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專題文章
Feature Article

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Labour Productivity Index and Shift-share Analysis of Productivity Growth in Hong Kong, 2000 to 2019

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提高勞工生產力是推動經濟增長的主要動力之一。分析勞工生產力統計數據可有助揭示推動生產力增長的一些主要因素。

勞工生產力指數是一個重要經濟指標。它顯示如何有效地把勞工投入運用在實質生產中，在分析有關勞工生產力的改變對各行業及整體經濟的貢獻時，十分有用。

本文分析 2000 年至 2019 年選定主要經濟行業的勞工生產力指數，並且使用「轉移比例分析」解構勞工生產力的增長，以作更深入的結構分析。

Increasing labour productivity is one of the key drivers for propelling economic growth. Analysing labour productivity statistics could shed light on the key elements driving productivity growth.

Labour Productivity Index (LPI) is an important economic indicator. It shows how efficiently labour input is used for generating real output and is very useful for analysing the contribution of changes in labour productivity to various industries and the economy as a whole.

This article analyses the LPIs for selected major economic sectors during 2000 to 2019 and also uses shift-share analysis to decompose the growth of labour productivity for more in-depth structural analysis.

如對本文有任何查詢，請聯絡政府統計處物流及生產者價格統計組
（電話：(852) 3903 7255；電郵：transport@censtatd.gov.hk）。

Enquiries on this article may be directed to the Logistics and Producer Prices Statistics Section, Census and Statistics Department
(Tel. : (852) 3903 7255; E-mail : transport@censtatd.gov.hk).

2000 年至 2019 年香港的勞工生產力指數及生產力增長的「轉移比例分析」

Labour Productivity Index and Shift-share Analysis of Productivity Growth in Hong Kong, 2000 to 2019

1. 引言

1.1 提高勞工生產力是推動經濟增長的主要動力之一。分析勞工生產力統計數據可有助揭示推動生產力增長的一些主要因素。

1.2 自 1980 年起，政府統計處開始發布製造業的勞工生產力指數。而自 2002 年起，政府統計處開始每年發布選定服務行業與電力、燃氣及水務業的勞工生產力指數。

1.3 本文分析 2000 年至 2019 年選定主要經濟行業的勞工生產力指數，並且使用「轉移比例分析」解構勞工生產力的增長，以作更深入的結構分析。

2. 勞工生產力指數

2.1 勞工生產力指數的計算方法是將實質生產指數除以勞工投入指數。它顯示如何有效地把勞工投入運用在實質生產中，在分析有關勞工生產力的改變對各行業及整體經濟的貢獻時，十分有用。引致勞工生產力指數變動的因素包括生產技術、機構架構、管理方法、資產等的改變。編製勞工生產力指數的概念及方法載列於附錄 1。

主要用途

2.2 勞工生產力指數主要用作分析生產技術的提高、機構架構和勞工質素的改善，以及資本的增加等因素對一個行業／經濟體的生產力的長遠影響。由於勞工投入的調整在時間上通常未能完全配合實質生產的轉變，勞工生產力指數的按年變動率可能會有別於其長期趨勢。這個現象在經濟上揚或下滑的初期更為明顯。因此在分析勞工生產力指數時，一般會集中分析其長期趨勢而非其按年變動率。

1. Introduction

1.1 Increasing labour productivity is one of the key drivers for propelling economic growth. Analysing labour productivity statistics could shed light on the key elements driving productivity growth.

1.2 Since 1980, the Census and Statistics Department (C&SD) has been publishing the labour productivity index (LPI) for the manufacturing sector. In 2002, C&SD also started to publish LPIs annually for selected service activities together with the electricity, gas and water sector.

1.3 This article analyses the LPIs for selected major economic sectors during 2000 to 2019 and also uses shift-share analysis to decompose the growth of labour productivity for more in-depth structural analysis.

