

# Understanding the Gains from Wage Flexibility: The Exchange Rate Connection

Jordi Galí Tommaso Monacelli

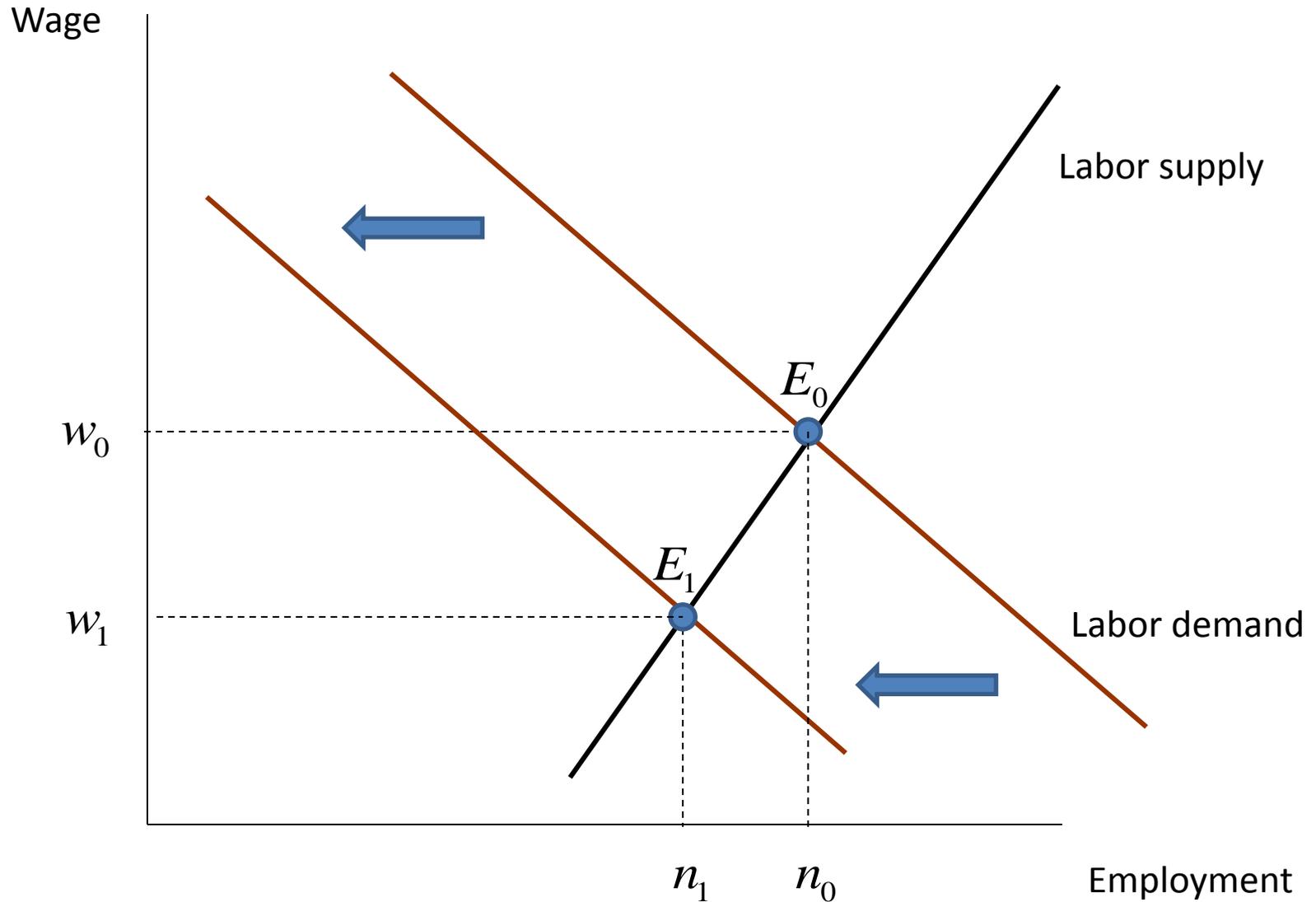
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# Gains from Wage Flexibility: The Conventional Wisdom

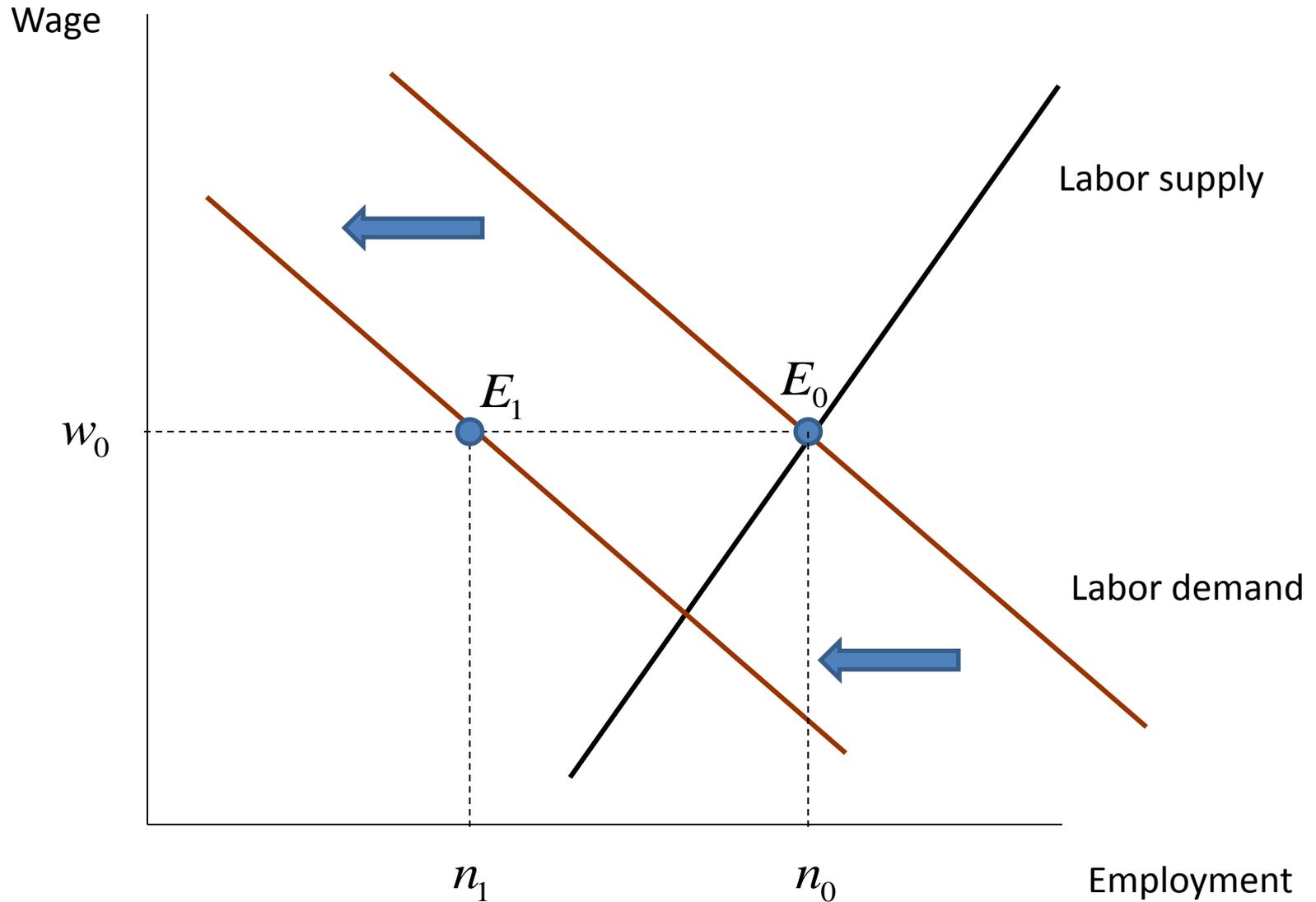
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*"Wage flexibility is a good thing"*

