
Lecture III: Fair Wage Preferences, Heterogeneous Firms and Globalisation

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Motivation: Firm heterogeneity

- Firm heterogeneity
 - empirical fact (firm size, export status, ...)
 - long neglected in GE models of international trade
- Tractable framework – Melitz (2003):
 - monopolistic competition
 - firm heterogeneity due to productivity differences
 - number of firms endogenous
 - pure profits of successful firms in equilibrium



Motivation: Labour market imperfect.

- Melitz model:
 - globalisation leads to firm selection
 - labour market perfectly competitive
 - globalisation has firm-specific effects, but no worker-specific effects
- Fairness preferences of workers
 - rent-sharing at the firm level in Melitz-type model
 - resulting framework features intra-group wage inequality and involuntary unemployment



Issues analysed

- Effect of inter-firm productivity differences on
 - firm size, profits, wages (firm perspective)
 - per capita income, wage inequality, unemployment (GE perspective)
- Impact of globalisation on aggregate variables
 - per capita income, average profits
 - unemployment, intra-group wage inequality



Outline of this lecture

- The model under autarky
- Trade liberalisation
- Discussion of the results
- Extensions
 - Marginal trade liberalisation
 - Heterogeneous beachhead costs
 - The role of unemployment benefits



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The model

- Labour L single factor of production
- Representative consumer, uses all income for consumption of homogeneous final good Y
- Y produced from differentiated intermediates q
- Final goods market *perfectly* competitive
- Intermediate goods market *monopolistically* competitive



The model

- Technology in intermediate goods sector
 - continuum of producers (mass M)
 - invests per-period fixed cost f (in units of final good Y)
 - output q depends on labour input l and productivity ϕ : $q(\phi) = \phi l$



The model

- Technology in final goods sector
 - following Blanchard and Giavazzi (2003)

$$Y = \left[M^{-(1-\rho)} \int_{v \in V} q(v)^\rho dv \right]^{1/\rho}, \quad 0 < \rho < 1$$

- *If* use of all intermediates in same quantity q
→ $Y = Mq$ instead of $Y = M^{(1-\rho)/\rho} (Mq)$
- Traditional globalisation effect (due to larger market size) eliminated



The model

- Profit maximisation in final goods sector
 - Input demand

$$q(\phi) = \frac{Y}{M} p(\phi)^{-\sigma}, \quad \sigma \equiv 1/(1-\rho)$$

with $P \equiv 1$ (final good as numeraire)

- Profit maximisation in intermediates sector
 - price is constant mark-up on marginal cost

$$p(\phi) = \frac{w(\phi)}{\rho\phi}$$



The model

- Workers expect a fair treatment and a sufficiently high wage (Akerlof, 1982)
- Effort of workers depends on wage rate

$$e = \min\left(\frac{w}{\hat{w}}, 1\right)$$

\hat{w} is the (fair) reference wage

- In equilibrium (Akerlof and Yellen, 1990):

$$w = \hat{w}$$



The model

- Reference wage \hat{w} determined by
 - firm specific productivity ϕ
 - average wage \bar{w}
 - employment rate $1-U$

$$\hat{w}(\phi) = \phi^\theta [(1-U)\bar{w}]^{1-\theta}, \quad 0 < \theta < 1$$



First results

- More productive firms
 - pay higher wages
 - charge lower prices
 - have higher output, revenue and profits
- Results consistent with empirical evidence on
 - impact of productivity on wages (Blanchflower, Oswald and Sanfey, 1996)
 - impact of firm size on wages (Bayard and Troske, 1999)



The average firm

- Economy can be represented by firm with average productivity $\tilde{\phi}$: $Y = Mq(\tilde{\phi})$

- This implies $R = Mr(\tilde{\phi})$
 $\Pi = M\pi(\tilde{\phi})$
 $P = p(\tilde{\phi}) = 1$

- But: $(1 - U)L \neq Ml(\tilde{\phi})$



Market entry

- Participation cost at market entry lottery f_e
- After productivity draw, firms decide whether to pay f and start production
- All firms face an exogenous probability of death δ in each period



