On the Limits to Monetary Policy

March 2012

Narayana Kocherlakota

Federal Reserve Bank of Minneapolis

Monetary Policy in the United States

- The Federal Open Market Committee (FOMC) formulates monetary policy.

- It seeks to fulfill a dual mandate from Congress.

  - promote price stability

  - promote maximum employment

- The FOMC views the two objectives as generally complementary.

Dual Mandate Performance Since 2007

- The Great Recession began in the fourth quarter of 2007.

- Over the intervening four years, average inflation is close to the Fed's target of 2%.

- But employment is much lower now than four years ago.

- The Fed is clearly doing well on the price stability mandate.

- Why does its performance appear to be so much worse on the other?

- I suggest an answer to this question in the context of a model.

Disclaimer and Acknowledgements

Demand Shocks Since 2007

- Starting point for analysis: two distinct kinds of demand shocks.

- *Labor* demand: at a given real wage, firms demand fewer workers than in 2007.

- *Product* demand: at a given real interest rate, households demand fewer goods than in 2007.

- Usual models/analyses emphasize one force or the other - I include both.

Falls in Employment

- Labor demand shock generates a fall in employment.

- This fall in employment is magnified if the real wage adjusts slowly to the shock.

- The product demand shock generates an additional fall in employment.

Main Model Implications

In this model:

1. Monetary policy **can** offset the jobs impact of a *product* demand shock.

2. Monetary policy **cannot** offset the jobs impact of a *labor* demand shock and any associated slow real wage adjustment.

3. Non-monetary policy **can** offset the jobs impact of a *labor* demand shock – but only with the support of monetary policy.

Dual Mandate Implications of the Model

- The dual mandate is: promote price stability and maximum employment.

- The model implies that, acting alone, the Fed **cannot** offset the impact of adverse labor demand shocks.

- Hence: adverse labor demand shocks reduce the maximum employment achievable by the Fed.

Connections

- Long line of disequilibrium models that nest "classical" and "Keynesian" unemployment.

  - See, for example, Malinvaud (1977), Coen and Hickman (1988).

- These concepts have rough analogs in my model.

  - "Classical" unemployment = employment shortfall due to slow real wage adjustment.

  - "Keynesian" unemployment = employment shortfall due to high real interest rates.

More Recent Connections

- Recent academic work studies how increased uncertainty about financial conditions reduces labor demand.

  - See Quadrini and Perri (2011), among others.

- Shimer (2010) - models impact of real wage rigidities.

- Hall (2011) - models labor market impact of high real interest rates.

  - Like Hall, I use a disequilibrium model (not New Keynesian or search).

Outline

1. **Labor Demand Shock**

2. **Product Demand Shock**

3. **Limits to Monetary Policy**

4. **Other Policy Responses**

5. **Conclusions**

6. **Appendix: Model Math**

Before I Get Started ....

- "Real" wages are actual wages, divided by the price index.

  – Real wage growth is wage growth, adjusted for inflation.

- "Real" interest rate is the actual interest rate net of inflation.

  – I assume that the Fed controls current and future real interest rates.

- (Minor) assumption: no income effects on labor supply.

1. LABOR DEMAND SHOCK

Fall in Labor Demand

- For a given real wage:

- Firms want to hire fewer workers/hours in 2012 than in 2007.

- Why?

Multiple Sources of Fall in Labor Demand

• Harder to start up new firms (because households have less net worth).

– Young firms are important source of employment growth.

• High firm profits suggest that product market competition has declined.

– Recession eliminated many firms.

– Less startup activity means less competition from potential entrants.

Uncertainties

- Firms now see adverse financial shocks as being more likely than they did in 2007.

    - They learned in 2008 that such shocks can trigger large layoffs.

    - This possibility makes them less willing to hire new workers.

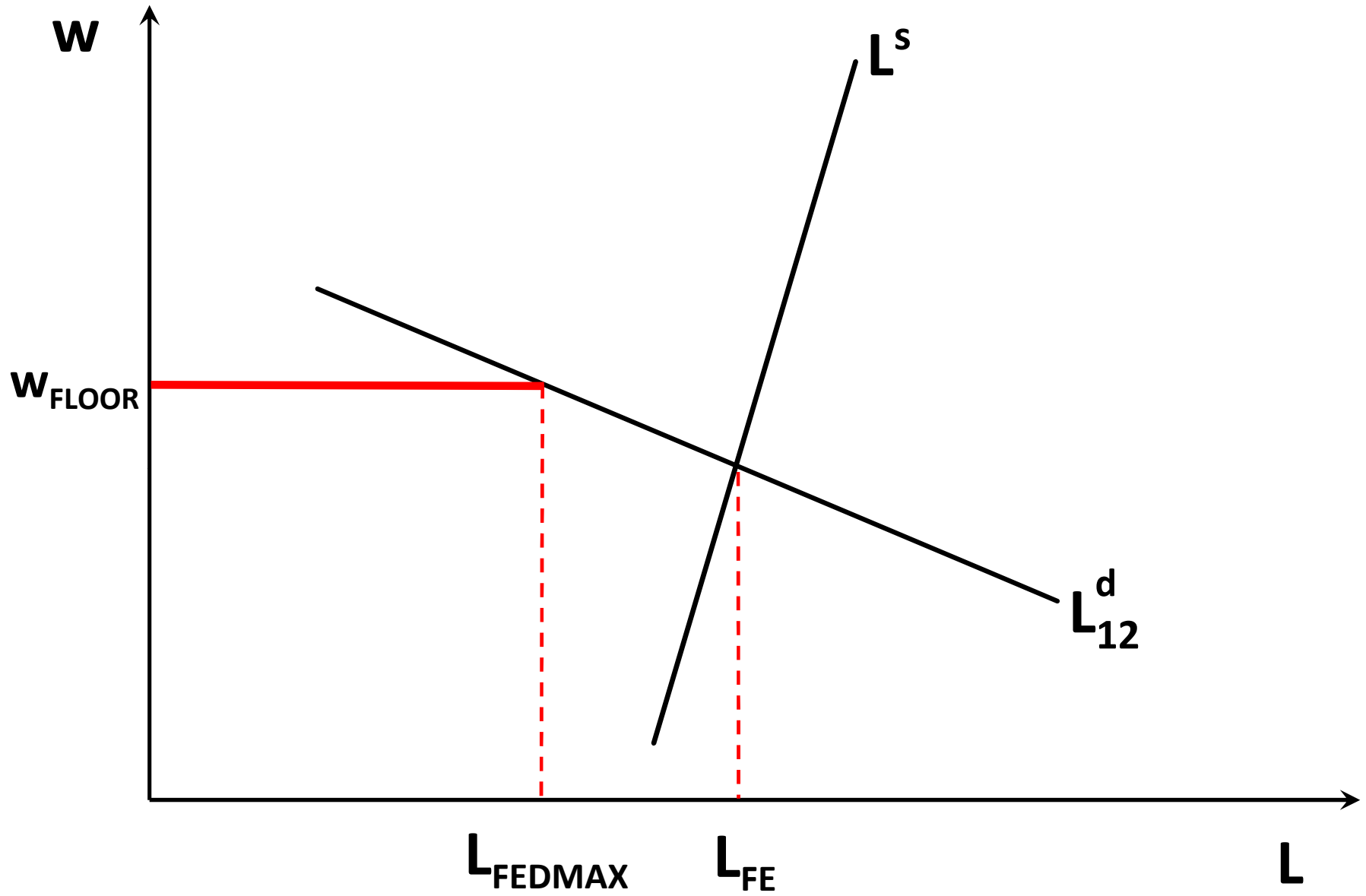- Firms remain concerned about possible increases in taxes and regulations.

