Offshoring, Employment, and Aggregate Demand

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The project in a nutshell

Offshoring in a demand-constrained macro model

- Standard model in Keynes-Kalecki tradition
- Add-on: labor-saving import-using technical change
- Offshoring tends to weaken domestic demand and create unemployment if the price elasticity of exports is low

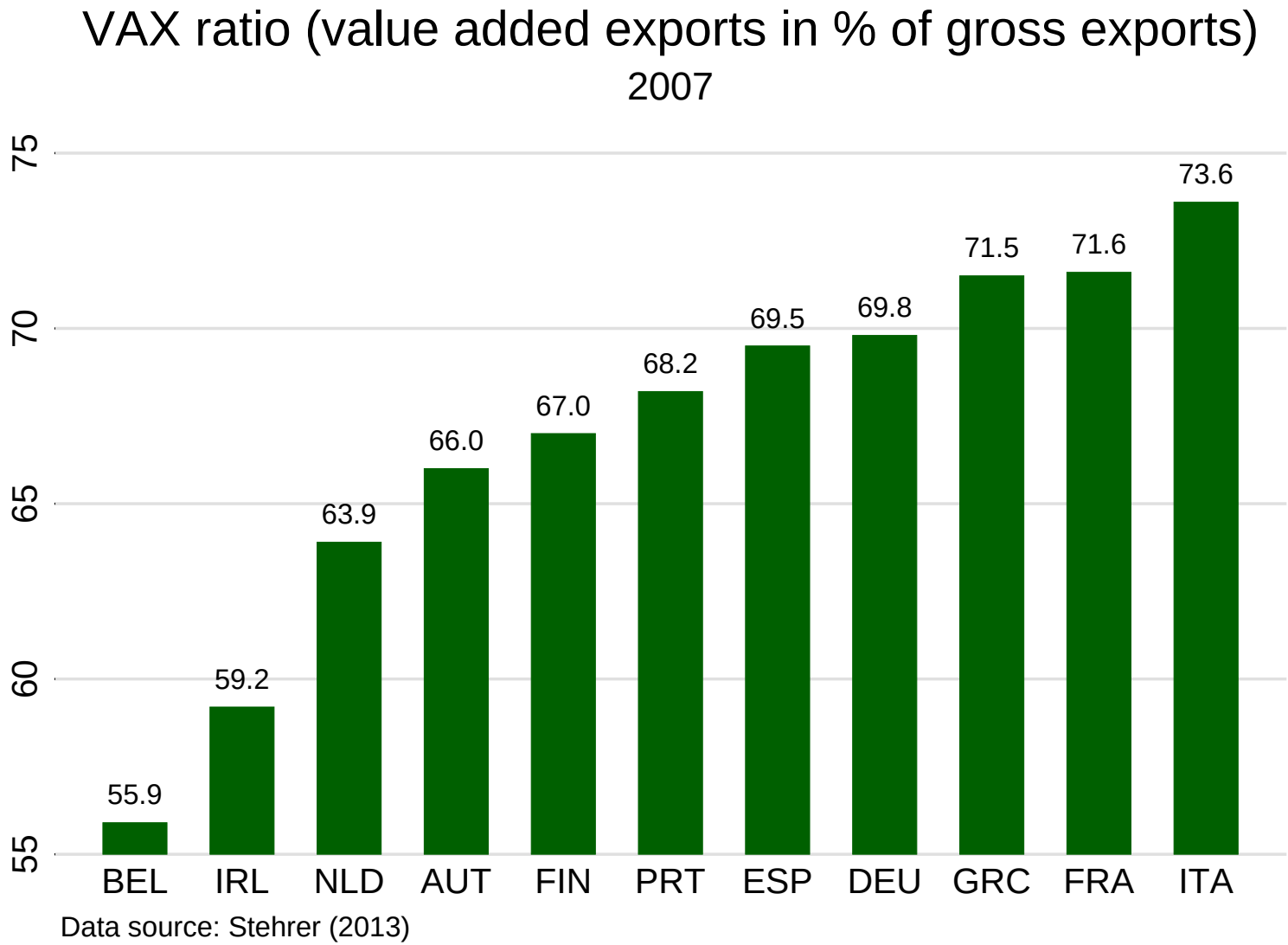
Offshoring helps explain the "sick man of Europe"