Market entry

- Two equilibrium conditions:
 - market (lottery) entry until discounted average profits equal participation cost f_e
(*free entry condition* – FE)
 - post-entry production if per-period profits non-negative
(*zero cutoff profit condition* – ZCP)
- These two conditions determine average profit $\pi(\tilde{\phi})$ and cutoff productivity ϕ^*



Pareto distributed productivities

- Productivity distribution is Pareto:

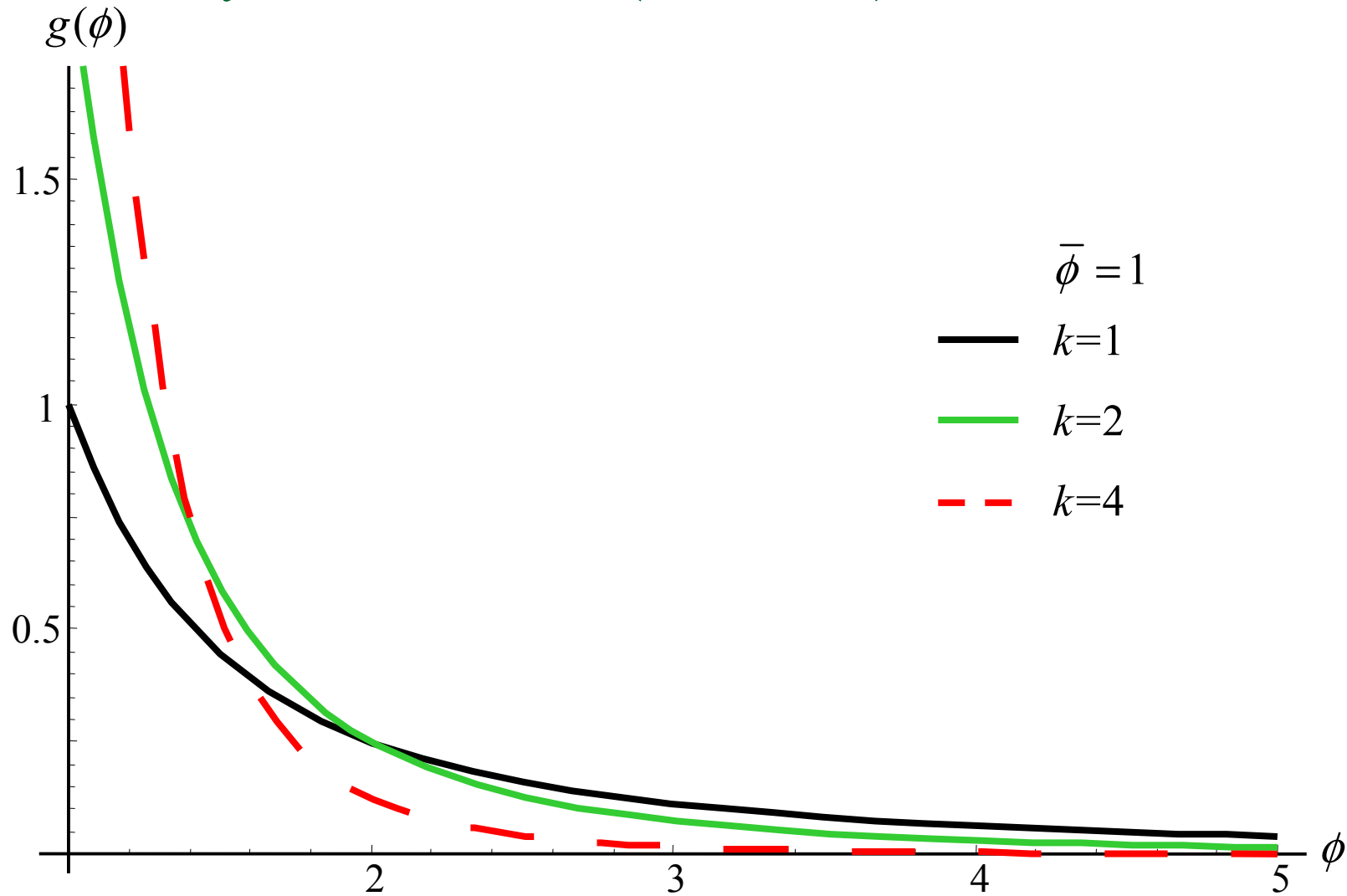
$$G(\phi) = 1 - \left(\frac{\bar{\phi}}{\phi} \right)^k \quad \text{with density } g(\phi) = \frac{k}{\phi} \left(\frac{\bar{\phi}}{\phi} \right)^k$$

