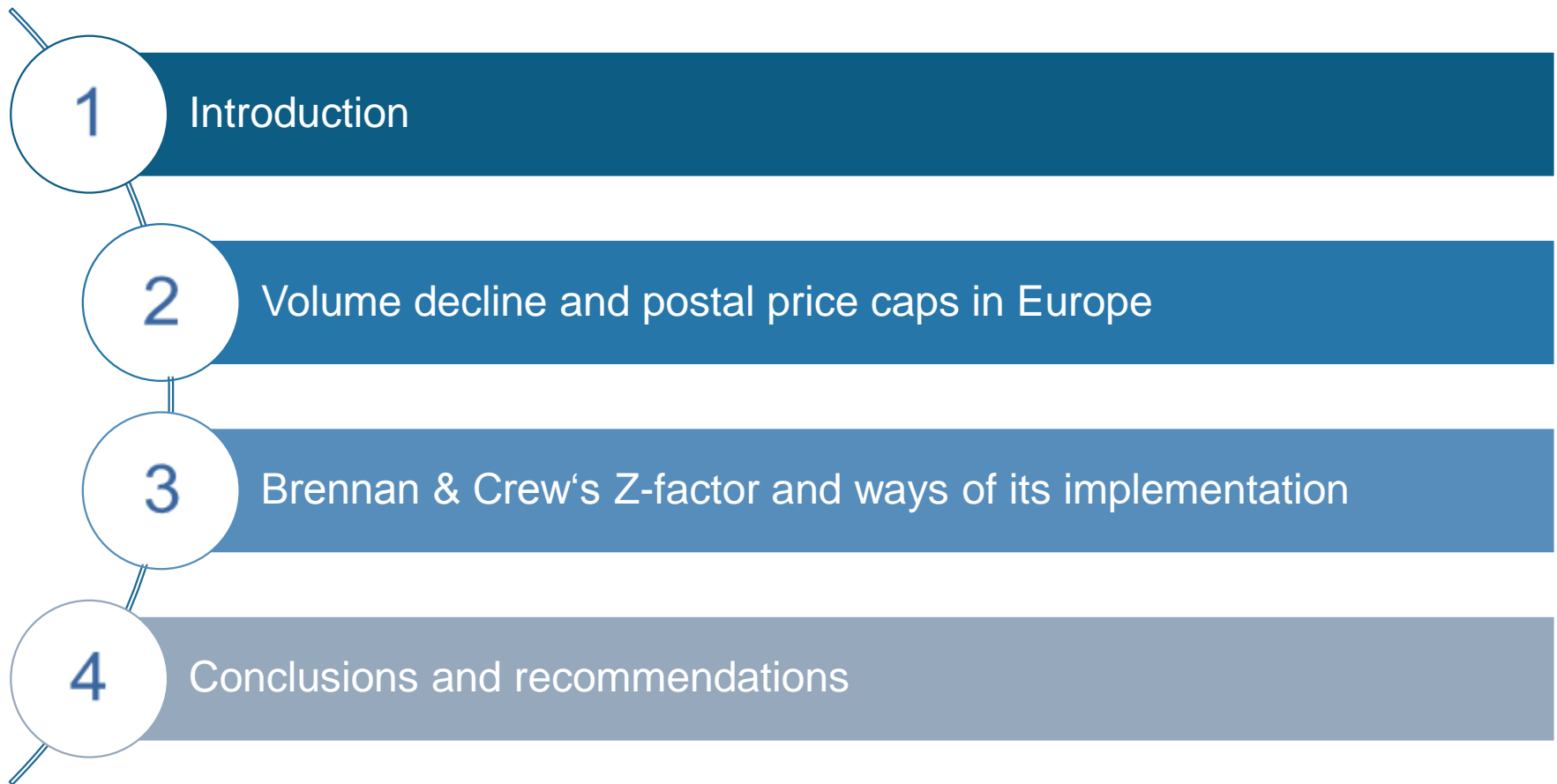



How to respond to declining volumes in postal price caps?