# Wage Flexibility and Employment Stability: The Classical View



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# Gains from Wage Flexibility: The Conventional Wisdom

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- 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  $\phi_\pi$  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  $\phi_\pi$  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

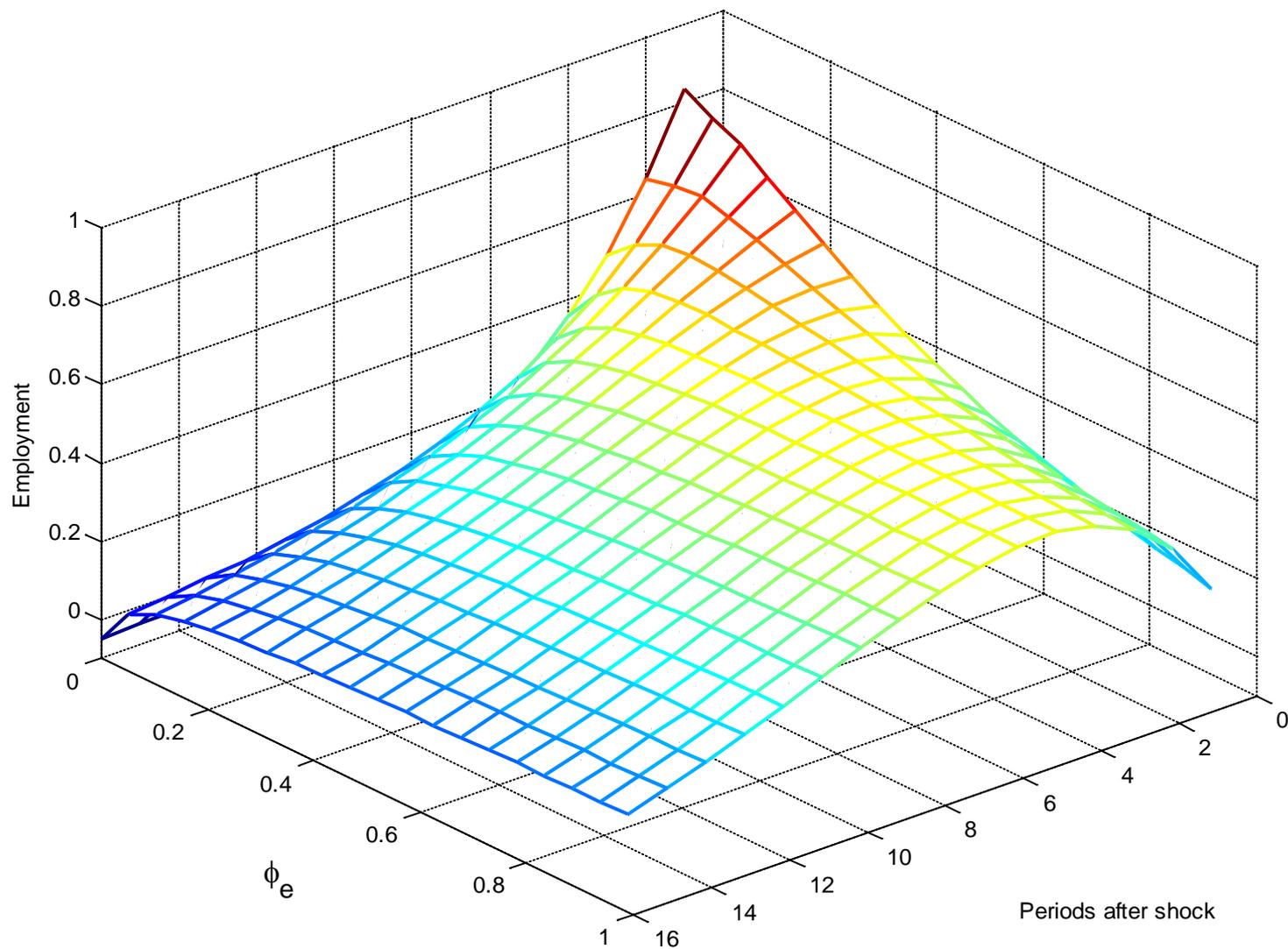
- Exogenous payroll tax process

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

- 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  $\phi_e$

**Figure 1.a. 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:

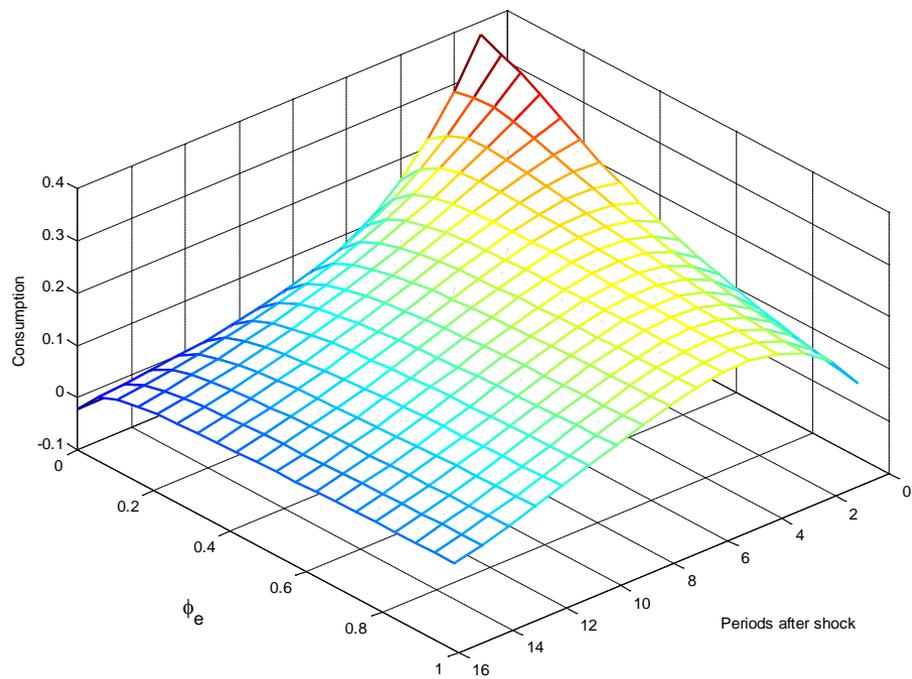
$$c_t = x_t - (1 - \nu)E_t \left\{ \sum_{k=0}^{\infty} (i_{t+k} - E_t\{\pi_{H,t+1+k}\}) \right\}$$

- Equilibrium terms of trade:

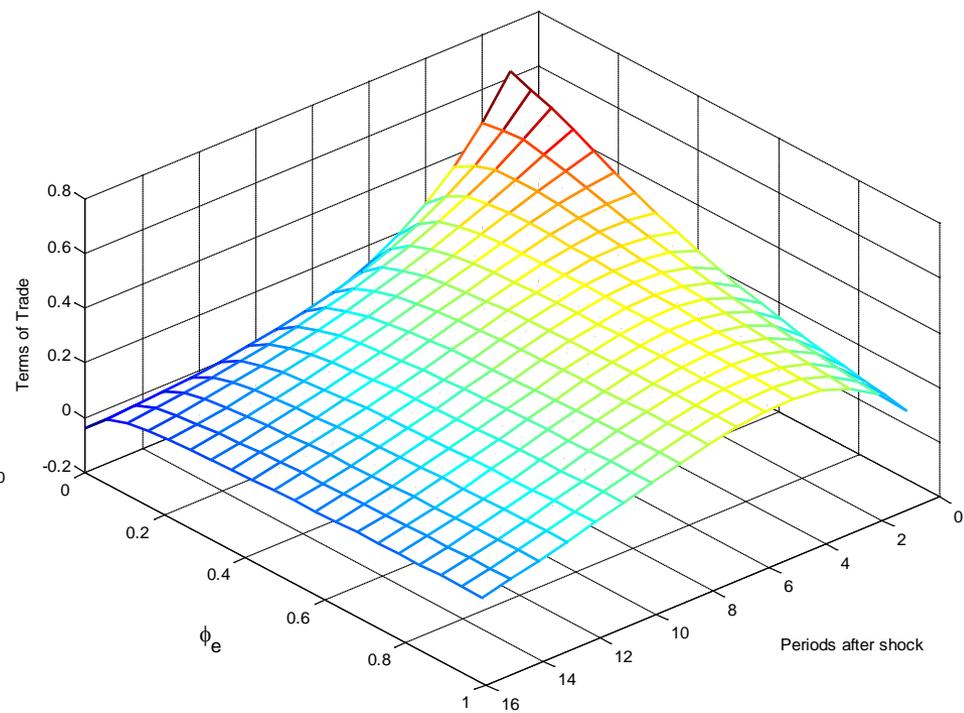
$$s_t = -E_t \left\{ \sum_{k=0}^{\infty} (i_{t+k} - E_t\{\pi_{H,t+1+k}\}) \right\}$$

