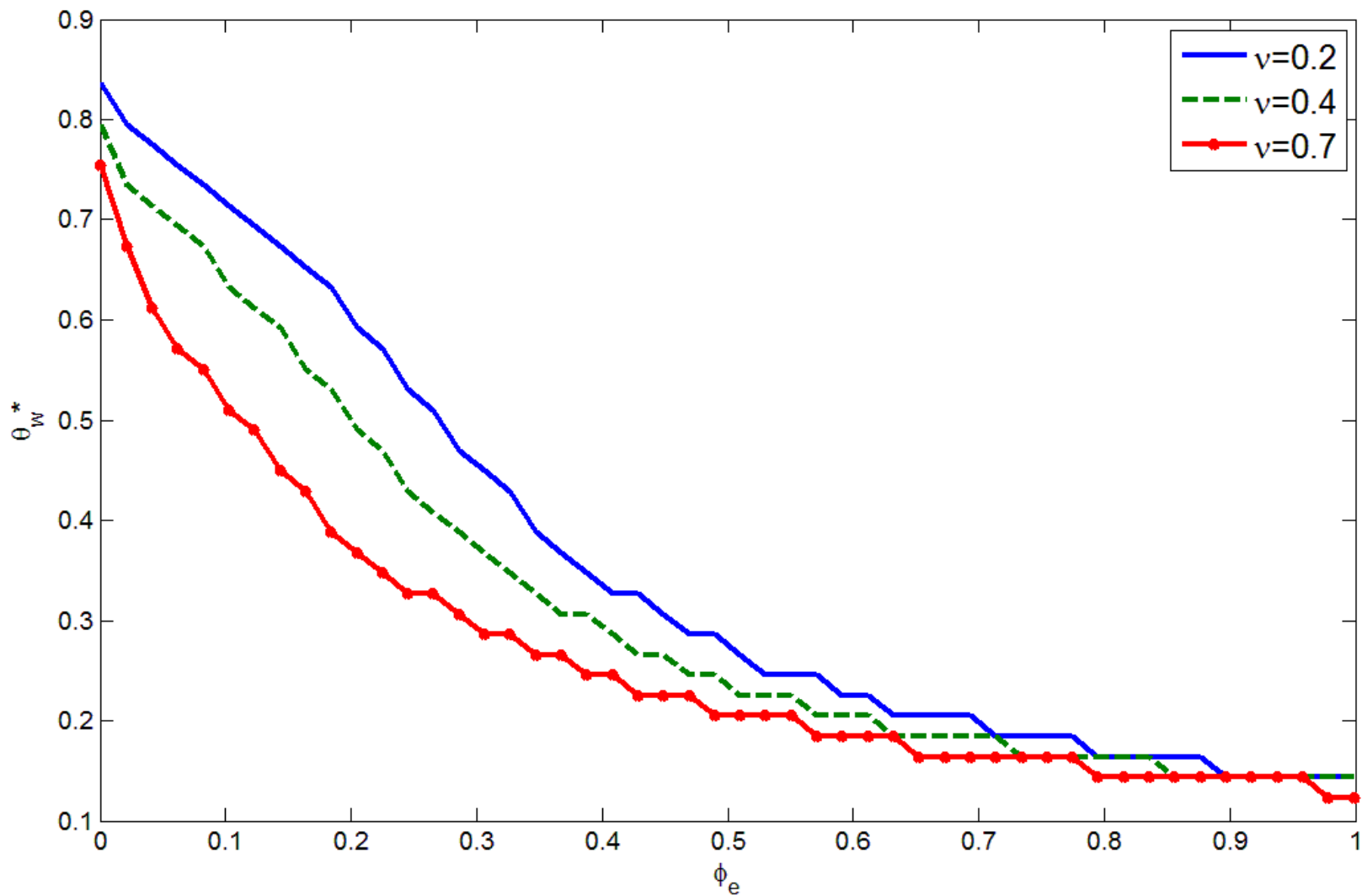