Adverse Labor Demand Shock
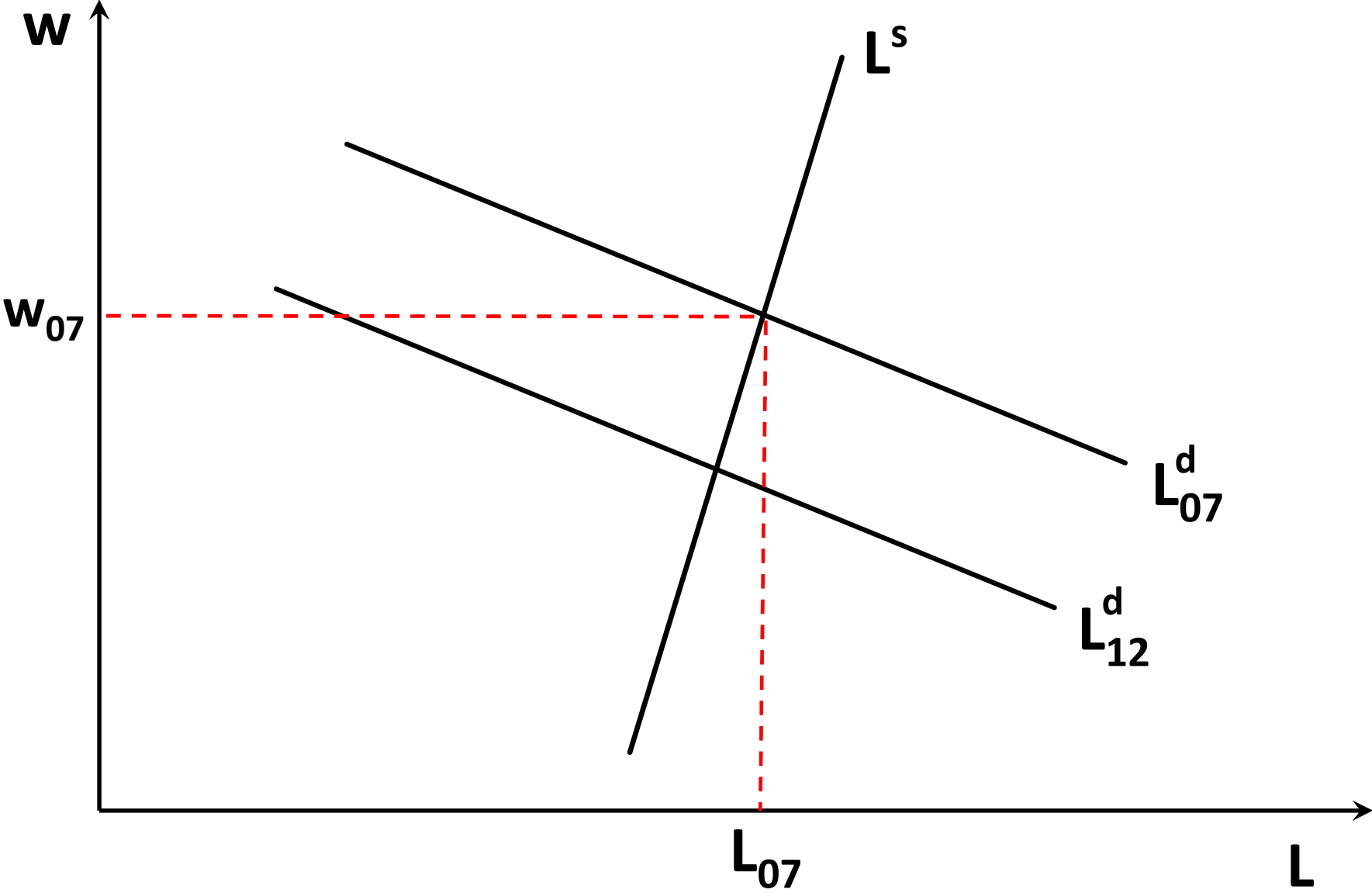
Slow Real Wage Adjustment

- Real wages should fall to clear markets.

- But firms may face internal and external impediments to cutting real wages for new hires.

- This gives rise to even lower employment.

Slow Real Wage Adjustment

W

L^S

W_{FLOOR}

L^d_{12}

L_{FEDMAX} L_{FE}

L

2. PRODUCT DEMAND SHOCK

- When real interest rate is high: people buy less and save more.

- When real interest rate is low: people buy more and save less.

- For a given real interest rate, people demand less consumption in 2012 than in 2007.

- Why?

Sources of Lower Product Demand

- Loss of wealth due to fall in housing values and equity wealth.

