



# Market structure analysis

## *Price-setters or price-takers?*

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# COMETR

## Competitiveness effects of Environmental Tax Reform

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ETR : Carbon taxes with reduction of others taxes

ETR countries : Denmark, Finland, Germany, the Netherlands, Sweden, the UK and Slovenia.

### Market structure analysis

1. Which sectors are potentially vulnerable ?
2. Are they exposed to global competition ?



# 1 Which sectors are potentially vulnerable ?

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## Screening

1. energy-expenditure shares
2. labour
3. exports share of output
4. imports share of domestic market

Trade shares with EU and non-EU

Taking account of geographic variations



# Sectors selected for analysis

(UK data)

## Sectors potentially vulnerable under ETR

	NACE code	<i>Intensity</i>			
		Energy Expend.	Labour	Export	Import
Food and beverages	15	high	low	low	low
Pulp, paper and board	21	high	medium	low	low
Wood and wood prod.	20	medium	low	low	low
Basic chemicals excl. pharmaceuticals	24 less 24.4	high	low	high	high
Pharmaceuticals	24.4	low	low	high	high
Non-metallic min. prod.	26	high	medium	low	low
Basic metals	27	high	high	medium	medium



## 2. Exposed to global competition?

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Do they have market power?  
Price-takers OR price-setters?

Do they have to match world price or sink?  
OR  
Can they pass on cost increases, eg carbon taxes?

Their pricing behaviour reveals the answer.



## Check revealed price determination

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Are prices:

- externally determined ?  
(price-taker, vulnerable under ETR)
- a mark-up on domestic costs ?  
(price-setter, market power, less vulnerable)



# Model

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the following model can be considered:

$$p_i = \alpha_0 + \alpha_1 mc_i + p_i^f$$

where for sector  $i$

$p_i$  = the domestic output price

$mc_i$  = the domestic marginal cost

$p_i^f$  = the foreign or world price  
(US and German prices)

Error Correction Model allows a lag in adjusting prices

$\lambda$  = speed of adjustment



## (Detail)

Model estimated:

$$P_d^* = f(P_j, R_j, W_k)$$

Where

- $P_d^*$  = the long-run wholesale price for the sector's domestic output
- $P_j$  = the wholesale price index in the 'competing' country or bloc j
- $R_j$  = the exchange rate with country or bloc j
- $W_k$  = the price index for domestic input factor k. Wage rates are used.

Data:

Quarterly over 30 years: Q1 1975 to Q4 2004

OECD Statistical Compendium for producer prices (with Eurostat updates)  
and for US prices.

OECD for quarterly index of hourly earnings in All Manufacturing.

Eurostat (Ameco) for exchange rates.

Error Correction Model representation:

$$\Delta Y_t = \alpha_1 + \lambda(Y_{t-1} - \beta_1 X_{t-1}) + \sum \alpha_2(i) \Delta y_{t-i} + \sum \alpha_3(i) \Delta X_{t-i} + \varepsilon_{yt}$$



## RESULTS - 6 sectors in 6 ETR countries

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### EXAMPLE 2 sectors

1. Basic metals
  - generally high energy use
  - highly traded
  
2. Non-metallic minerals
  - high energy use
  - high weight to value
  - less traded



# Are output prices determined by domestic or foreign prices?

-Adjustment speed $\lambda$ -Domestic cost -Foreign price -Fit: Adjusted R <sup>2</sup>	BASIC METALS		NON-METALLIC MINERAL PRODUCTS	
	US price	German price	US price	German price
<b>Denmark</b>	-0.062** 0.174 0.643*** 0.323	-0.156*** 0.079* 0.866*** 0.500	0.009 1.377 -0.920 0.540	-0.234*** 0.513*** 0.139 0.211
<b>Germany</b>	-0.149 0.270 1.246 0.598	..	-0.022 0.079 -0.327 0.498	..
<b>Finland</b>	-0.116*** 0.375*** 0.301*** 0.600	-0.136*** 0.194** 0.516*** 0.643	-0.048** 0.278** 0.056 0.410	-0.315*** 0.419*** 0.053** 0.227
<b>Netherlands</b>	-0.083** 0.300*** 0.405*** 0.508	-0.139*** 0.146** 0.665*** 0.605	-0.016 0.124 0.134 0.395	-0.177*** 0.406*** 0.412*** 0.178
<b>Sweden</b>	-0.038* 0.410* 0.711** 0.634	-0.124*** 0.047 0.942*** 0.830	-0.002 -8.456 0.027 0.727	-0.176* 0.716*** 0.018 0.257
<b>UK</b>	-0.055*** 0.329*** 0.267* 0.700	-0.115*** 0.229*** 0.476*** 0.830	-0.035*** 0.352*** 0.260 0.730	-0.167** 0.518*** -0.000 0.216
<b>RESULT</b> (no. of significant price determinants in sector)	<b>4 Domestic</b> <b>5 US</b>	<b>4 Domestic</b> <b>5 German</b>	<b>2 Domestic</b> <b>0 US</b>	<b>5 Domestic</b> <b>2 German</b>