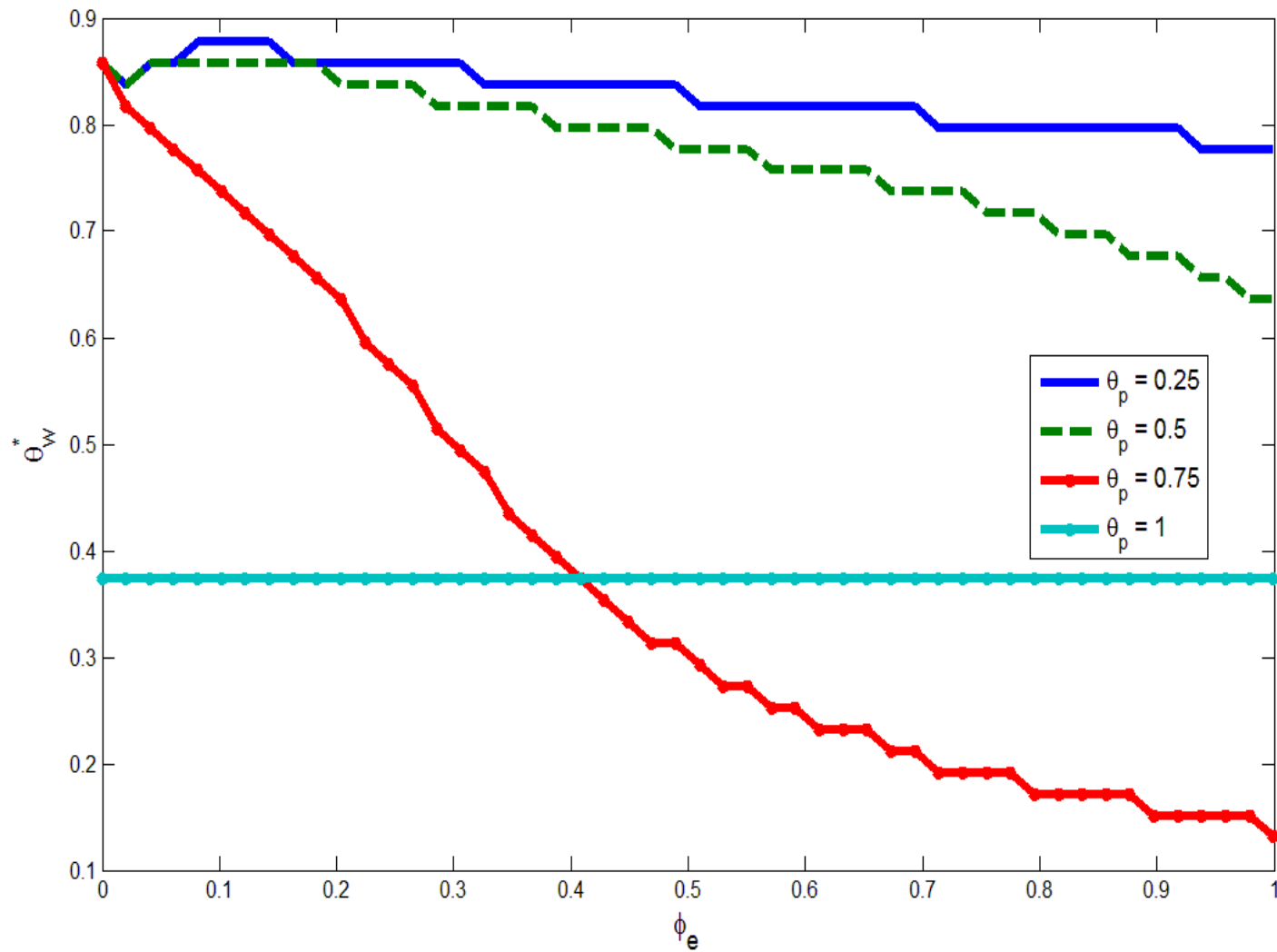


