

Urbanization and Agglomeration Economics

Bhanupong

Lecture 29

Outline

1. The Central Business District (CBD)
2. The Rent gradient
3. Economies of Agglomeration
4. Costs of excessive concentration

1. Central Business District (CBD)

- CBD refers to the commercial center of a large city (e.g. the Central World in Bangkok)
- CBDs are anything but static.
- Within the CBD, central office functions exert a **mutual attraction**, since they require frequent contact between firms.
- Firms will locate *close together* rather than occupying scattered sites.

If firms can come to locate at the CBD,

- The closer each firm to the CBD, the less costly to it in time and transportation costs in ***maintaining contact*** with each other.
- Thus a location near the CBD will reduce the firm's own costs and other ***costs of maintaining*** contact with that firm.
- Nevertheless, with the fast development digital information network, such demand for closeness can be reduced.

The Law of retail gravitation

- Reilly's law: The law of **retail gravitation** suggests that people are generally attracted to the largest shopping center in the area.
- Examples abound: Central World, Siam Paragon, Central Embassy, and M-District shopping areas in Bangkok. (Iconsiam too?)
- Shopping malls provide ***retail therapy*** for mall rats and generate employment of unskilled workers.

How many malls does Bangkok need?



Takashimaya makes splash at Iconsiam
Thirty millions are expected to visit each year
Expected sales in 2019: 3.8 billion baht



The Economist

November 9, 2018

I came, I saw, I conquered : Thailand

Today, South-East Asia's biggest shopping mall will open near Bangkok's historic centre. Thailand's royalist establishment and the family of the kingdom's richest commoner own the firms that built and operate the high-end, \$1.7bn, "IconSiam", which is as big as 105 football pitches.

They have touted it as an "icon of eternal prosperity" and expect 150,000 shoppers to flock daily to this grand palace of commerce. The mall, built on royal land, will use more electricity than many of Thailand's poorest provinces. For most Thais, it will be too pricey.

But there is still a shortage of shopping malls across South-East Asia, and visitors, especially those from China and India, have been coming to the kingdom in droves of late. Indeed, Bangkok was the world's most visited city last year, according to Mastercard, a finance firm. Even if the Icon's prosperity does not spread too far domestically, its commercial future seems secure.

High demand for limited spaces at the CBD

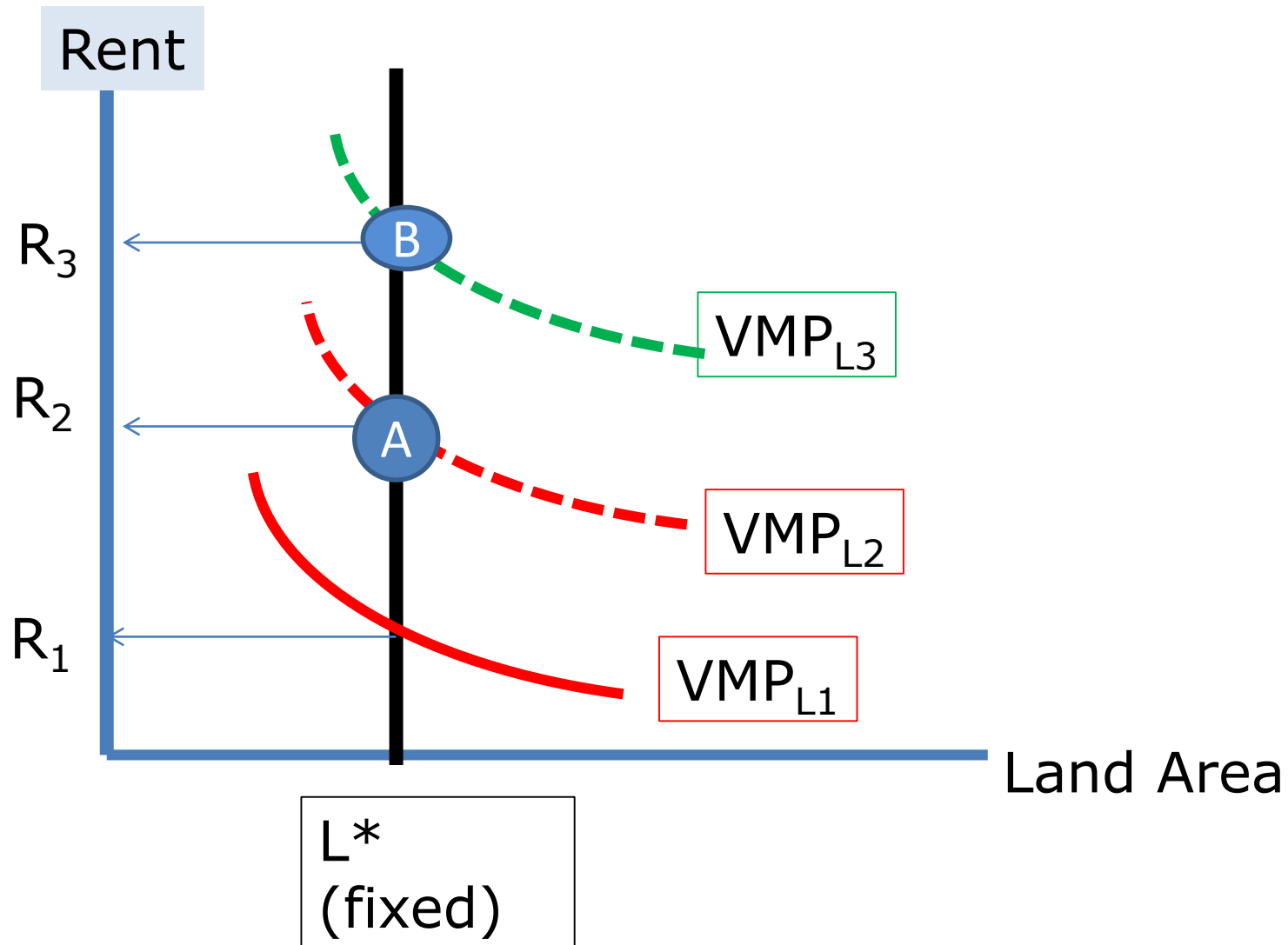
When moving near the CBD, transportation and communication costs among firms will be decreasing

Sales will be increasing as distance to the center diminishes.

But there is also a high cost of staying at the CBD—the high rent and the high cost for employees to travel to the offices.