- Higher risk of job loss: households need to do more self-insurance.
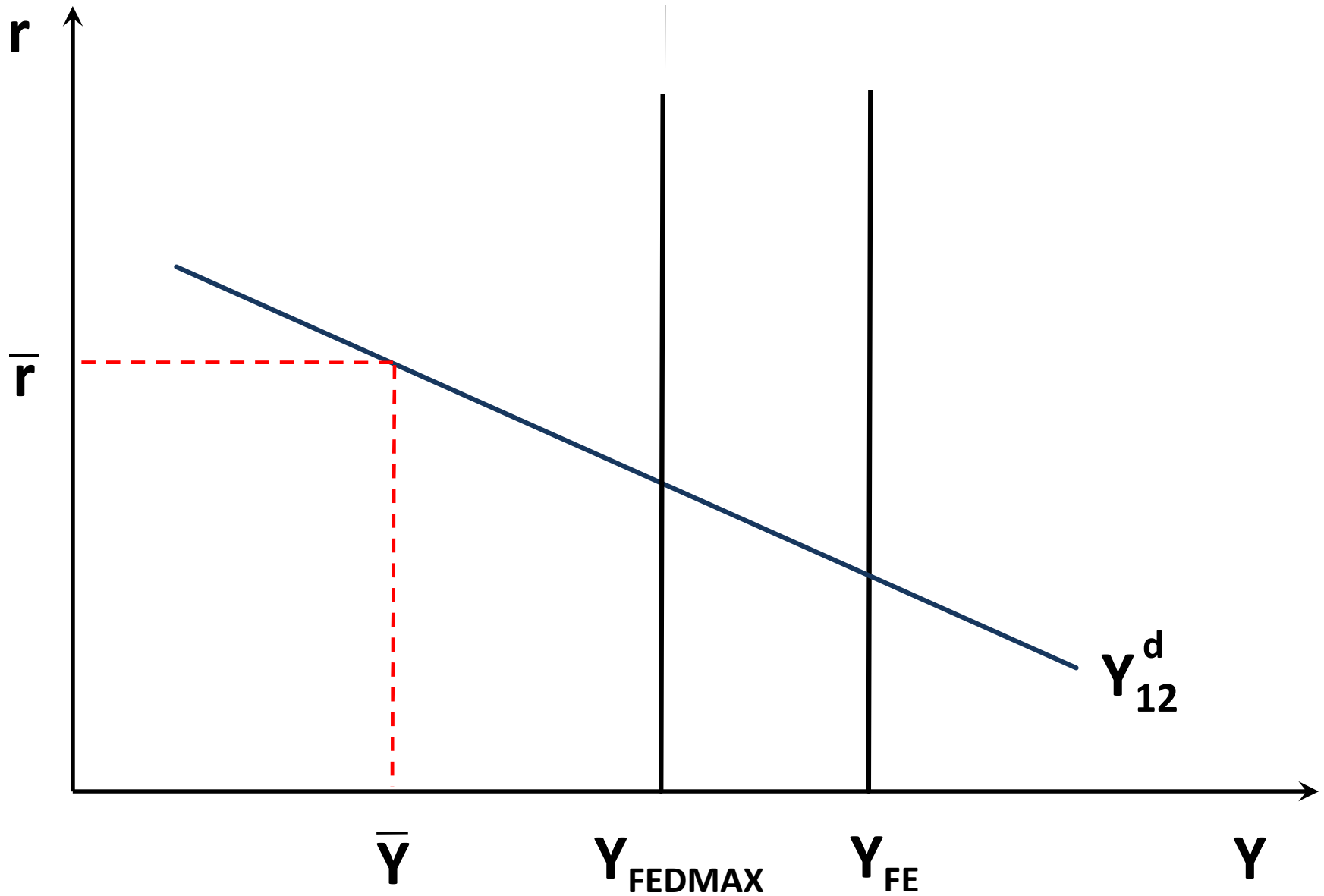
- Tighter access to household credit.
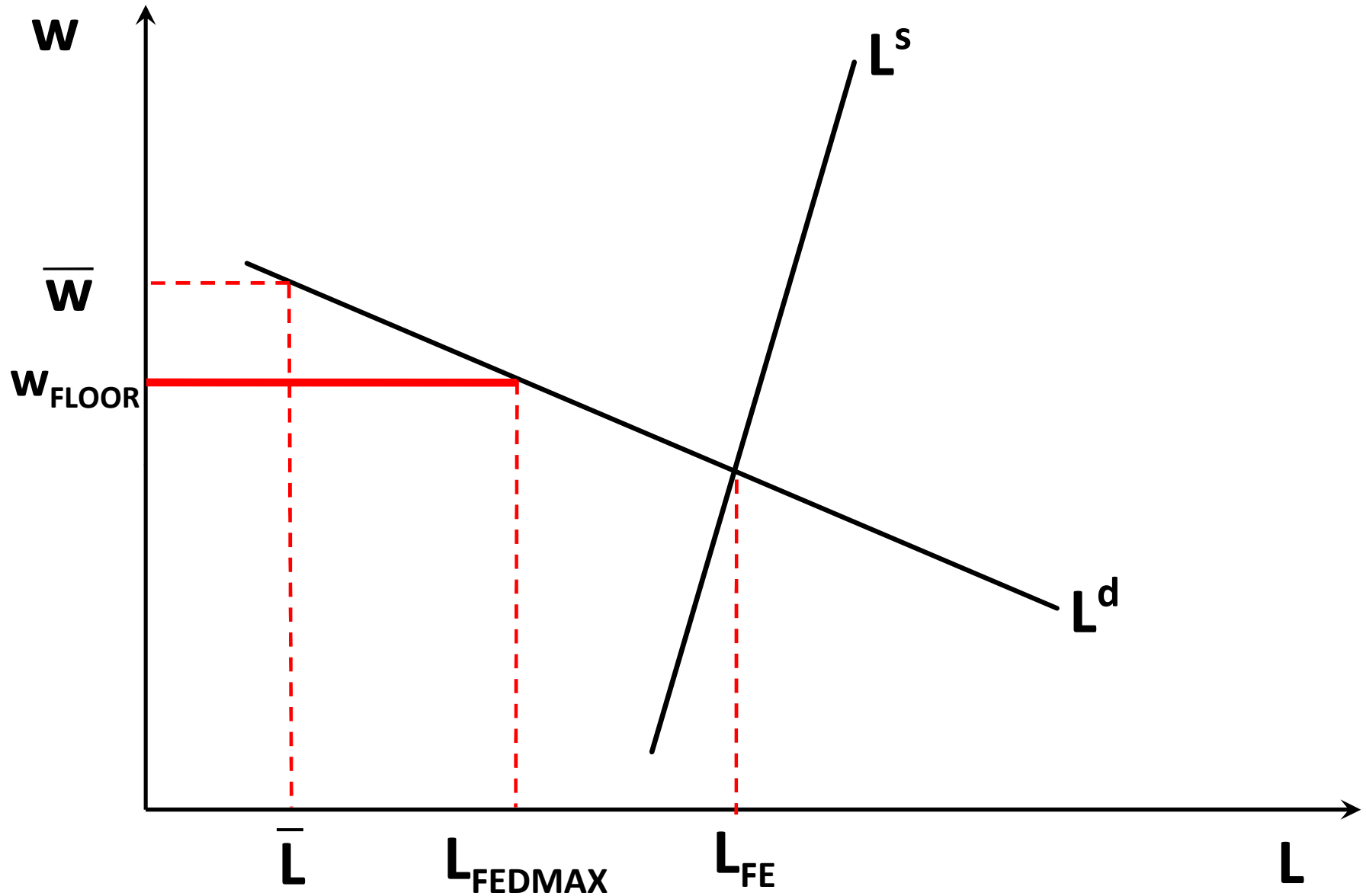
Adverse Product Demand Shock

