

(MAYBE) THE SIMPLEST MODEL OF LONG-RUN PROFITABILITY IN PROVISION OF WIRELESS CONNECTIVITY

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Key points & exam tips

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- The telecommunication sector's *share of pocket* appears little affected by technological revolutions
- *Economies of scale* drive consolidation; governments define and enforce its limits
- Larger operators have cost advantages; a game of “musical chairs” challenges operators' strategy units (one of the operators in each market will have a hard time making a profit)
- The real winners appear to be consumers who pay the same and get more over time

For exam: At least..

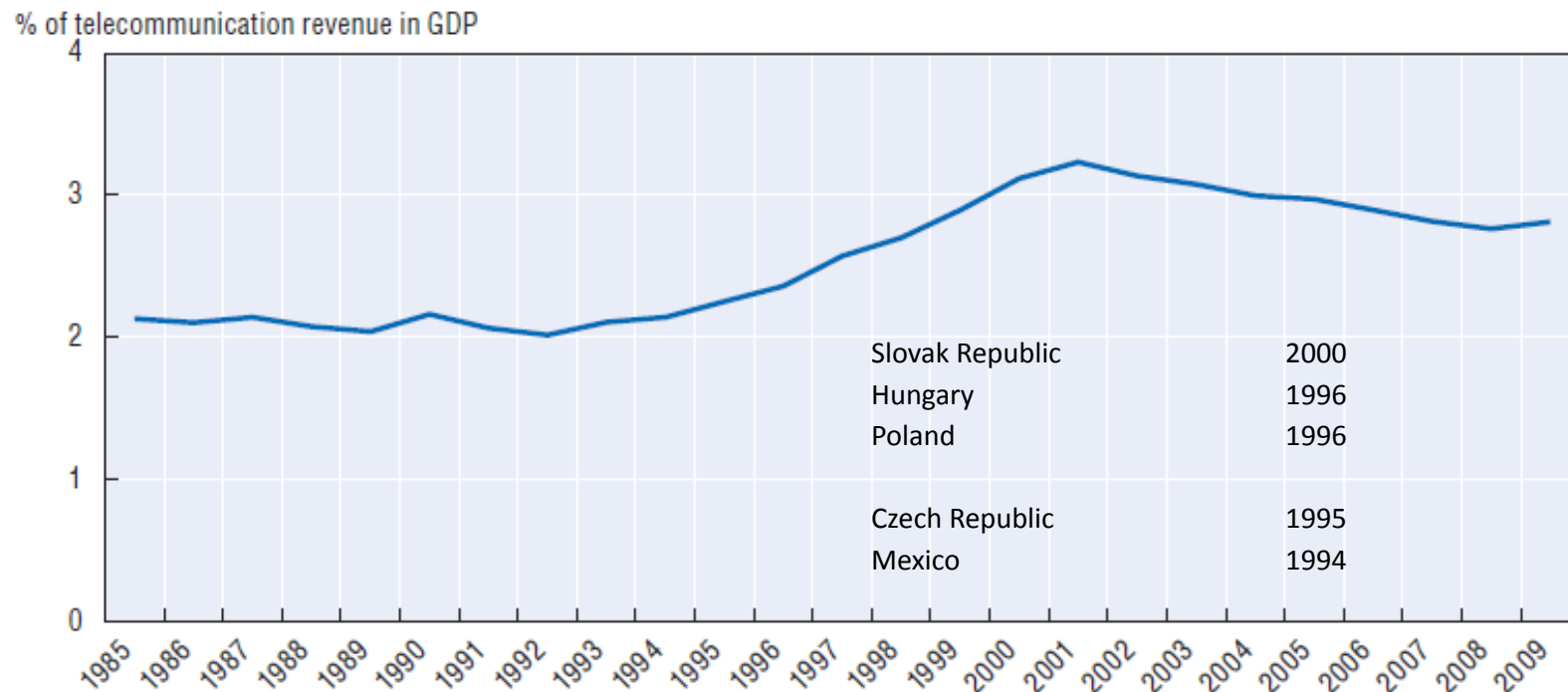
- Remember the key messages in the context slides
- Replicate the model graphically and use it to perform the analysis (remember what it is meant to represent and its main simplifications compared to “reality”)
- Note in particular the relevance of *economies of scale* (as opposed to a flat or increasing Average Cost Curve)