Figure 5.b Welfare Impact of Enhanced Wage Flexibility: Demand Shocks
The Role of Openness under a Low Trade Elasticity ($\eta=0.5$)

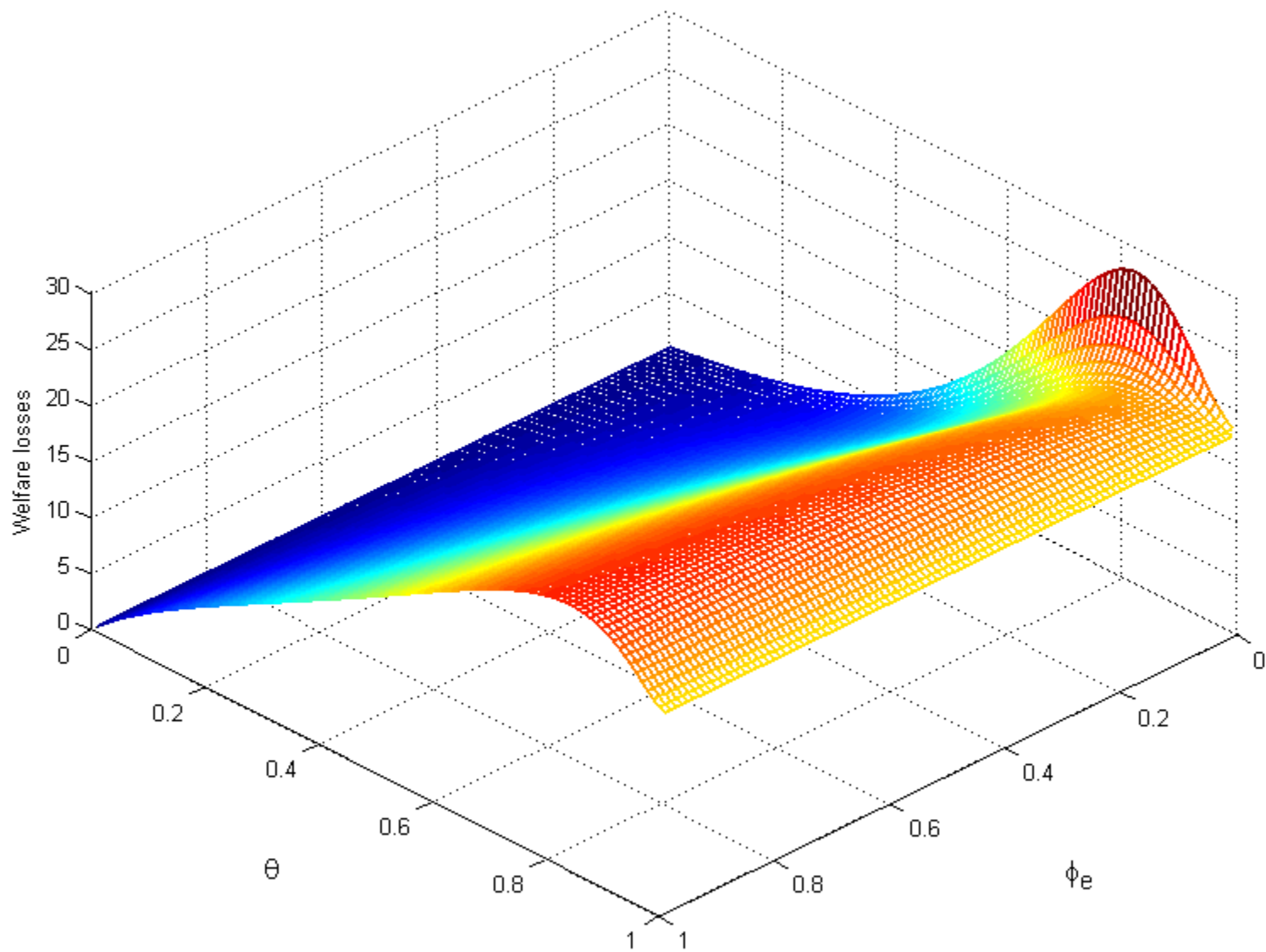


Welfare Impact of Enhanced Wage Flexibility: Demand Shocks

The Role of Price Stickiness



Wage and Price Flexibility, Exchange Rate Policy and Welfare: Demand Shocks



Concluding remarks

- Conventional wisdom

"Wage flexibility is a good thing. More so in a currency union"

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- *Finding #1*: Effectiveness of labor cost adjustments on employment inversely related to exchange rate "rigidity"

