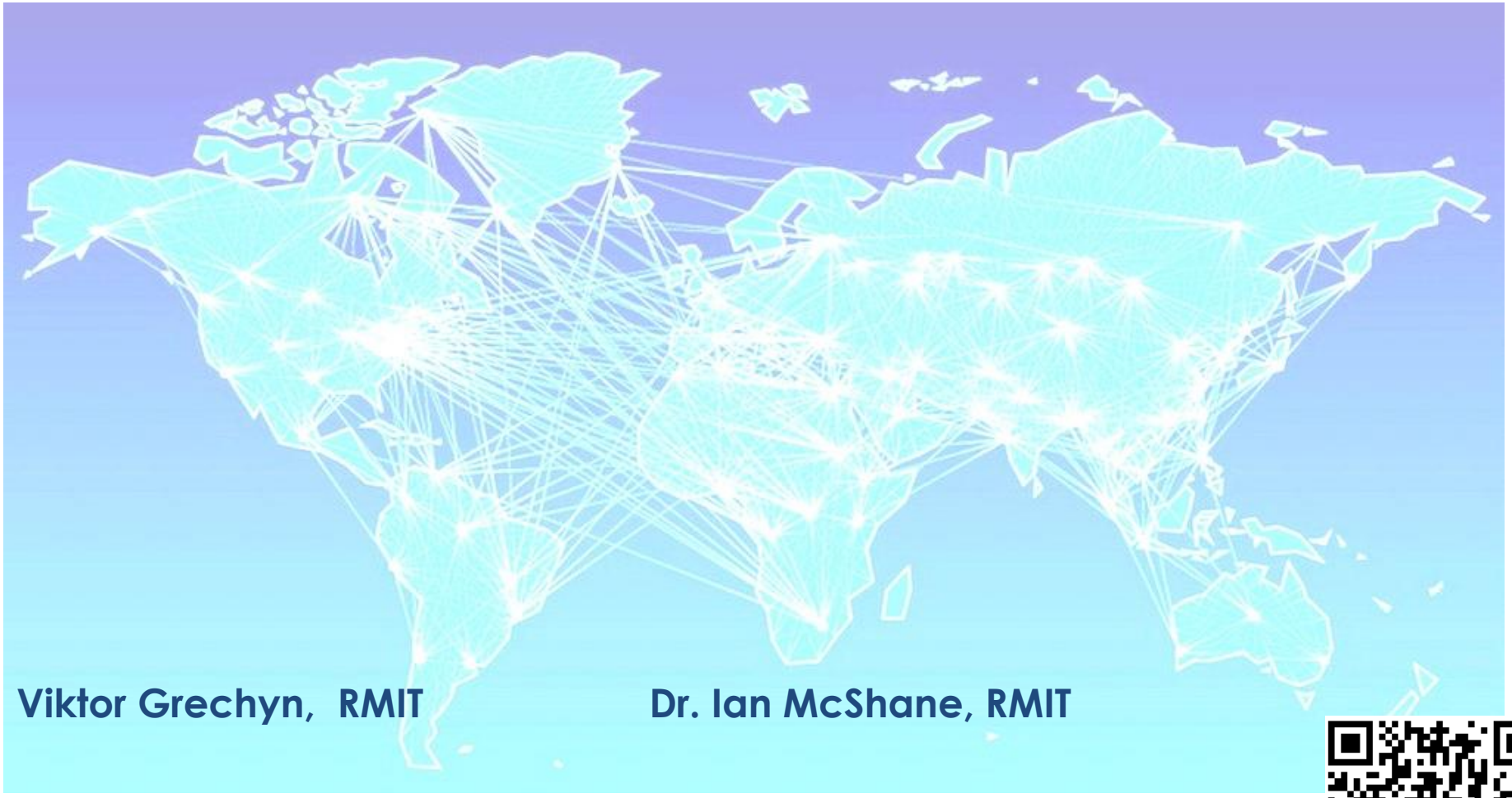
What influences international differences in broadband prices?