CONTEXT

“Share of pocket” appears constant: Economic growth and increased cost-effectiveness may become primary source of profit growth within wireless sector

3. TELECOMMUNICATION MARKET SIZE

Figure 3.2. Telecommunication revenue as a percentage of GDP for total OECD, 1985-2009



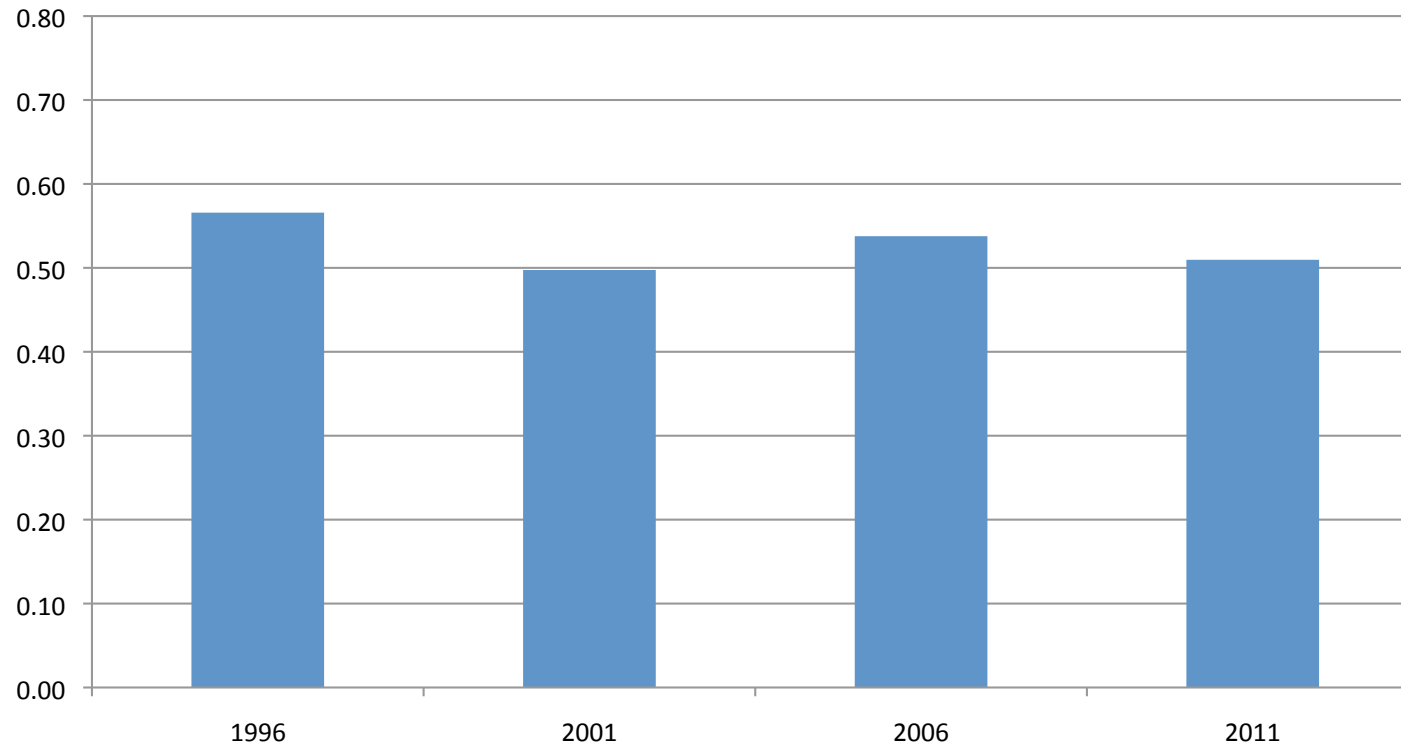
StatLink  <http://dx.doi.org/10.1787/888932394699>