$\bar{\phi} > 0$ is lower bound to productivity and k is assumed sufficiently large

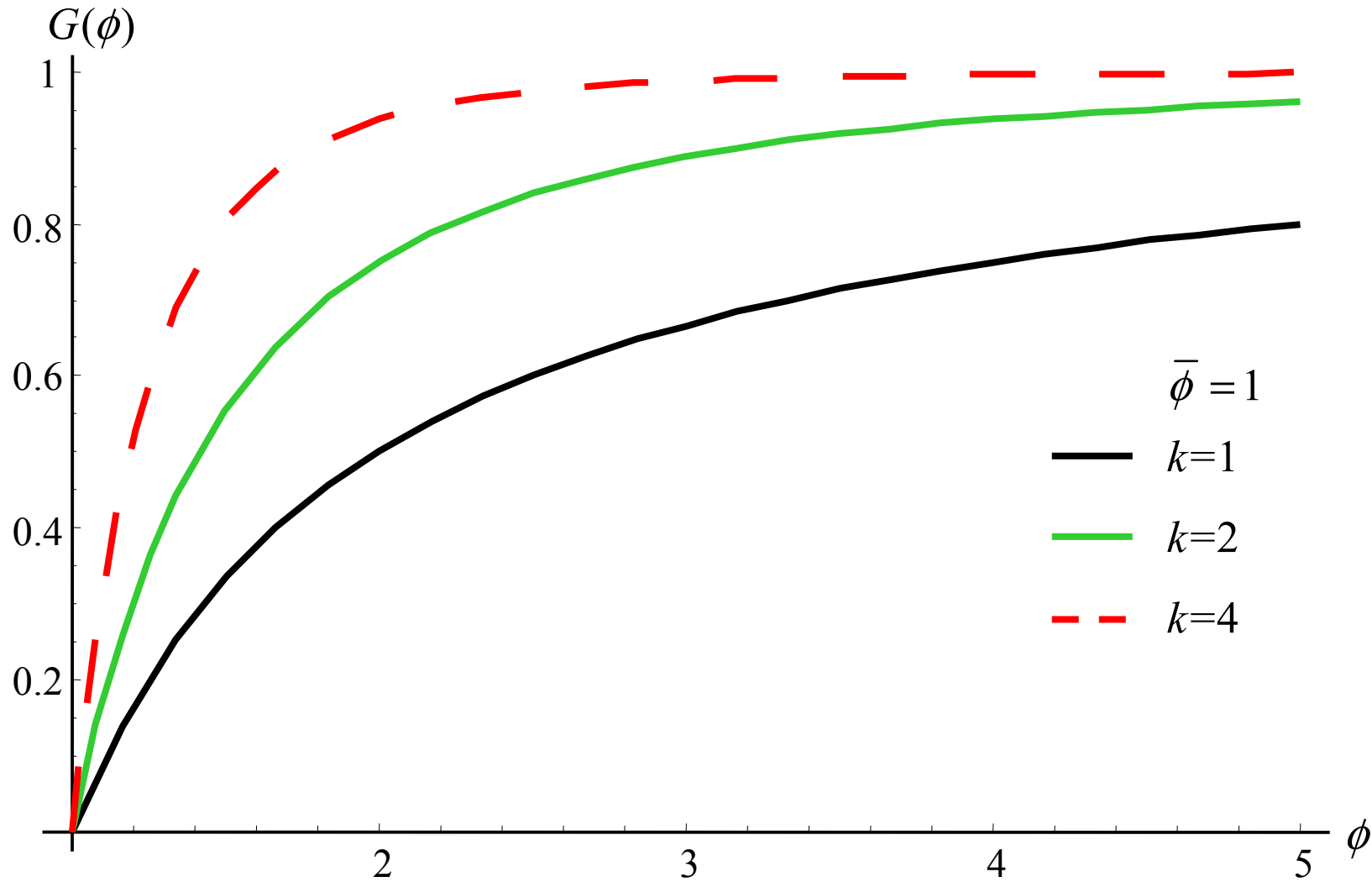
- Helpman, Melitz and Yeaple (2004)
- Del Gatto, Mion and Ottaviano (2006)