Viktor Grechyn, RMIT

Dr. Ian McShane, RMIT

28 February 2017

Paper URL: http://dx.doi.org/10.18080/ajtde.v4n4.67

Plan

- Introduction
- Comparing price
- Perceived broadband prices
- Factors influencing the broadband price throughout the world
- Call for further research

In-country difficulties in comparing broadband prices:

Diversity of Fixed Broadband Plans

Country	Number of Standalone Fixed Broadband Plans	Country	Number of Standalone Fixed Broadband Plans	Country	Number of Standalone Fixed Broadband Plans
Australia	**66**	Greece	8	Singapore	8
Austria	16	Hong Kong	11	Slovak Republic	13
Belgium	6	Hungary	28	Slovenia	57
Brazil	25	India	64	Spain	5
Bulgaria	14	Israel	7	Sweden	24
Canada	22	Italy	8	Switzerland	8
Chile	14	Japan	28	Turkey	37
Czech Republic	8	Korea	14	United Kingdom	13
Denmark	19	Mexico	10	United States	25
Finland	7	Netherlands	7		
France	1	Poland	21		
Germany	17	Portugal	8		
Greece	8				

Source: Federal Communications Commission DA 16-97 FIFTH REPORT January 29, 2016, p. 21.
https://apps.fcc.gov/edocs_public/attachmatch/DA-16-97A1.pdf

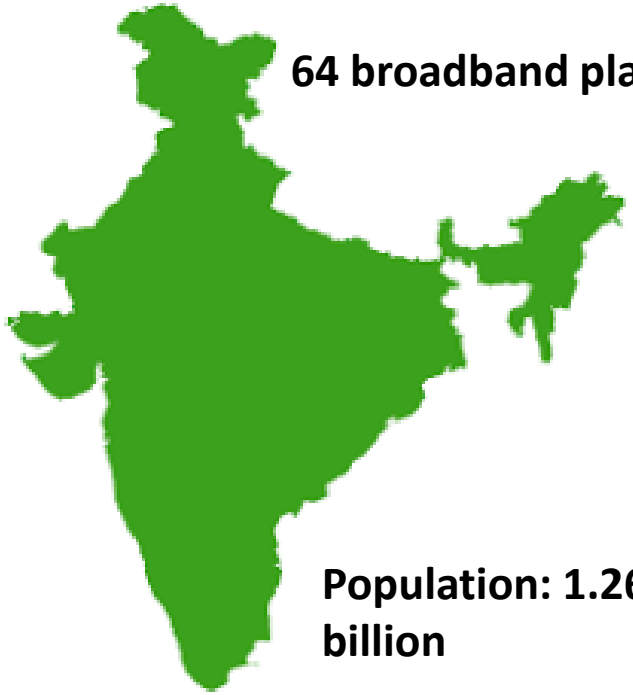
There are as many as 66 standalone fixed broadband plans in Australia

(1st place in Federal Communications Commission report. India with 64 plans sits in second place).

66 broadband plans

Population: 23.1 million

64 broadband plans



Population: 1.26 billion

Inter-country difficulties in comparing broadband prices: **Difference in income levels**

Country	Price $ (PPP)	Price $ (Exchange Rate)	Rank (PPP)	Rank (Exchange Rate)
France	18.81	20.13	1	2
Israel	28.05	30.29	2	9
Bulgaria	30.31	13.19	3	1
Spain	33.51	28.98	4	7
Slovak Republic	34.77	22.45	5	4
Austria	35.81	37.93	6	11
Poland	36.65	20.19	7	3
Czech Republic	36.95	23.46	8	5
United Kingdom	37.09	41.59	9	15
Denmark	41.54	54.36	10	23
Germany	41.54	41.21	11	14
Sweden	43.34	52.04	12	21
Netherlands	45.24	47.32	13	19
Greece	45.35	36.93	14	10
Korea	48.52	39.48	15	12
Hungary	52.93	27.62	16	6
Japan	53.50	50.50	17	20
Canada	58.30	64.41	18	25
Singapore	58.64	40.17	19	13
Belgium	61.76	66.25	20	26
Hong Kong	65.17	46.62	21	18
Finland	67.50	79.44	22	28
United States	69.93	69.93	23	27
Mexico	70.52	41.77	24	16
Portugal	73.63	57.02	25	24
Chile	78.76	46.54	26	17
Switzerland	79.15	114.58	27	32
Italy	84.77	81.56	28	29
India	108.08	29.48	29	8
Turkey	109.26	52.63	30	22
Slovenia	124.72	95.51	31	30
Australia	134.70	176.87	32	33
Brazil	146.91	96.44	33	31