r

Y_{07}^d

Y_{12}^d

Y_{FEDMAX} Y_{FE} Y
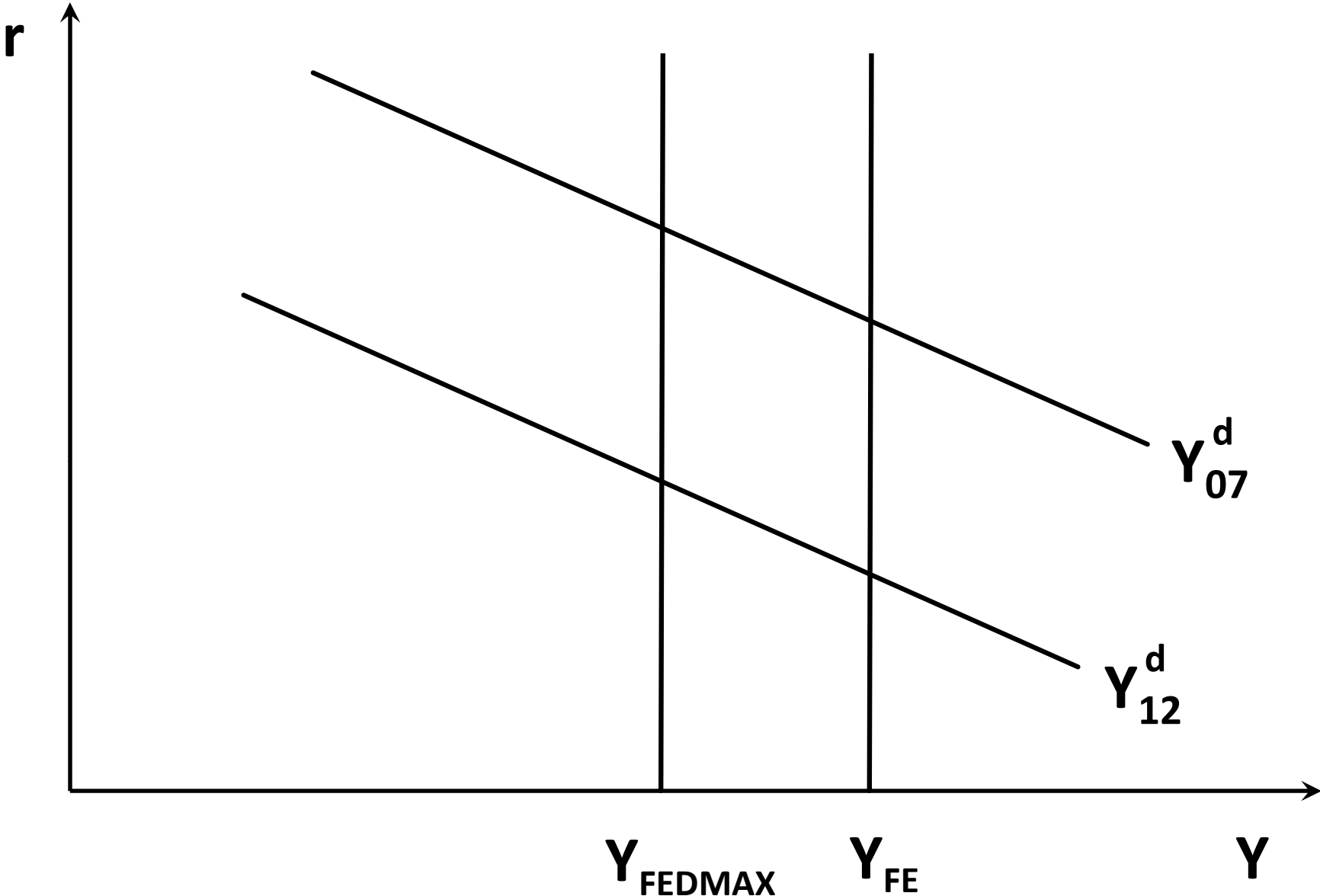
Real Interest Rate, Output and Employment

- The Fed controls r.

- Its choice of r determines the aggregate demand for goods.

- That in turn determines output, and thereby employment.