Density function (Pareto)



Cumulative distribution (Pareto)



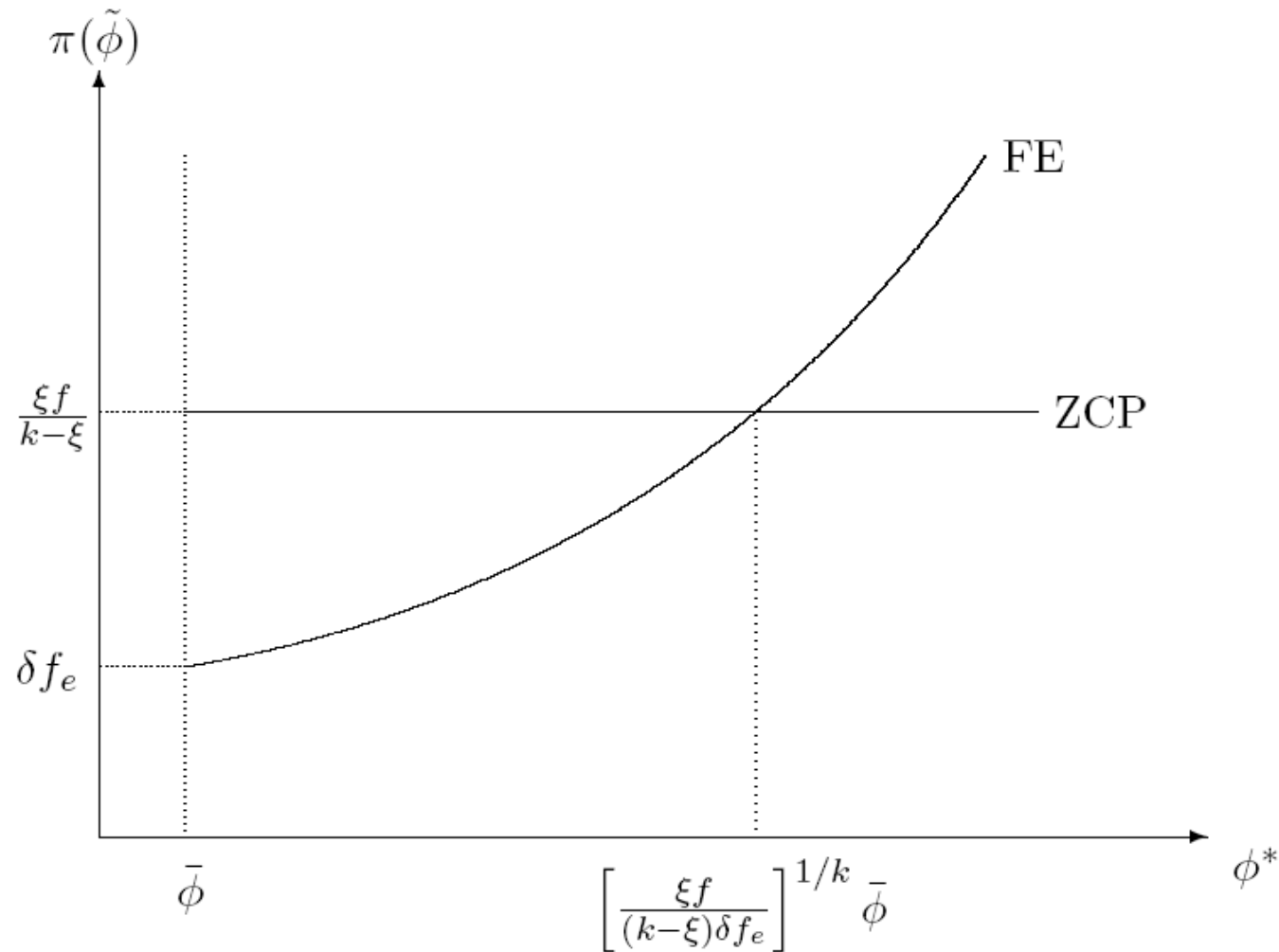
Pareto distributed productivities

- Major simplification: $\tilde{\phi} / \phi^*$ is constant:

$$\tilde{\phi}(\phi^*) = \left(\frac{k}{k - \xi} \right)^{1/\xi} \phi^*, \quad \xi \equiv (\sigma - 1)(1 - \theta)$$