Source: Federal Communications Commission DA 16-97 FIFTH REPORT January 29, 2016, p. 21.
https://apps.fcc.gov/edocs_public/attachmatch/DA-16-97A1.pdf

This presentation has two foci:

first, to suggest some datasets and methodologies that contextualise and clarify inter-country price differences;

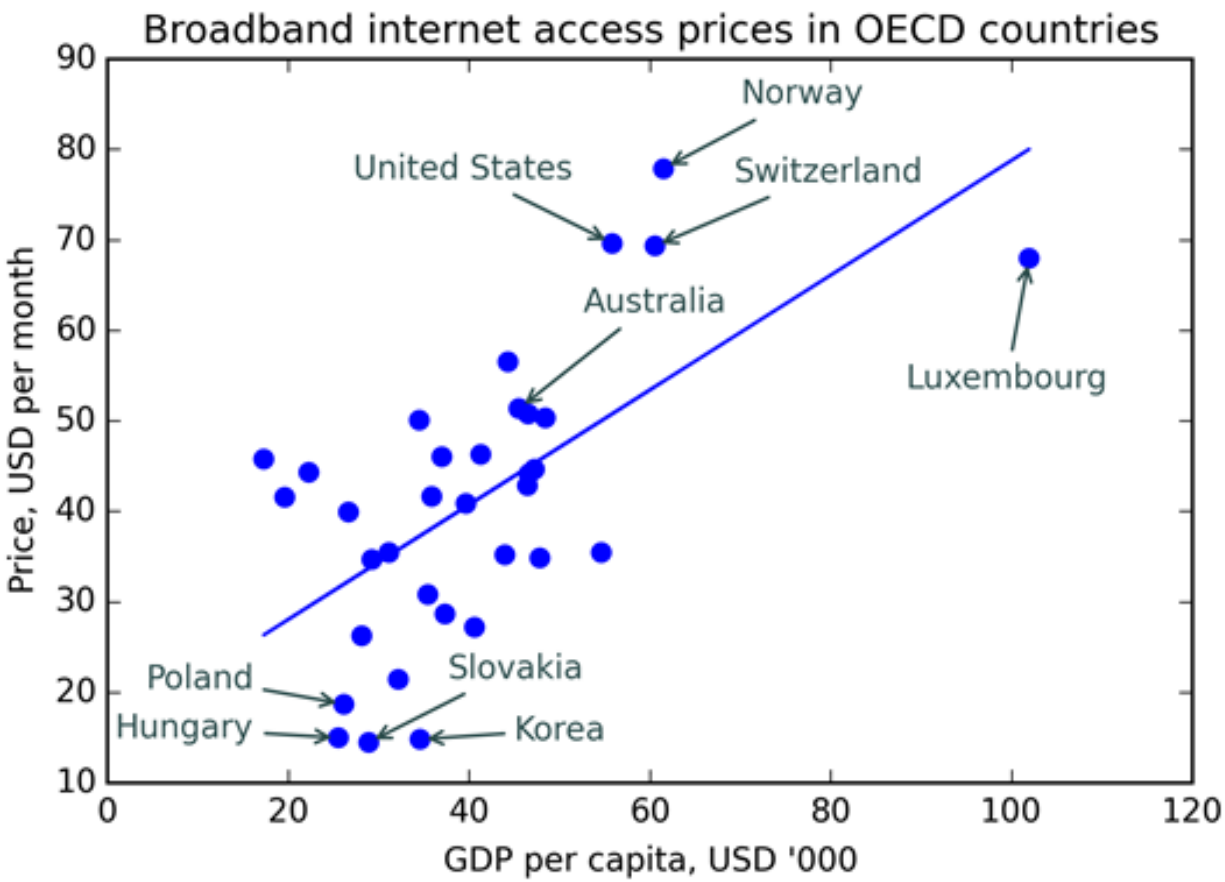
second, to introduce five groups of factors that influence international price differences: physical and infrastructural factors, regulation, the average level of prices, demand and supply factors.

In the numerical examples we use data from **OECD** fixed (landline) broadband basket **Medium 4** which refers to a monthly data allowance of 50 GB with a speed of 25 Mbps and above, delivered across cable or ADSL.

We also we use data from **Numbeo** (i.e. a crowd-sourced global database of different statistics) which refers to unlimited data at 10 Mbps speed, cable or ADSL.

