2.3 : The Gini Coefficient

Objectives:

After the lessons, students will be able to
1. understand how income inequality is indicated by the Gini Coefficient;
2. interpret the meaning of the Gini Coefficient;
3. compare the Gini Coefficients of selected countries with that of Hong Kong;
4. identify the effect of change in family size on the Gini Coefficient in Hong Kong.*

(*More able students would be expected to explain the effect of change in family size on the Gini Coefficient in Hong Kong.)

Prerequisite knowledge:

1. An understanding of the characteristics and limitations of the Lorenz Curve.
2. The knowledge of determining the area of a triangle.

Time required:

60-65 minutes

Learning Activities:

Three learning activities
2.3 The Gini Coefficient

**Activity 1: Understanding of Gini coefficient**

**A. Objectives:**
- To learn the calculation of Gini Coefficient.
- To understand the boundaries of Gini Coefficient.

**B. Time required:** 20 minutes

**C. Materials needed:**
- one page of income distribution data of selected countries (TM1)
- two graphs showing two special Lorenz Curves for finding the Gini Coefficient (TM2)
- one page of information on features of Gini Coefficient (TM3)
- one worksheet for students

**D. Teaching plan and instructional procedures:**

<table>
<thead>
<tr>
<th>Teacher Activities</th>
<th>Student Activities</th>
<th>Time (mins)</th>
<th>Target Content/ Skills</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Demonstrate cases of Lorenz Curves based on data from TM1. Ask students to explore the differences of income inequality among three countries.</td>
<td>Attend to presentation. Discuss in pairs the differences of income inequality among three countries.</td>
<td>3</td>
<td>Understand that Lorenz Curves may have limitations in comparing the income inequalities among economies in some cases.</td>
<td>Generate Lorenz Curves with the excel programme. • TM1</td>
</tr>
<tr>
<td>2. Explain Gini Coefficient is one of the measurements reflecting income inequality. Explain the formula and show the calculation of the Gini Coefficients for two extreme cases. (TM2)</td>
<td>Watch and listen. Check the calculation of the Gini Coefficients and predict the boundaries of Gini Coefficient in pairs.</td>
<td>5</td>
<td>Know that Gini Coefficient is one of the measurements reflecting income inequality and is related to the Lorenz Curve. Predict and understand the boundaries of Gini Coefficient.</td>
<td>• TM2</td>
</tr>
<tr>
<td>Task</td>
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<tr>
<td>3. Briefly go over the positions/ shapes of two Lorenz Curves (LC₂, LC₃) and the counting method. Ask students to determine the Gini Coefficients in pairs (worksheet).</td>
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<tr>
<td>Form groups of four, each has one pair working on LC₂ and another on LC₃.</td>
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<td>4. Understand the relationship between the Lorenz Curve and the Gini Coefficient.</td>
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<tr>
<td>4. Supervise students as they determine Gini Coefficients in pairs and in groups.</td>
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<tr>
<td>Share in pair and explain their work in groups.</td>
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<tr>
<td>3. Collaboration and counting skills.</td>
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<tr>
<td>5. Invite one representative from each of the two groups to report the steps and answers.</td>
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<tr>
<td>Listen and check.</td>
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<tr>
<td>2. Presentation skill.</td>
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<tr>
<td>6. Feedback; comment with TM3 if necessary, and give assignment.</td>
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<tr>
<td>Listen and finish assignments 1 and 2.</td>
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<tr>
<td>• TM3</td>
<td></td>
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<tr>
<td>• Assignment 1 &amp; 2.</td>
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</tr>
</tbody>
</table>
E. Teaching Materials

**Teaching Material 1 (TM1)**

(For more able students, teacher may ask them to explain why it is difficult to conclude the differences in income inequality among different countries by inspecting their Lorenz Curves.)

**Teaching Procedures:**

1. Generate the Lorenz Curves of Canada, China and Portugal (or Egypt, Taiwan and USA) with the excel programme. (For convenience, teacher is advised to round up the values to whole numbers.)

2. Explain that it is easier to conclude that Canada has less income inequality than China and Portugal by inspecting their Lorenz Curves (the same case for USA, Egypt and Taiwan).

3. Explain that it is difficult to compare the income inequality between China and Portugal by inspecting their Lorenz Curves (the same case for Egypt and Taiwan). Therefore, it is necessary to develop another measurement of income inequality.