Determination of ϕ^* and $\pi(\tilde{\phi})$



Determination of per capita output

- Per capita income is natural welfare measure
- Per capita labour income is fraction ρ of per capita output: $(1 - U)\bar{w} = \rho Y / L$
- Per capita labour income equals total per capita income as discounted average profits equal participation cost f_e



Determination of per capita output

- Per capita output can be determined using
 - fair wage constraint (FWC):

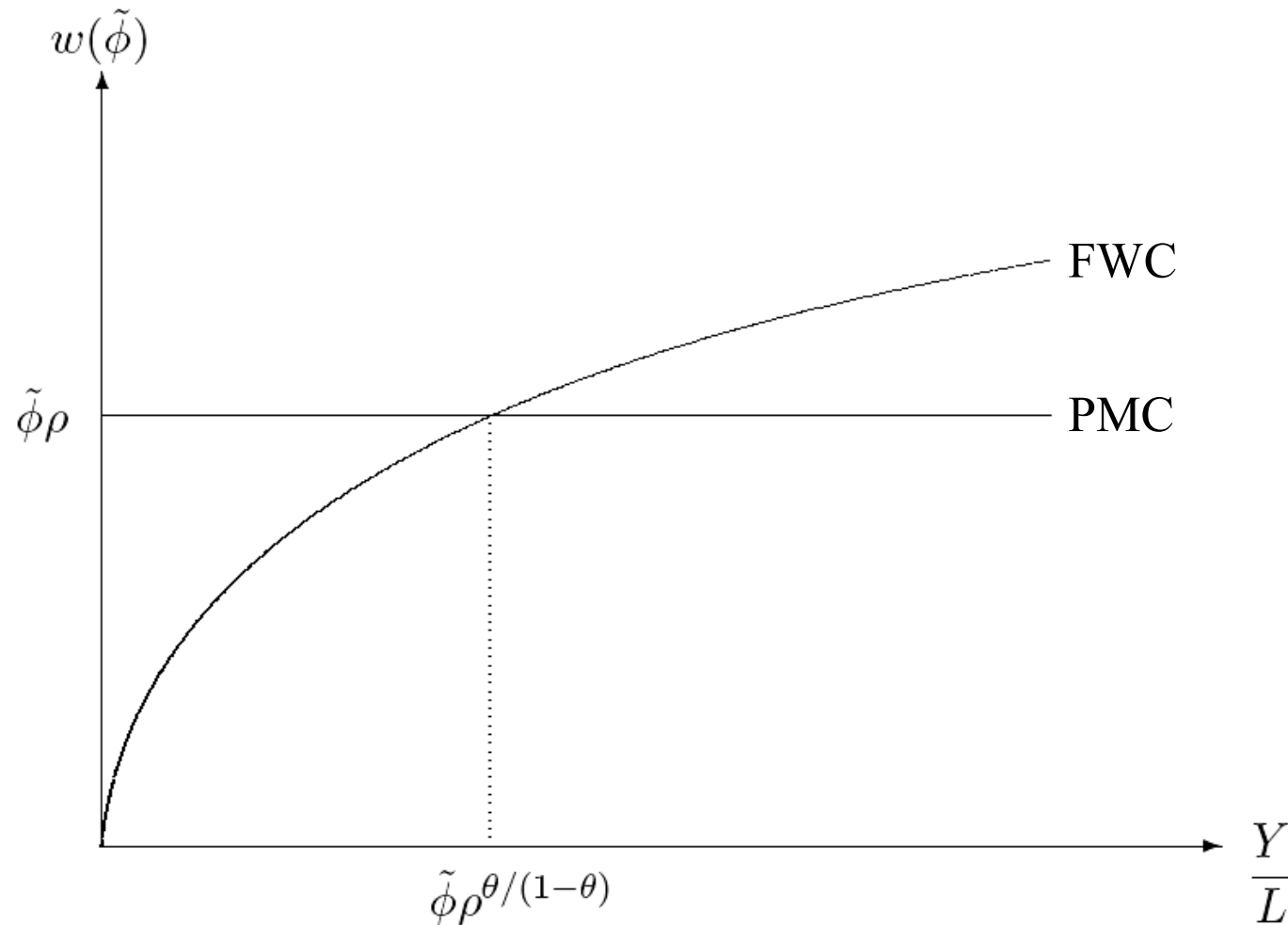
$$w(\tilde{\phi}) = \tilde{\phi}^{\theta} [\rho Y / L]^{1-\theta}$$