- Germany 1995-2005: high unemployment, low growth, emergence of trade surplus
- Offshoring created unemployment, weakened domestic demand, contributed to trade surplus

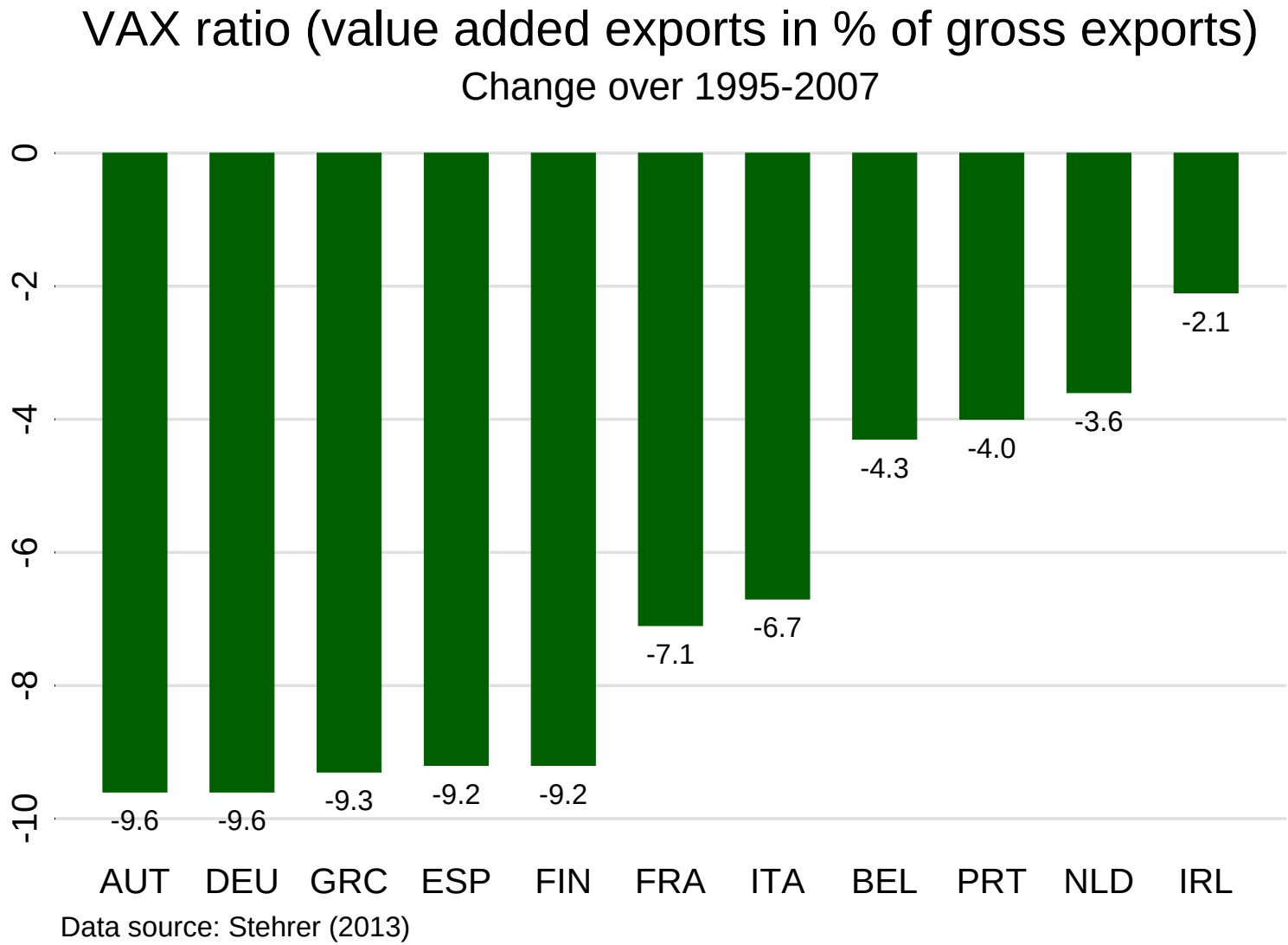
Why did Germany's export boom fail to generate income and employment growth?