⇒ least effective in a currency union

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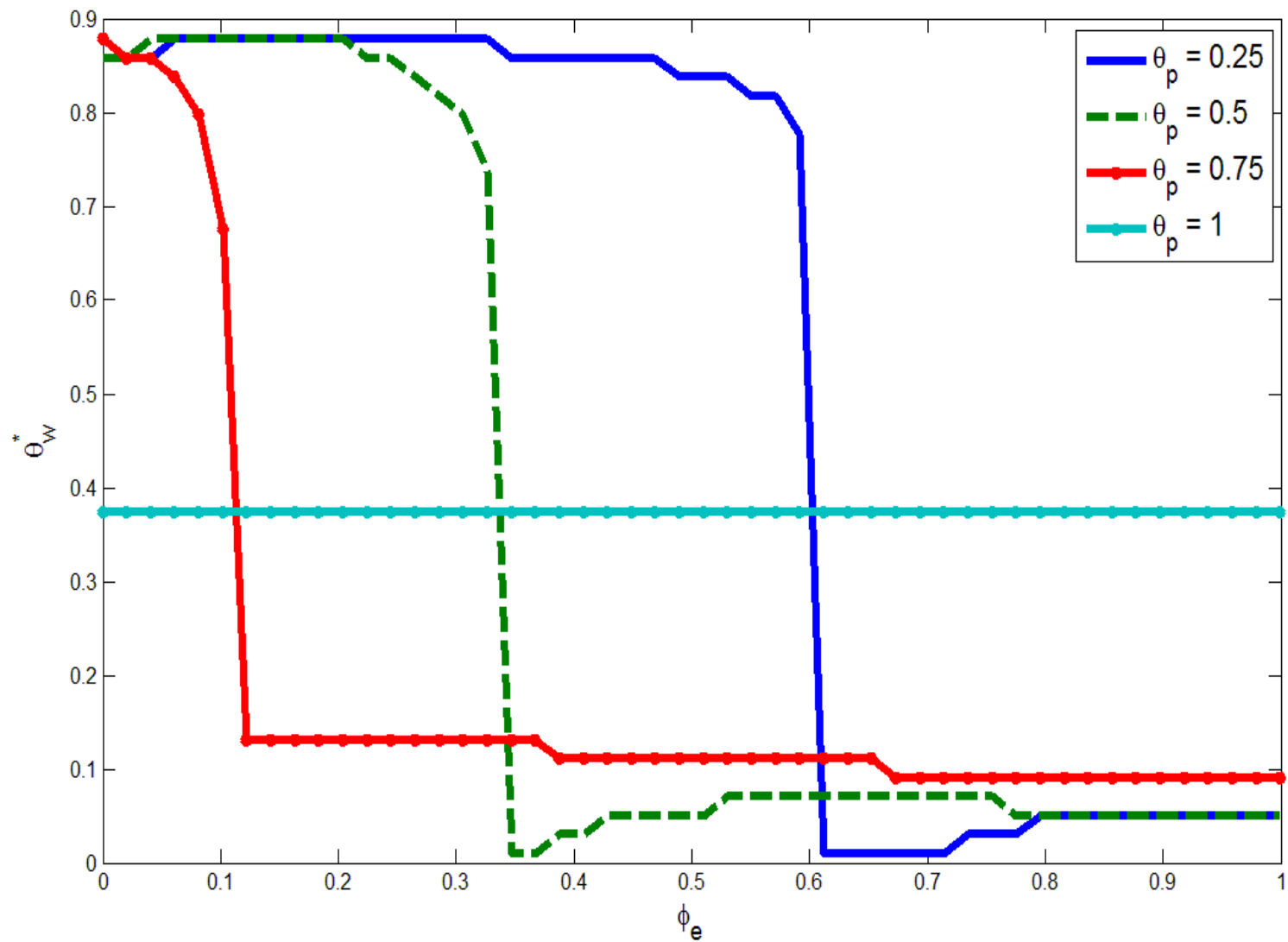
⇒ least effective in a currency union

- *Finding #2*: Increased wage flexibility often welfare-reducing.

⇒ more likely so in a currency union.