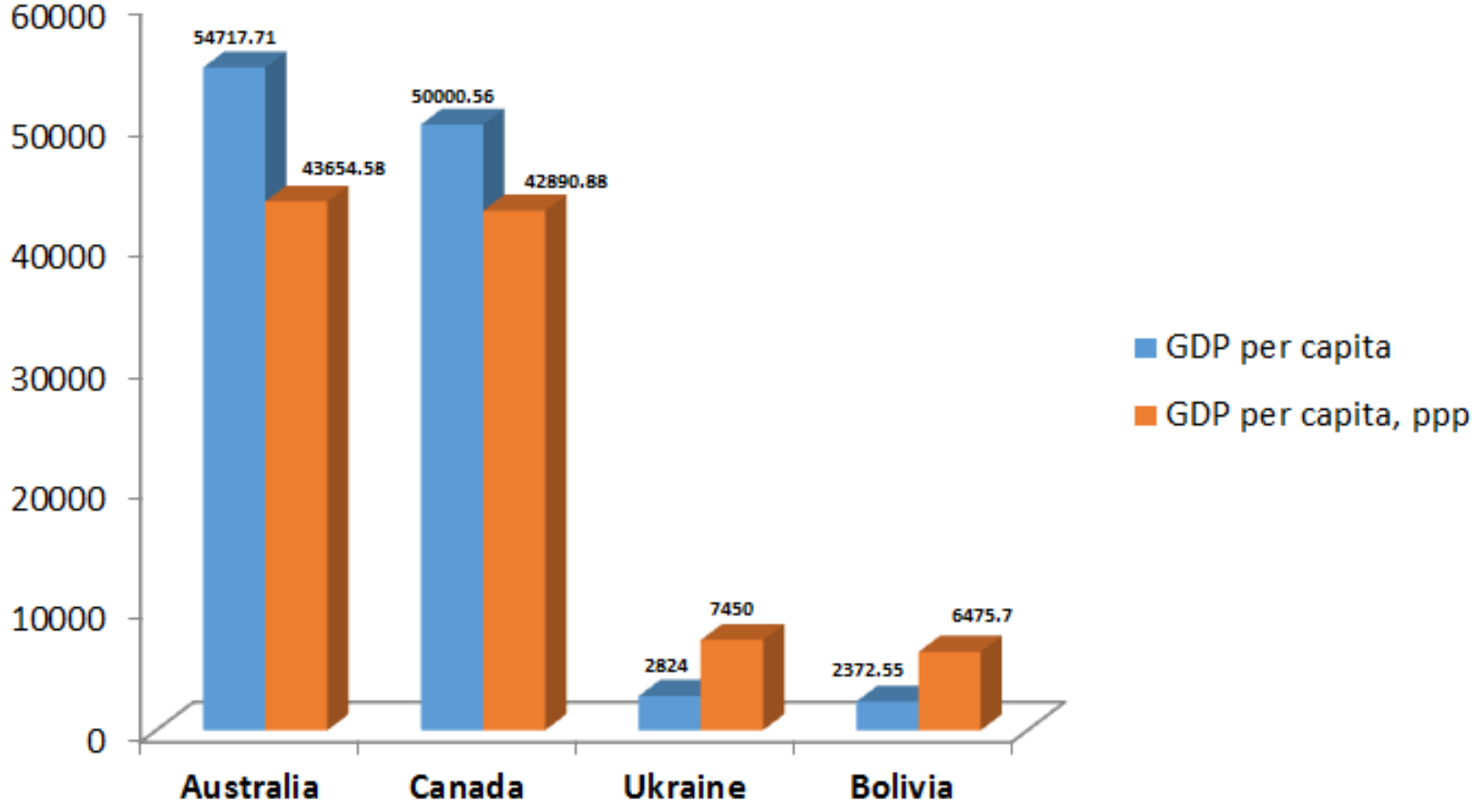
Comparing price (I)

The effect of a comparatively large GDP per capita (and thus the average income) in developed countries might be partially offset by the comparatively high cost of broadband access in those countries. This is referred to as the Penn effect: a rich country (compared to a poor one) appears to be wealthier than it really is.
(Samuelson 1994 Summers & Heston 1991).