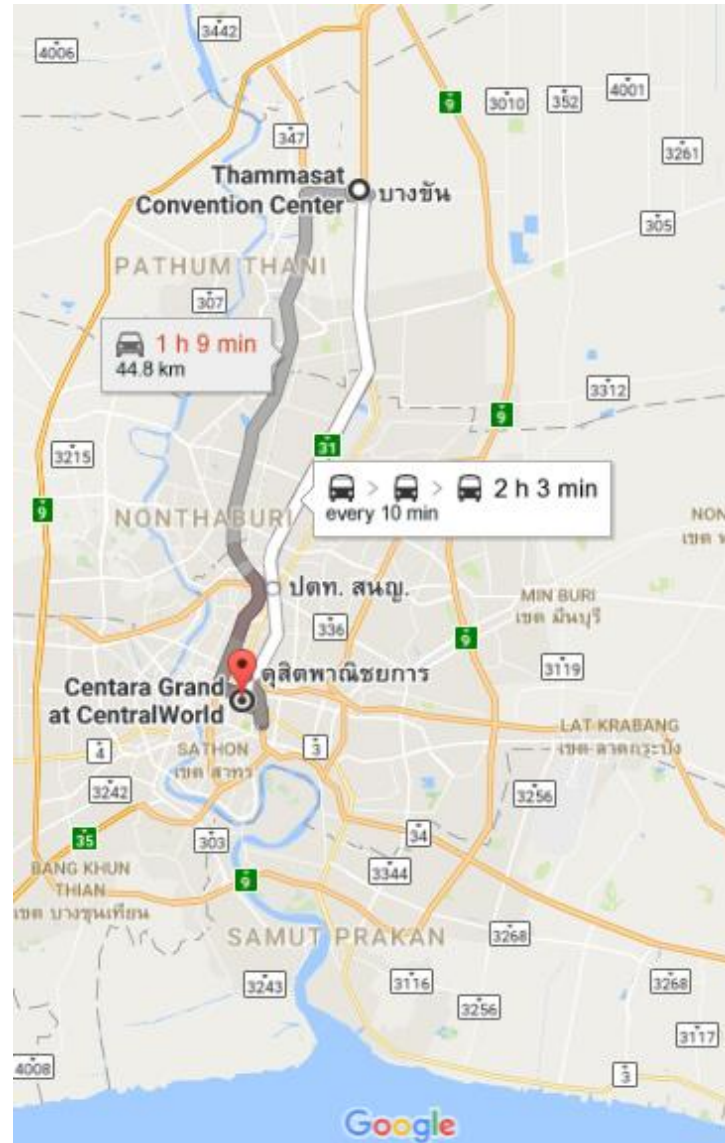
The rent at CBD rises because of high demand for limited spaces

$$\text{Rent} = (\text{MP}_{\text{Land}} \times P) = \text{Value of Marginal Product of land}$$



From Thammasat Rangsit Campus to Central World

45 km, 2 hours by bus, 1 hour 10 mins by car



Property Development Land: Lower Sukhumvit
to Eakamai are high in demand
But those were **2014** prices



Where high-income people live

Land parcels along the BTS at Siam, Chidlom and Ploenchit stations were among the highest in prices at B1.75 million per sq.wa

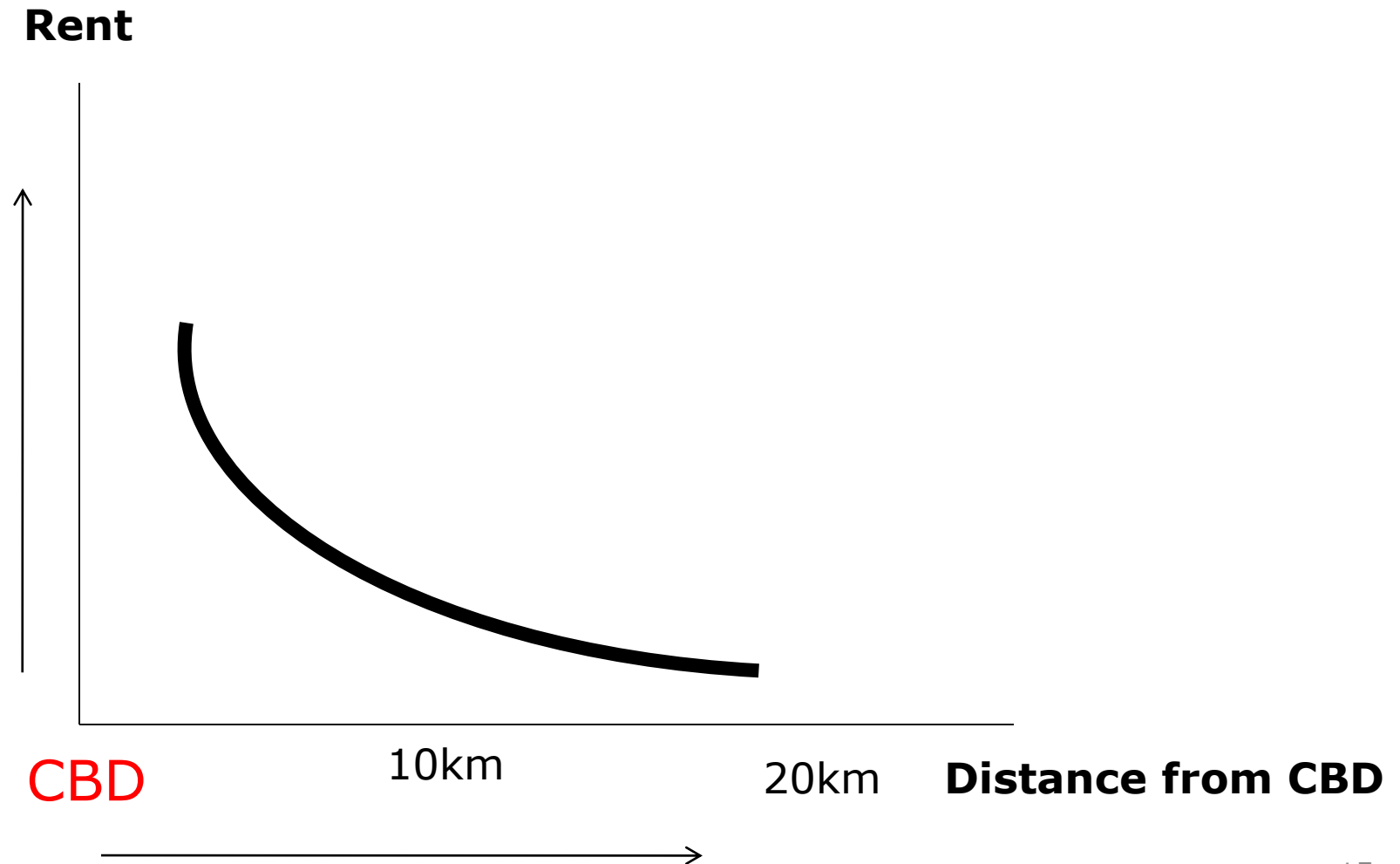
Along the BTS at *Nana* and *Asoke* stations were valued at B1.70million.