Welfare Impact of Enhanced Wage Flexibility: Technology Shocks

The Role of Price Stickiness



Wage and Price Flexibility, Exchange Rate Policy and Welfare: Technology Shocks

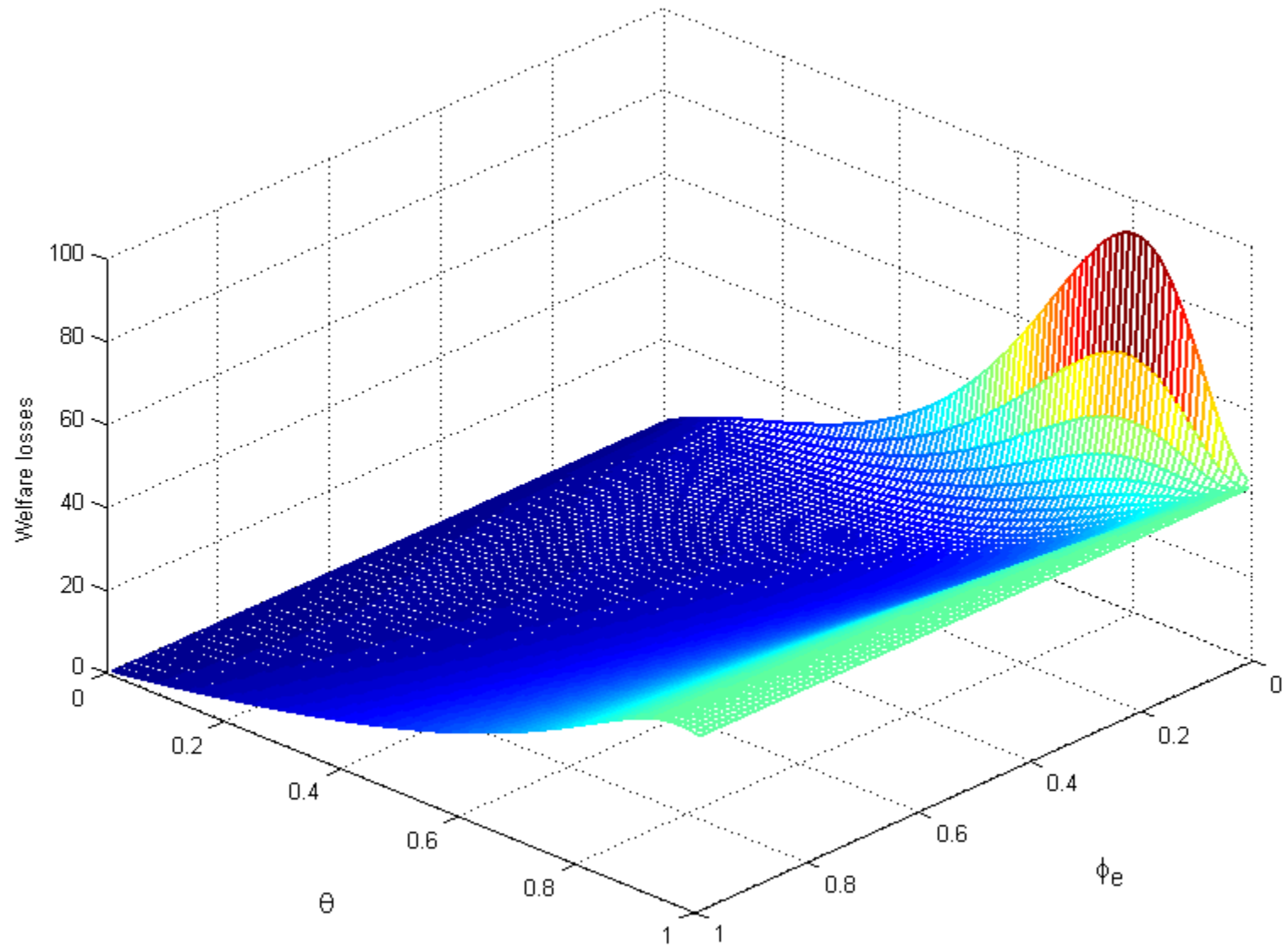


Figure 19
Wage Flexibility, Monetary Policy and Welfare
Technology Shocks

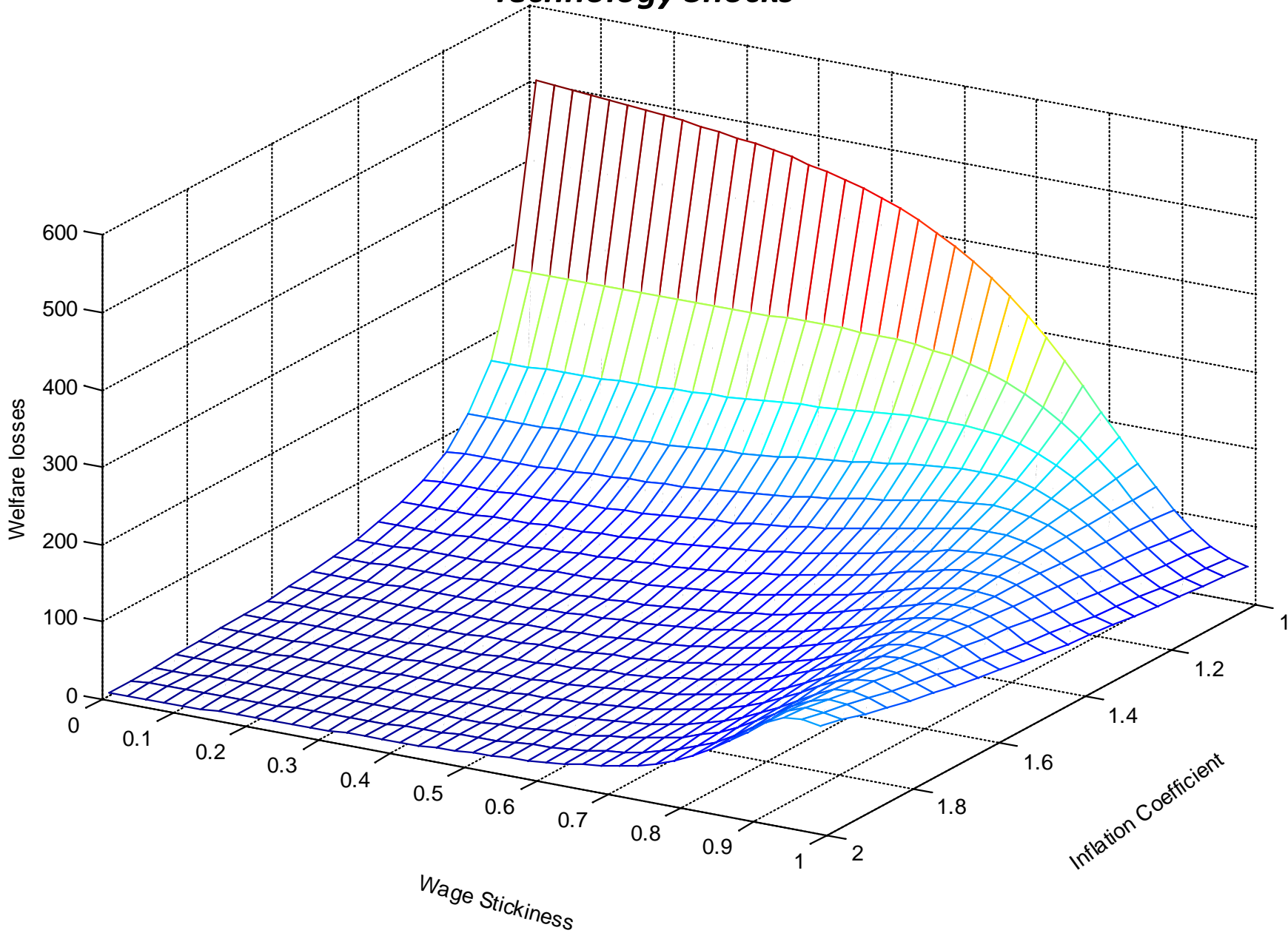
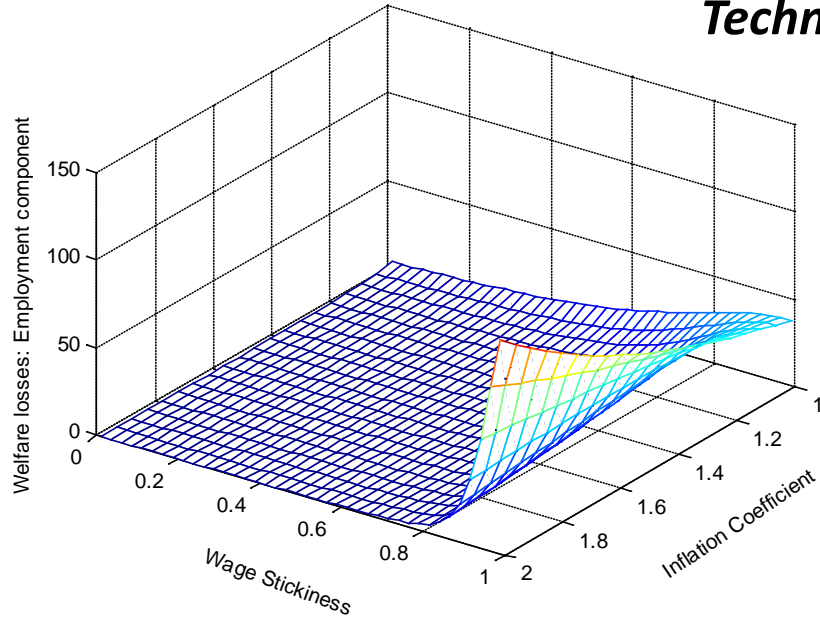