OECD average growth rate 2000-2010 = 4.3 %

Telecommunications revenue growth 2000 - 2010 = 3.9 %

Another view of the “wireless revolution” in the US

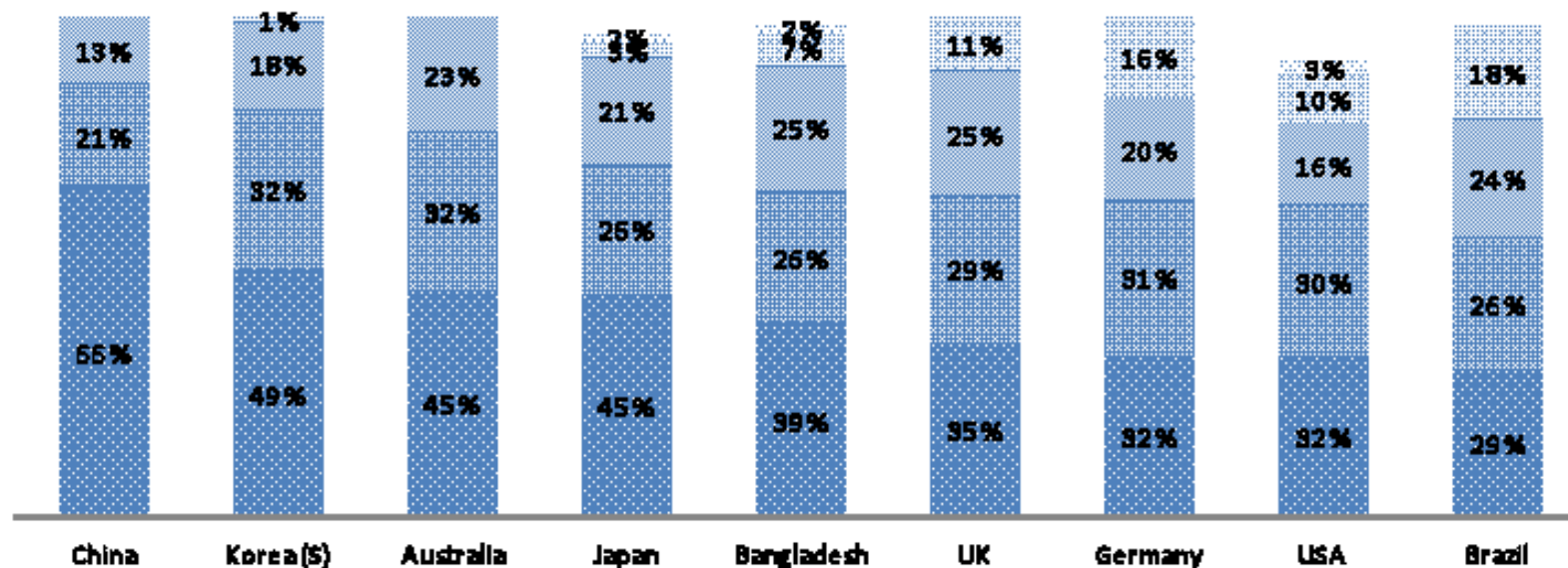
kUSD per wireless connection (annualized)



US wireless Quick Facts (Source: CTIA)

Mid-year estimates (annualized)	1996	2001	2006	2011
Wireless connections (M)	38	118	220	323
Total revenue (B)	21,5	58,7	118,3	164,6
Revenue / connection (K)	0,57	0,50	0,54	0,51

Five largest operators (share of connections Q1 2012) in a set of markets: market structures are strikingly similar (why?)