Comparing price (II)

To adjust for the impact of relative values of different countries on GDP, the concept of *GDP per capita, ppp* (gross domestic product adjusted to purchasing power parity) is used. Generally, GDP per capita is greater than GDP per capita, ppp in wealthier countries while in middle or low-income countries the opposite tendency occurs .



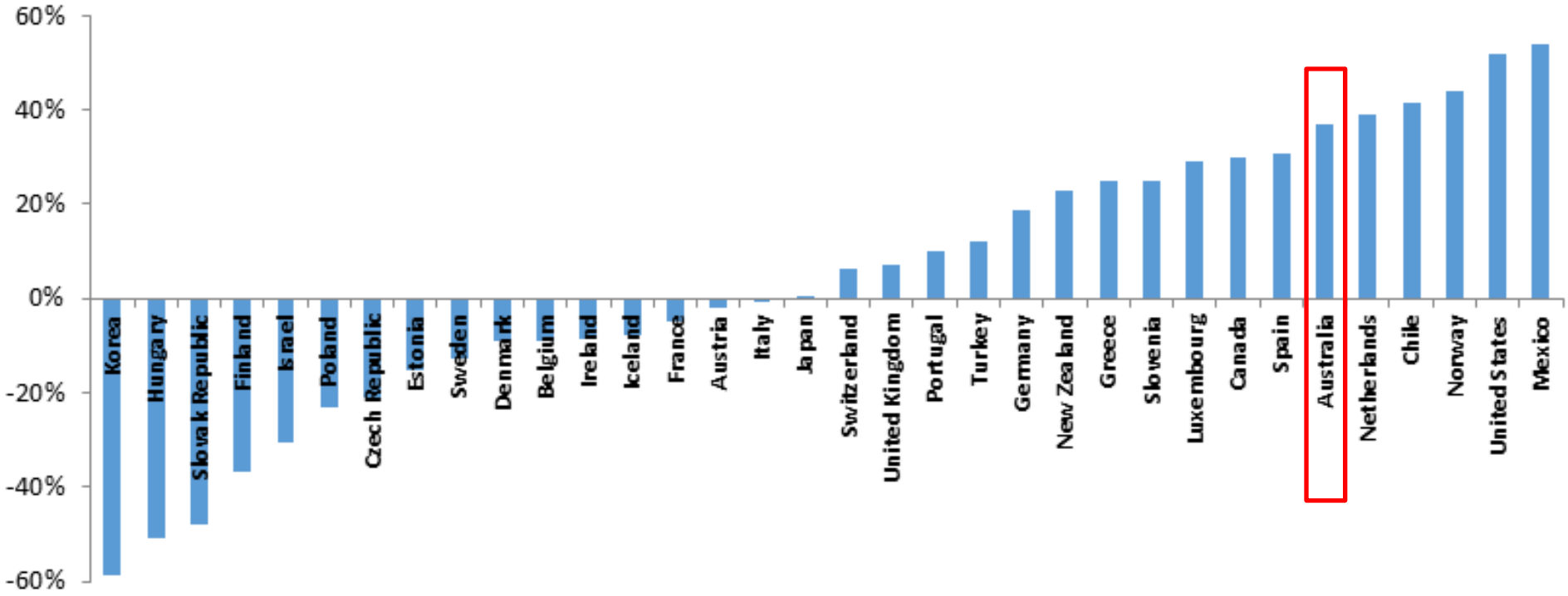
Comparing price (III)

To better explain the differences in price levels between different countries, *The Economist* introduced its **Big Mac index** in 1986 (The Economist 2013).

The Big Mac index appears to be a good proxy for comparing price levels in OECD countries. In June 2016, correlation between the **Big Mac index** and OECD comparative price levels was **0.84**.

Through comparing ratios of broadband prices and Big Mac indexes in OECD countries, the level of ‘undervaluation’ or ‘overvaluation’ of broadband prices can be estimated. (Big Mac index is a proxy for average level of consumer goods in every given country).

Comparison of prices for landline broadband in OECD countries (% of undervaluation or overvaluation corresponding to the relative Big Mac Index)



Considering adjustment to Big Mac index, broadband price in Australia is 36.8% higher than the benchmark value of Japan.