Relevance of the Real Interest Rate: Product Market

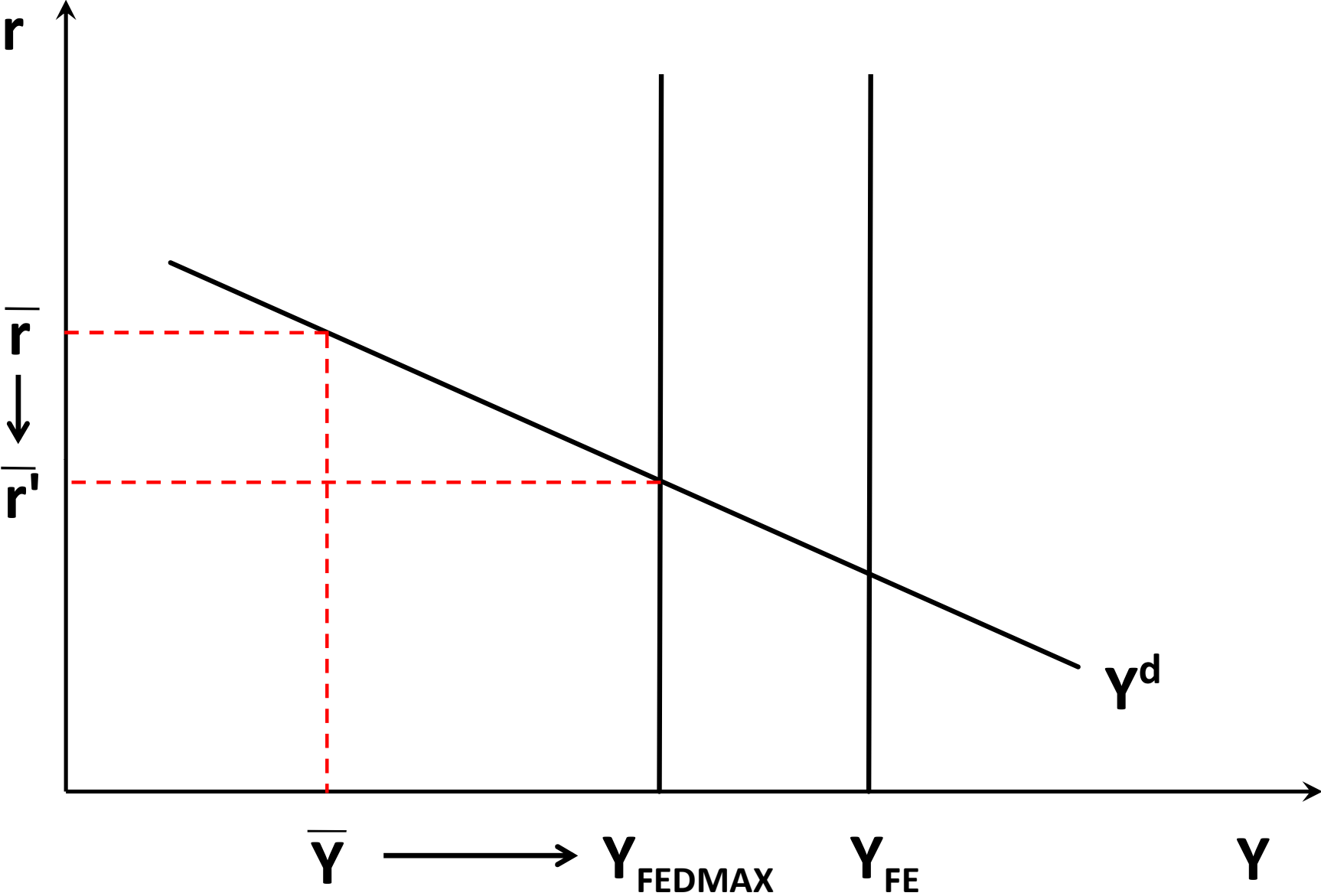# Relevance of the Real Interest Rate: Labor Market
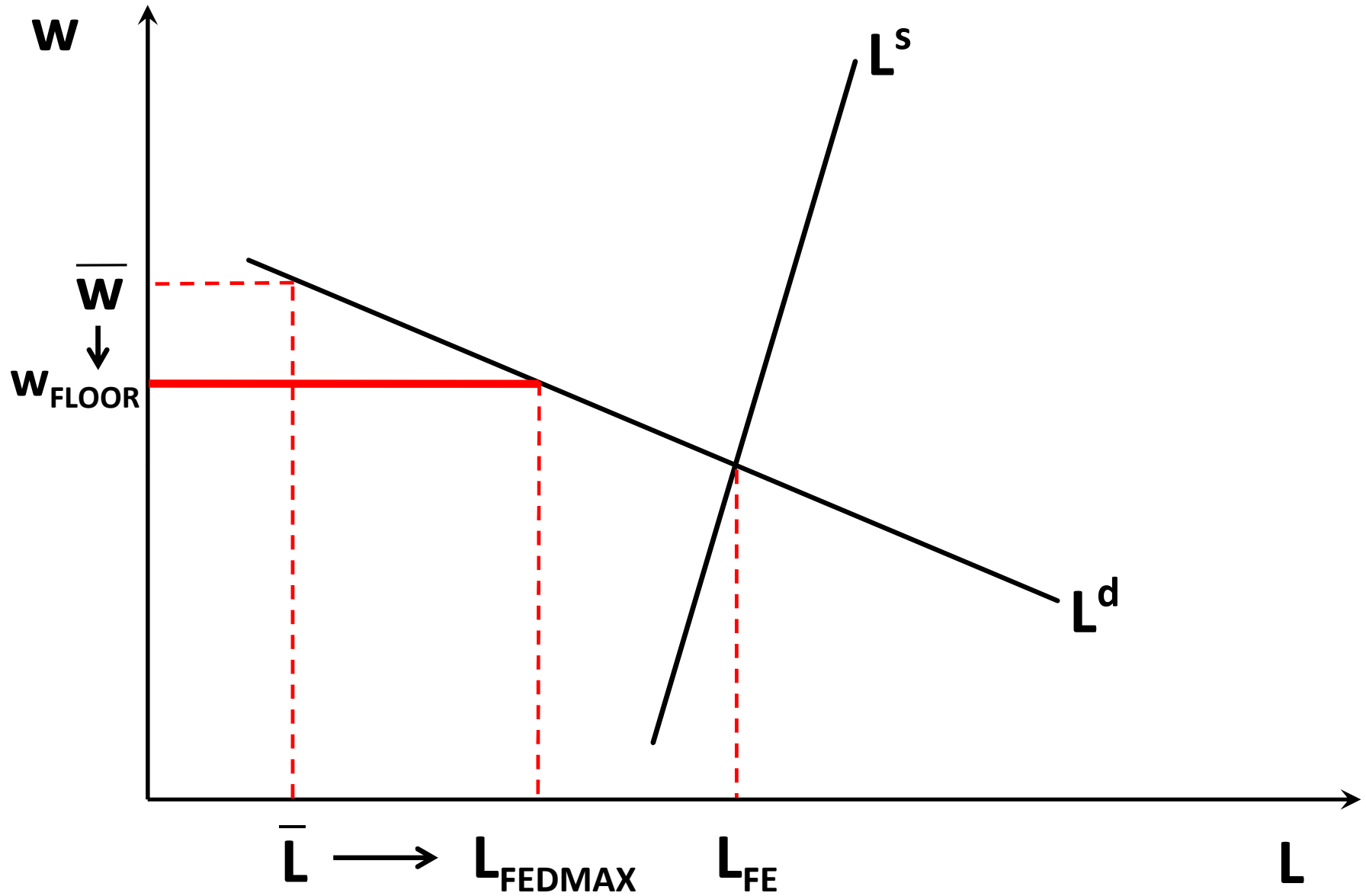
3. LIMITS TO MONETARY POLICY