China	Korea(S)	Australia	Japan	Bangladesh	
China Mobile	66 % SK Telecom	49 % Telstra	45 % NTT DOCOMO	45 % Grameenphone (Telenor)	39 %
China Unicom	21 % KT	32 % Optus (SingTel)	32 % au (KDDI)	26 % Robi (Axiata)	26 %
China Telecom	13 % LG Uplus	18 % Vodafone Hutchison	23 % SoftBank Mobile	21 % banglalink (Orascom)	25 %
	KT Powertel	1 %	EMOBILE (eAccess)	3 % Airtel (Bharti Airtel)	7 %
			UQ Communications	2 % Citycell (Pacific Bangladesh)	2 %
SUM	100 %	100 %	100 %	97 %	99 %
UK	Germany	USA	Brazil		
Everything Everywhere (France Telecom)	35 % Vodafone	32 % Verizon Wireless	32 % Vivo (Telefónica)	29 %	
O2 (Telefónica)	29 % Telekom (Deutsche Telekom)	31 % AT&T Mobility	30 % TIM	26 %	
Vodafone	25 % E-Plus (KPN)	20 % Sprint (Sprint Nextel)	16 % Claro (América Móvil)	24 %	
3 (Hutchison)	11 % O2 (Telefónica)	16 % T-Mobile (Deutsche Telekom)	10 % Oi	18 %	
	0 % NetCologne	0 % CLEAR (Clearwire)	3 % Algar Telecom	0 %	
SUM	100 %	100 %	92 %	98 %	

