

Exercise walk-through

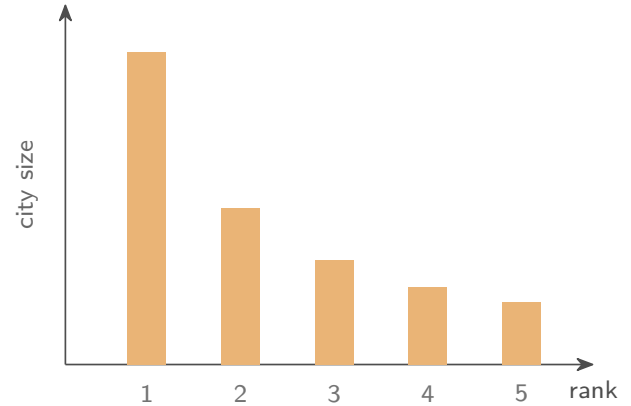
6.4

The Size and Distribution of Cities

AP Human Geography

Size and distribution

- The **rank-size rule** : the n th city $\approx 1/n$ of the largest.
- A **primate city** is more than twice the second city.
- The **gravity model** : interaction rises with size, falls with distance.



n th city $\approx 1/n$ of the largest

Worked example – rank-size or primate?

Country A: largest 12M, 2nd 6.1M, 4th 3.0M. **Country B:** largest 12M, 2nd 2.5M. Which fits rank-size?

A: rank-size predicts $2\text{nd} = \frac{12}{2} = 6\text{M}$ and $4\text{th} = \frac{12}{4} = 3\text{M}$. Both match, so A follows rank-size.

B: $12 > 2 \times 2.5 = 5$, so B has a primate city.

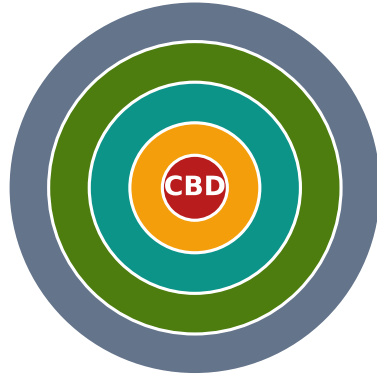
Test the **second** city first:
more than double $\Rightarrow$ primate,
and you can stop. Only if it
is not primate do you check
whether the **whole** $1/n$ ladder
holds.

Internal structure

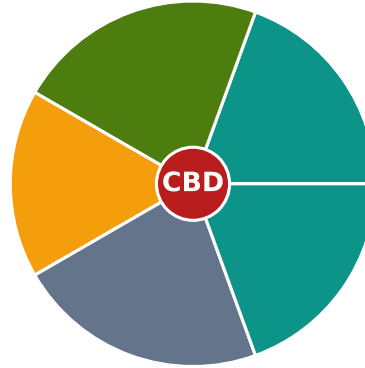
- **Concentric zone model** : rings around a CBD.
- **Sector model** : wedges along transport routes.
- **Multiple nuclei model** : several centres.

The concentric-zone

Concentric zone (Burgess)



Sector (Hoyt) Multiple nuclei (Harris-Ullman)

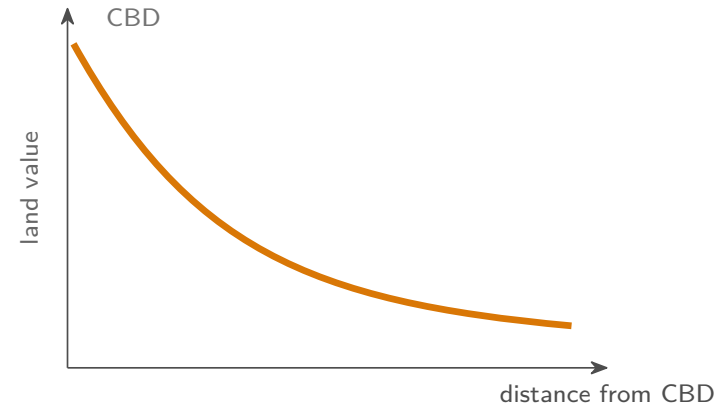


■ CBD ■ wholesale / light mfg ■ low-income housing ■ middle-income housing ■ commuter / industry

The concentric-zone, sector, and multiple-nuclei models each explain city land use differently

Density and infrastructure

- **Land value** peaks at the CBD, pushing buildings up.
- **Zoning** sets what is built where.
- **Infrastructure** enables growth and development.



land value peaks at the CBD (bid-rent)

Exercises 2.1-2.3

2.1 State the rank-size rule.

[2]

2.2 Define a primate city.

[2]

2.3 A country's largest city has 8 million people; the next largest has 1 million.

(a) Does this fit the rank-size rule or primacy? Explain.

[2]

Exercises 2.1-2.3

2.1 State the rank-size rule.

[2]

2.1

- the n th largest city is about $1/n$ the size of the largest; e.g. the 4th city $\approx 1/4$ of the largest

2.2 Define a primate city.

[2]

2.2

- a city more than twice the size of the next largest that dominates the country

2.3 A country's largest city has 8 million people; the next largest has 1 million.

(a) Does this fit the rank-size rule or primacy? Explain.

[2]

2.3

(a)

- primacy – the largest is far more than twice the second, not the ~ 4 million the rank-size rule predicts

Exercise 3.1

3.1 If the largest city has 12 million people, the rank-size rule predicts the 3rd city has about [1]

☐

A 12 million

B 6 million

C 4 million

D 1 million

Exercise 3.1

3.1 If the largest city has 12 million people, the rank-size rule predicts the 3rd city has about [1]

☐

A 12 million

B 6 million

C 4 million

D 1 million

3.1 C

- 3rd city $\approx 12\text{M} \div 3 = 4$ million

Exercise 3.2

3.2 The gravity model predicts that interaction between two cities increases with their size and decreases with [1]

☐

A their populations

B the distance between them

C their site

D their toponyms

Exercise 3.2

3.2 The gravity model predicts that interaction between two cities increases with their size and decreases with [1]

☐

A their populations

B the distance between them

C their site

D their toponyms

3.2 B

- interaction falls with distance (squared) in the gravity model

Exercise 3.3 (a)

3.3 A capital dominates its country, dwarfing every other city.

(a) Name this pattern.

[1]

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3.3 A capital dominates its country, dwarfing every other city.

(a) Name this pattern.

[1]

(a)

- primate city / urban primacy

Exercise 3.3 (b)

3.3 A capital dominates its country, dwarfing every other city.

(b) State one problem a primate city can cause.

[1]

Exercise 3.3 (b)

3.3 A capital dominates its country, dwarfing every other city.

(b) State one problem a primate city can cause.

[1]

(b)

- uneven development – resources and jobs concentrate in one city, neglecting the rest