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

# Figure 1.b. Dynamic Responses to a Payroll Tax Cut

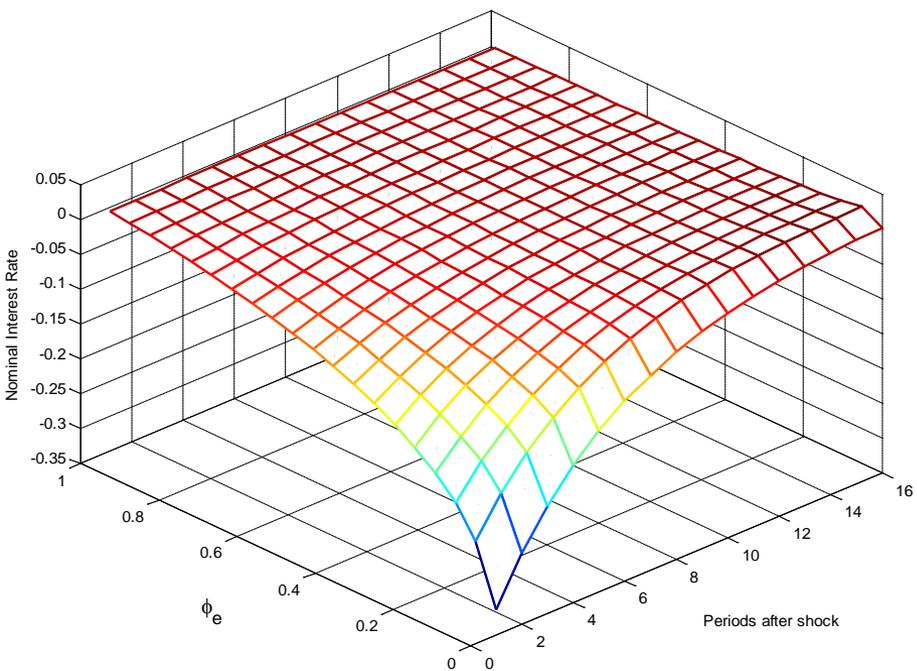


## Consumption

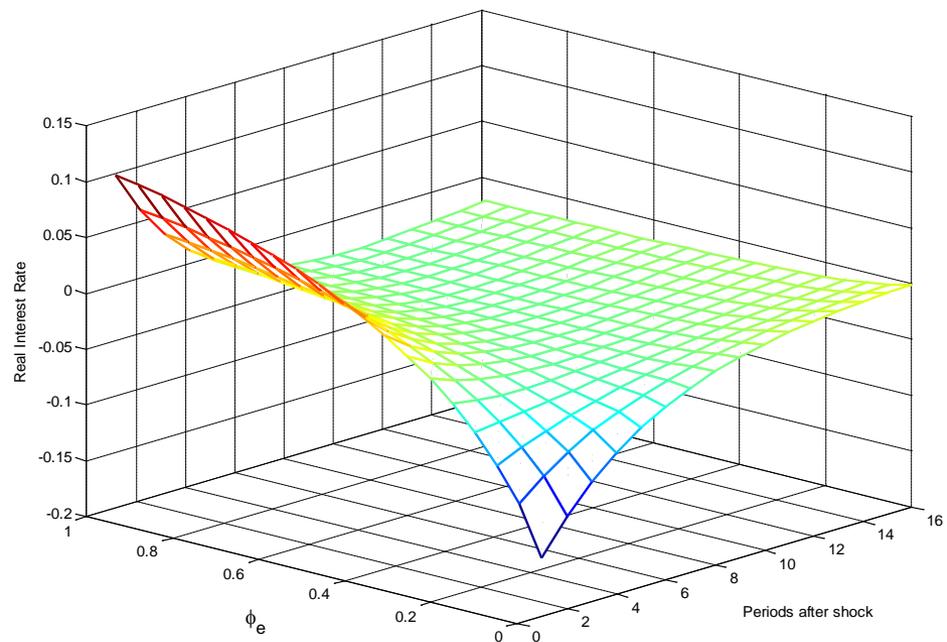


## Terms of Trade

# Figure 1.c. Dynamic Responses to a Payroll Tax Cut



**Nominal interest rate**



**Real interest rate**

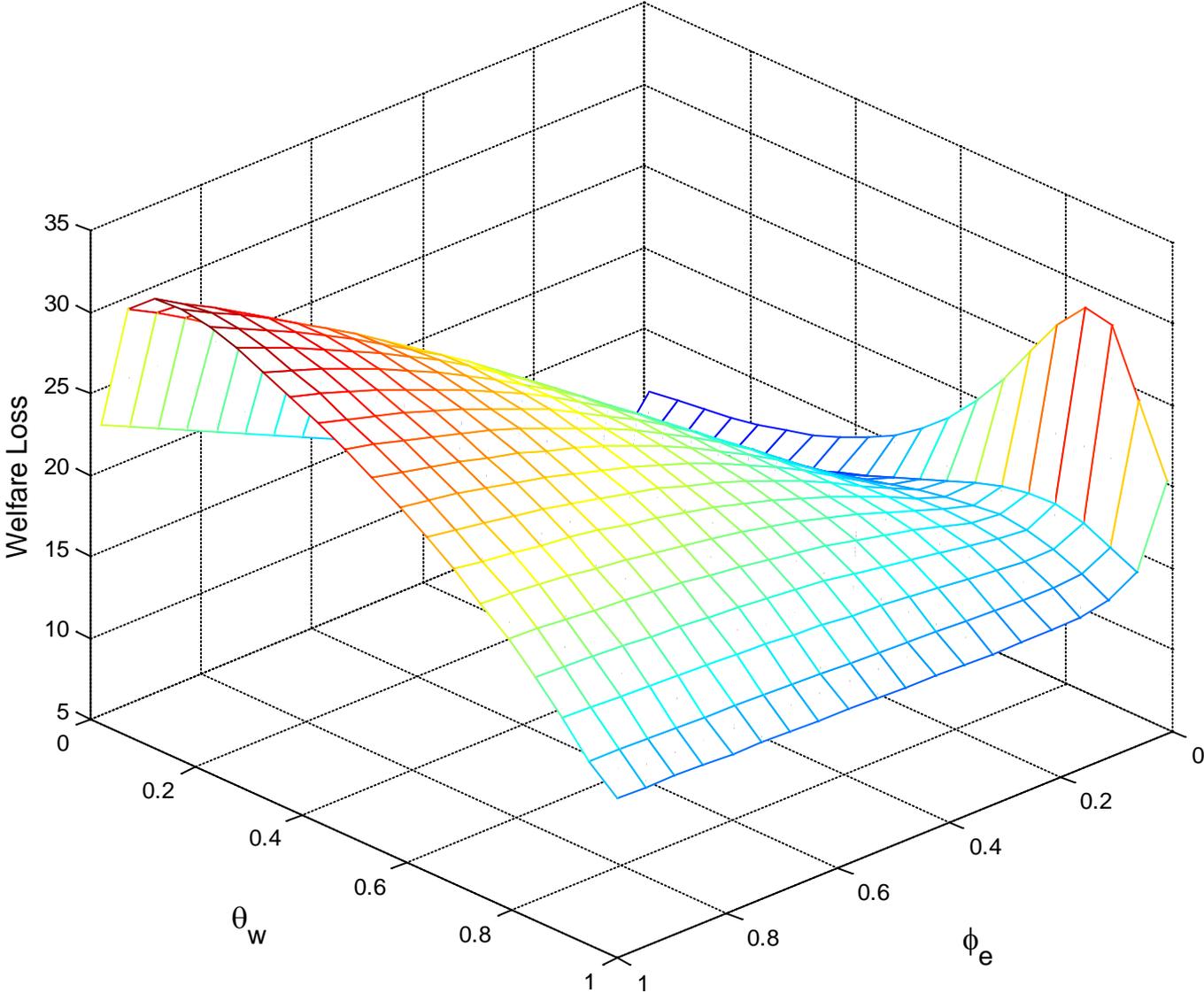
# Welfare Gains from Increased Wage Flexibility: The Exchange Rate Connection