- Exports represent demand injection
- Foreign trade multiplier $\Rightarrow$ Robust growth
- Germany's growth performance poor and unemployment high (until 2006)
- How can export boom and near stagnation coexist?
- Some kind of demand leakage – offshoring
- Offshoring refers to relocation of production to foreign country; the output of offshored activity is then imported as input to domestic production
- Domestic value added per unit of output declines
- A given level of domestic expenditure creates less domestic income and employment
- A given level of exports creates less domestic income and employment
- Domestic income may stagnate even as gross exports are growing

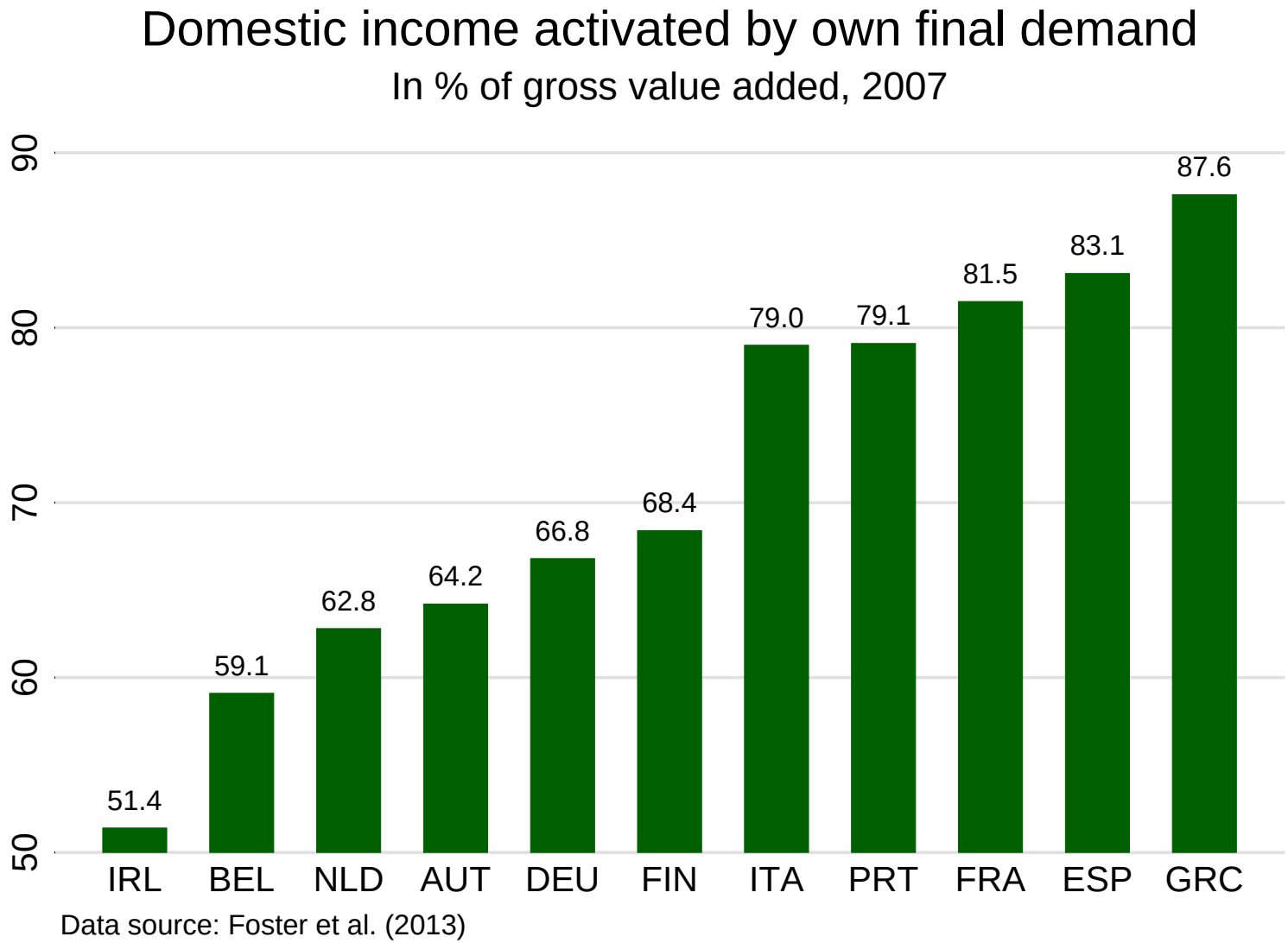
One euro export revenue generates 70 cent income in Germany