For example, taking other things equal, **world travellers choosing between surfing Internet and eating hamburgers are better off eating hamburgers in Australia, Chile and Mexico, while surfing the Internet in Korea, Hungary and Finland.**

Perceived (broadband) price

The broadband price say in Estonia is lower than it is in Australia

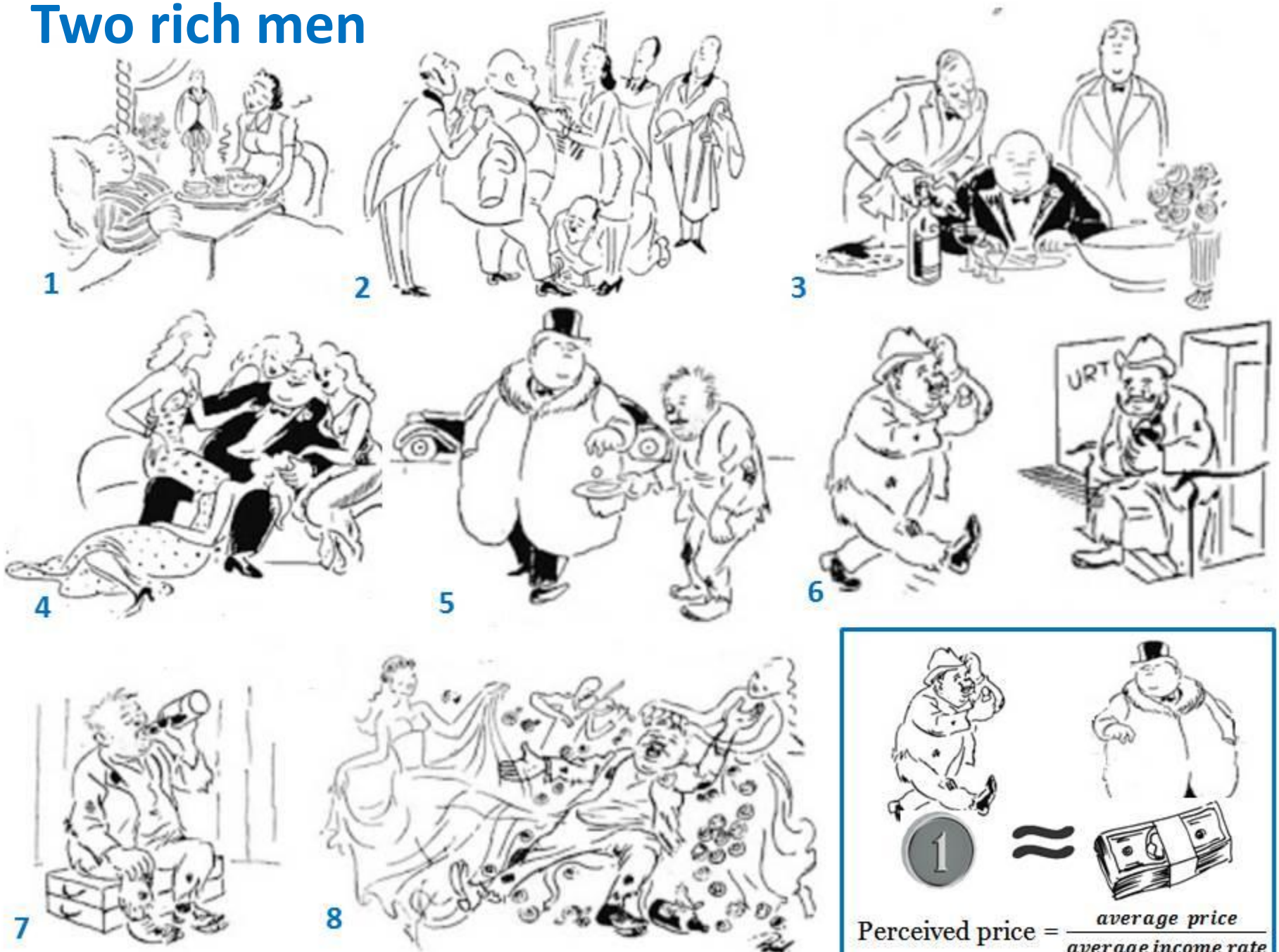
BUT

People in Estonia earn less, on average.