Christian Bender, Alex Dieke, Antonia Niederprüm


29 March 2018
10th bi-annual Postal Economics Conference, Toulouse



Some European postal regulators have implemented price cap regulations



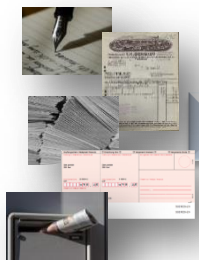
Postal markets are changing:
declining demand for letter services



Regulators review the price cap regulations to incorporate volume decline

Crew & Brennan proposed an adjustment factor (Z-factor) to link price caps to volume decline

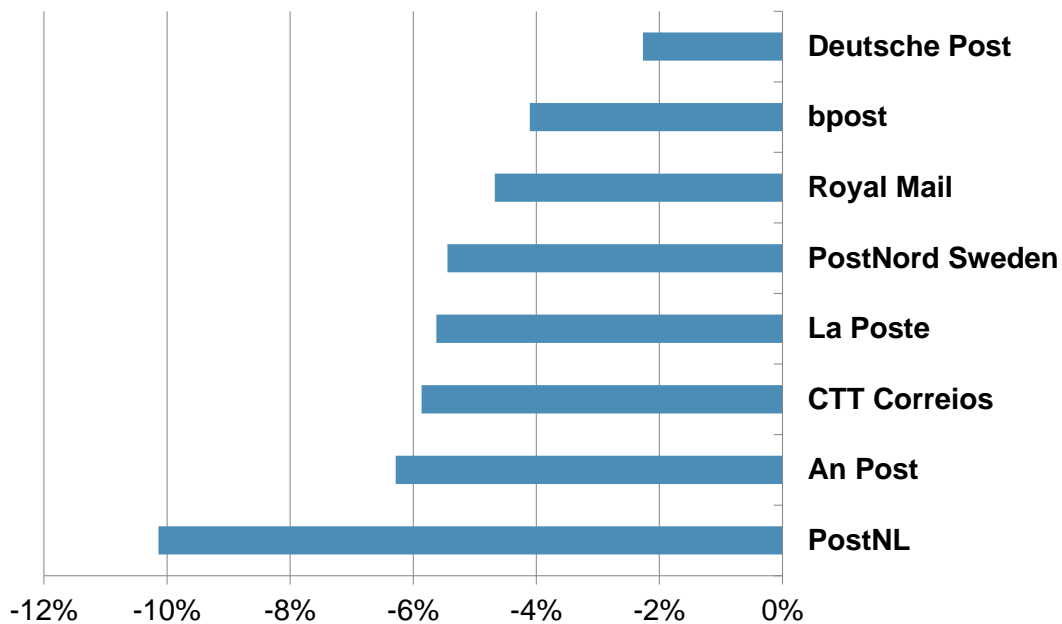
Universal service providers face declining letter volumes...



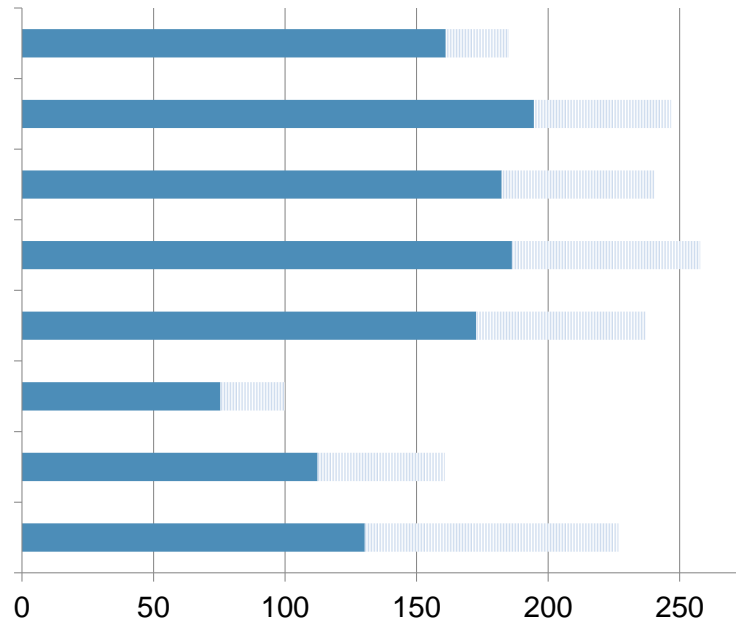
Changes in communication patterns accelerate volume decline