**“Cumulative % of total income” of different levels of “cumulative % of total households” of some selected countries in 1991**

<table>
<thead>
<tr>
<th>Country</th>
<th>Gini Coefficient</th>
<th>“Cumulative % of total income” of different levels of “cumulative % of total households”</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>20%*</td>
</tr>
<tr>
<td>Canada (H)</td>
<td>0.2765</td>
<td>7.68**</td>
</tr>
<tr>
<td>China (P)</td>
<td>0.362</td>
<td>6.44</td>
</tr>
<tr>
<td>Portugal (H)</td>
<td>0.3563</td>
<td>6.14</td>
</tr>
<tr>
<td>Egypt (P)</td>
<td>0.32</td>
<td>8.71</td>
</tr>
<tr>
<td>Taiwan (P)</td>
<td>0.3049</td>
<td>7.37</td>
</tr>
<tr>
<td>USA (H)</td>
<td>0.3794</td>
<td>4.5</td>
</tr>
</tbody>
</table>

(H) refers to household income and (P) refers to personal income

* 20%, 40%, 60%, 80% and 100% are “cumulative % of total households”.
** 7.68 means 7.68% of total income earned by the lowest 20% of total households in Canada, while 21.36 means 21.36% of total income earned by the lowest 40% of total households.

Source:
(http://go.worldbank.org/UVPO9KSJJ0)
Fig A. Lorenz Curves of Canada, China and Portugal

Fig. B. Lorenz Curves of Egypt, Taiwan and USA
Teaching Material 2 (TM2)

1. Review the Lorenz Curve and the labels of the two axes with students, and explain the labels if necessary.

2. Review the Line of Equality and the Line of Absolute Inequality with students.

3. Define the variables of the formula of Gini Coefficient. Gini Coefficient = Area A / Area A+B (where A is the area between the Line of Equality and the Lorenz Curve, Area B is the area below the Lorenz Curve).

4. Ask students to predict the boundaries of the Gini Coefficient.

5. Ask students to determine the Gini Coefficient if the distribution is represented by the Line of Equality (LE). Show the steps of finding the value of Gini Coefficient (either by counting squares or calculating the area of triangle).

6. Ask students to determine the Gini Coefficient if the distribution is represented by the Lorenz Curve (LC1). Show the steps. (Teacher may explain that the value of Gini Coefficient ranges from 0 to 1 inclusive. When all income is earned by one household, the Gini Coefficient will be 1.)

For simplicity, we assume that each side of the squares in the figure is 1 unit long.

For the Line of Equality (LE):
Area of A(A1) is 0, Area of A1+B=50,
Gini Coefficient=0/50=0

For Lorenz Curve (LC1):
Area A1+B=50, Area B= 2x10/2=10
Area A1=Area A1+B-Area B
= 50-10 =40
Gini Coefficient = 40/50=0.8
Worksheet

1. Form groups of four with two pairs in each group (A and B).
2. **Pair A** to determine the value of Gini Coefficient of LC\(_2\).
3. **Pair B** to determine the value of Gini Coefficient of LC\(_3\).
4. Each pair take turn to explain the working steps and the answer, while the other pair check and confirm the working steps and the answer.
5. Explain the possible relationship between the position (and shape) of the Lorenz Curve and the Gini Coefficient.

   *(When the Lorenz Curve is closer to the Line of Equality, the Gini Coefficient is smaller and closes to zero, representing a smaller income inequality. When the Lorenz Curve is more concave, the area of A is larger and so is the value of the Gini Coefficient, representing a greater income inequality.)*

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**For Pair A**

For LC\(_2\),
Area of A\(_2\) is 2x10/2=10 (see note),
Area A\(_2\)+ B = 50,
Gini Coefficient = 10/50=0.2

---

**Note:**

Area A\(_2\)+B = \(\frac{Y \times Y}{2}\) = 50 ; \(\therefore Y = 10\)

LE= \(\sqrt{10^2 + 10^2} = 10\sqrt{2}\)

Z = \(\sqrt{1^2 + 1^2} = \sqrt{2}\)

Area of A\(_2\) = \(\frac{10 \times \sqrt{2} \times \sqrt{2}}{2} = \frac{10 \times 2}{2} = 10\)
For simplicity, we assume that each side of the squares in the figure is 1 unit long.