It is feasible to presume that the more people earn, the less is the subjectively perceived price for a service or commodity. In a marginal case, if someone has an infinite sum of money, they may not care about prices at all. On this basis, the simple formula for “perceived price” is:

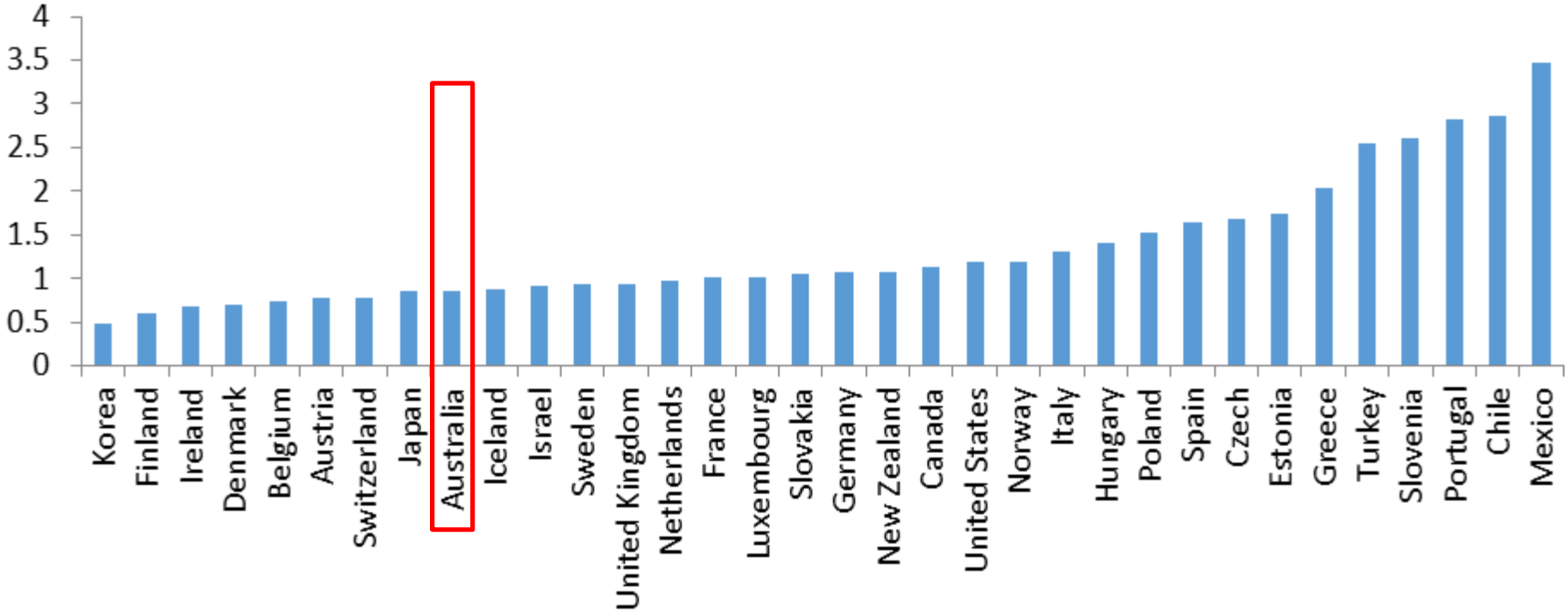
$$\text{Perceived price} = \frac{\textit{average broadband price}}{\textit{average income rate}}$$

Two rich men



Caricature: Herluf Bidstrup

Perceived price



This exercise ranks Australia ninth among the OECD ‘cheapest’ broadband countries (or, more precisely, among the countries with the lowest ratio of broadband price to average income rate). Needless to say, that if we compare the ratio of hamburger price to average income rate Australia would be an even ‘cheaper’ country.

Factors influencing broadband price (I)

We suggest there are five types of factors:

- **supply factors** (shaped by market patterns, degree of competition etc.),
- **demand factors** (where income levels play a crucial role),
- **regulatory and policy factors**,
- **average price levels within countries** and
- **physical/infrastructural factors** (topography, population density, telecommunications infrastructure).

Factors influencing broadband price (II)

Call for further research

Regression analysis could estimate the relationship between the factors mentioned and broadband prices in a sample of countries.

<u>Challenge</u>: choosing proxies or estimations for qualitative categories as “regulatory factors”, “infrastructure” or “topography”.

References

Akamai. 2015. State of the Internet Report. Akamai.com. Retrieved 18 October 2016, from https://www.akamai.com/us/en/our-thinking/state-of-the-internet-report

Biggs, P; Kelly, T. 2006. 'Broadband Pricing Strategies', *Info*, 8(6): 3-13.