Average annual volume decline (2011-2016)

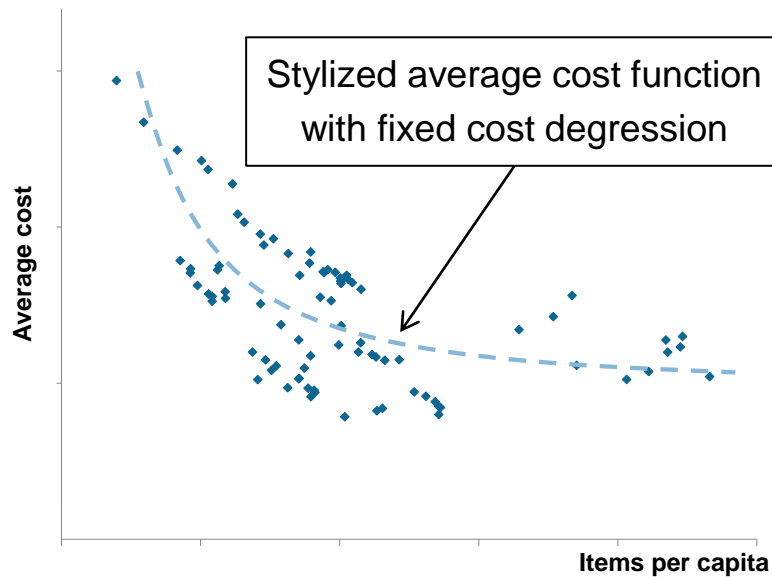


Letter post items per capita (2011, 2016)



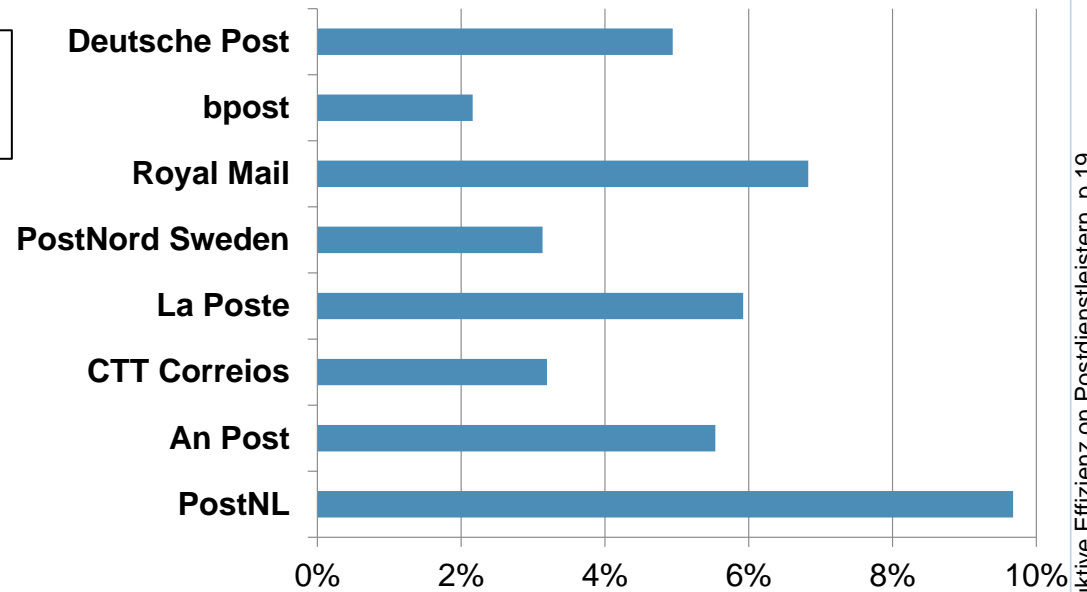
...that results in increasing average cost and tariffs