For LC₃,
The Area $A₃$ is $(5 \times 10 / 2) = 25$, the Area $A₃ + B = 50$
Gini Coefficient $= 25 / 50 = 0.5$

**Alternative method:**

Area of $\triangle CDE = \frac{7 \times 2}{2} = 7$, Area of $DEHG = 2 \times 3 = 6$
Area of $\triangle FDH = \frac{8 \times 3}{2} = 12$, Area of $\triangle CFG = \frac{10 \times 10}{2} = 50$

Area of $A₃ = $ Area of $\triangle CFG - $ Area of $\triangle CDE - $ Area of $DEHG - $ Area of $\triangle FDH$

$= 50 - 7 - 6 - 12$

$= 25$

Gini Coefficient $= 25 / 50 = 0.5$
Teaching Material 3 (TM3)

Teaching Procedure:

1. Ask students to explain the calculation of Gini Coefficient with reference to the diagram on the top.

2. Ask students to explain the boundaries of Gini Coefficient (0-1) and the level (more/less even) of income inequality indicated by different Gini Coefficients.

3. Ask students to explain the relationship between the change in the position/shape of the Lorenz Curve and the change of Gini Coefficient, and the relationship between such changes and income inequality.
F. Assignments

Assignment 1

Fill in the missing information by referring to the diagram.

a. Gini Coefficient is the ratio of area A divided by the sum of areas A and B.

b. Area A is the area between the Line of Equality and the Lorenz Curve.

c. Area B is the area under the Lorenz Curve. So Gini Coefficient = Area A /(Area under the Line of Equality).

d. When A is zero, the Gini Coefficient will be zero. The income distribution will be completely even. It is because the Lorenz Curve is the Line of Equality, so all households have equal income.

e. When B is zero, the Gini Coefficient will be 1. The income distribution will be completely unequal. It is because the Lorenz Curve stands extremely vertical and is farthest away from the Line of Equality. Therefore, all income is in the hand of the richest household (i.e. one household).
Assignment 2

How did the income distribution of Hong Kong change during the period (1981-2006)? Suggest possible reasons (one to three reasons, depending on the abilities of students) for your answer.

Table 1 - Gini Coefficient of Hong Kong, 1981-2006

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.451</td>
<td>0.453</td>
<td>0.467</td>
<td>0.518</td>
<td>0.525</td>
<td>0.533</td>
</tr>
</tbody>
</table>

Source: Hong Kong Census and Statistics Department
2.3 The Gini Coefficient

Activity 2: Comparing the Gini Coefficient between
Hong Kong and other countries

A. Objectives:
• To compare the Gini Coefficients of Hong Kong and some selected countries.
• To discuss the relationship between income inequalities and the per capita GDP of the countries.
• To identify factors that affect Hong Kong’s income inequality.

B. Time required: 30 minutes

C. Materials needed:
• One page of the Gini Coefficient data of selected countries. (TM1)
• One page of the Gini Coefficient data of Hong Kong, the trend on the number of people engaged in the selected industry between 1980 and 2008 and a minute extract from the 6th meeting of the Committee on Social Development and Quality of Life of the Commission on Strategic Development held on 30 November 2006. (TM2)

D. Teaching plan and instructional procedures:

<table>
<thead>
<tr>
<th>Teacher Activities</th>
<th>Student Activities</th>
<th>Time (mins)</th>
<th>Target Content/ Skills</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ask students to form groups of four. Explain briefly the meaning of per capita GDP. Ask students to answer Q1.</td>
<td>Form groups and discuss the level of income inequality among these countries.</td>
<td>5</td>
<td>A basic concept of per capita GDP</td>
<td>TM 1</td>
</tr>
<tr>
<td>2. Supervise the group discussion.</td>
<td>Discuss and answer.</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Show the Gini Coefficients of different countries in TM 1 and ask students to answer Q2.</td>
<td>Answer Q2 according to the Gini Coefficients given.</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Show the answers of Q2 and ask students answer Q3.</td>
<td>Discuss the difference between the answers of Q1 and Q2.</td>
<td>5</td>
<td>There is no direct relationship between the income inequality and the income of the countries.</td>
<td></td>
</tr>
</tbody>
</table>
5. Ask students to identify factors that lead to Hong Kong’s income inequality.