Lag effects of condo prices on land

About six months



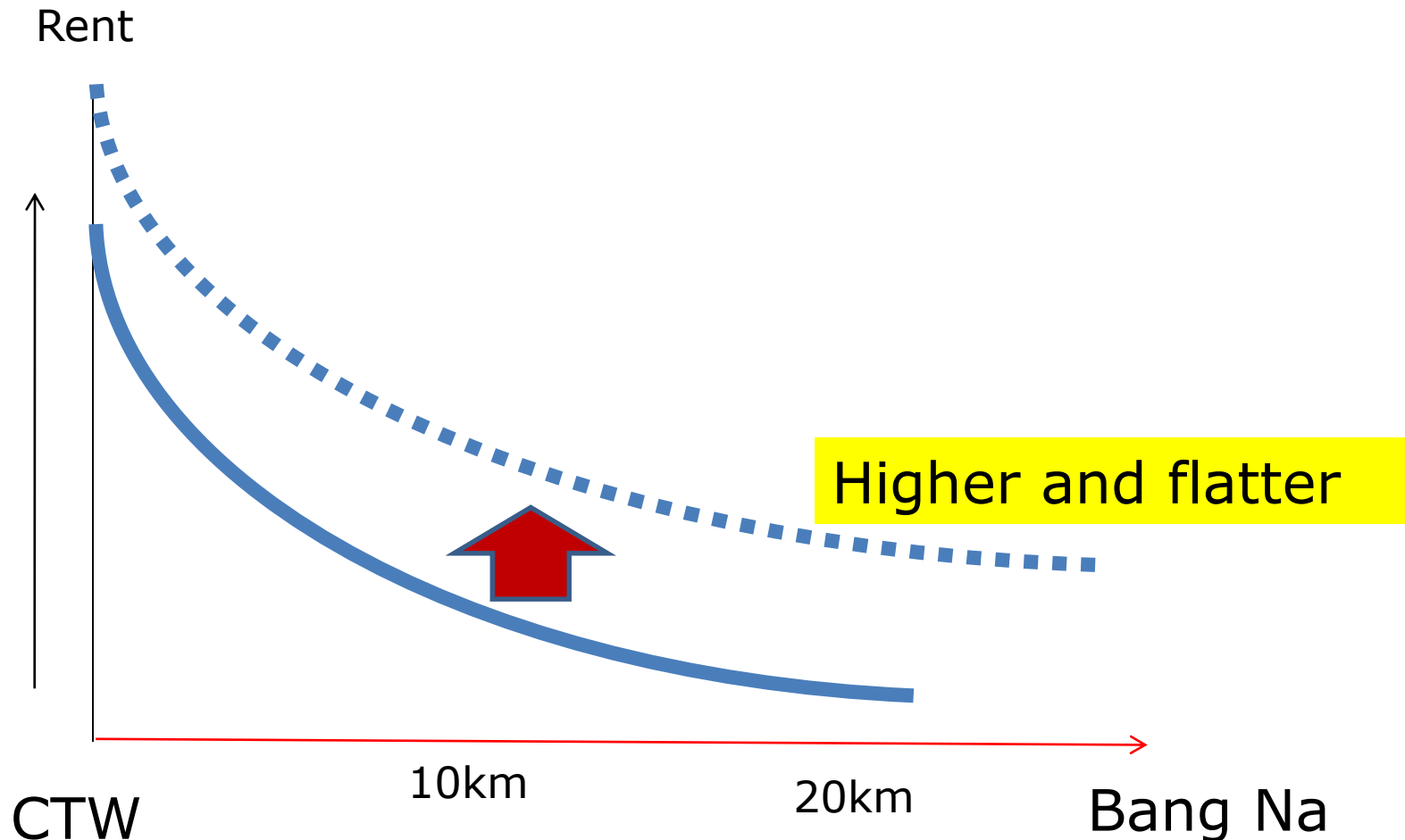
2. Rent Gradient



Rent gradients can shift the intercept and change the slope

- Inflation (land as inflation hedge)
- Transportation cost (oil prices)
- Traffic jam (higher opportunity cost)
- New infrastructure: expansion of BTS and MRT
- De-concentration (new shopping malls away from old CBD)

Changes in factor affecting land rent *slope and intercept shifts*



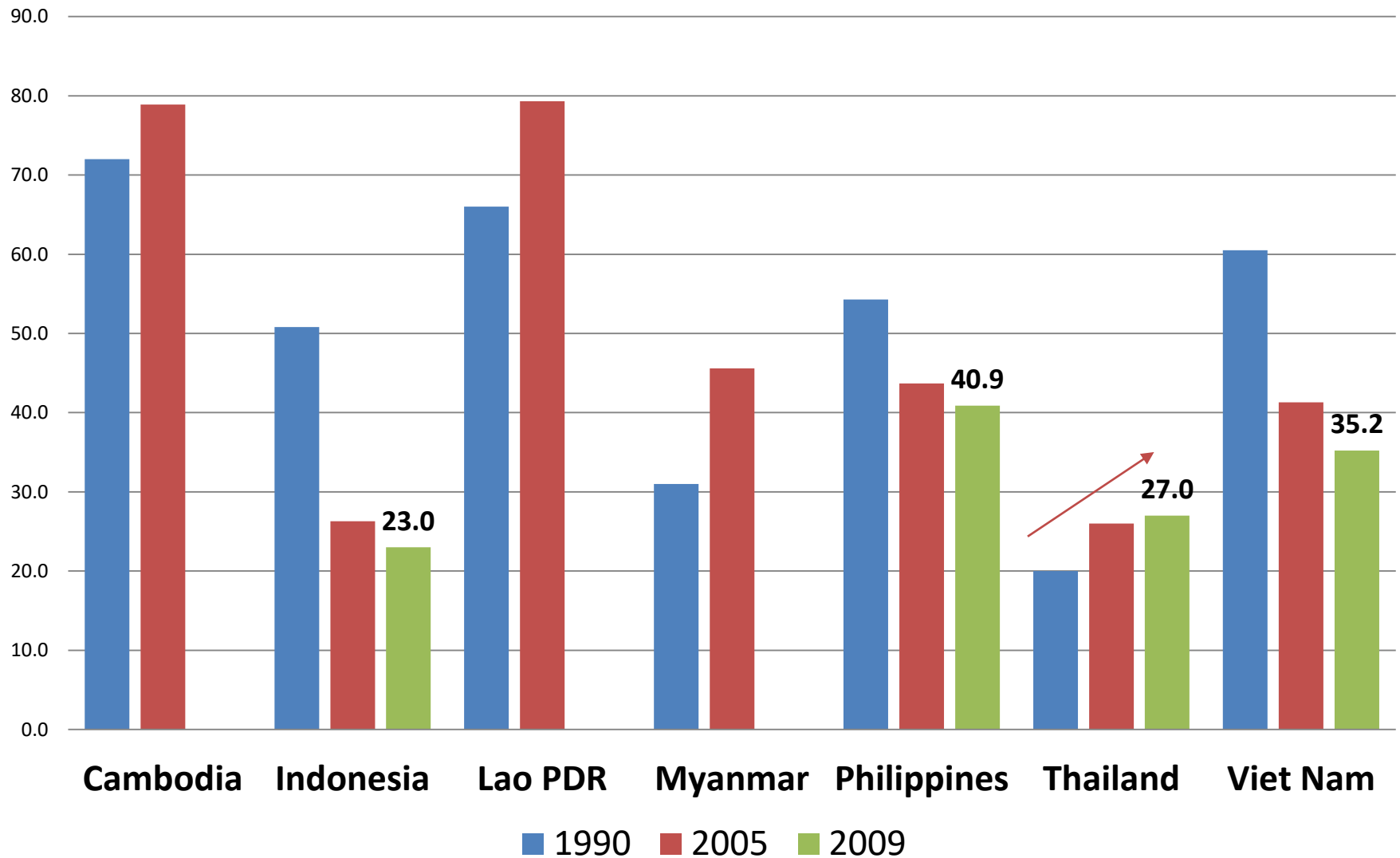
A trade-off: accessibility and space

- Land prices are required to *decline with distance* to *compensate for higher transportation costs*, as individual moves away from the CBD.
- Individuals can acquire a larger piece of land in compensation for less convenient access to the CBD.
- Thus, there is a trade-off relationship between the access to CBD and space.
- Staying in the suburbs: More difficult and more costly to access CBD but bigger space to live.

The rich and the poor

- The cost of commuting depends on distance.
- Wealthy families settle on large plots of relative cheap land toward the city's edge. (But that was before the condominium-boom era, which shortening the travelling time)
- Poor families tend to occupy very small portions of higher priced land near the center.
- In developing countries, there are a large number of **slums** in capital cities.