- profit maximisation condition (PMC):

$$\frac{w(\tilde{\phi})}{\rho \tilde{\phi}} = 1 \quad \rightarrow \quad w(\tilde{\phi}) = \rho \tilde{\phi}$$



Determination of per capita output



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Trade liberalisation

- Trade between identical countries
 - fixed cost of entering export market $f_x = f$
 - variable iceberg transport costs $\tau > 1$
 - In equilibrium, only most productive firms export
- Effect of trade on exporters and non-exporters
 - all firms hurt by import competition
 - least productive non-exporters shut down
 - new profit opportunities for exporters



Trade liberalisation

- “Everything increases”
 - average productivity and per capita income
 - average profits
 - unemployment
 - ✓ output effect vs. productivity effect
 - wage inequality (average wage relative to wage paid by marginal firm)
 - ✓ per capita income increases proportionally to $w(\phi^*)$
 - ✓ U increases $\rightarrow \bar{w}$ rises more than proportionally



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Discussion

- Similar to traditional trade theory:
 - trade increases welfare (per capita income), but causes distributional conflict
- Specific to this model
 - distributional conflict between firms in the same sector (as in Melitz, 2003)
 - distributional conflict between ex ante identical workers
 - Simultaneous increase of $\pi(\bar{\phi})$ and U



Discussion

The *International Herald Tribune* remarks on 11 April, 2005 that across wealthy nations “job creation stalled at a time, when corporate profits are soaring”.

According to the presented model, globalisation may be responsible for this development.