Discuss and answer. 15 Deduce the factors affecting income inequality.

<table>
<thead>
<tr>
<th></th>
<th>Per capita GDP (PPP) (2007)</th>
<th>Gini Coefficient*</th>
<th>Survey Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>US$45,800</td>
<td>0.45</td>
<td>2007</td>
</tr>
<tr>
<td>Hong Kong, China</td>
<td>US$42,000</td>
<td>0.53</td>
<td>2007</td>
</tr>
<tr>
<td>Australia</td>
<td>US$37,300</td>
<td>0.31</td>
<td>2006</td>
</tr>
<tr>
<td>Finland</td>
<td>US$36,000</td>
<td>0.26</td>
<td>2005</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>US$35,000</td>
<td>0.34</td>
<td>2005</td>
</tr>
<tr>
<td>Japan</td>
<td>US$33,500</td>
<td>0.38</td>
<td>2002</td>
</tr>
<tr>
<td>Korea, South</td>
<td>US$25,000</td>
<td>0.35</td>
<td>2006</td>
</tr>
<tr>
<td>South Africa</td>
<td>US$9,700</td>
<td>0.65</td>
<td>2005</td>
</tr>
<tr>
<td>China</td>
<td>US$5,400</td>
<td>0.47</td>
<td>2007</td>
</tr>
<tr>
<td>Philippines</td>
<td>US$3,200</td>
<td>0.46</td>
<td>2006</td>
</tr>
<tr>
<td>Vietnam</td>
<td>US$2,600</td>
<td>0.37</td>
<td>2004</td>
</tr>
</tbody>
</table>

* The data shown in the CIA’s web is Gini Index which is 100 times of Gini Coefficient and represented by percentage. To avoid students’ confusion, Gini Coefficient is presented here.

Source: Central Intelligence Agency (CIA)
Questions:

1. Based on the information given in Table 1 (i.e. per capita GDP (PPP) in 2007), guess the level of income inequality of those selected countries and rank them accordingly (from the lowest level of income inequality to the highest level of income inequality). Explain your answers.

2. Rank these countries in descending order of inequality according to the Gini Coefficients given.
   Finland, Australia, United Kingdom, South Korea, Vietnam, Japan, United States, Philippines, China, Hong Kong, South Africa

3. Based on your ranking in Q.2, please explain whether there is a relationship between the income inequality and the per capita income of the countries.
   There is no direct relationship between per capita GDP (national income) and Gini Coefficient (degree of income inequality). For instance, even though Hong Kong enjoyed high per capita GDP, its income inequality was even greater than that in some developing countries, e.g. Vietnam and Philippines. Meanwhile, even though the per capita GDP of Vietnam was the lowest among these countries, its income inequality was lower than that in the United States.
Teaching Material 2 (TM2)

Source 1
Number of people engaged in the selected industry (1980-2008)

Key: ① Manufacturing  
② Wholesale, retail and import/export trades, restaurants and hotels  
③ Financing, insurance, real estate and business services  
④ Construction sites (manual workers only)

Source: Census and Statistical Department, Table 017: Number of Establishments, Persons Engaged and Vacancies (Other than those in the Civil Service) Analyzed  
(http://www.censtatd.gov.hk/showtableexcel2.jsp?tableID=017)

Source 2
Gini Coefficient of Hong Kong from 1981 to 2006

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Gini Coefficient</td>
<td>0.451</td>
<td>0.453</td>
<td>0.476</td>
<td>0.518</td>
<td>0.525</td>
<td>0.533</td>
</tr>
</tbody>
</table>

Questions:

1. Which industry faced a dramatically decrease in the amount of employment over the past twenty years? Please explain.

   Manufacturing industry. The shift of manufacturing factories to the mainland had a significant impact on the employment opportunities of the workers. Hence the number of workers engaged in the manufacturing sector has been decreasing.

2. Source 2 shows that Hong Kong’s Gini Coefficient has been rising continuously over the past twenty years. How did the trend shown in Source 1 affect the Gini Coefficient? Can you think of some reasons?

   Source 1 shows that the number of workers engaged in manufacturing industry has dropped dramatically during the past twenty years. This reflects that the importance of manufacturing industry in Hong Kong has been declining. However, workers engaged in this industry may not be able to find a high-skilled jobs in the up-market e.g. retails and financial sector. This partly explains the widening income differentials in Hong Kong.