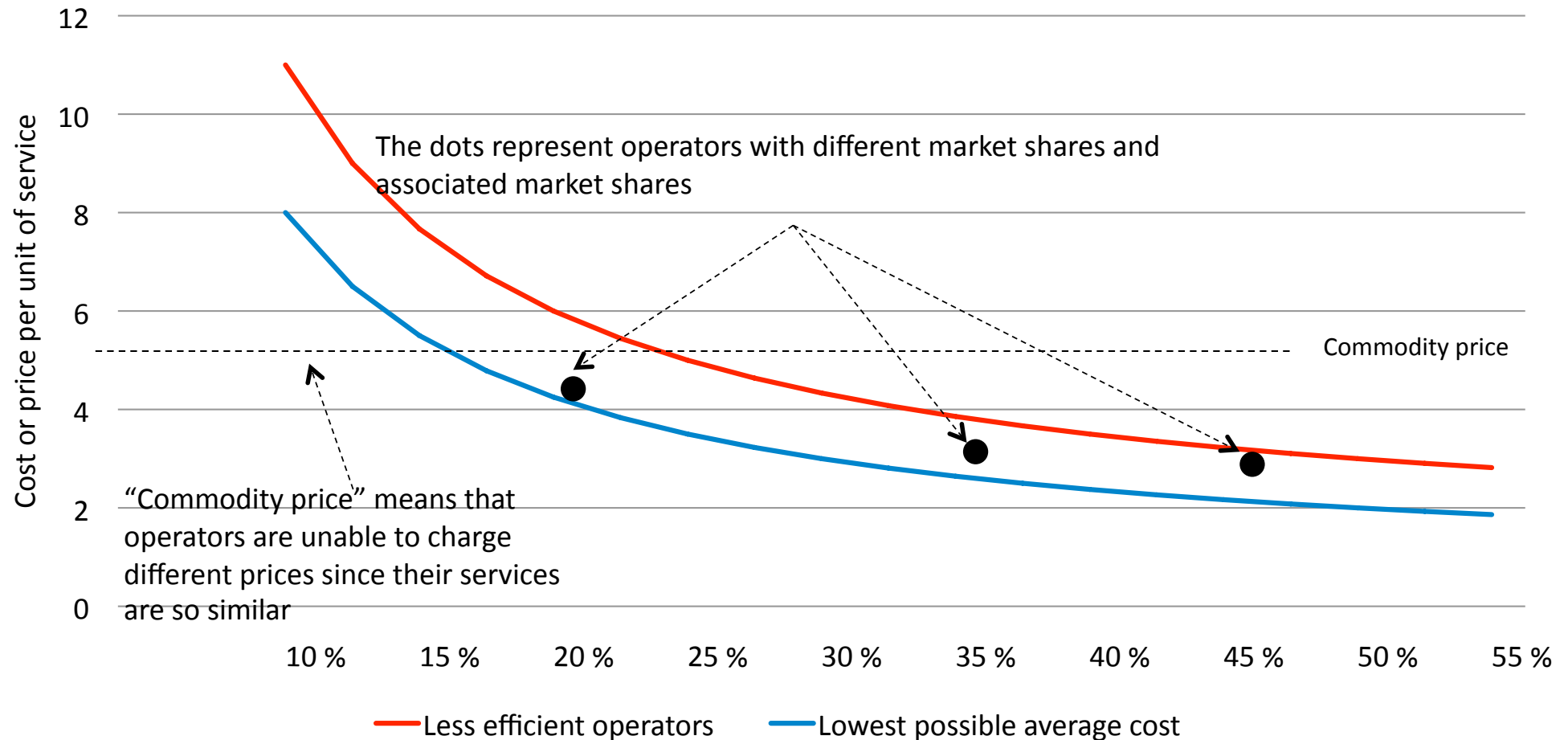
A SIMPLE MODEL OF MARKET STRUCTURE, COSTS, AND PROFITABILITY

Total required study time should decrease if you spend 10 minutes working through this exercise prior to studying the model

(It is very simple but intended to save NTNU students' time spent learning, not as an insult to their analytical skills)

- There is a factory with 100 workers who buy and eat exactly 1 hot-dog each every day
- There are three hot-dog vendors outside the factory
 - Each pay NOK 100 a day to rent a caravan from which they sell hot dogs (fixed cost)
 - They buy sausages & buns at REMA1000 at a cost of NOK 1 per hot-dog (marginal cost)
- Calculate the average cost per hot-dog per day for a vendor with 20, 35, and 45 % market share, respectively
- Plot the Average Cost curve in a *market share* (horizontal axis) – *Average Cost* (vertical axis) diagram (see next slide for tips)
- Assume the "commodity sales price" per hot dog is NOK 6.5 and represent it by a horizontal line in your diagram
 - Calculate the daily profit for each vendor (both per hot-dog per day and total per day)
 - How much would the combined profit of the two smallest vendors rise if they consolidated (and sell from the same caravan)?
 - Which market structure (number of sellers and their associated market shares) creates the lowest Average Cost per hot-dog? What if competition authorities insisted there be at least three sellers?