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

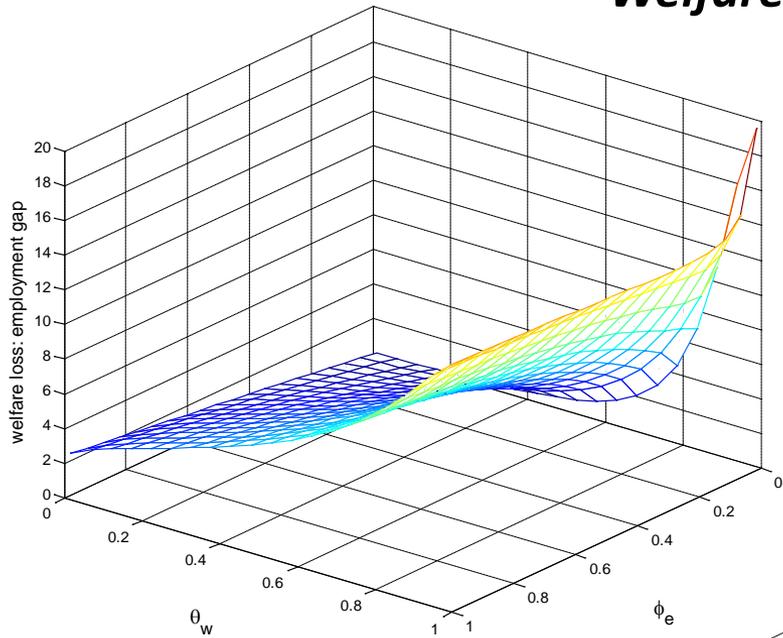
$$\mathbb{L} \sim (1 + \varphi) \text{var}(\tilde{n}_t) + \left( \frac{\epsilon_p}{\lambda_p(1 - \alpha)} \right) \text{var}(\pi_t^p) + \left( \frac{\epsilon_w}{\lambda_w} \right) \text{var}(\pi_t^w)$$

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

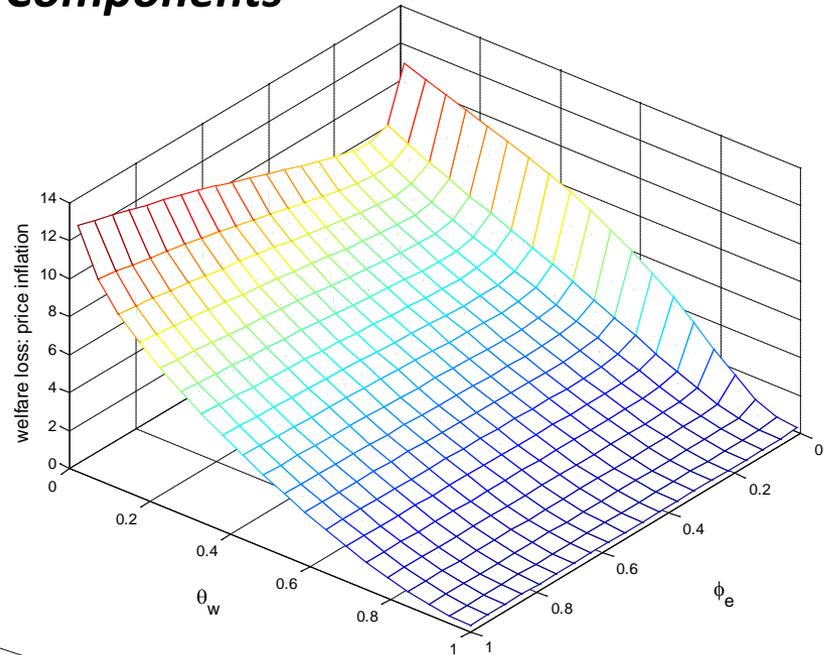
**Figure 2.a. Wage Flexibility, Exchange Rate Policy and Welfare: Demand Shocks**



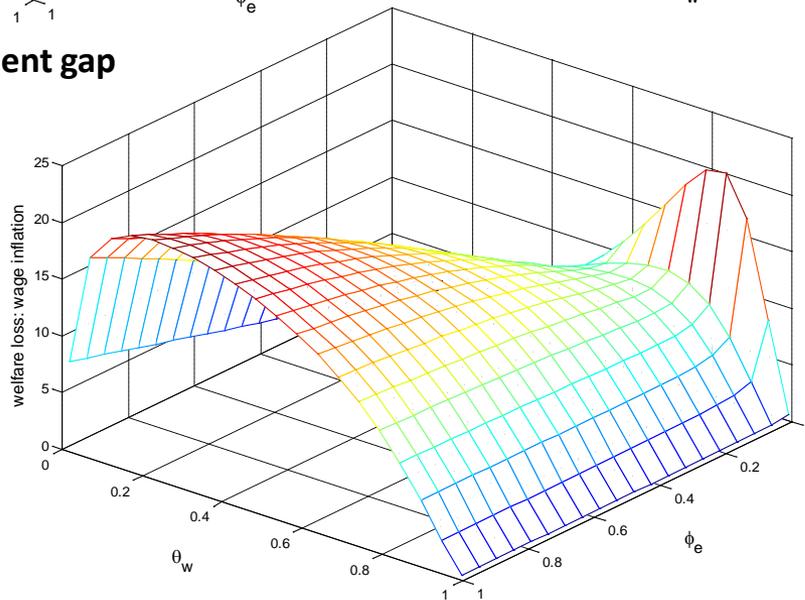
**Figure 2.b. Wage Flexibility, Exchange Rate Policy and Welfare: Demand Shocks**  
***Welfare Loss Components***