Average cost increase with volume decline



Significant share of fixed cost in postal operations

Average annual tariff increase (20g D+1 letters, 2011-2016)



Universal service providers respond with price increases

Purpose of price cap regulation

- Price cap regulation aims at simulating cost-based prices in competitive markets

$$\Delta\%P = \Delta\%I - X$$

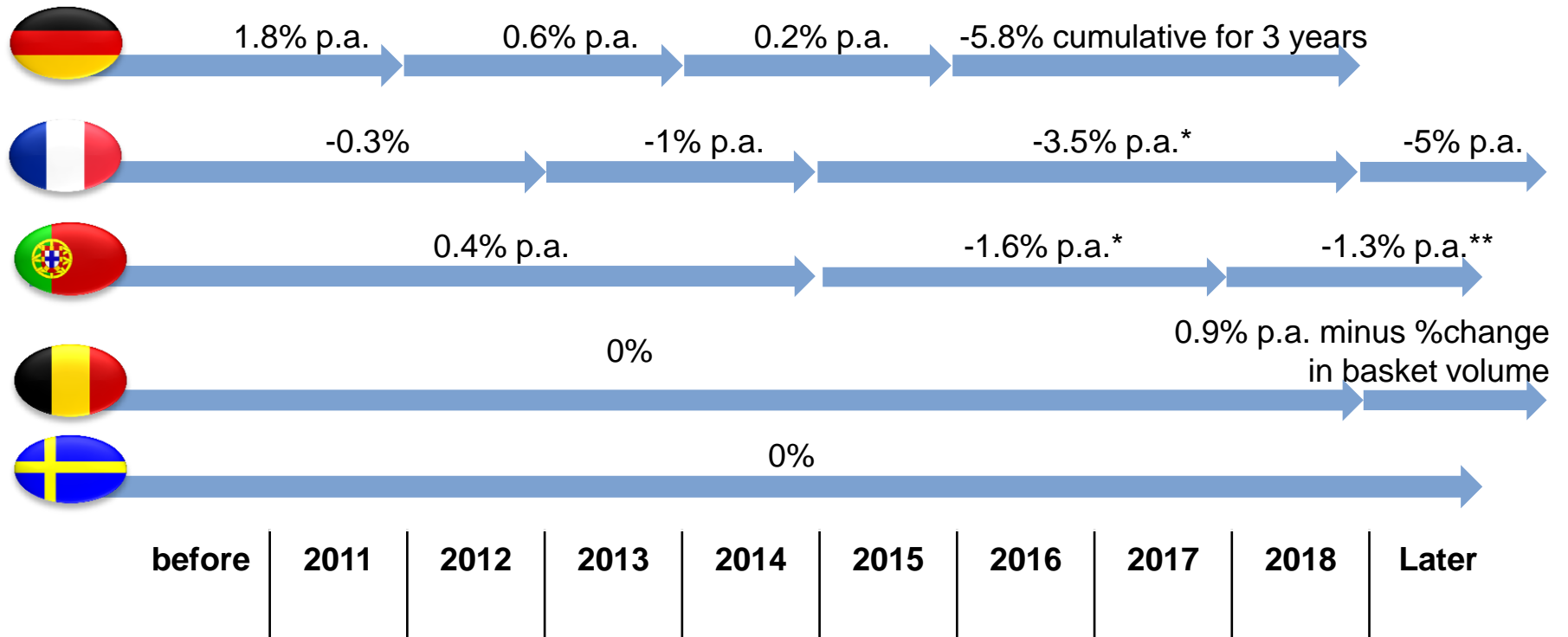
The diagram illustrates the relationship between three variables in price cap regulation. At the top, the equation $\Delta\%P = \Delta\%I - X$ is shown, with each term enclosed in an oval. Below the equation, three rectangular boxes are arranged horizontally, each connected to its corresponding term in the equation by a thin line. The first box, labeled 'Allowed price adjustment', is connected to $\Delta\%P$. The second box, labeled 'Inflation', is connected to $\Delta\%I$. The third box, labeled 'Efficiency measure', is connected to X .