## Results on pricing power

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### 1. Basic metals

- US price and German price (more so) have strong influence on price.
- Foreign price outweighs influence of domestic costs. **PRICE-TAKER**

### 2. Non-metallic minerals

- US price is not a determinant.
- Domestic costs are dominant influence.
- Except German price also influences Netherlands' price, and Finland's minimally. **PRICE-SETTER**



## Results, cont'd

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- Model performs well overall
- Plausible results
- German 'foreign' price was generally more influential than US price
- EU-wide ETR (or auctioned permits) would have advantages: firms supplying EU would be affected in a consistent manner.
- Can RANK sectors by extent of foreign price influence, ie by vulnerability on pricing



## Ranking sectors on pricing vulnerability

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**Basic metals (most vulnerable)**

**Paper and paper products**

**Wood and wood products**

**Chemicals**

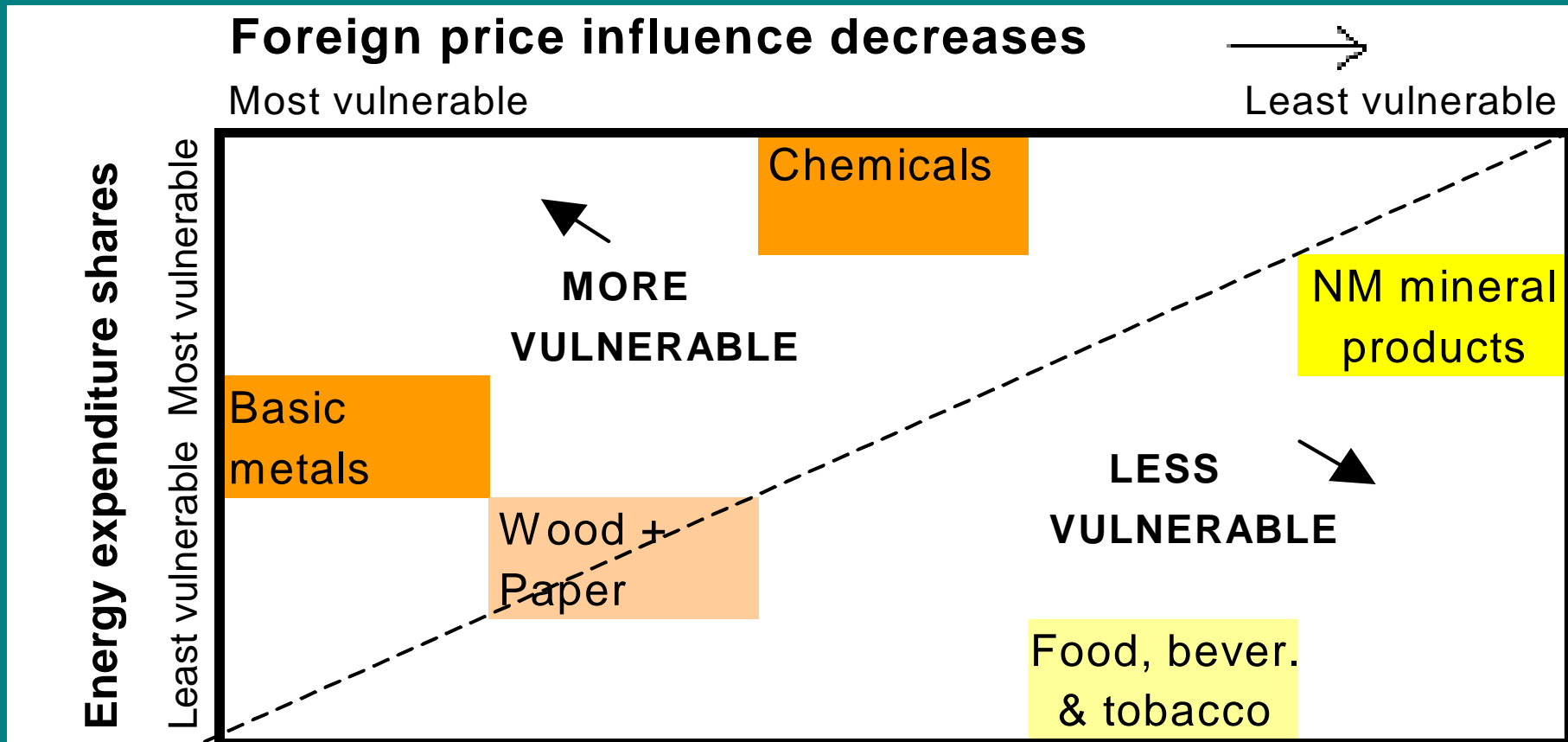
**Food, beverages and tobacco**

**Non-metallic mineral products (least vulnerable)**

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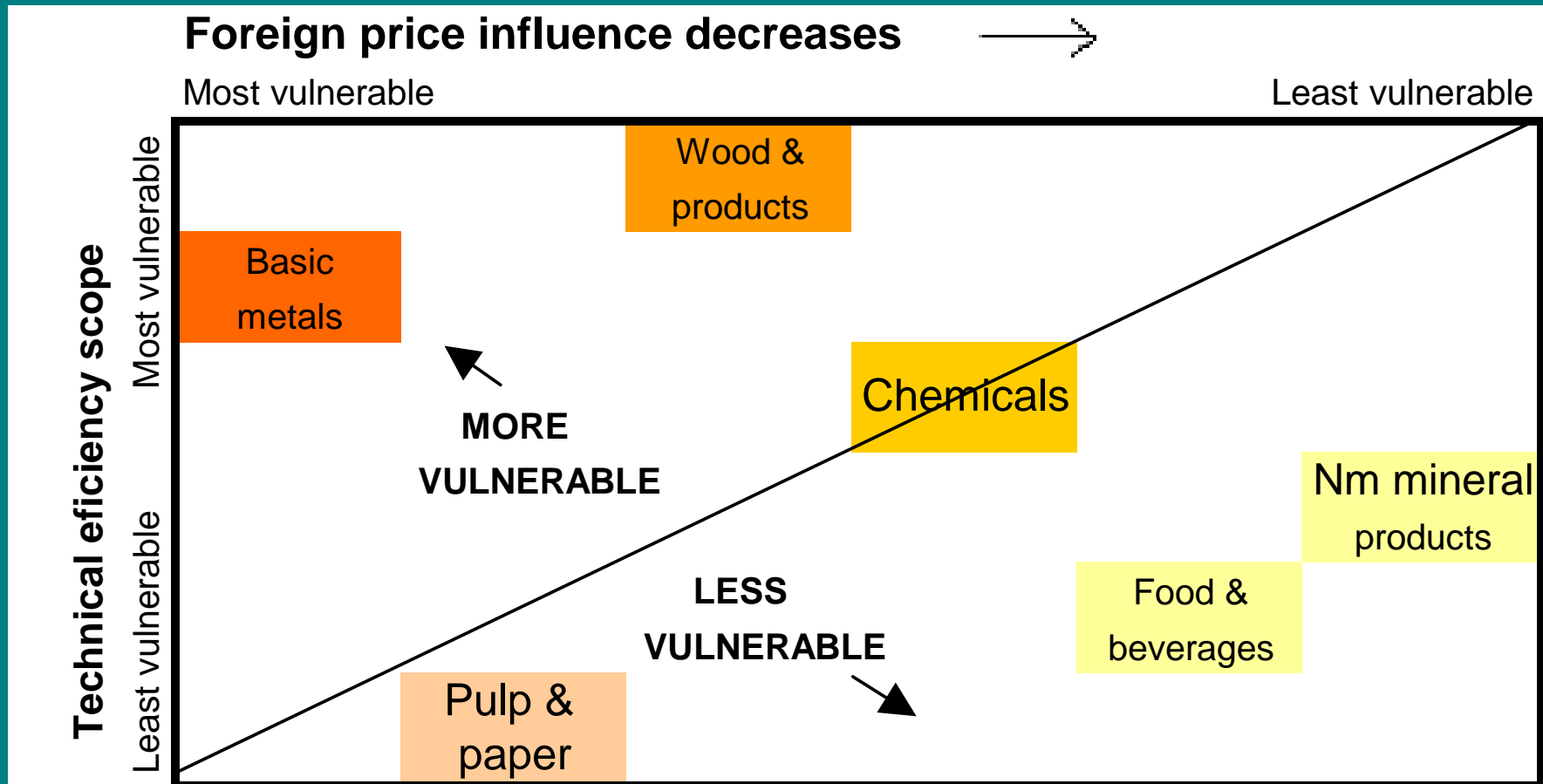


# Further insights: Ranked vulnerability on energy and pricing





# Further insights (UK) : Ranked vulnerability on technology and pricing





# Conclusions

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## Vulnerability:

- Energy use and trade exposure are important.
  - PRICING POWER is also important determinant.
  - Can be assessed and ranked:
    - Basic metals has least (most vulnerable),
    - non-metallic mineral products has most pricing power (least vulnerable).
- Indicates priorities for policies.