Germany and Austria experienced the sharpest decline in this measure



One euro final demand by Germany generates 67 cent income in Germany



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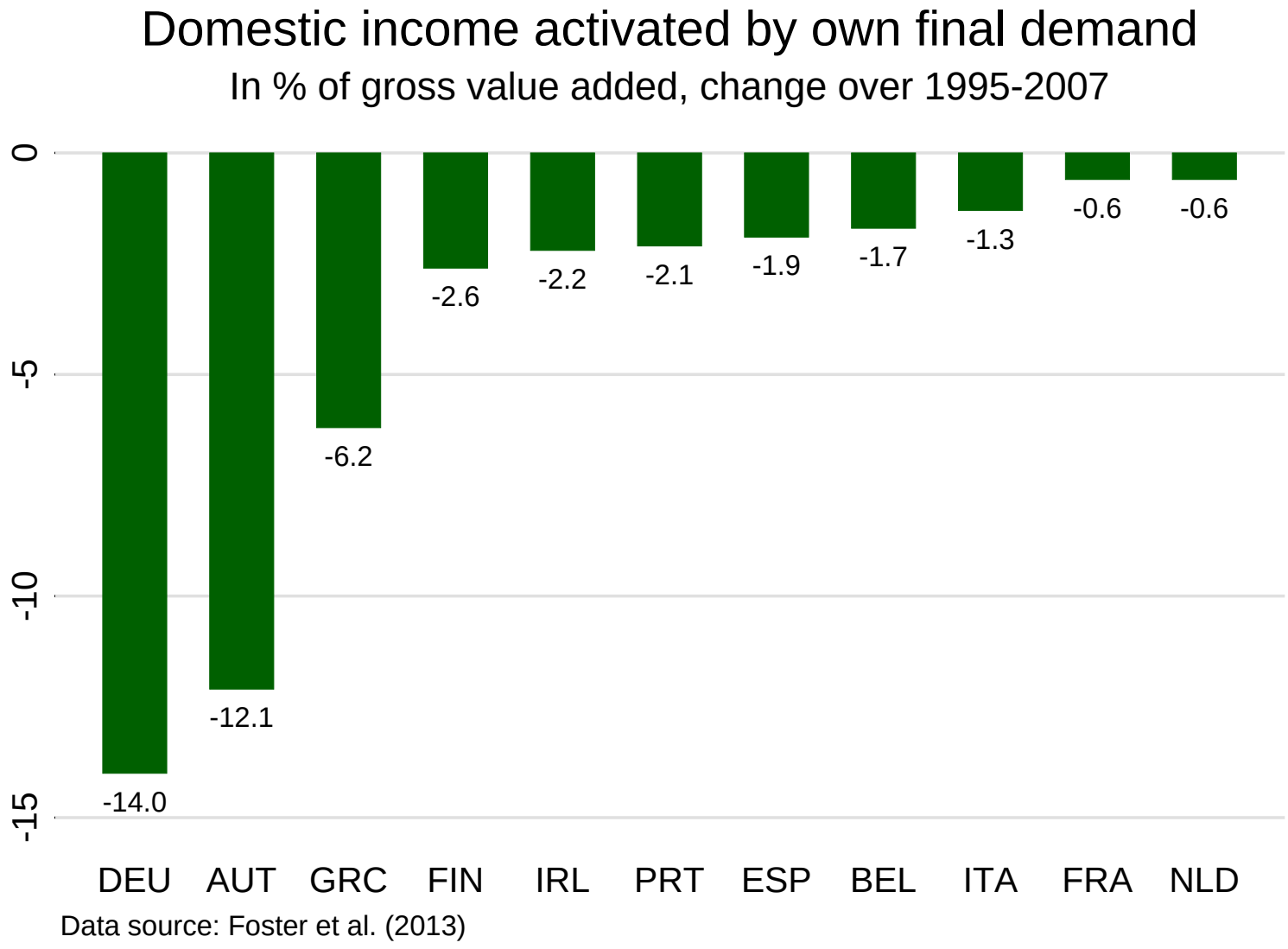