Slum Population in Southeast Asia (% of urban population)



Where do you live?

- For the poor family, the increase in commuting costs as distance increases will diminish rapidly the small fund of income available for housing.
- Consequently the poor cannot bid much for locations where commuting cost is expensive.
- The rich, who are prepared to spend large sums on housing, find the barrier of *commuting costs* rather *inconsequential* and they can bid higher prices than the poor for land at distance locations.
- Some archarns pay 300 for toll fees each day to come to Tha Prachan..(not to mention gasoline and traveling time)

Other factors affecting land prices

- Urban land markets are differentiated and can be segmented into sectors by transportation routes.
- **Quality of infrastructure and transportation routes** in different areas produces different impact on land prices.
- There can be *multiple CDBs* within the city, depending on network of transportation system.

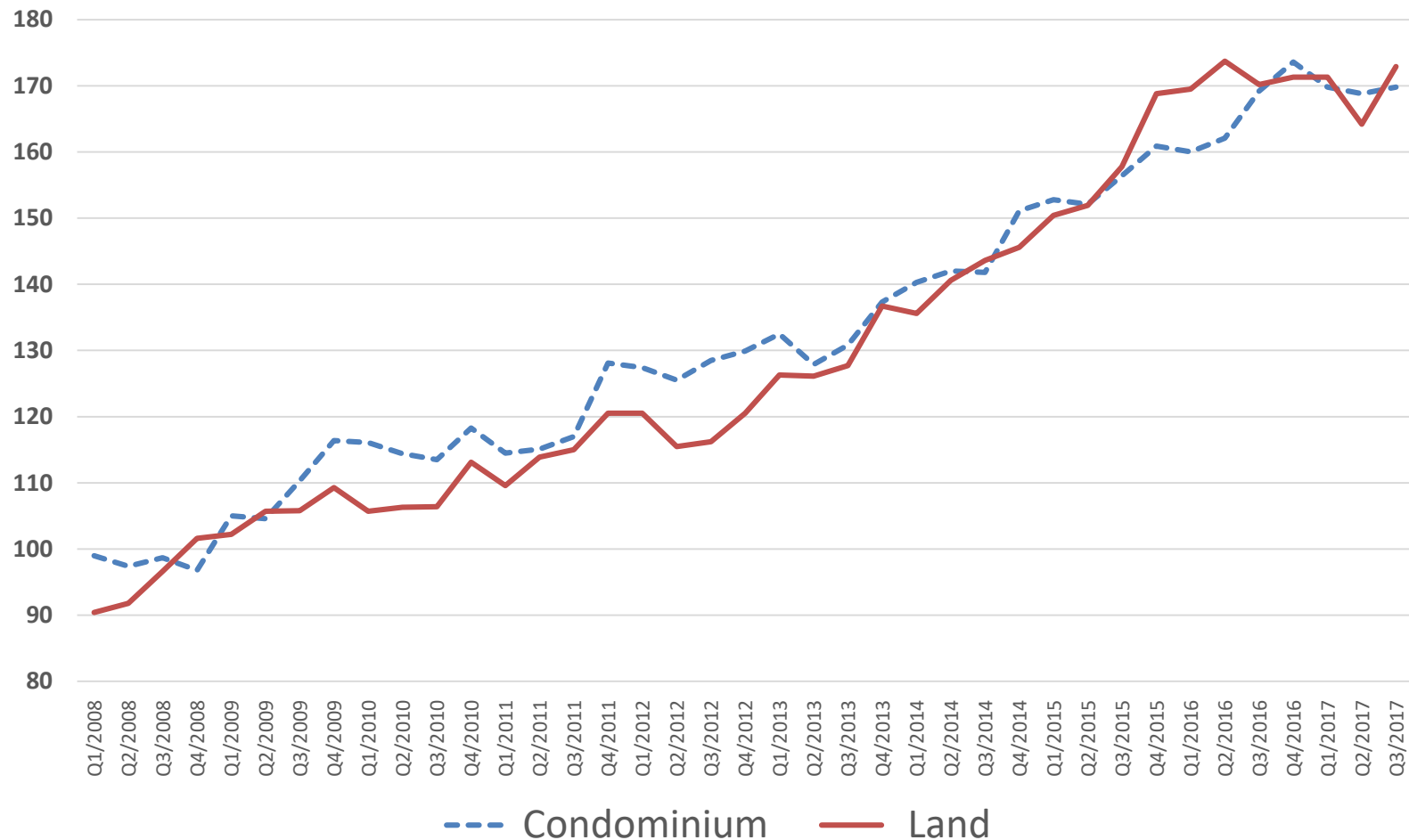
Life in a high-rise cage

- To increase areas in CBD, buildings became taller and taller.
- Price per square meter of housing unit has increased dramatically.
- The average size of condominium in the city has been declining to maintain the unit price, in some cases below 20 sqm.

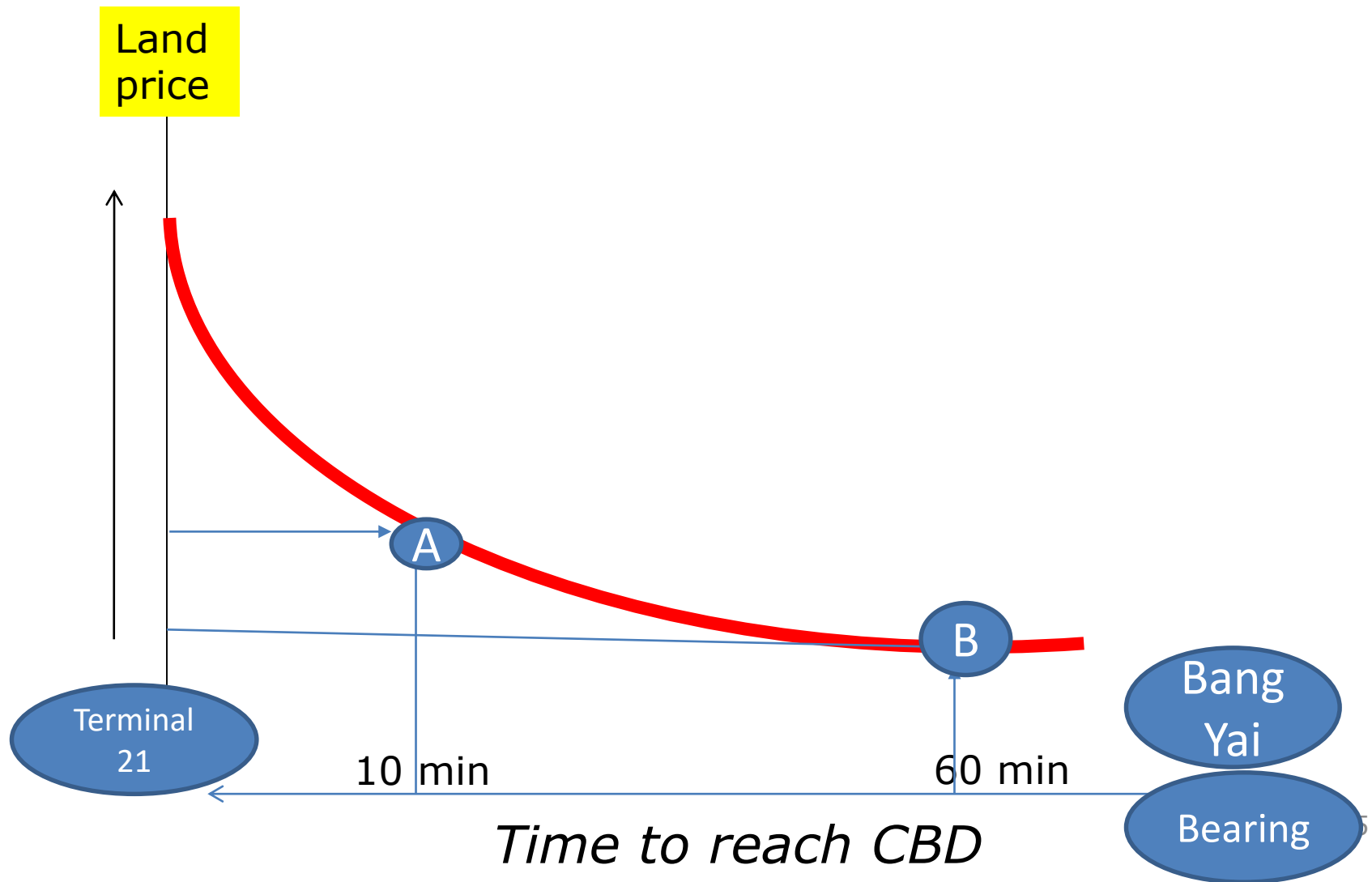
As the cost of commuting to CBD keeps on rising, land prices in CBD continue rising exorbitantly