Source 3

Minute extract from the 6th meeting of the Committee on Social Development and Quality of Life of the Commission on Strategic Development held on 30 November 2006.

Similar to other world cities such as London and New York, it was expected that the development of Hong Kong towards a services-oriented economy would experience a widening income inequality. The emergence of world cities entailed a major cluster of high value-added business activities such as financial and up-market consumer services. Members noted that those people engaged in the activities would likely be able to earn high income, but the number of jobs created was not large.

Source: The minute of 6th meeting of the Committee on Social Development and Quality of Life of the Commission on Strategic Development held on 30 November 2006 (http://www.cpu.gov.hk/english/documents/csd/csd_sc_summary_6.pdf)
Source 4

Average Wage Rates for Employees received in the selected Industry Sector (1982-2008)

Key:
1. Transport Services
2. Wholesale, retail and import /exports trades, restaurants and hotels
3. Financing, insurance, real estate and business services
4. Manufacturing

Source: Census and Statistical Department, Table 021, Average Wage Rates for Employees up to Supervisory Level (Excluding Managerial and Professional Employees) by Broad Occupational Group by Selected Industry Sector (1982-2008)
**Question:**

3. Source 3 shows that members from the committee noted that those workers engaged in the high value-added business activities such as financial and up-market consumer services would likely be able to earn high income. However, Source 4 shows that the income generated from financial sectors was not significantly higher than that from the manufacturing sectors. Why there is a divergence between these two sources?

**Possible Answers:**

- Those employees engaged in the financial sectors received commission which was not reported to the Census and Statistics Department. Thus, the data collected by the Census and Statistical Department did not reflect the full picture.

- Even though the number of people engaged in the financial sector was much higher than that in manufacturing sector, only a small portion of them (e.g. managerial and professional employees) were able to earn very high income, thus, the average salary of financial sector would not significantly higher than that of the manufacturing sector.

**Remarks:**

Teacher can access more information on factors affecting income inequality and social mobility from the minute of the 6th meeting of the Committee on Social Development and Quality of Life of the Commission on Strategic Development held on 30 November 2006. (http://www.cpu.gov.hk/english/documents/csd/csd_sc_summary_6.pdf)
Activity 3: Effect of the change in family size on Gini Coefficient in HK

A. Objective:
- To understand the effect of the change in family size on the Gini Coefficient in Hong Kong.

B. Time required: 10-15 minutes. (depending on the participation or abilities/ readiness of students)

C. Materials needed: One page of information about the effect of household size on income distribution (TM1)

D. Teaching plan and instructional procedures:

<table>
<thead>
<tr>
<th>Teacher Activities</th>
<th>Student Activities</th>
<th>Time (mins)</th>
<th>Target Content/ Skills</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ask students to suggest factors that would affect income distribution in Hong Kong.</td>
<td>Think and share in pairs.</td>
<td>2</td>
<td>Deduce the factors affecting the Gini Coefficient.</td>
<td>• If students are ready to participate or more capable, teacher may arrange group discussion.</td>
</tr>
<tr>
<td>2. Either explain directly with Exhibits 1 and 2 in TM1 or ask students to discuss according to the suggestions in TM1.</td>
<td>Listen and jot down notes or discuss in pairs and share answers in groups.</td>
<td>5</td>
<td>Understand how the change in household size affects the Gini Coefficient.</td>
<td>• Extra time for discussion and presentation.</td>
</tr>
<tr>
<td>3. Invite one representative from one to two groups to share their views.</td>
<td>Listen, jot down notes and reflect on the thinking process.</td>
<td>0/5*</td>
<td>Communication skills.</td>
<td></td>
</tr>
<tr>
<td>4. Give feedback and assignment.</td>
<td>Listen, jot down notes and finish Assignment 1.</td>
<td>3</td>
<td>Consolidation of learning.</td>
<td></td>
</tr>
</tbody>
</table>

* optional activity
E. Teaching Materials

**Teaching Material 1 (TM1)**

Teacher will explain, illustrating with the following case, how the family size affects the Gini Coefficient.