- Price cap regulation should provide incentives for postal operators to improve efficiency
- Price caps usually applied to service baskets for more pricing flexibility within the basket
- Regulators should be committed to the price cap during the term to ensure regulatory certainty

Price cap regulations in Europe

Country	Services included	Formula	Period
Belgium	Single-piece letters and parcels	$\Delta \text{CPI} + \text{Quality Bonus}$ (until end of 2017) $\Delta \text{CPI} - X$	Without a fixed term
France	Single-piece and bulk letters, single piece parcels	$\Delta \text{CPI} - X$	3 – 4 years
Germany	Single-piece letters (up to 1kg)	$\Delta \text{CPI} - X$	2 – 4 years
Ireland	Single-piece and some bulk letters and postal parcels	$\Delta \text{CPI} - X$	5 years [repealed in 2017]
Netherlands	Single-piece letters and parcels	$\Delta \text{CPI} - X$	Without a fixed term
Portugal	Single-piece letters and postal parcels	$\Delta \text{CPI} - X$	3 years
Sweden	Single-piece letters (up to 500g)	ΔCPI	Without a fixed term
UK	Single-piece letters (non-priority mail)	$53\% + \Delta \text{CPI}$	8 years

X-factors became negative over time



* Adjusted for actual volume and CPI developments:

FR: 2017, 2018: -3.3%

PT: 2016: -0.6%, 2017: -1.2%

** Anacom's proposed price cap decision, consultation period extended

Brennan & Crew proposed an approach for linking price caps to volume decline

- Introduction of an adjustment factor into the price cap formula

$$\Delta\%P = \Delta\%I - X + Z * \Delta\%Q$$

improves transparency by explicitly separating

- price adjustments due to projected productivity gains (X-factor) and
 - price adjustments to compensate effect of volume decline on average cost (Z-factor)
- Z-factor should capture effects that are not under control by the regulated firm
 - Promising theoretical approach ...but how to implement it in regulatory practice?
 1. Determination of the volume development $\Delta\% Q$
 2. Determination of the Z-factor

Determining the volume base

$$\Delta^{\%} P = \Delta^{\%} I - X + Z * \Delta^{\%} Q$$

- Forecasts versus actual (past) volume development?
- Basket volume versus total volume of the regulated company?
- Total volume of the regulated company versus market volume?

Brennan & Crew's Z-factor requires information on cost and demand functions

$$\Delta\%P = \Delta\%I - X + \mathbf{Z} * \Delta\%Q$$

$$\mathbf{Z} = \mathbf{e}_{AC} + \mathbf{e}_{AC} * \mathbf{e}_D * \mathbf{Z} \Leftrightarrow \mathbf{Z} = \frac{\mathbf{e}_{AC}}{1 - \mathbf{e}_{AC}\mathbf{e}_D}$$