Property Price Index

Source: BoT



Travel time to the city center



3. Economies of Agglomeration

Productivity increases when other firms are located nearby

- Alfred Marshall(1890) explained spillover benefits for a plant to other plants in the neighborhood in terms of ***information spillover*** about technology, suppliers, purchases, and market conditions.
- Economic activity agglomerates (lot of many different things brought together) in cities because of local external economies of scale in production—***a plant's productivity*** is enhanced if other plants are located ***nearby***.

Why did they locate in the same areas?

- IT centers, Panthip plaza, MBK mall
- Pratunam, Platinum mall, Bo Bae tower
- K Village and J village in Sukhumvit area
- Even when competing firms are in the **same** location, there may be advantages because that location **attracts** more suppliers and customers than a single stand-alone firm could.

Benefits of Spillover Effects

- The ***proximity*** of buyers and sellers reduces ***transportation*** costs of trade and ***search costs*** in retailing.
- Increased ***diversity of suppliers*** to local producers.
- ***Lower search cost***: Search for workers and matching improvements between workers and firms in local ***labor markets***.
- That is why they agglomerates into one specific place.

Economies of agglomeration: Growing Cities

- The *more related* firms that are clustered together, the *lower* the cost of production (firms have competing multiple suppliers, greater specialization and division of labor result) and the greater the market that the firm can sell into.
- Cities form and grow to exploit *economies* of agglomeration.

Economies of Agglomeration



Diseconomies of agglomeration

- Diseconomies of agglomeration take place when *additional competition* drives down pricing power.
- Large cities encounter problems of crowding and congestion.
- *Should we locate our office in Asoke, Sukhumvit Soi 21?*
- It is this tension between economies and diseconomies that allows cities to grow, **but keeps them from becoming too large.**

Non-standardized industries

- Non-standardized industrialization occurs more in urban areas because of opportunities to exploit scale economies of local agglomeration.
- There are scopes for local **intra-industry specialization** of plants in specific activities
- Firms which engaged in non-standardized products benefit from urbanization economies.

Why big cities?

- The non-standardized production includes special-order machinery, **fashion apparel, entertainment services**, and publishing.
- Plants for non-standardized products need to obtain *specialized services* beyond their own industry.
- They also need *large local market* to test their products; they need to stay in mega or big cities

Where to locate your firm?

Standard vs. non-standardized products

- Production in **large** metropolitan areas focuses on *services* and *non-standardized* manufacturing.
- **Standardized** manufacturing production tends to be **de-concentrated** into **smaller** and medium-size metropolitan areas to avoid higher operating cost in big cities.
- But standardized firms also need to stay (agglomerate) together to exploit the localized economies of scale.

Standardized products: relatively low degree of product differentiation

- Plants producing ***standardized*** products, such as textiles, steel, ceramics, food processing, *learn mostly from other plants in the same industry locally.*
- They benefit primarily from what are called *localized economies.*
- If the cities are growing too fast, they do not have sufficient time for effective and efficient planning and management.

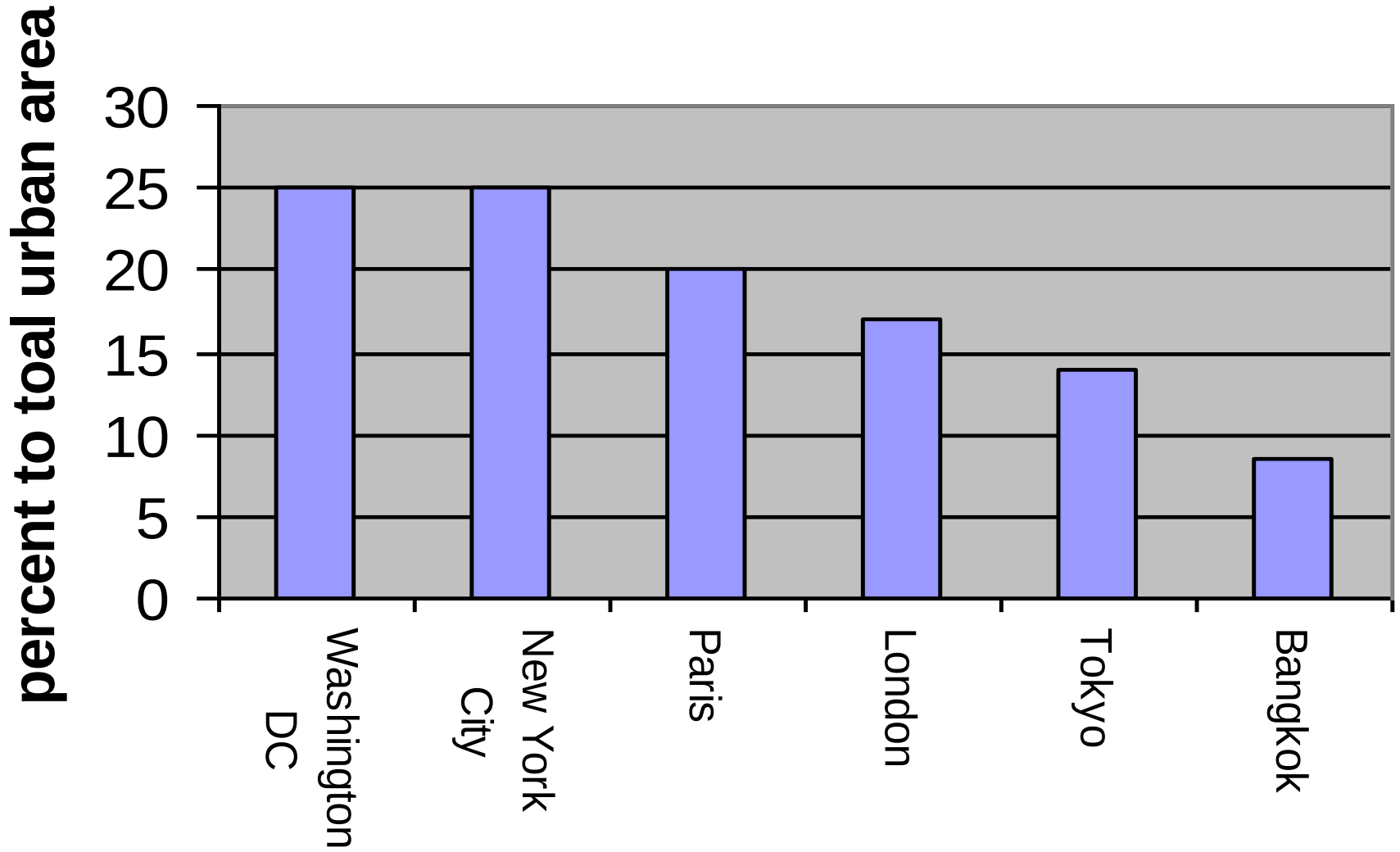
4. Costs of excessive concentration

- **Why too much concentration in mega cities?**
- Underdeveloped institutions for urban planning and management
- Inadequate human resources
- **Externalities of congestion** and pollution are relatively *underpriced* in megacities, encouraging overpopulation in larger cities.
- Excessive concentration significantly **reduces** economic growth.