For more able students, teacher may ask them to study the case and the extract in groups of four. Pair A study Exhibit 1 (the case) and Pair B study Exhibit 2 (the extract). Students then explain how the household size affects the Gini Coefficient.

**Exhibit 1: A case showing the change in household size and change in Gini Coefficient**

<table>
<thead>
<tr>
<th>Situation 1: 20 years ago</th>
<th>Situation 2: Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>There were two families: The Ho and the Lee.</td>
<td>There are five families originated from the Hos and the Lees.</td>
</tr>
<tr>
<td>1. The Lee family: Mr. and Mrs. Lee with three sons</td>
<td>All Mr. Lee’s sons married to the daughters of Mr. Ho.</td>
</tr>
<tr>
<td>The total family income was $40,000.</td>
<td>1. The Lee family (first generation):</td>
</tr>
<tr>
<td>2. The Ho family: Mr. and Mrs. Ho with three daughters</td>
<td>Mr. and Mrs. Lee.</td>
</tr>
<tr>
<td>The total family income was $40,000.</td>
<td>Total family income is $10,000.</td>
</tr>
<tr>
<td>Total annual income was $80,000. Gini Coefficient was zero.</td>
<td>2. The Ho family (first generation):</td>
</tr>
<tr>
<td></td>
<td>Mr. and Mrs. Ho.</td>
</tr>
<tr>
<td></td>
<td>Total family income is $10,000.</td>
</tr>
<tr>
<td></td>
<td>3. The first Lee family (second generation):</td>
</tr>
<tr>
<td></td>
<td>Mr. and Mrs. Lee.</td>
</tr>
<tr>
<td></td>
<td>Total family income is $20,000.</td>
</tr>
<tr>
<td></td>
<td>4. The second Lee family (second generation):</td>
</tr>
<tr>
<td></td>
<td>Mr. and Mrs. Lee.</td>
</tr>
<tr>
<td></td>
<td>Total family income is $20,000.</td>
</tr>
<tr>
<td></td>
<td>5. The third Lee family (second generation):</td>
</tr>
<tr>
<td></td>
<td>Mr. and Mrs. Lee.</td>
</tr>
<tr>
<td></td>
<td>Total family income is $20,000.</td>
</tr>
<tr>
<td></td>
<td>Total annual income is $80,000.</td>
</tr>
<tr>
<td></td>
<td>Gini Coefficient is 0.15.</td>
</tr>
</tbody>
</table>

Source: Cases presented by Census and Statistics Department, 2007
Exhibit 2: An extract of a report

**Impact of the change in family size on income inequality**

Big families with three generations living together were common in the 1960s and 1970s in Hong Kong. But nowadays, there are increasing numbers of small families, elderly households and elderly living alone. These changes have caused great effect on household income distribution. As the average size of household was diminishing, the growth in average household income has slowed down. Many old people are living separately from their children. Many of them do not have any income, but live on past savings or social security. As a result, there is a great increase of small but low-income families. This change in family structure has significant and obvious impact on the Gini Coefficient.

Source:
Adapted from KWOK Kwok Chuen, Income Distribution of Hong Kong and the Gini Coefficient.

* Teacher can access the full text at http://www.eabfu.gov.hk/en/pdf/income.pdf
F. Assignments

Assignment 1

Answer the following questions by referring to the following report:

Some legislators asked the Head of Census and Statistics Department for the Gini Coefficient / ratio when they discussed the findings of the 2006 by-census. But Mr. FUNG Hing-wang, the department head, claimed that ordinary Gini Coefficient might not reflect the real gap between the rich and the poor, but agreed to determine the ordinary Gini Coefficient and modified Gini Coefficient for the legislators in mid 2007.

Some legislators in other occasion urged the Hong Kong SAR Government to raise the Old Age Allowance from HK$900 to HK$1,000 in order to help the poor elderly.

Sources:
Ming Pao 13 April 2007 and RTHK news 10 December 2007

a. Why did the legislators ask for the Gini Coefficient, but not the Lorenz Curve?
   
   It is easier to understand and compare the Gini Coefficients of other years or countries.

b. Mr. Fung claimed that (ordinary) Gini Coefficient might not reflect the real gap between the rich and the poor, do you agree with him? Justify your answer.
   