**employment gap**

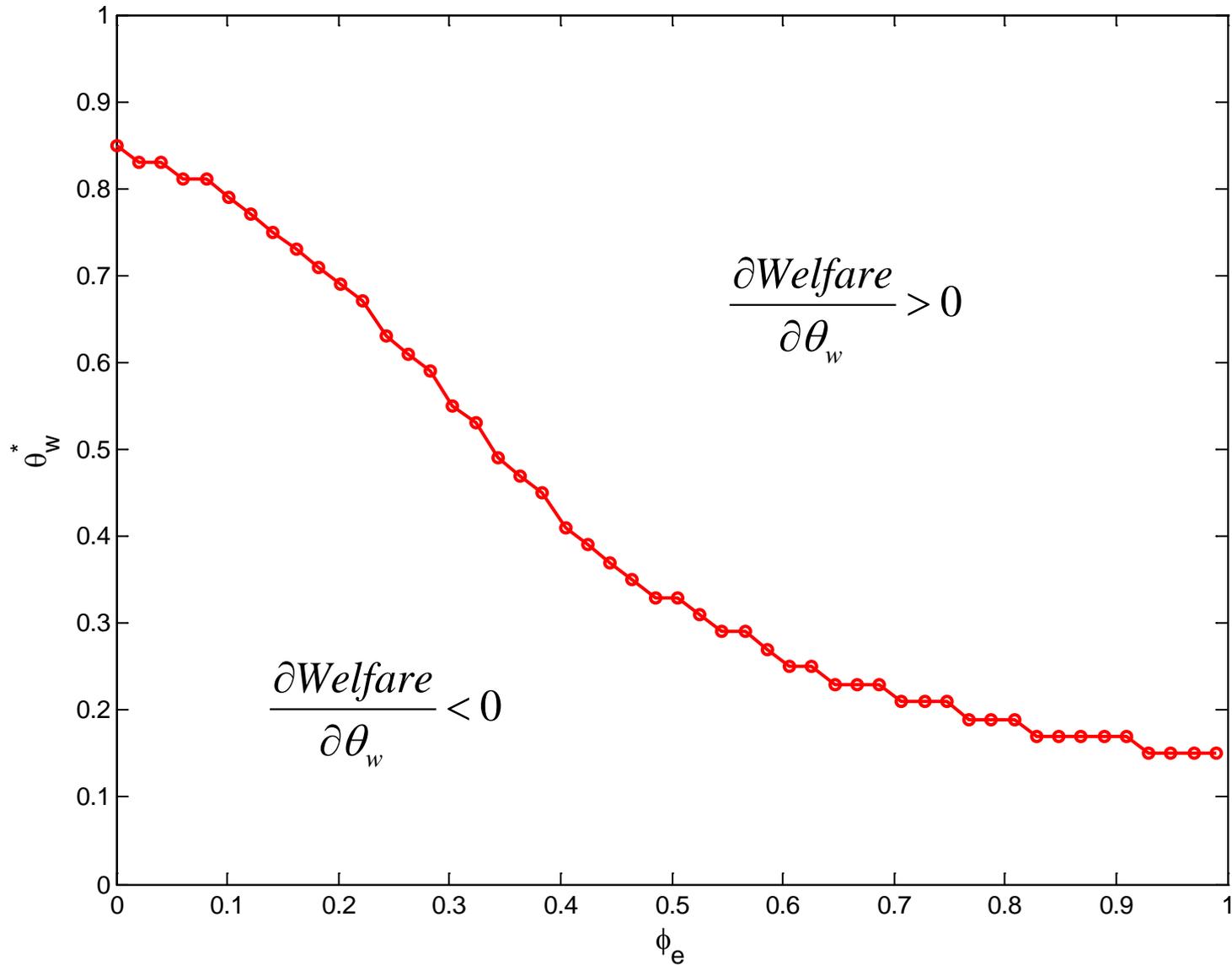


**price inflation**

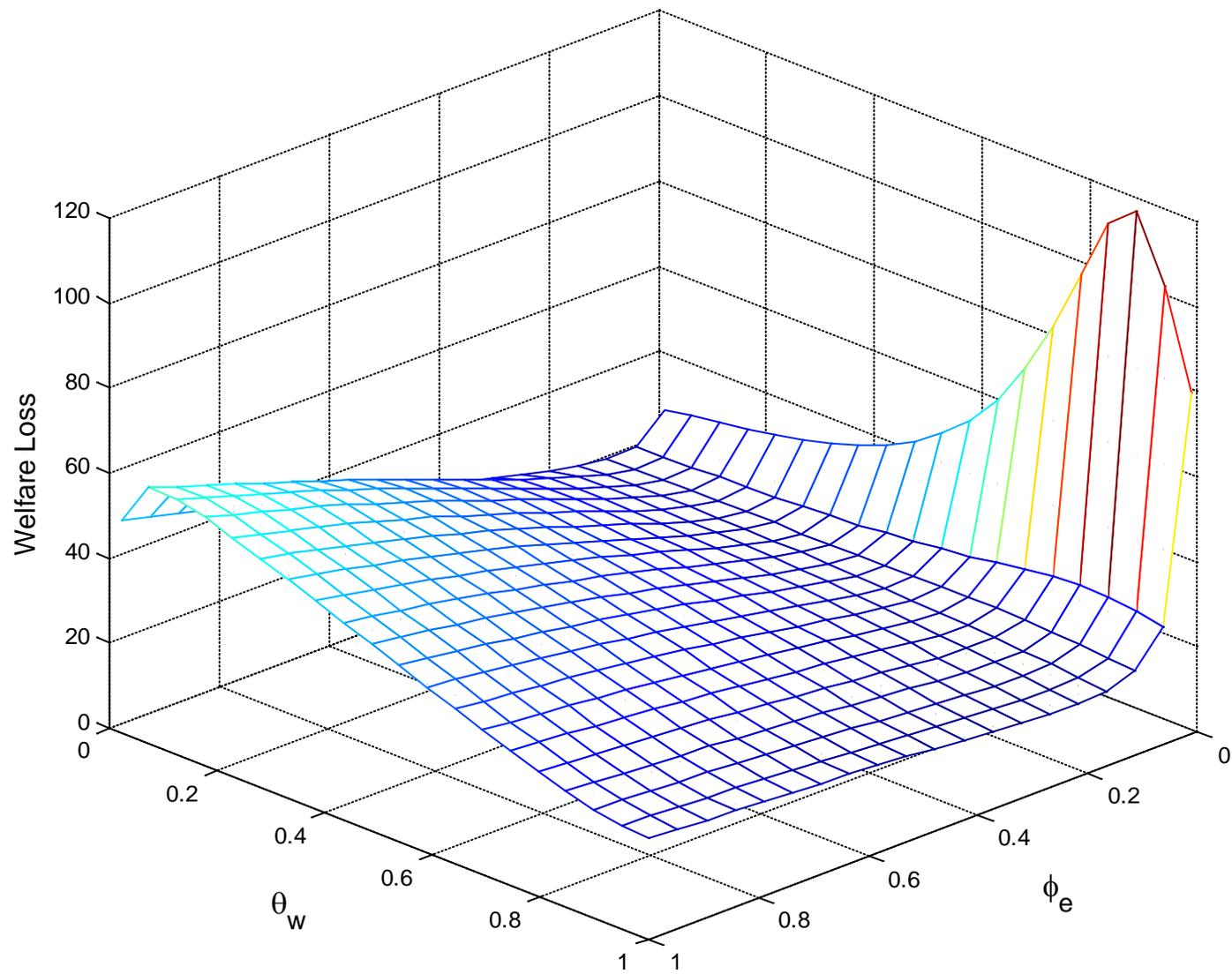


**wage inflation**

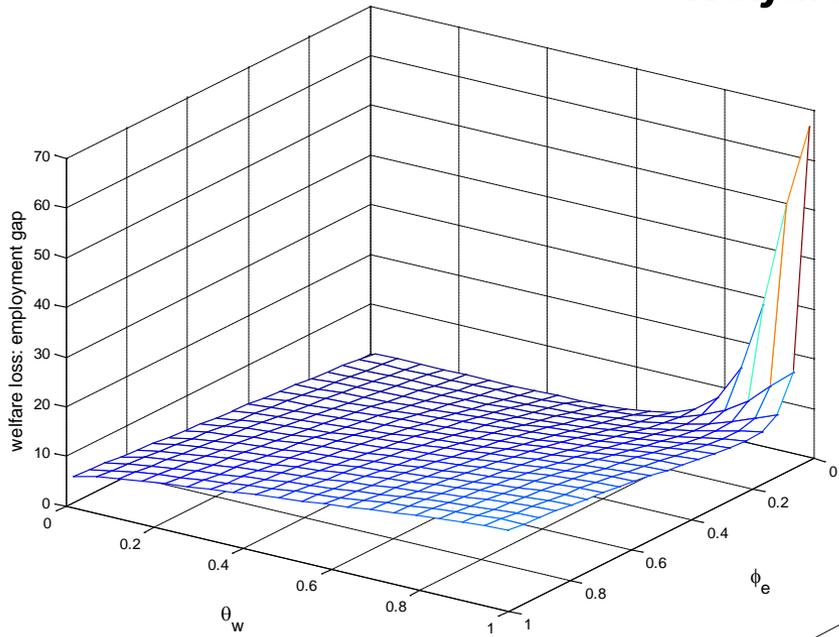
**Figure 2.c. Welfare Impact of Enhanced Wage Flexibility: Demand Shocks**