Trade/offshoring and unemployment in economic models

Pure theory of trade

- Full employment (e.g. Grossman & Rossi-Hansberg)
- Frictions and rigidities regulate speed of adjustment

Frictional unemployment

- Search-and-matching frictions in Heckscher-Ohlin models (Davidson & Matusz)
- Search-and-matching frictions in heterogeneous-firm models ala Melitz (Helpman & Itskhoki)

Demand-deficient unemployment

- In a model where prices, money wages, and exchange rates do not adjust so as to maintain full employment and balanced trade, what is the effect of offshoring on employment and demand?

Standard Keynes-Kalecki model

- Output is demand-constrained
- Domestic demand is function of profits and wage bill:
  $A = a\left(WB,\, F,\, \alpha^{a}\right) = c\left(WB,\, F,\, \alpha^{c}\right) + i\left(F,\, \alpha^{i}\right)$
- Foreign demand is function of real exchange rate: $X = x\left(R,\, \alpha^{x}\right)$
- Two factors of production: domestic labor and imports
- Production technology for A and X identical (Leontief)
- Labor demand: $N = n \cdot (A + X)$
- Import demand: $M = m \cdot (A + X)$
- Unit costs composed of unit labor costs and unit import costs:
  $UC = W \cdot n + P^{M} \cdot m$
- Relationship between price, markup and unit costs:
  $P = (1 + \tau) \cdot UC = UC / (1 - \pi)$
- Equilibrium condition: $Y = A + X - R \cdot M$
- Wages and profits make up domestic income: $Y = WB + F$

The complete equation system

$$
\begin{aligned}
Y &= A + X - R \cdot M && (1)\\
A &= a\left(WB,\, F,\, \alpha^{a}\right), \qquad a_{WB} > a_{F} > 0,\ a_{\alpha^{a}} = 1 && (2)\\
X &= x\left(R,\, \alpha^{x}\right), \qquad x_{R} > 0,\ a_{\alpha^{x}} = 1 && (3)\\
M &= m \cdot (A + X) && (4)\\
N &= n \cdot (A + X) && (5)\\
P &= UC / (1 - \pi) && (6)\\
UC &= W \cdot n + P^{M} \cdot m && (7)\\
R &= P^{M} / P && (8)\\
WB &= W \cdot N / P && (9)\\
F &= Y - WB && (10)\\
\psi &= 1 - \pi - R \cdot m && (11)
\end{aligned}
$$