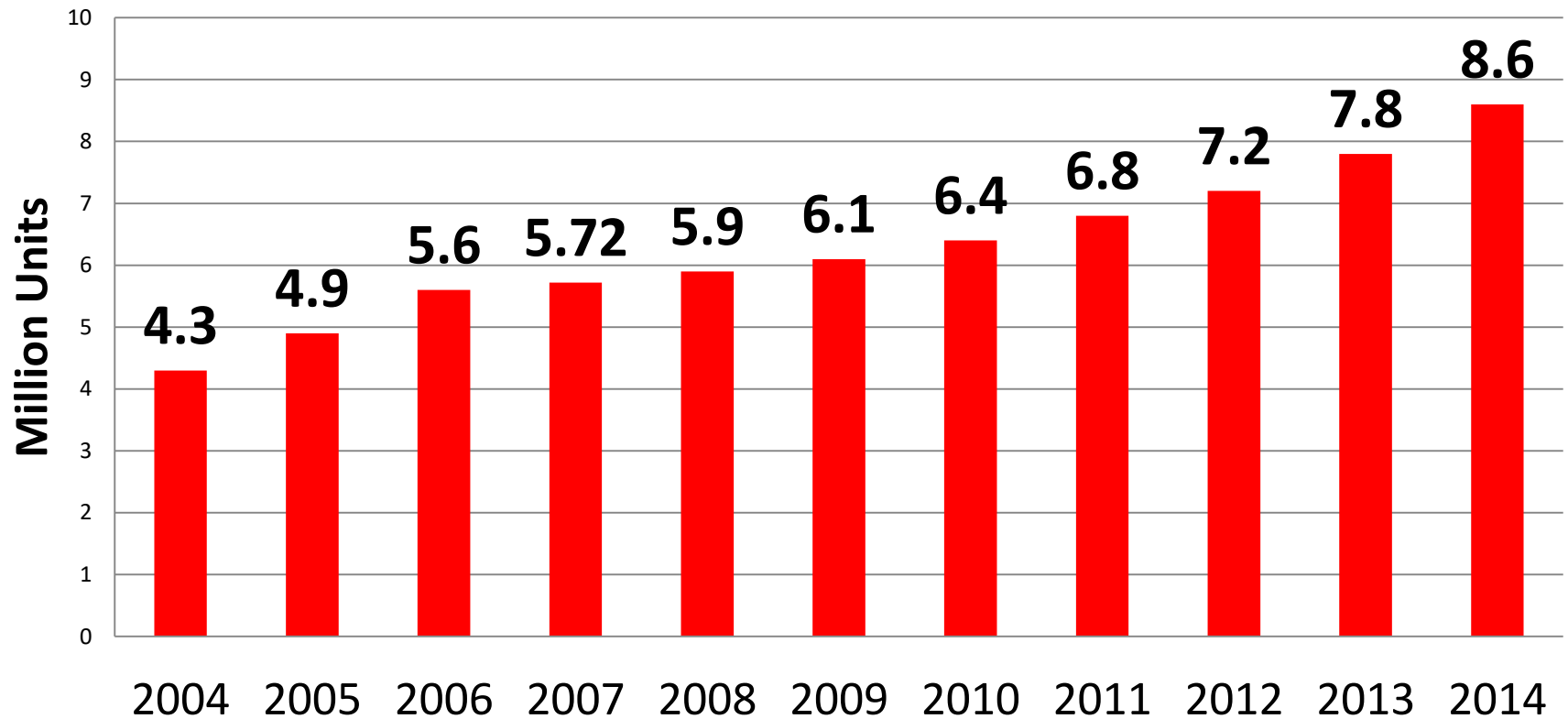
Consequences of heavy concentration

- **Growth losses** in countries with excessive mega-cities resulting from significantly deficient human and physical capital investment.
- Wages, land and infrastructure costs escalate with mega-city size relative to scale benefits for standardized products, making it more difficult to attract foreign investment and to remain competitive in world markets.
- Bangkok is an example of city with excessive congestion.

Urban Road Area



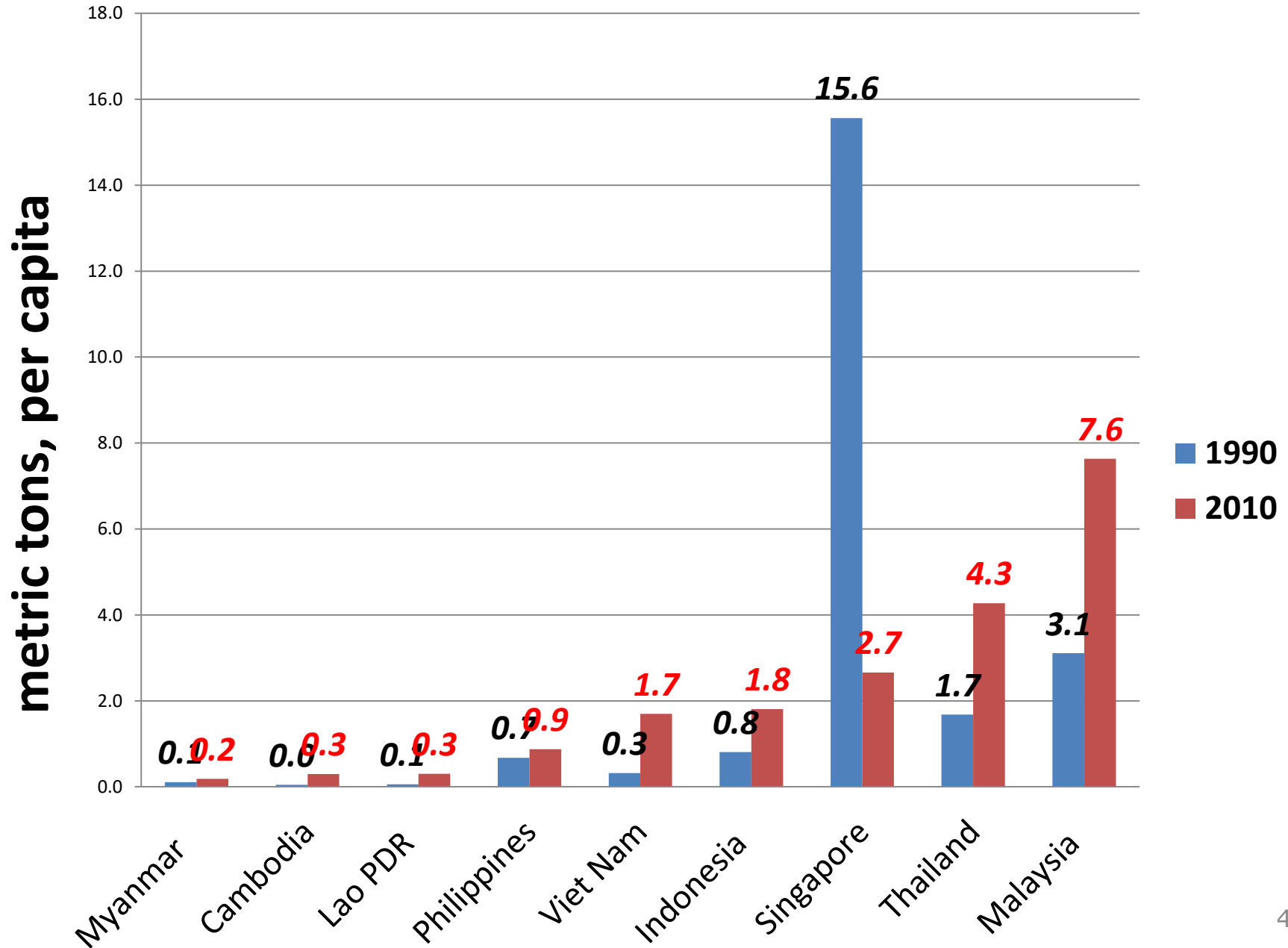
Accumulated number of cars registered in Bangkok