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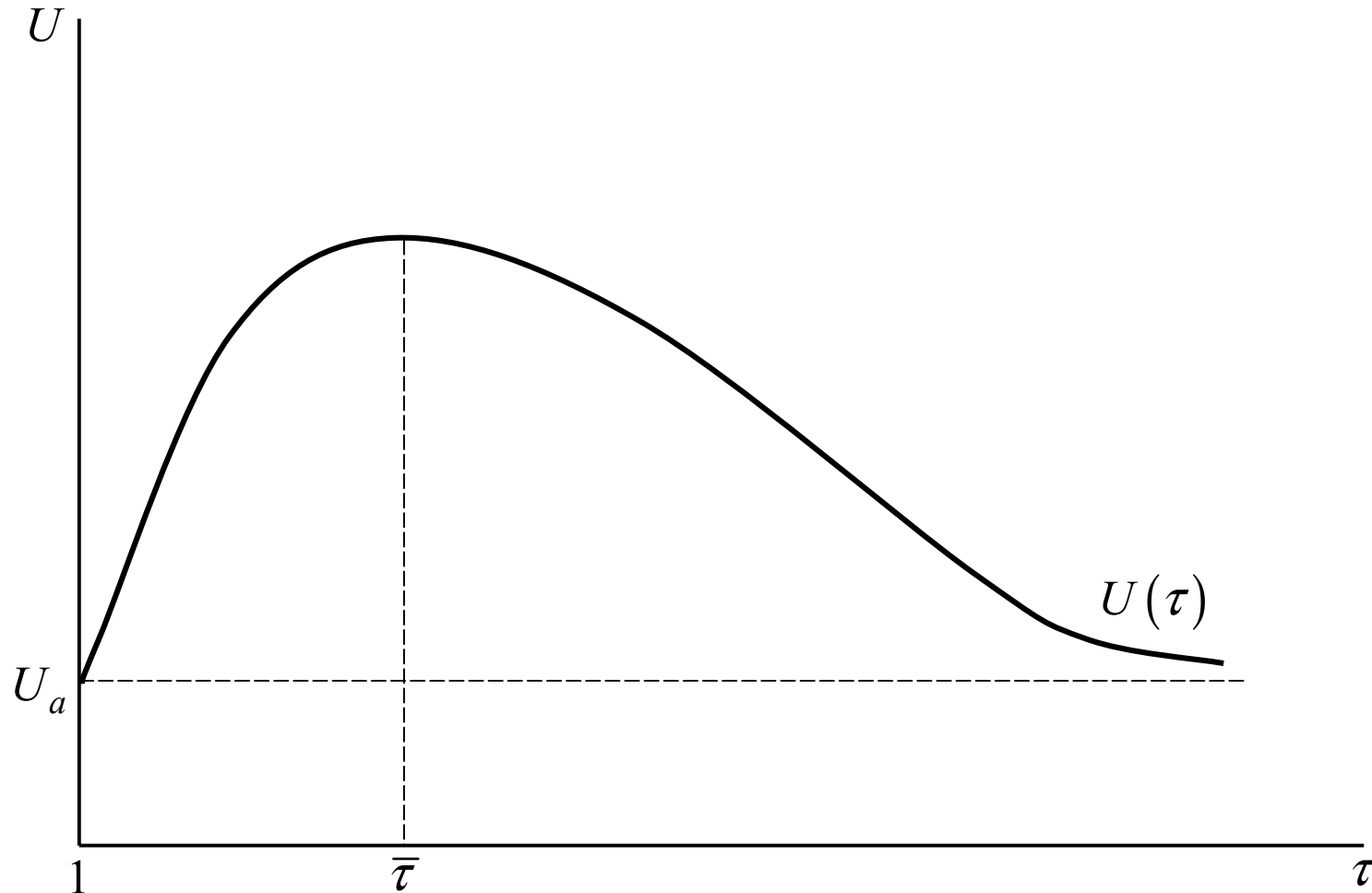


Extension: Marginal trade liberalisat.

- Marginal increase in the number of trading partners:
 - raises average productivity and per capita income
 - raises unemployment and wage inequality
- Marginal decline of variable transport costs τ
 - raises average productivity and per capita income
 - raises (decreases) unemployment and wage inequality if $\tau > \bar{\tau}$ ($\tau < \bar{\tau}$)



Extension: Marginal trade liberalisat.



Extension: Heterogeneous beachhead

costs $f_x \neq f$

- With f_x sufficiently small, all firms export
 - aggregate losses from trade possible
 - with losses from trade, employment will definitely fall
- With f_x sufficiently large
 - employment gains (along with welfare gains) possible



Extension: Heterogeneous beachhead

costs $f_x \neq f$

- Higher foreign than domestic beachhead costs ($f_x > f$)
 - sufficient for welfare gains
 - necessary for employment gains



Extension: Unemployment benefits

- Unemployment benefits are a constant share γ of the average wage in the economy: $b = \gamma \bar{w}$
- Financing is important
 - if unemployment benefits are financed by a wage income tax \rightarrow no impact on ϕ^* and $\tilde{\phi}$
 - if unemployment benefits are financed by a tax on per-period profits \rightarrow changes in γ exhibit an impact on ϕ^* and $\tilde{\phi}$