   Answer should be positive, for the actual income of different income groups may be affected by some government policies or measures.

c. How would the income inequality and Gini Coefficient (based on post-tax post-social transfer monthly household income) change if the HKSAR Government increases the Old Age Allowance as proposed by some legislators?
   
   The income distribution would be more equal/even and the Gini Coefficient (based on post-tax post-social transfer monthly household income) would decrease because the actual income of the elderly, who probably have no or low income, would increase.
Challenging Questions (For more able students)

d. What factors would Mr. Fung consider to prepare the modified Gini Coefficient? Explain your answers.

The factors may include household size, government transfer payment to the poor and tax on the high-income groups.

e. Given that the Gini Coefficient of Hong Kong in 2001 was 0.525, some legislators expected the ordinary Gini Coefficient in 2006 to change. What did they expect? Suggest two possible reasons behind their expectation by referring to some economic events happened in Hong Kong between 2001 and 2006.

They expected it to increase. There is no standard answer for the reasons.

According to the Hong Kong Census and Statistics Department, the original and adjusted Gini Coefficients for 1996, 2001 and 2006 were as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>1996</th>
<th>2001</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original Gini Coefficient</td>
<td>0.518</td>
<td>0.525</td>
<td>0.533</td>
</tr>
<tr>
<td>Adjusted Gini Coefficient (based on Post-tax post-social transfer household income)</td>
<td>0.466</td>
<td>0.470</td>
<td>0.475</td>
</tr>
</tbody>
</table>

Source: Hong Kong Census and Statistics Department, Thematic Report: Household Income Distribution in Hong Kong (P.14), 2006
Assessment 1

Fill in the missing information by referring to the diagram below.

a. Usually the Gini Coefficient of a country lies between 0 and 1.

b. When the Gini Coefficient is close to 1, the income distribution is more uneven/unequal because most income is earned by the richest households, whereas the lowest-income group earns much less.

c. When the Gini Coefficient is close to 0, the income distribution is more even/equal because the highest-income group does not earn much more than the lowest-income group.

d. When Area A expands, the Gini Coefficient will be nearer to 1; and the income distribution will be more uneven/unequal. When Area A diminishes, the Gini Coefficient will be nearer to 0; and the income distribution will be more even/equal.
Assessment 2

Why the Gini Coefficient is more frequently used in news report to describe income inequality than the Lorenz Curve?

It is because it is easier for readers to compare the values of different periods or/and different countries and easier to see the level of income inequality.

Assessment 3 (for more able students)

Please refer to table 1 for the Gini Coefficients of two countries.

Table 1: Gini Coefficients of Countries A and B

<table>
<thead>
<tr>
<th>Country</th>
<th>Gini Coefficient</th>
<th>Survey Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.5</td>
<td>2001</td>
</tr>
<tr>
<td>B</td>
<td>0.52</td>
<td>1996</td>
</tr>
</tbody>
</table>

Given the information in Table 1, suggest some possible reasons that the income distribution in Country A may not be more equal than that in Country B. Explain your suggestion.

Possible answers:

(i) Different years of survey. (ii) The Gini Coefficients may not have taken taxes and social transfer into consideration. (iii) The Gini Coefficients may be on household basis, and Country A may have a smaller proportion of small families.
Assessment 4 (for more able students)

What is the trend of Gini Coefficient of Hong Kong? Explain one to three possible reasons for the trend.

<table>
<thead>
<tr>
<th>Year</th>
<th>1996</th>
<th>2001</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gini Coefficient</td>
<td>0.518</td>
<td>0.525</td>
<td>0.533</td>
</tr>
</tbody>
</table>

Source: Hong Kong Census and Statistics Department, 2006 Population By-census Thematic Report: Household Income Distribution in Hong Kong (P.14)

Possible Answer:

The Gini Coefficient increases because of the following reasons: steady rise of small but low-income families; widening wage difference among workers of different education level and working experience; and a boom in the services sector, especially the financial sector, and a decline in the manufacturing sector.

(Other reasonable answers are possible)

Teacher’s reference:

4. Reports of census and by-census by Hong Kong Census and Statistics Department
5. Summary of the views expressed at the Sixth Meeting of the Committee on Social Development and Quality of Life of the Commission on Strategic Development held on 30 November 2006 (www.cpu.gov.hk/english/documents/csd/csd_sc_summary_6.pdf)
7. World Bank (2006), World Development Indicators. World Bank