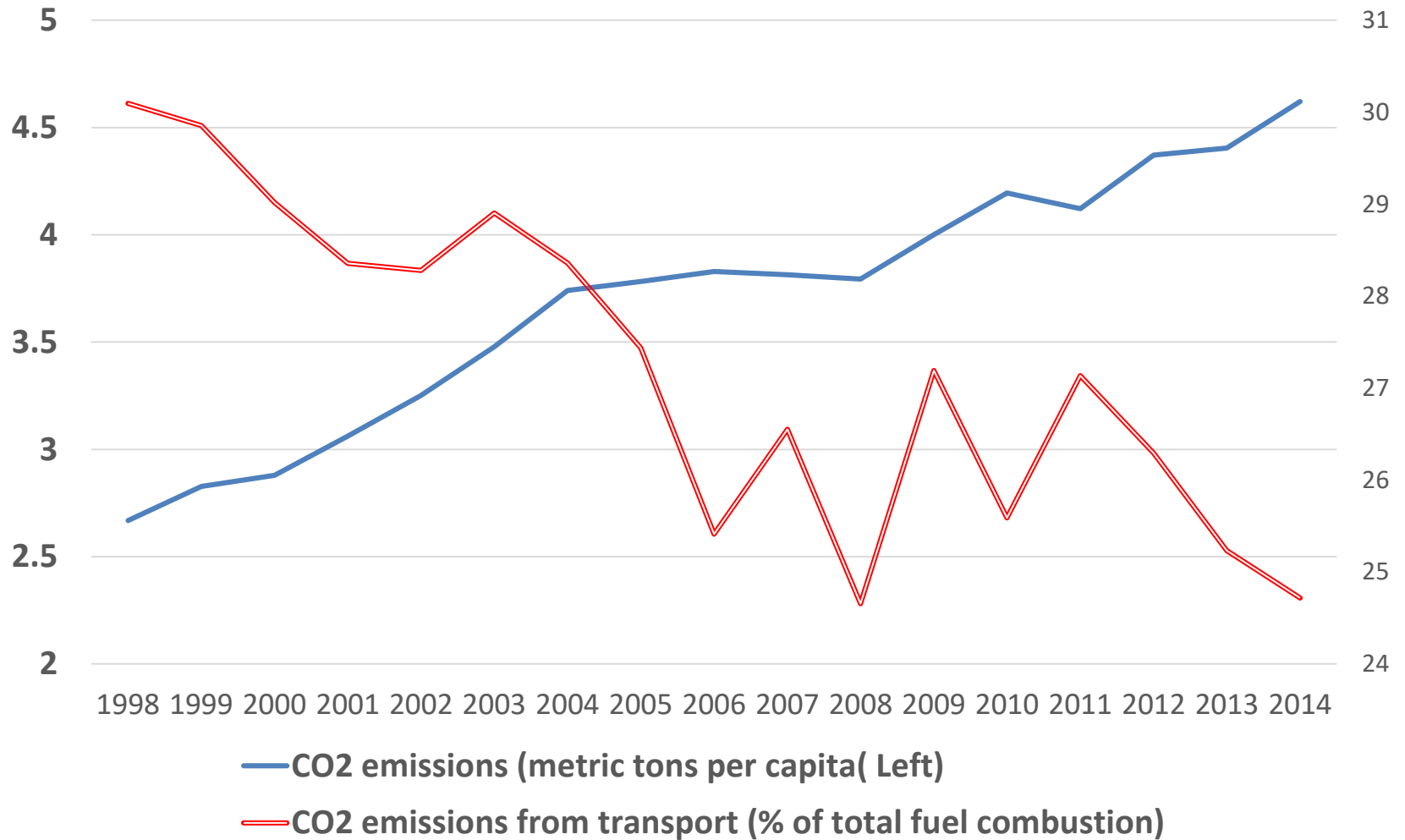
Consequences of traffic congestion

- Huge economic cost in terms of time lost and energy consumption and cost of health treatment
- Alarming levels of CO, black smoke, Hydrocarbon, noise level and particulate matters (PM) .
- Road traffic is responsible for 70% of the dust.
- The main sources of dust are diesel and motor cycle exhaust and construction sites.

Carbon Dioxide Emissions



Thailand's CO₂ Emissions



Further costs of excessive concentration

- Traffic accidents
- Health costs from exposure to high level of air and water pollution
- Contamination of ground water
- Gastrointestinal and infectious diseases
- Poor air quality
- Time lost due to long commutes

Extra travel time: 64 minutes per day

Source: Tom Tom Traffic index

- Extra travel time during peak hours vs. an hour of driving during a free flow situation.
- 64 minutes per day, 244 hours per year
- Multiply by 230 days to annual figure of extra travel time of 244 hours per year

CONGESTION LEVEL ⓘ

● 61%

EXTRA TRAVEL TIME

↑ 4% increase since last year

Morning Peak ⓘ 91%

Evening Peak ⓘ 118%

Highways ⓘ 40%

Non-highways ⓘ 65%

WORLD RANK		CITY	CONGESTION LEVEL
1		<u>Mexico City</u>	66%
2		<u>Bangkok</u>	61%
3		<u>Jakarta</u> NEW	58%
4		<u>Chongqing</u>	52%
5		<u>Bucharest</u>	50%
6		<u>Istanbul</u>	49%
7		<u>Chengdu</u>	47%
8		<u>Rio de Janeiro</u> 	47%
10		<u>Beijing</u>	46%