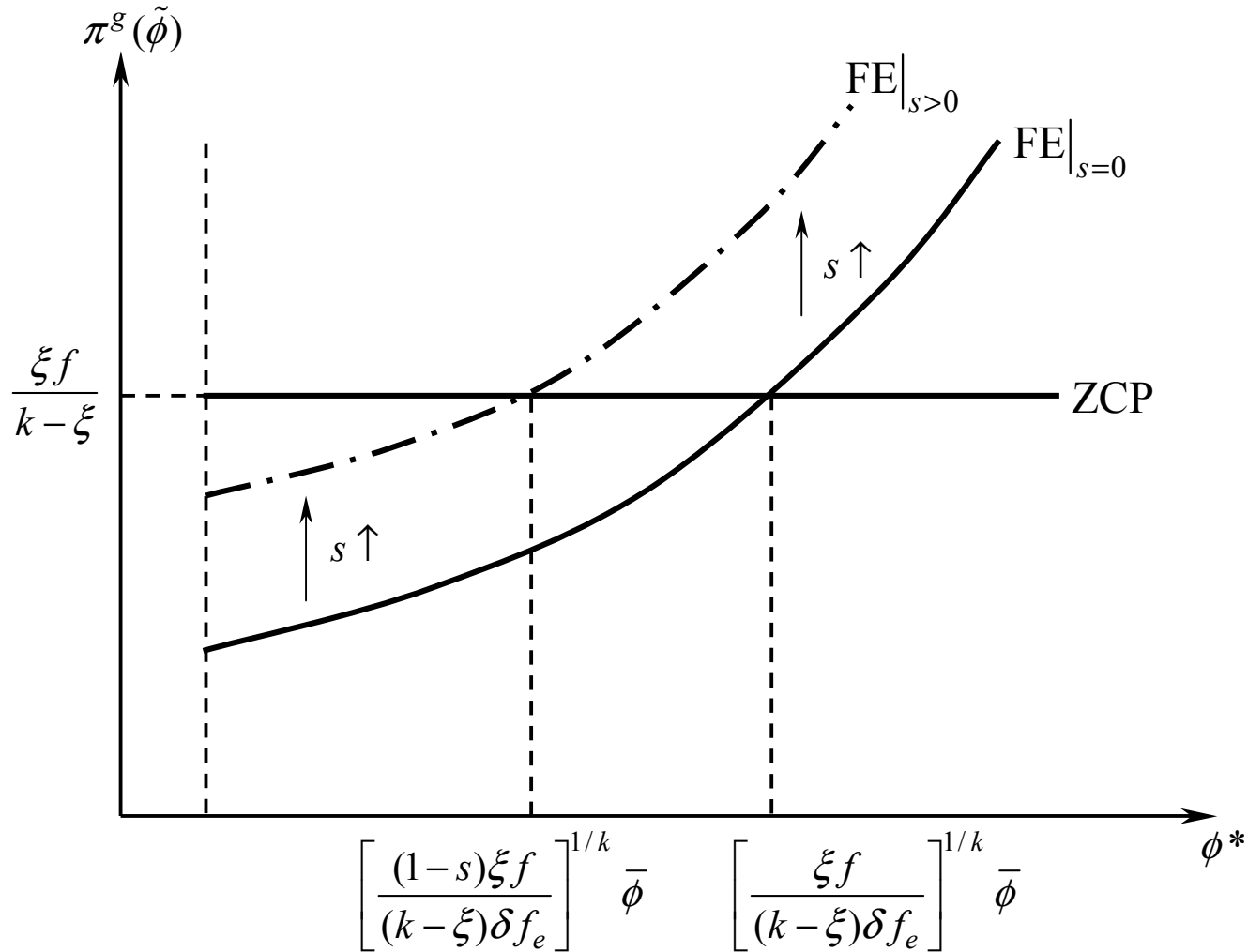


Extension: Unemployment benefits

- Taxation of per-period profits
 - $\pi^n(\phi) = (1-s)\pi^g(\phi)$
 - zero cutoff profit condition implies that $\pi^g(\tilde{\phi}) = \xi f / (k - \xi)$ remains unaffected by changes in s
 - But: $\pi^n(\tilde{\phi})$ is relevant for the entry decision of firms



Extension: Unemployment benefits



Extension: Unemployment benefits

- A γ -increase under autarky
 - raises unemployment U and leaves wage inequality $\bar{w} / w(\phi^*)$ unaffected
 - raises profit tax rate s (due to budget constraint of the government)
 - reduces cutoff productivity ϕ^* and average net profits $\pi^n(\tilde{\phi})$
 - reduces per capita income



Extension: Unemployment benefits

- Globalisation effects ($f_x = f, \tau > 1$)
 - wage inequality effect does not depend on γ
 - increase in the unemployment rate ($U - U_a$) is more pronounced if γ is higher
 - both cutoff productivity ϕ^* and average productivity $\tilde{\phi}$ can fall if γ is sufficiently high
 - in this case, trade liberalisation reduces per capita income



References

Basic Literature

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