Modeling Monetary Policy

- By lowering r, monetary policy can increase output.

Impact of Monetary Stimulus in the Product Market

Impact of Monetary Stimulus in the Labor Market

Key Model Result

- The Fed cannot remove impediments to real wage adjustment.

- This means that lowering r cannot raise Y above Y_{FEDMAX}.

- And: lowering r cannot raise L above L_{FEDMAX}.

- Fed's "maximum employment" is L_{FEDMAX} - which may be less than full employment L_{FE}.

4. OTHER POLICY RESPONSES

Non-Monetary Policies

- Can non-monetary policies raise employment above L_{FEDMAX}?

- The model implies that:

  - Product demand stimulus policies cannot.

  - Labor demand stimulus policies can - but only with the help of monetary policy.

Product Demand Stimulus

- Suppose the government stimulates product demand.

  - examples: buying more goods itself or reducing sales taxes

- For a fixed r, such a policy can increase Y.

- But it cannot raise Y above Y_{FEDMAX} - or L above L_{FEDMAX}.
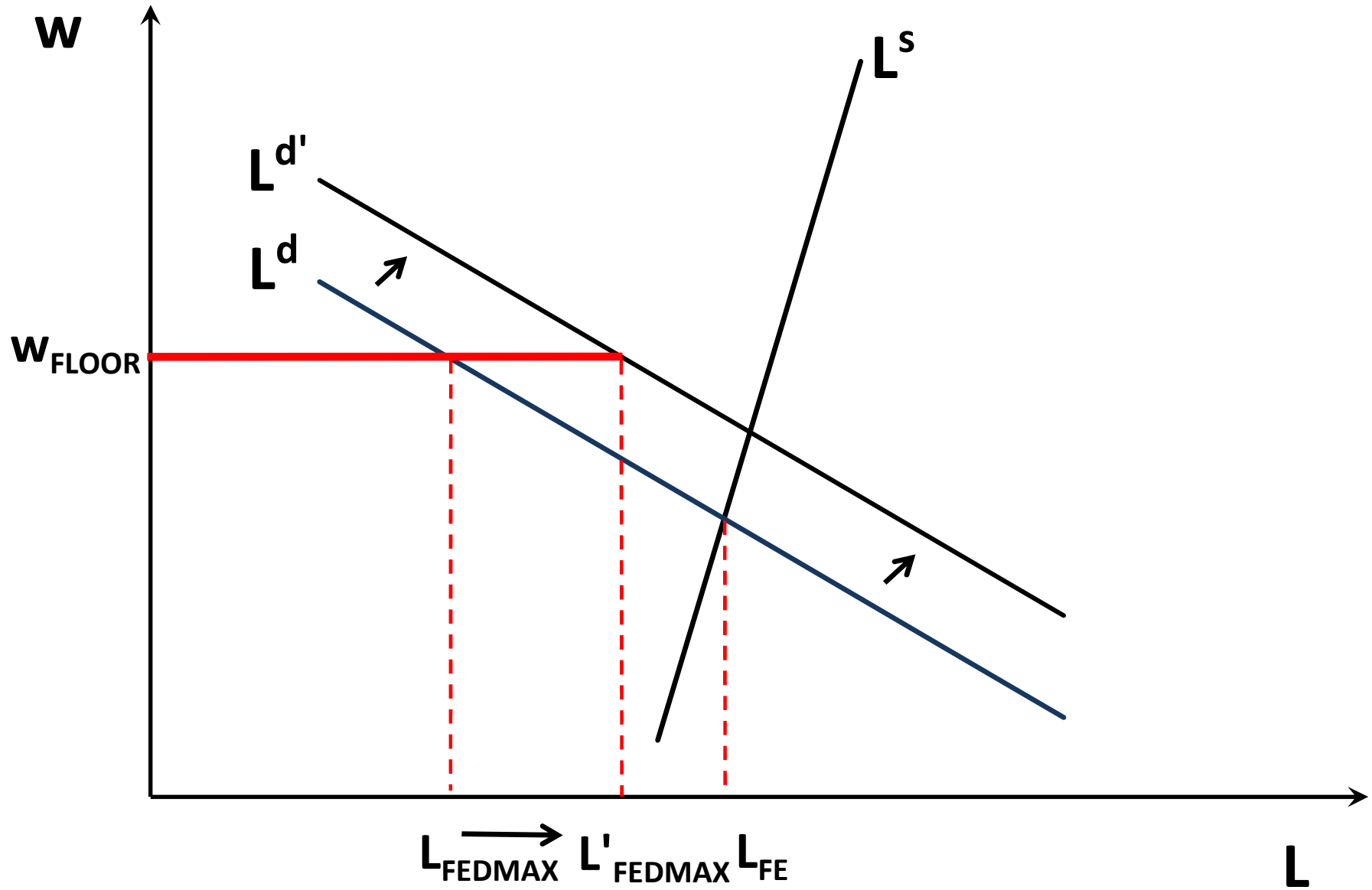
Impact of Product Demand Stimulus
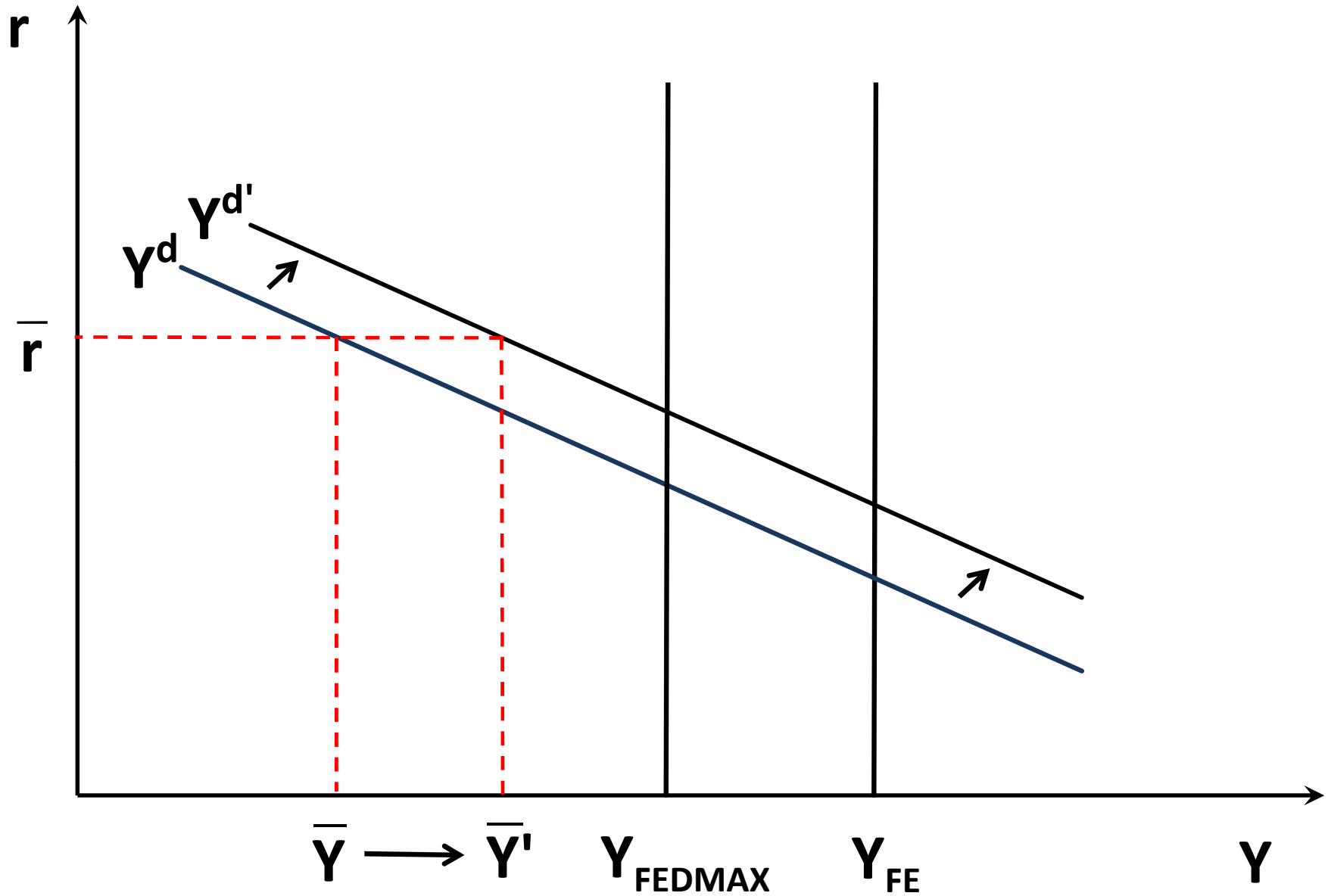
Labor Demand Stimulus

- Policies that stimulate labor demand can raise L_{FEDMAX}.