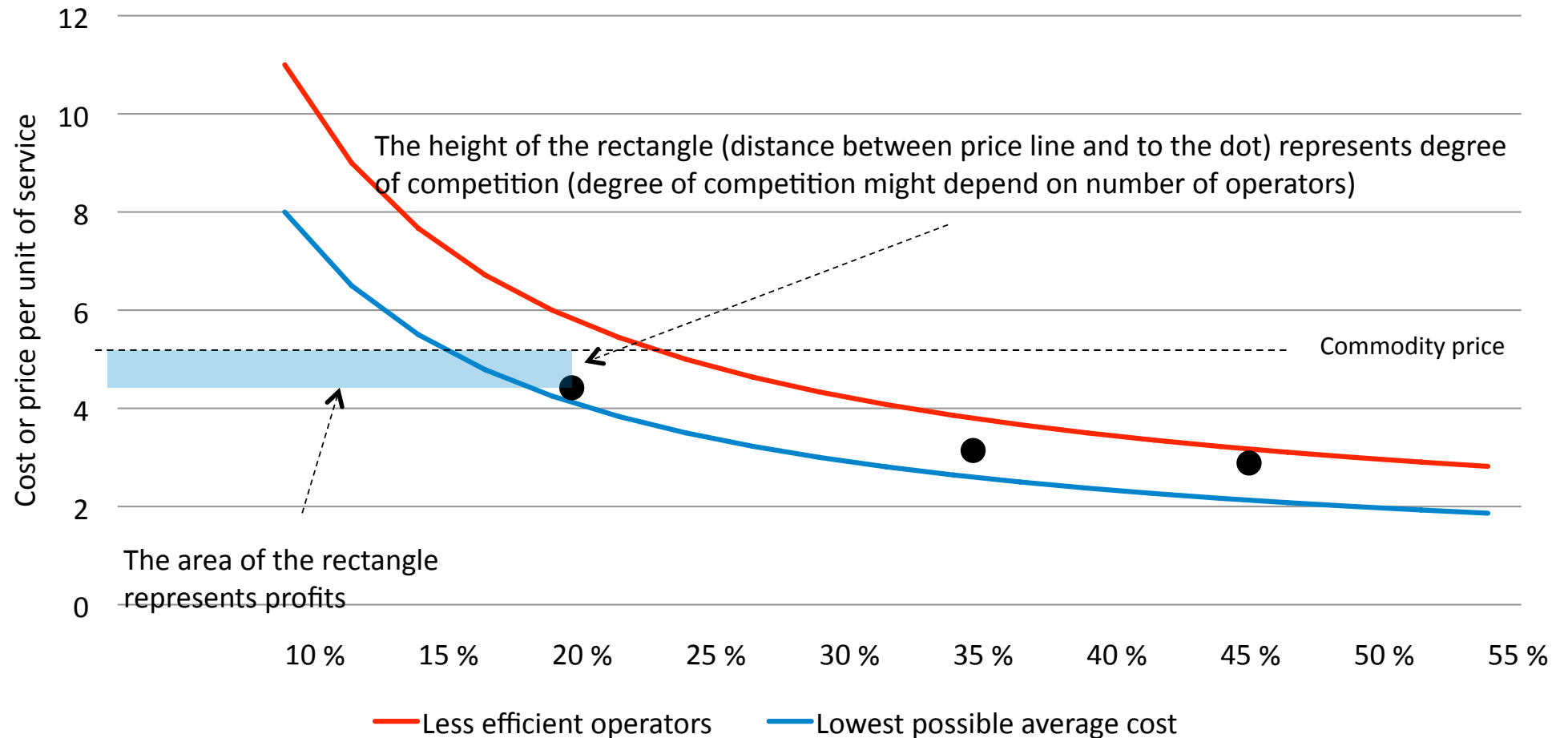
Analytical framework: (Conceptual) Average Cost as function of market share 1:3



Businesses (like athletes and students) may not realize their full potential. In the diagram, a “perfect” operator would have an average cost per unit of services on the blue line. In this example, large operators are further away from their potential but that is not a natural law.

In the hot-dog vendor example in the previous slide all were equally efficient (given market share). An inefficient hot-dog vendor could have been one who didn't bother to go to REMA 1000 but rather bought input factors at 7/11 at a higher price and therefore produced at higher marginal and average cost. (Check by assuming NOK 1.50 per hot dog as marginal cost and draw a second line in the hot-dog vendor diagram)