Bouckaert, J; van Dijk, T; Verboven, F. 2010. 'Access Regulation, Competition and Broadband Penetration: An International Study', *Telecommunications Policy*, 34(11): 661-671.

Curran, K; Poland, K. 2011. Broadband penetration in countries around the world. IJED, 1(1), pp.34-37. Available at: http://scisweb.ulster.ac.uk/~kevin/ijed-broadband.pdf [Accessed 29 Nov. 2016]

Falch, M. 2007. 'Penetration of Broadband Services: The Role of Policies'. *Telematics and Informatics*, 24(4): 246-258.

Falkner, M; Devetsikiotis, M; Lambadaris, I. 2000. 'An Overview of Pricing Concepts for Broadband IP Networks'. *IEEE Communications Surveys & Tutorials*, 3(2): 2-13.

FCC (Federal Communications Commission). 2015. *2015 Measuring Broadband America Fixed Report*. Available at: https://www.fcc.gov/reports-research/reports/measuring-broadband-america/measuring-broadband-america-2015 [Accessed 29 Sep. 2016].

Flamm, K. 2005.'The Role of Economics, Demographics, and State Policy in Broadband Availability', LBJ School of Public Affairs. Available at: http://bear.warrington.ufl.edu/centers/purc/DOCS/PRESENTATIONS/events/0205%20LBS/papers/Flamm-flammbb0205.pdf [Accessed 05 Oct. 2016].

Flamm, K; Chaudhuri, A. 2007. 'An Analysis of the Determinants of Broadband Access', *Telecommunications Policy* 31: 312-326.

ITU (International Telecommunication Union). 2015. *The State of Broadband*. Available at: http://www.broadbandcommission.org/documents/reports/bb-annualreport2015.pdf [Accessed 11 Sep. 2016].

McLean, R; Sharkey, W. 1993. 'An Approach to the Pricing of Broadband Telecommunications Services', *Telecommunication Systems*, 2(1):159-184.

Nevo, A; Turner, J; Williams, J. 2016. 'Usage-Based Pricing and Demand for Residential Broadband', *Econometrica*, 84(2): 411-443.

OECD. 2015a. *Monthly Comparative Price Levels*. Available at: https://stats.oecd.org/Index.aspx%3FDataSetCode%3DCPL+&cd=1&hl=en&ct=clnk&gl=au [Accessed 09 Sep. 2016].

OECD. 2016a. *OECD Broadband Portal - OECD*. Available at: http://www.oecd.org/sti/broadband/oecdbroadbandportal.htm [Accessed 11 Sep. 2016].

OECD. 2016b. *Average Annual Wages*. Available at: https://stats.oecd.org/Index.aspx?DataSetCode=AV_AN_WAGE [Accessed 15 Sep. 2016].

Polykalas, S; Vlachos, K. 2006. 'Broadband Penetration and Broadband Competition: Evidence and Analysis in the EU Market, *info*, 8(6): 15-30.

Rogers, S. 2016. 'Bridging the 21st Century Digital Divide', *TechTrends*, 60(3): 197-199.

RTIRC (Regional Telecommunications Independent Review Committee). 2015. *Issues Paper*. Available at: https://www.communications.gov.au/sites/g/files/net301/f/RTIRC_Independent_Committee_Review_2015_FINAL.pdf [Accessed 04 Oct. 2016].
Samuelson, P. 1994. Facets of Balassa-Samuelson Thirty Years Later. *Review of International Economics*, 2(3): 201-226.
Schneir, R.J; Xiong, Y. 2016. 'A Cost Study of Fixed Broadband Access Networks for Rural Areas', *Telecommunications Policy*, 40(8): 755-773.
Summers, R; Heston, A. 1991. 'The Penn World Table (Mark 5): An Expanded Set of International Comparisons, 1950-1988' *The Quarterly Journal of Economics*, 106(2): 327.
The Economist. 2013. *The Big Mac Index*. Available at: http://www.economist.com/content/big-mac-index [Accessed 10 Sep. 2016].

Thank you

Paper URL: http://dx.doi.org/10.18080/ajtde.v4n4.67

RMIT UNIVERSITY

School of Global, Urban and Social Studies