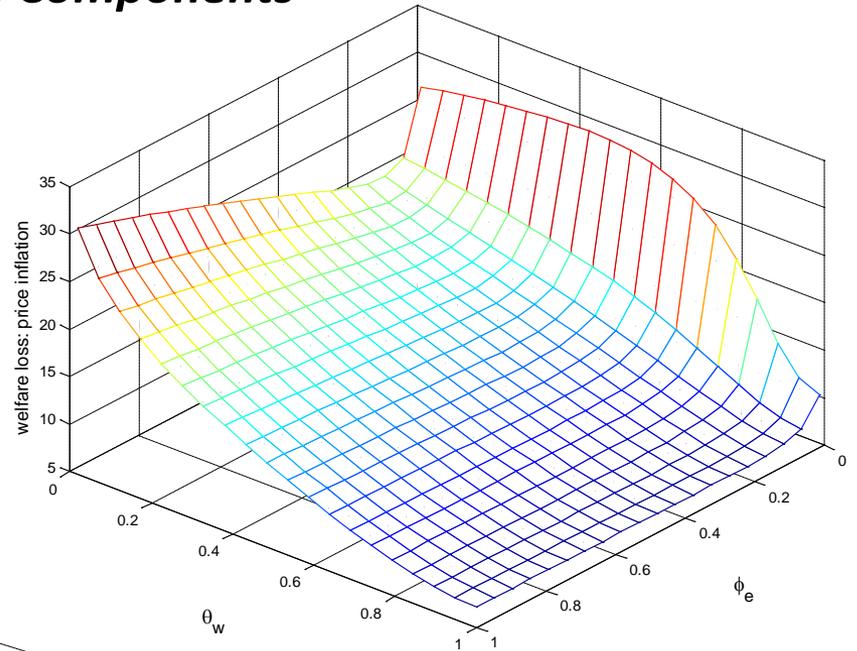
**Figure 3.a. Wage Flexibility, Exchange Rate Policy and Welfare: Technology Shocks**



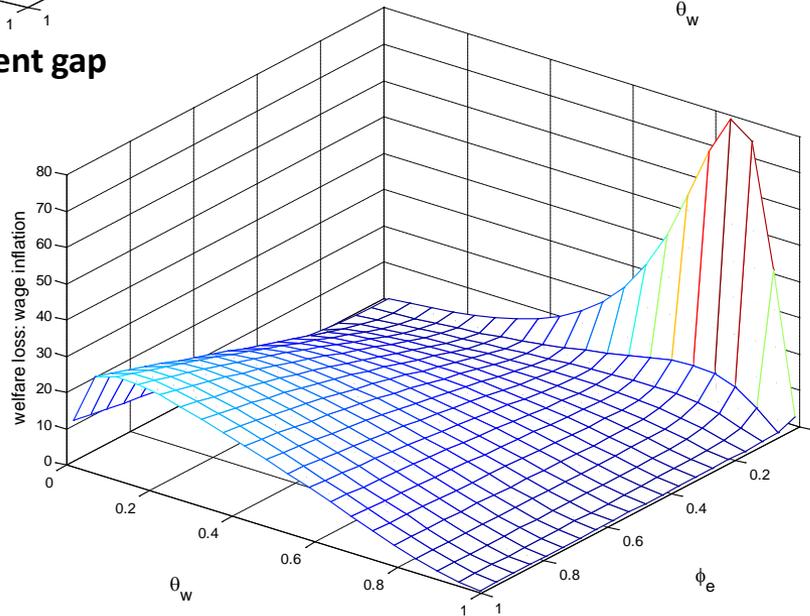
**Figure 3.b: Wage Flexibility, Exchange Rate Policy and Welfare: Technology Shocks**  
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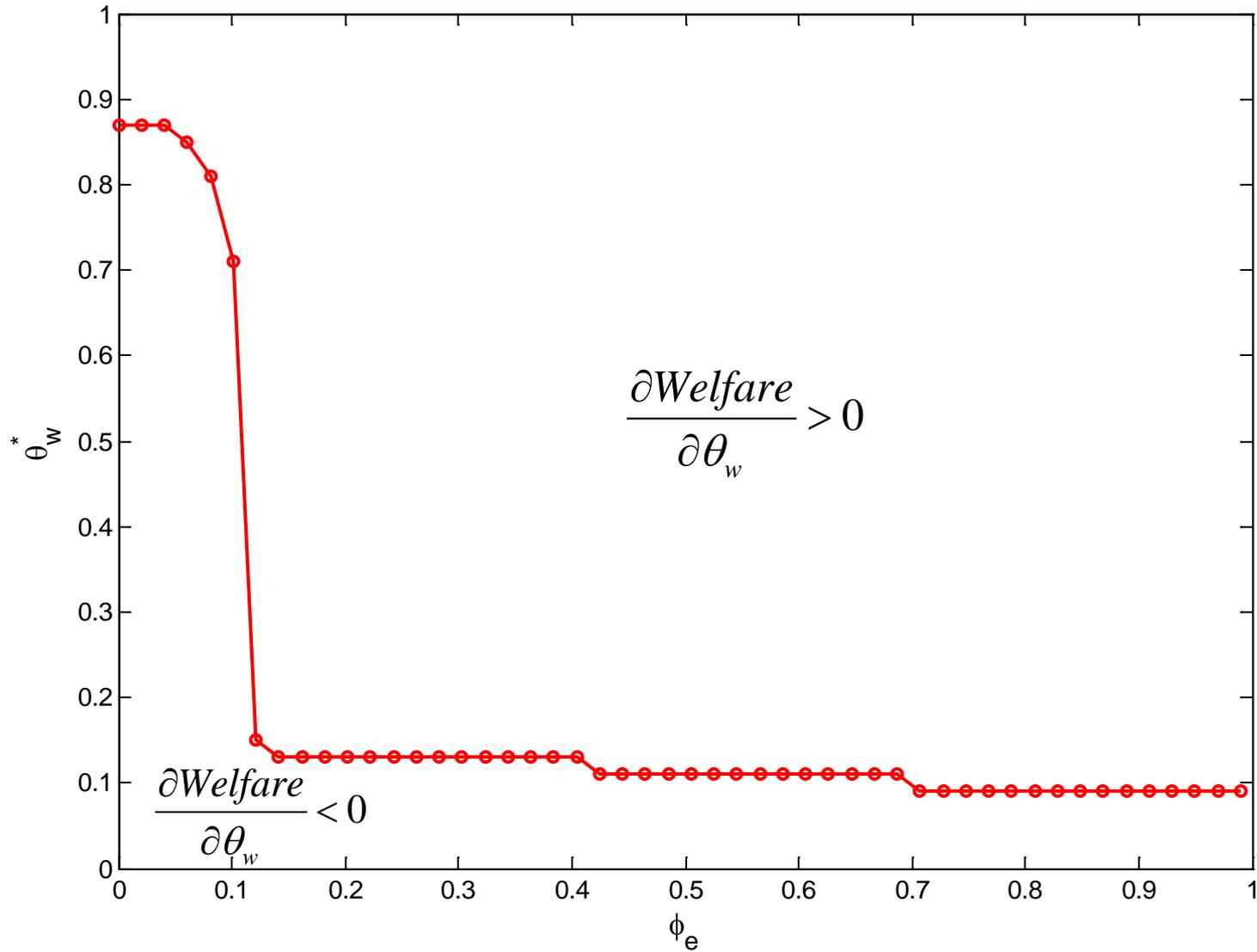