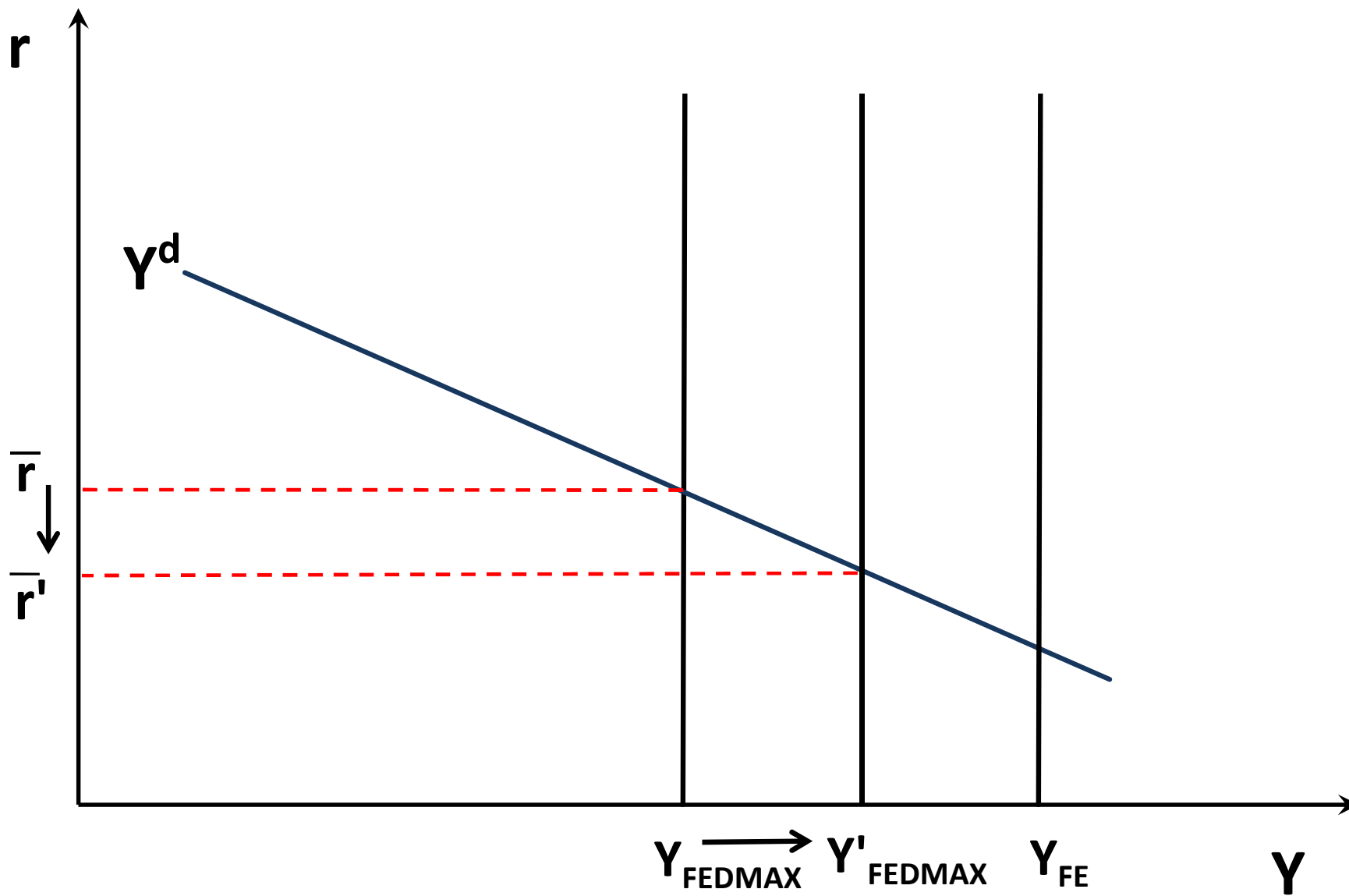 – Example: subsidies for hiring by firms.

Impact of Hiring Subsidies in the Labor Market

Needed: Help from Monetary Policy

- Consider any policy that raises the Fed's maximum employment L_{FEDMAX}.

- This policy only raises employment itself if monetary policy also eases.

Impact of Hiring Subsidies in the Product Market

5. CONCLUSIONS

Motivating Question

- The FOMC views its two mandates as generally complementary.

- But over the past four years, the Fed has apparently done better on its price stability mandate than on its employment mandate.

- Why?

Model's Answer to the Motivating Question

- The Fed's accommodative policy has offset the impact of the product demand shock.

- Those actions have successfully kept inflation near target.

- But the Fed can't offset the large adverse shock to labor demand and slow real wage adjustment.

- This limitation is what keeps employment low.

- In the language of the model, $\overline{L}$ is near L_{FEDMAX} ...

- But L_{FEDMAX} is well below L_{FE}

Important Policy Implication from the Model

- Some argue that raising employment requires *product demand stimulus*.

  – easier monetary policy or increased government purchases

- Others argue that raising employment requires *labor demand stimulus*.

  – cutting taxes or increasing subsidies to firms

- This model incorporates both labor demand *and* product demand shocks.

- Raising employment above L_{FEDMAX} requires *dual* stimulus:

  - Labor demand stimulus (e.g. hiring subsidies) AND

  - Monetary easing

APPENDIX: MODEL MATH

Four Equilibrium Restrictions (in every date and state)

1. $\overline{Y}_t = F(\overline{L}_t)$

2. $\overline{w}_t = F'(\overline{L}_t)\eta_t$

3. $\overline{Y}_t = Y^d(\overline{r}_t; \xi_t)$

4. $\overline{w}_t \geq \mathsf{max}(w_t^{FLOOR}, v'(\overline{L}_t))$

Assumptions

$v'(\overline{L}_t)$ is indep. of C_t (no income effects on labor supply)

F' is strictly decreasing in L

Y^d is strictly decreasing in r

Understanding the Restrictions

Restriction 2: $\overline{w}_t = F'(\overline{L}_t)\eta_t$

- Restriction 2 is implied by the following four assumptions:

  - Firms maximize profits.

  - Firms can freely adjust prices (unlike New Keynesian models).

  - Firms take wages as given.

  - Firms face revenue distortions η_t (like taxes or market power).

Restriction 3: $Y_t = Y^d(r_t; \xi_t)$

- I assume that the Fed's changes in the nominal interest rate have little impact on inflation expectations.

- In this way, the Fed is able to control the *real* interest rate r_t.

Restriction 4: $\overline{w}_t \geq \max(w_t^{FLOOR}, v'(\overline{L}_t))$

- Restriction 4 is implied by the following three assumptions:

  - Firms reject any worker's offer to supply labor at a real wage below $\overline{w}_t$.

  - Real wages cannot fall below w_t^{FLOOR}.

  - Firms cannot force workers to supply labor.

Changes Since 2007

- Fall in labor demand: modeled as fall in η_t.

  - This change is not due to technology, because F is unchanged.

- Fall in product demand: modeled as fall in ξ_t.

Definitions of Key Concepts

Def'n of full employment L_t^{FE}

$$\eta_t F'(L_t^{FE}) = v'(L_t^{FE})$$

—————————————————————————————————

Def'n of Fed's maximum employment L_t^{FEDMAX}

$$\eta_t F'(L_t^{FEDMAX}) = \mathsf{max}(w_t^{FLOOR}, v'(L_t^{FEDMAX}))$$

Key Results

- $L \leq L_t^{FEDMAX} \leq L_t^{FE}$.

- L_t^{FEDMAX} is independent of (r_t, ξ_t).

- That is, L_t^{FEDMAX} - not L_t^{FE} - is maximum employment for Fed (in any date and state).

Hiring Subsidies

- A hiring subsidy increases the value of η_t.

- Hence, a hiring subsidy raises L_t^{FEDMAX} (and L_t^{FE}).

- But $F(L_t) = Y^d(r_t; \xi_t)$.

- Hence, a hiring subsidy does not raise L_t, unless r_t is lower.