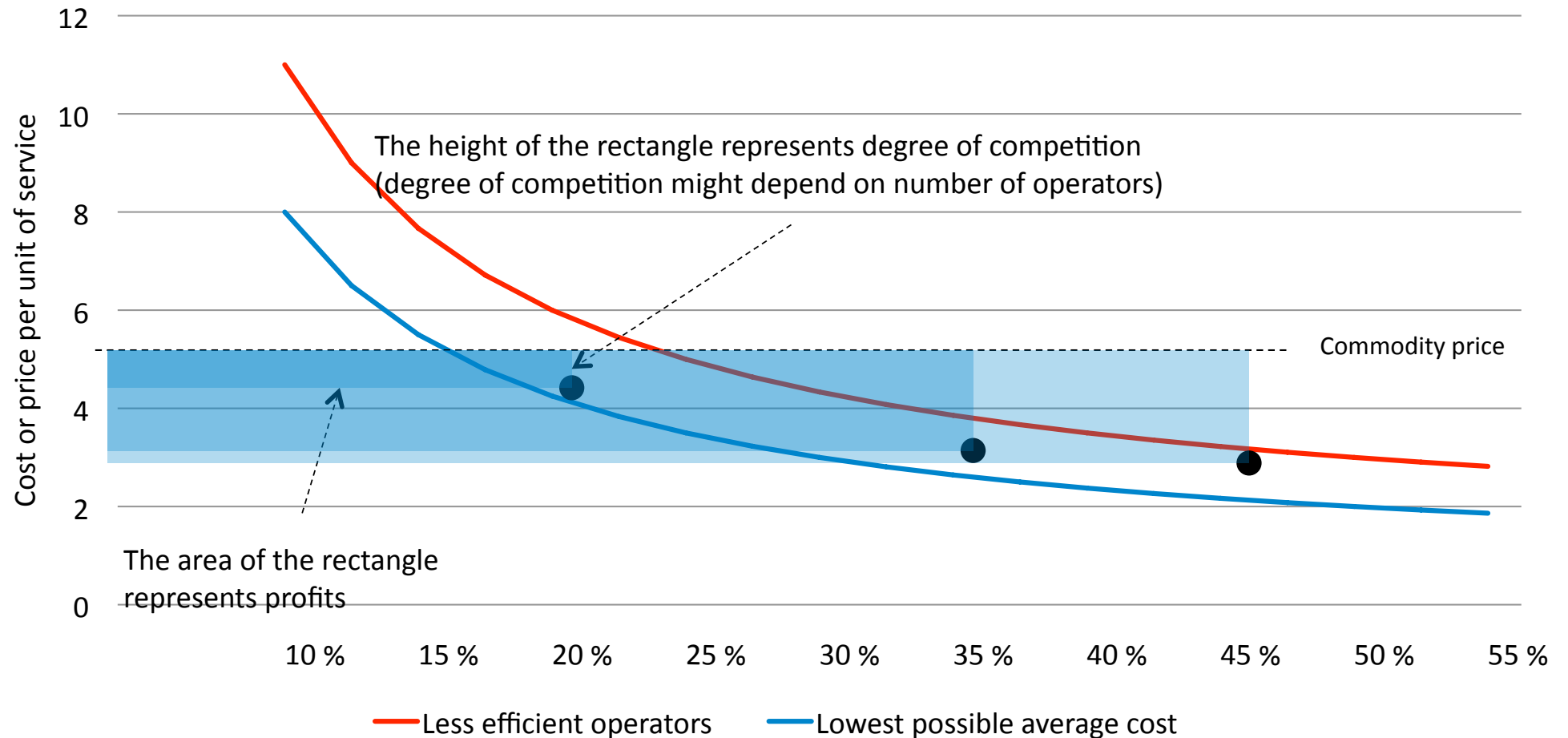
Analytical framework: (Conceptual) Average Cost as function of market share 2:3



If prices per unit are above average costs, operators earn a profit. In the model we assume prices are high enough to make the smallest operator profitable and explore the implications.

The model does not explain why all three are profitable and why the market does not consolidate into a monopoly. We simply assume that factors outside the model (governments, competition authorities) make this happen. The slide showing market shares across the world is intended to convince you that this assumption is reasonable.

Analytical framework: (Conceptual) Average Cost as function of market share 3:3



Analysis:

Will more operators lead to lower prices?

What is the government's tradeoff when determining optimal market structure?

How will technological development (shape of cost curves) affect this tradeoff?

Discussion (try to use this model to answer the questions without thinking too much about "reality") :

Will wireless operators' combined profits from provision of connectivity deteriorate as voice and SMS are phased out ?

How can the bargaining power of OTTs affect profits?

Who cares most about improving the efficiency of the largest two operators? (Government, customers, or owners?)

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- (Don't write anything about hot-dogs)