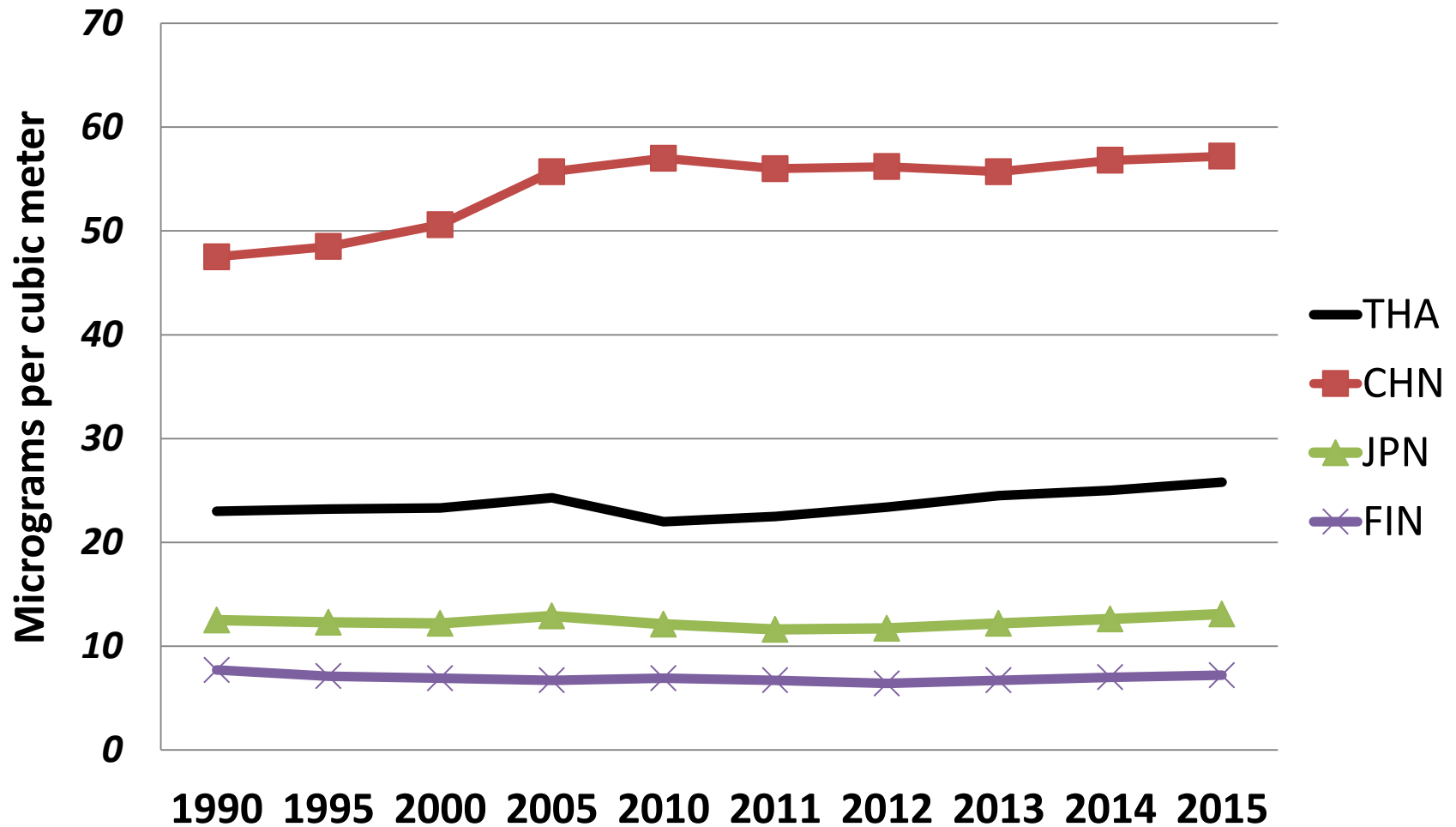
Particulate matter (PM 2.5)

- The effects of inhaling particulate matter: asthma, lung cancer, cardiovascular disease, respiratory diseases, premature delivery, birth defects, and premature death.
- The World Health Organization (WHO) estimated in 2005 that “Fine particulate air pollution less than 2.5 microns (PM_{2.5}), causes about 3% of mortality from cardiopulmonary disease, about 5% of *mortality from cancer of the trachea, bronchus, and lung*, and about 1% of mortality from acute respiratory infections in children under 5 years, worldwide

Particulate matter (PM 2.5)

- Short-term exposure at elevated concentrations can significantly contribute to heart disease.
- Traffic exhaust is the single most serious preventable cause of heart attack in the general public, the cause of 7.4% of all attacks

Particulate Matter: PM 2.5



How to alleviate urban concentration

- Investment in interregional transport and telecommunications to facilitate de-concentration of industry.
- The government creates investment promotional zoning to attract investors to rural areas.
- Fiscal de-concentration: small cities can raise fiscal resources and provide services need to compete with primate cities for industry and population.

Noise pollution and irrecoverable damage

- Maximum permissible level of noise was at 70 decibel (db).
- When exposing yourself to noise, think of three things: ***How loud, how long, and how close?***
- A normal conversation is about 60db.
- Noise that is ***Louder than 85db*** may damage your ears.
- Repeated exposure to noise-emitting machines and engines such as motorcycles can erode hearing more slowly but result in irrecoverable damaged ears.

As much as possible, avoid loud people

- Children become **aggressive** as their parents shout at one another.
- It inadvertently breeds a society full of aggressive people who cannot communicate with one another.
- Some even become suicidal, having suffered from persistent ringing in their ears.
- 21.4 % of Bangkok's population who lived along side the roads suffered from sensory neural hearing loss.

Hearing disability: A modern plague

- In 1990, 13.6% of the Thai population had some form of hearing disability, 3.9% of students in Bangkok, 6.1% of students in rural areas had hearing problem.
- Environmental noise pollution is a threat to health and well being.
- More severe and wider spread because of population growth, urbanization, and the use of increasingly powerful and highly mobile sources of noise.

Summary

- Business cycles are related to booms and busts in housing markets because there are lags in supply adjustment to price changes.
- This is a trade-off relationship between access to CBD and space, which explains choice of residential location among the rich and the poor in the city.
- Agglomeration economies explains choice of firms and business location as firms receive benefit network externality and spillover effects of being close together.

Summary

- Urbanization in developing countries is so rapid that they cannot prepare for the smooth transformation from rural to urban structure.
- Cost of excessive concentration prevails in mega cities.

State whether you agree or disagree with the following statement.

Provide brief reasons

1. Many poor people choose to live in slums in Bangkok, because of large wage differentials between urban and rural areas.
2. Since defense spending is public goods, the optimal level of military expenditure depends more on the level of threat by enemies rather than tax revenues.
3. Thailand 's inflation rate in April 2010 was contained at 3 % (year-on-year); inflation targeting strategy is effective.
4. Wider interest spreads of small commercial banks in Thailand indicate that they were less efficient and experienced lower profits than larger banks.
5. A proper exchange rate policy should aim at maintaining the stability of the bath-dollar rate to avoid excessive exchange risks that could lower international competitiveness of Thailand's export sector.

State whether you agree or disagree with the following statement.

Provide brief reasons

6. Other things equal, political violence in 2014 reduced Thailand's long-term growth path.
7. The gravity model suggests that Thailand should engage in free trade agreements with neighboring countries rather than countries in other parts of the world.
8. The sharp rebound of manufactured exports in the first quarter of 2010 underscored the increasing competitiveness of Thailand's manufacturing sector.
9. In 2010, as oil prices increased due to the recovery of the world economy it was likely that income inequality in Thailand would be worsened.
10. Both Baumal-Bowen cost disease and the Dutch disease have similar impacts on the Thai land's international competitiveness.