**price inflation**



**wage inflation**

**Figure 3.c. Wage Flexibility, Exchange Rate Policy and Welfare: Technology Shocks**  
*Welfare Impact Regions*



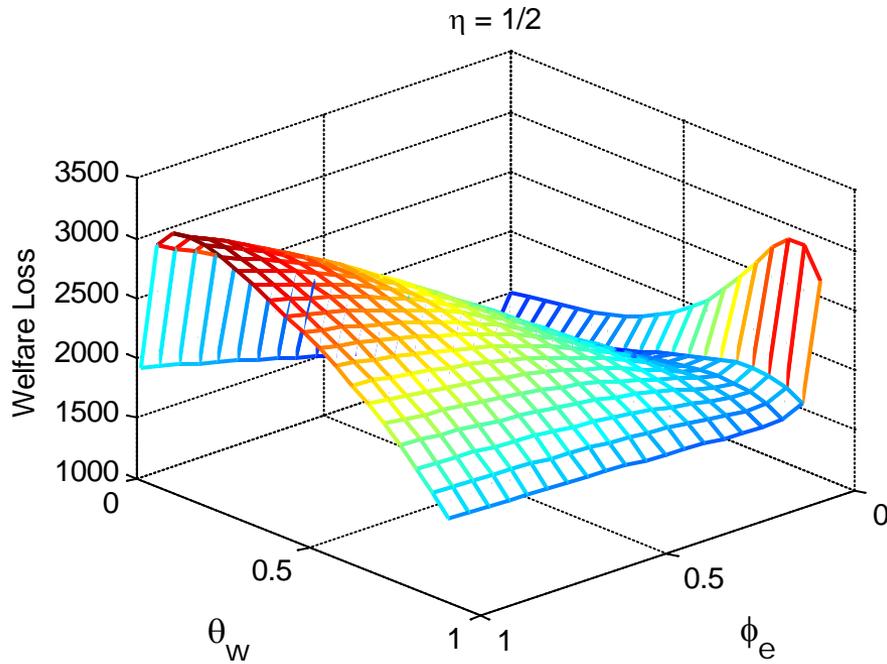
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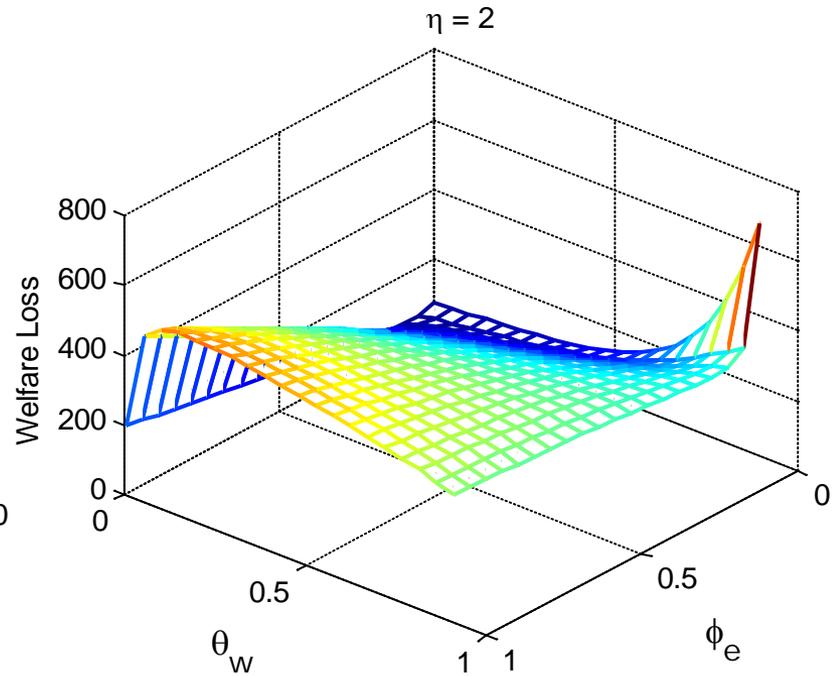
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- Conditional analysis:
  - (i) demand shocks
  - (ii) technology shocks
- Robustness to alternative calibrations:
  - trade elasticity,  $\eta$
  - openness,  $\nu$
  - price stickiness,  $\theta_p$

**Figure 4. Wage Flexibility, Exchange Rate Policy and Welfare: Demand Shocks**  
*The Case of a Non-Unitary Elasticity of Substitution*