First order effect:
Increase in average cost
due to volume decline

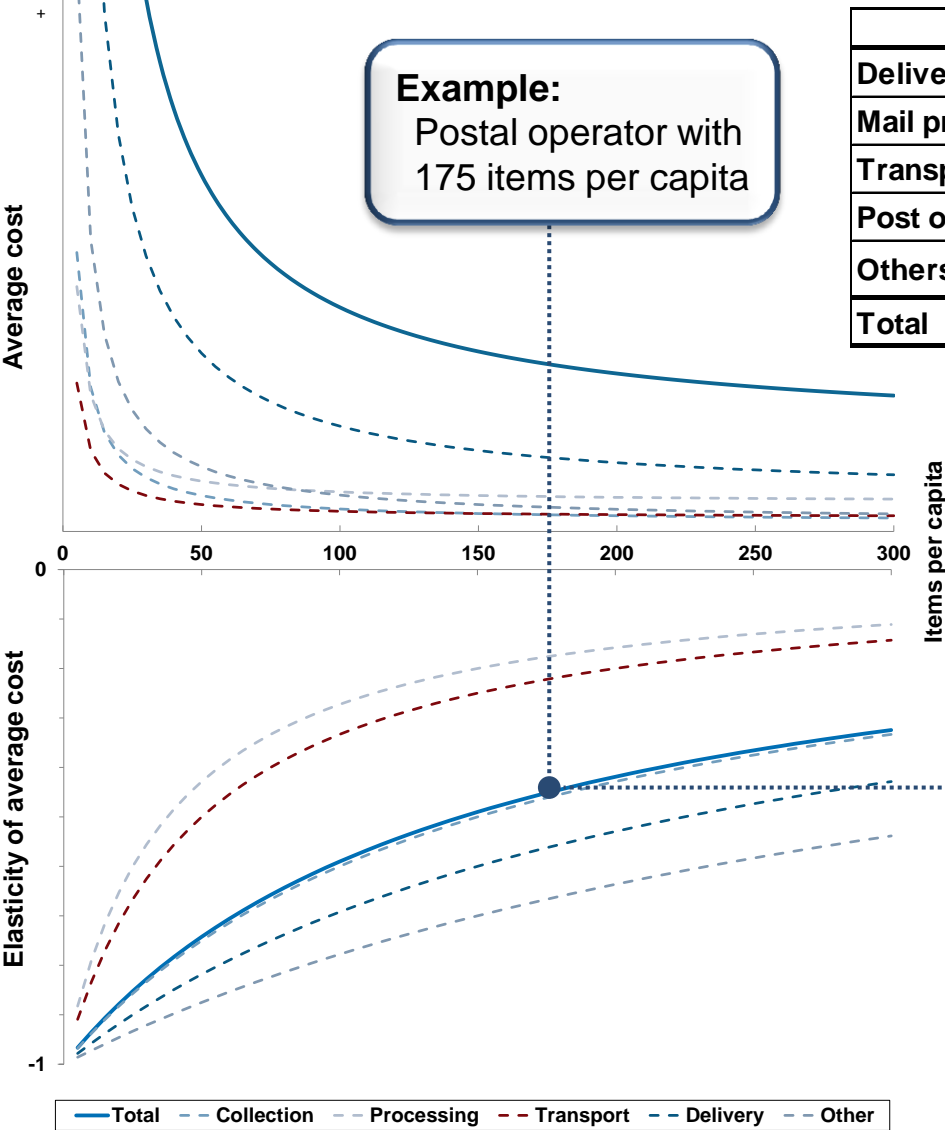
Second order effect:
Decline in demand from price increases
due to rising average cost

- To determine the Z-factor it is necessary to estimate two key components
 - Elasticity of average cost (w.r.t. volume) e_{AC}
 - Elasticity of demand (w.r.t. price) e_D

WIK model helps to estimate the elasticity of average cost

- WIK model to estimate the financial effects of volume decline
 - General cost function for a stylized postal operator allows estimation of relative changes in cost (Cohen, Pace et al. 2002 & Cohen, Robinson et al. 2004)
 - Includes core activities: collection, processing, transport, delivery, others
 - For each activity separately: considers economies of scale and fixed cost degression
 - Estimates for relative changes in cost due to volume changes independent from actual cost level
 - Published in the Main Development study for the European Commission in 2013
- Model parametrization per activity: cost shares and cost elasticities
 - Based on literature reviews, interviews and discussions with an expert panel of PostEurop
 - Estimates for a stylized European postal operator with 150 items per capita