The viability of labor-saving import-using technical change

- Technique of production is characterized by pair $[n, m]$, where n is unit labor requirement and m is unit import requirement
- Labor-saving import-using technical change means $\triangle n < 0$ and $\triangle m > 0$
- Firms adopt a new technique if it is viable
- A technique is viable if it increases the profit rate at the prevailing set of factor prices
- No capital stock, no fixed costs $\Rightarrow$ profit rate equal to markup rate
- Lower unit costs permit higher markup

$$\begin{aligned} UC^{old} &> UC^{new} \\ W \cdot n + P^M \cdot m &> W \cdot n \cdot (1-\eta) + P^M \cdot m \cdot (1+\gamma \cdot \eta) \\ W \cdot n &> P^M \cdot m \cdot \gamma \\ \text{Saved labor costs} &> \text{Additional import costs} \end{aligned}$$

- New technique is viable if it saves more labor costs than it adds import costs

Labor-saving import-using technical change in the model

- Amend the following equations:

$$M = m \cdot (1 + \gamma \cdot \eta) \cdot (A + X) \tag{4}$$
$$N = n \cdot (1 - \eta) \cdot (A + X) \tag{5}$$
$$UC = W \cdot n \cdot (1 - \eta) + P^M \cdot m \cdot (1 + \gamma \cdot \eta) \tag{7}$$
$$\psi = 1 - \pi - R \cdot m \cdot (1 + \gamma \cdot \eta) \tag{11}$$

- Direct effects of offshoring:

$$\frac{\partial M}{\partial \eta} > 0 \qquad \text{Imports increase}$$
$$\frac{\partial N}{\partial \eta} < 0 \qquad \text{Employment falls}$$
$$\frac{\partial UC}{\partial \eta} < 0 \qquad \text{Unit labor costs fall}$$
$$\frac{\partial \psi}{\partial \eta} < 0 \qquad \text{Wage share falls}$$

Offshoring may influence the markup

The Kaleckian vision

- Markup exogenous; it reflects degree of monopoly
- Degree of monopoly determined by institutional environment (industry concentration, product differentiation, union power)

Offshoring changes the institutional environment

It shifts bargaining power from workers to firms

- Increased elasticity of labor demand (Rodrik)
- Threat effects (e.g. Reddy & Dube)

Two alternative closures

$$P = (1 + \tau) \cdot UC$$

Constant-price closure

If price constant, then offshoring increases markup – redistribution from wages to profits

Constant-markup closure

If markup constant, then offshoring reduces price – improvement in price competitiveness

Results of constant-price closure

Exports remain constant

- No change in price competitiveness (firms absorb the competitiveness gain)

Domestic demand falls

↓ Imports replace domestic labor input, which reduces labor income

↓ Redistribution from high-spending wage recipients to low-spending profit recipients

Employment falls

↓ Productivity effect (less labor required per unit of output)

↓ Expenditure effect (domestic demand falls)

Results of constant-markup closure

Exports increase

$\uparrow$ Price competitiveness improves

Domestic demand rises or falls

$\downarrow$ Imports replace domestic labor input, which reduces labor income

$\uparrow$ Exports generate wage and profit income

Employment rises or falls

$\downarrow$ Productivity effect (less labor required per unit of output)

$\downarrow\uparrow$ Expenditure effect (domestic demand rises or falls)

$\uparrow$ Competitiveness effect (exports increase)

The model applies to the "sick man of Europe"

- Model gives conditions under which offshoring generates unemployment. Germany satisfies the conditions:
  - Aggregate wage share declined in "sick man period"
  - Price elasticity of exports is low
- Offshoring increased unemployment and weakened demand in Germany
- Weak demand held down consumption goods imports $\Rightarrow$ trade surplus