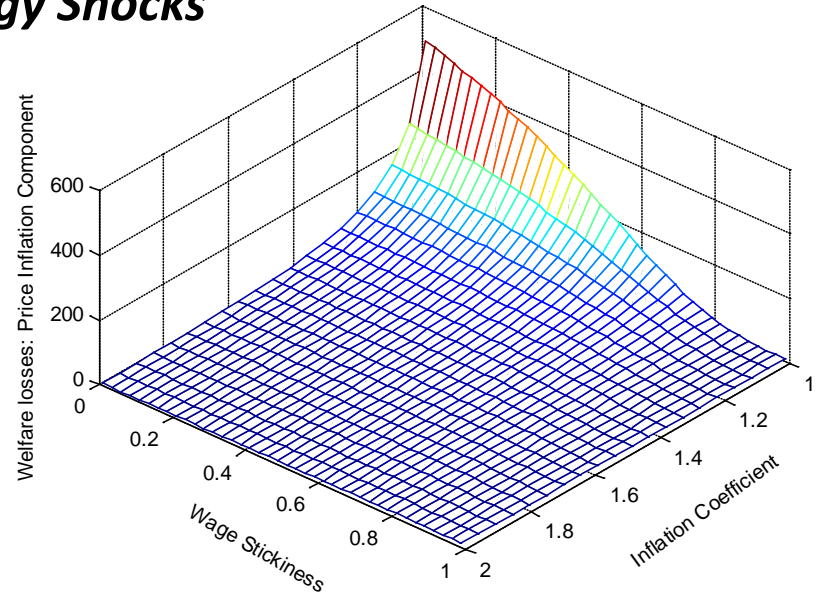
Figure 20

Decomposition of Welfare Losses

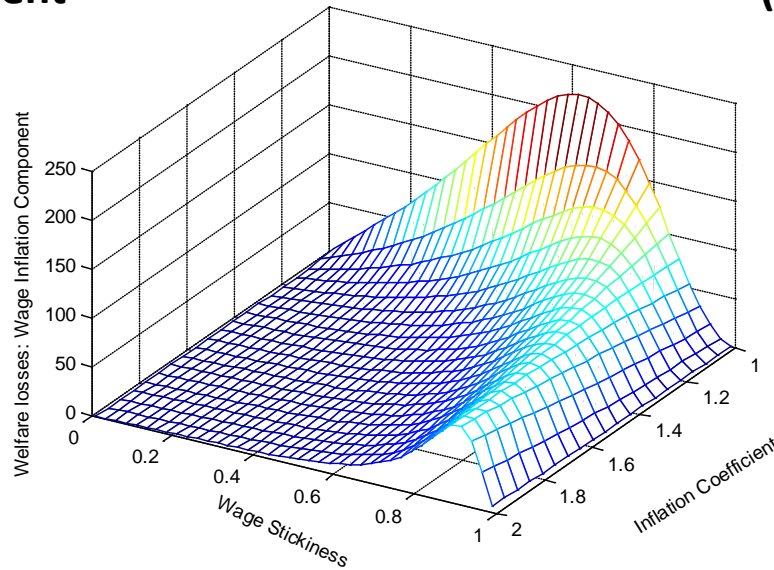
Technology Shocks



(i) Employment



(ii) Price Inflation



(iii) Wage Inflation