WIK model: Example



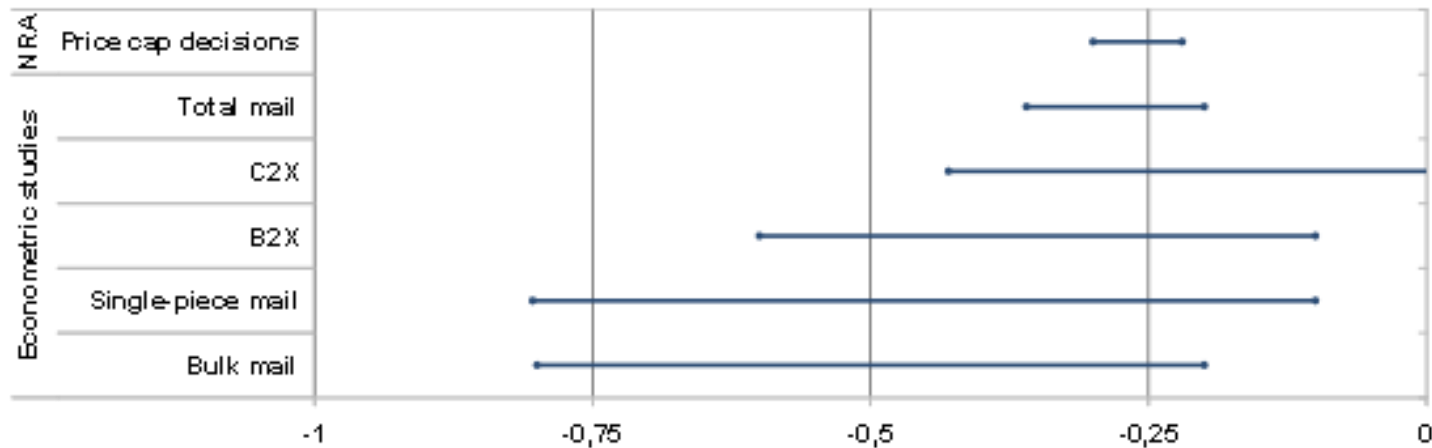
	Percent of Total Cost	Cost Elasticity
Delivery	45%	0.40
Mail processing	20%	0.80
Transportation	10%	0.75
Post offices & collection	10%	0.50
Others	15%	0.30
Total	100%	0.51

Source: WIK-Consult (2013), Main Developments in the Postal Sector (2010-2013)