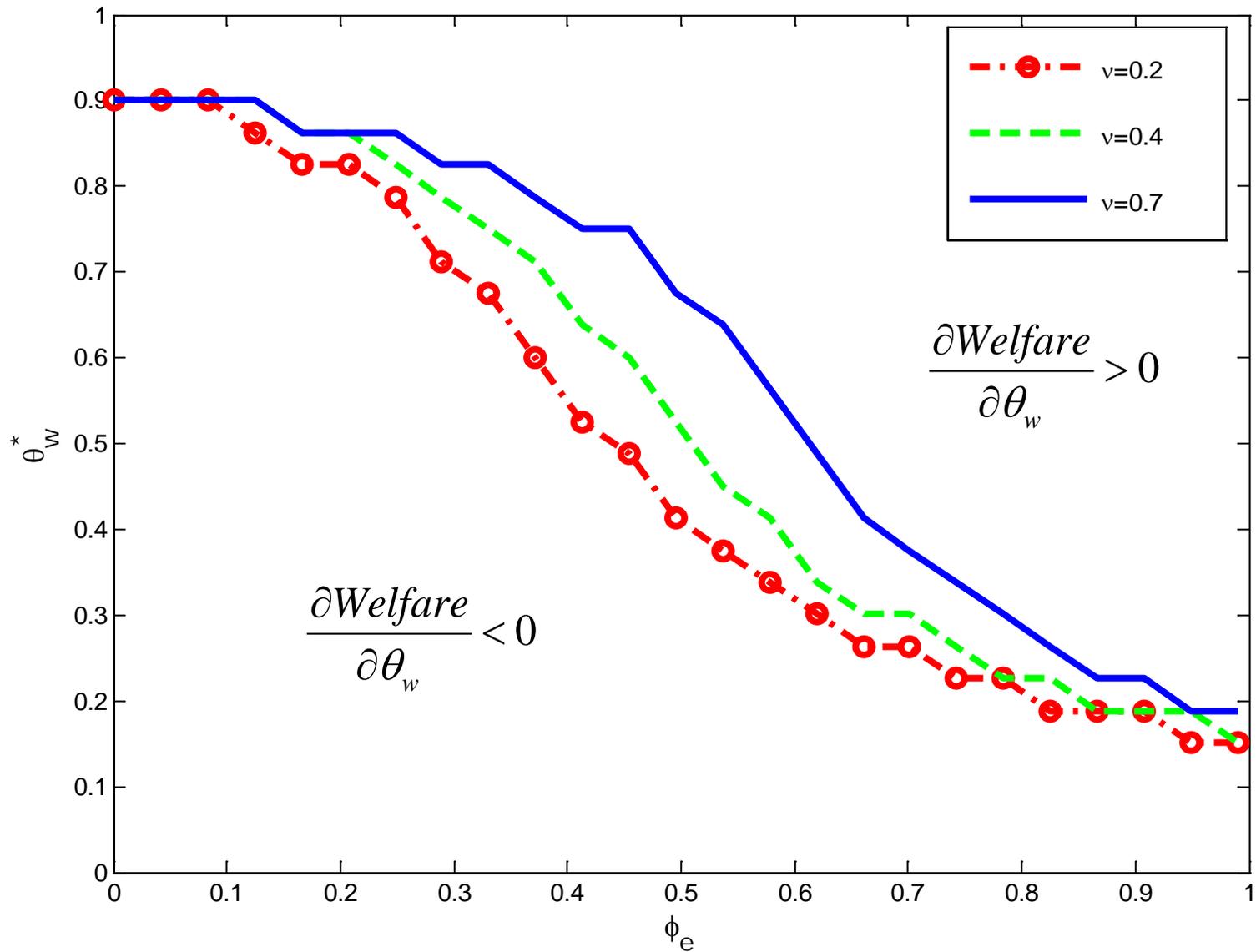


**Low Elasticity**

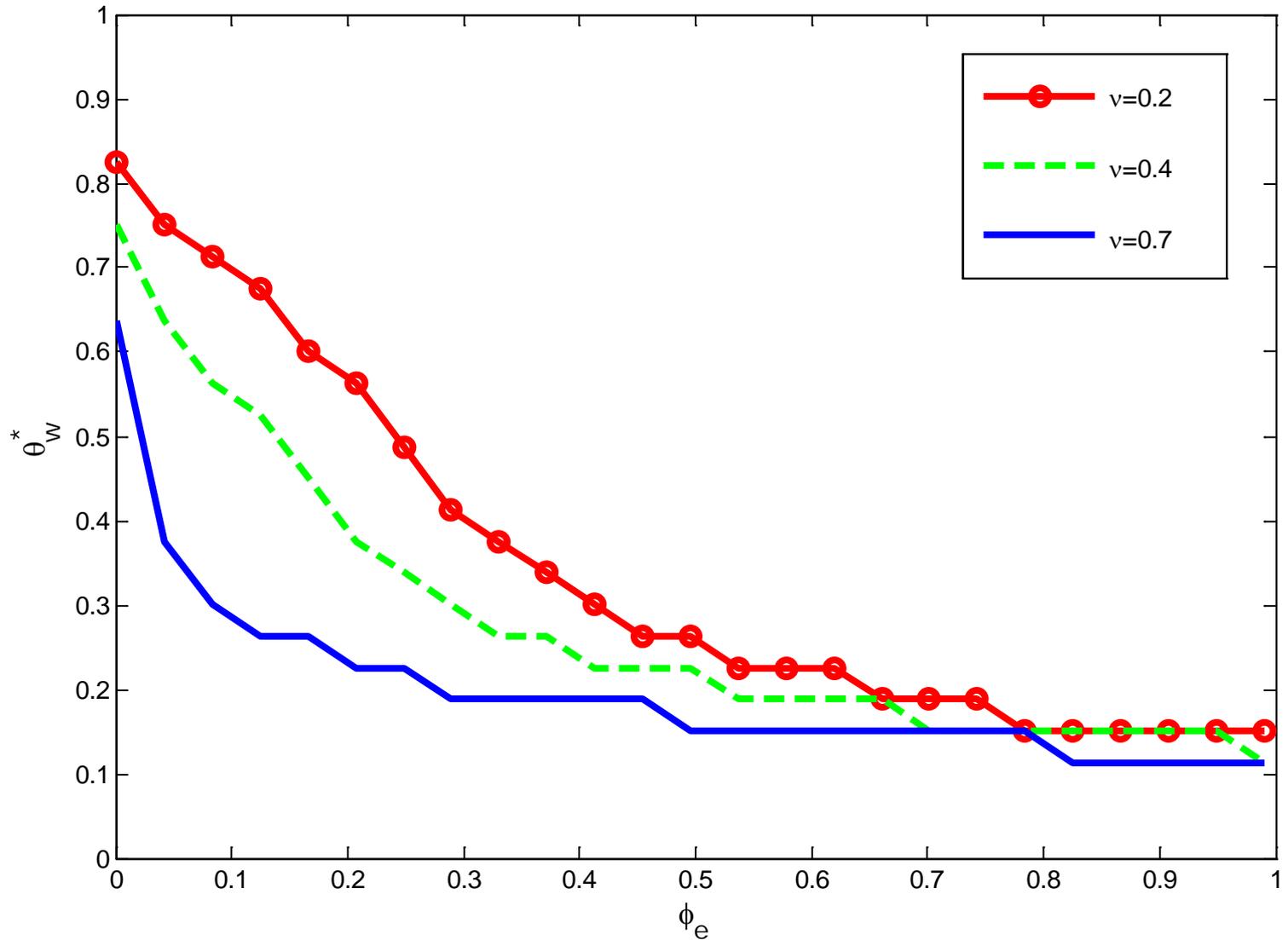


**High Elasticity**

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

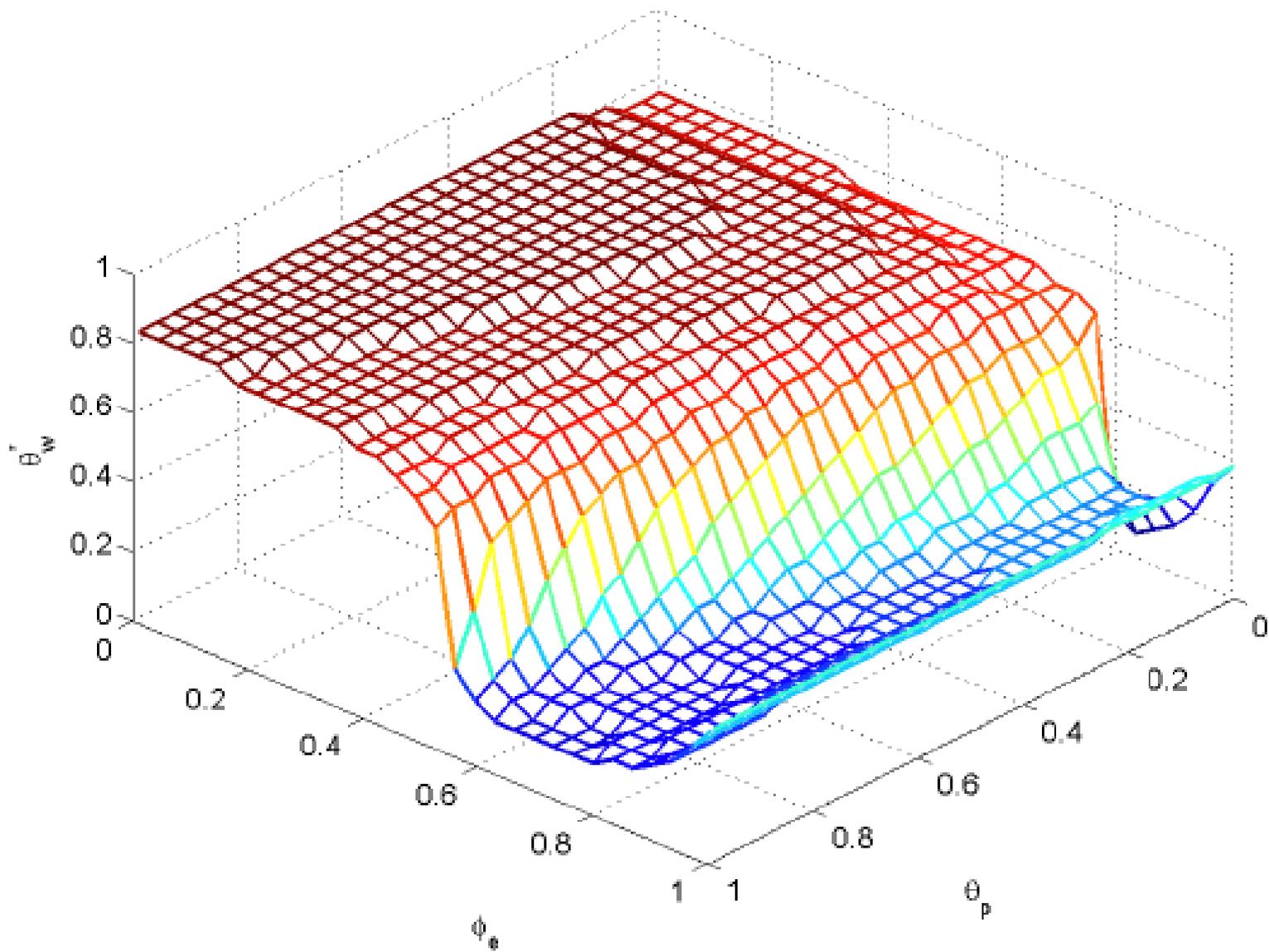


**Figure 5.a Welfare Impact of Enhanced Wage Flexibility: Demand Shocks**  
*The Role of Openness under a Low Trade Elasticity ( $\eta=0.5$ )*



# Welfare Impact of Enhanced Wage Flexibility: Demand Shocks

## *The Role of Price Stickiness*



## 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*

## Concluding remarks

- Conventional wisdom

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

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

*⇒ least effective in a currency union*

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

*⇒ more likely so in a currency union.*