Note: Calibrated for a stylized postal operator with 150 items per capita

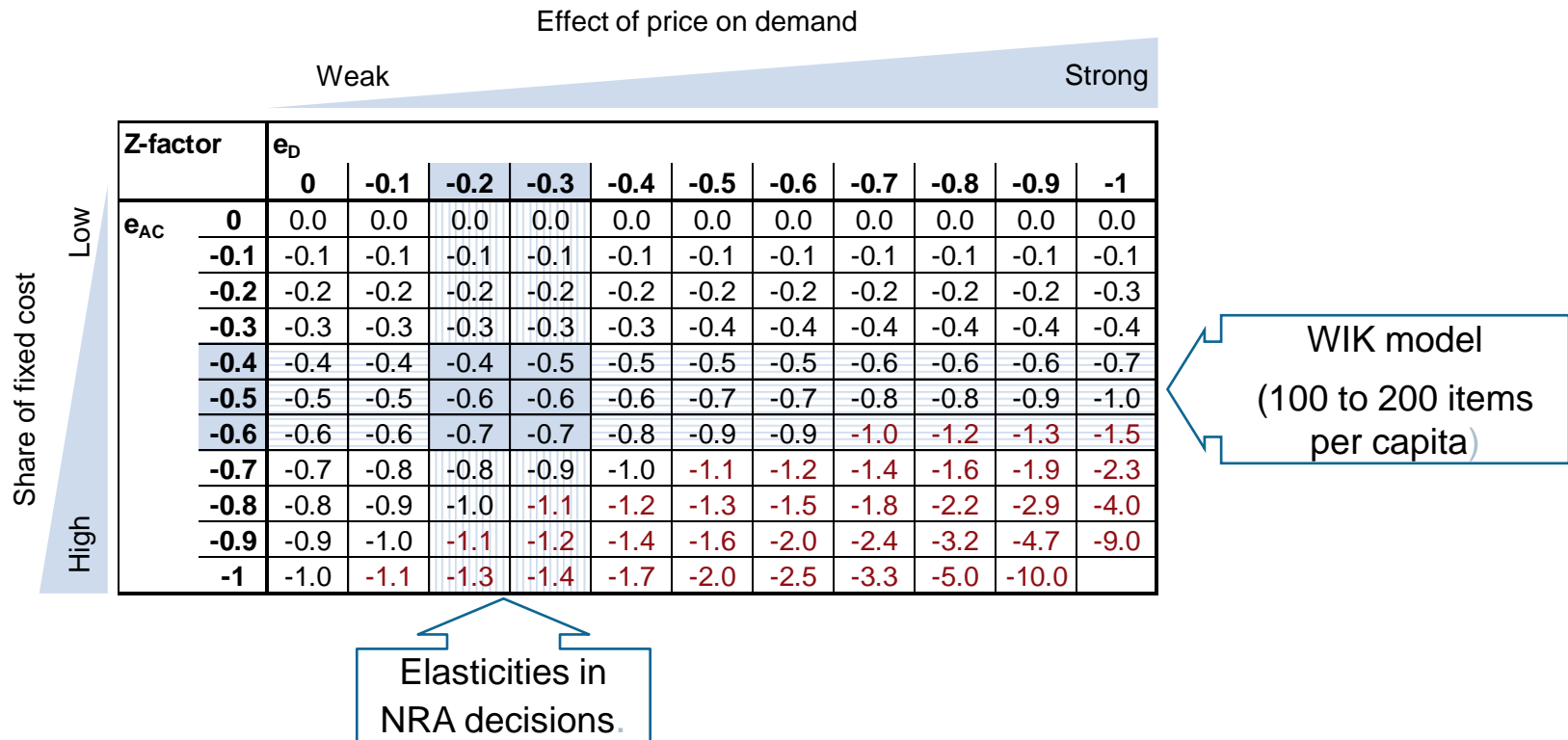
For a volume of 175 items per capita, elasticity of average cost is -0.45
A marginal volume decline increases average cost by 0.45%

Determining demand elasticities: Difficult task worth the effort?



- Estimation of demand elasticities w.r.t. price is a challenging task
 - Elasticity of demand varies between services and customer groups
 - Elasticity of demand varies with the level of service aggregation
 - Different economic models and econometric approaches lead to different results

Z-factor is primarily driven by average cost elasticity in relevant cases



- Low levels of demand elasticity w.r.t. price have a little effect on the Z-factor
- High levels of demand elasticity could immensely increase the Z-factor
 - Exploiting the cap could accelerate volume decline further (vicious cycle)
 - Price cap may not be binding for the regulated firm (price cap still meaningful?)
 - Affordability of postal tariffs at risk

How to implement the Z-factor in regulatory practice

- An adjustment factor additional to the X-factor increases transparency in price cap regulation
- The adjustment factor should only incorporate cost effects outside the control of the regulated firm
- Volume development ($\Delta\%Q$): Based on most recent developments of total letter volume
 - to avoid ex post adjustments and to be less dependent on USP's forecasts
 - to better reflect cost effects outside the control of the regulated firm
- Elasticity of average cost (e_{AC}):
 - WIK model facilitates the estimation of volume-driven cost effects without having detailed information on the costs of the regulated company
 - The model produces useful indications of the effect of volume decline on average costs and the elasticity of average cost
 - It can be adjusted on specific operators to better reflect differences in cost shares and elasticities.
- Second-order demand effect (e_D): Difficult to identify and for low values usually little effect on the Z-factor

MANY THANKS FOR YOUR ATTENTION!