2. Labour Productivity Index (LPI)

2.1 Labour productivity index (LPI) is compiled by dividing a real output index by an index of labour input. It shows how efficiently labour input is used for generating real output and is very useful for analysing the contribution of changes in labour productivity to various industries and the economy as a whole. Factors affecting changes in LPI include changes in technology, organisational structures, management practices, capital, etc. The concepts and methodology for compiling LPI are given in Annex 1.

Main uses

2.2 LPIs are mainly used for analysing the long term effects of factors such as enhancement in technology, improvements in organisational structures and quality of labour as well as increases in capital on the productive capacity of an industry/economy. The annual rates of change in LPI may deviate from the long term trend, as adjustments in labour input usually do not exactly match with changes in real output in terms of timing, particularly at the initial stage of economic upturns and downturns. In view of this, analyses of LPIs usually focus on the long term trend rather than the annual rates of change.

2.3 基於上述勞工生產力指數的特色，以下段落集中分析 2000 年至 2019 年期間的勞工生產力指數的**平均**按年變動率。

2.3 Given the characteristics of LPI as mentioned above, the **average** annual rates of change in LPIs covering the period from 2000 to 2019 are featured in the following analyses.

2000 年至2019 年勞工生產力指數的分析

Analysis of LPIs from 2000 to 2019

2.4 表 1 載列 2000 年至 2019 年整體經濟及選定具較高勞工生產力增長的主要經濟行業的勞工生產力指數。

2.4 Table 1 shows the LPIs for the whole economy and selected major economic sectors with higher labour productivity growth from 2000 to 2019.

2.5 在 2000 年至 2019 年期間，整體經濟的勞工生產力指數錄得 2.7% 的平均按年增幅。實質生產在此期間有 3.3% 的平均按年增幅，而總工作人時亦有 0.6% 的平均按年增幅。（表 1）

2.5 The LPI for the whole economy increased at an average annual rate of 2.7% from 2000 to 2019. While real output increased by an average of 3.3% per annum, there was also an average rise of 0.6% per annum in person-hours worked during the period. (Table 1)

2.6 雖然整體經濟的勞工生產力有所增加，但各主要經濟活動在生產力方面的表現並不相同。以下段落分析表現優於整體經濟的四類主要經濟行業。

2.6 However, the growth in labour productivity for the economy as a whole embraced variations in performance amongst different major economic activities. The four major economic sectors that out-performed the economy as a whole are analysed in the following paragraphs.

2.7 按選定經濟行業分析，在 2000 年至 2019 年期間，進出口貿易、批發及零售業的勞工生產力指數錄得最大的升幅，其平均按年增長率達 5.4%。期間這行業的實質生產平均按年上升 4.8%，而勞工投入則減少 0.6%。（表 1）

2.7 Analysed by selected economic sectors, the largest increase in LPI was recorded in import / export, wholesale and retail trades, with an average annual increase of 5.4% from 2000 to 2019. The real output of this sector increased at an average annual rate of 4.8% in the period while labour input decreased by 0.6%. (Table 1)

2.8 金融及保險業的勞工生產力指數平均按年上升 4.5%。其中勞工投入平均按年增幅為 2.2%，實質生產平均按年增加 6.7%。（表 1）

2.8 The financing and insurance services showed an average annual increase in LPI of 4.5%. Coupled with an average increase of 2.2% in labour input per annum, there was an average annual increase of 6.7% in real output. (Table 1)

2.9 運輸、倉庫、郵政及速遞服務業的勞工生產力指數錄得 4.0% 的平均按年增長率。實質生產上升 3.5%，而勞工投入則輕微減少 0.5%。 （表 1）

2.9 Transportation, storage, postal and courier services recorded LPI growth at an average annual rate of 4.0%. The real output increased by 3.5% while labour input decreased slightly by 0.5%. (Table 1)

2.10 資訊及通訊業的勞工生產力指數平均按年上升 3.5%。其中勞工投入平均按年增幅為 0.8%，實質生產平均按年增加 4.4%。(表 1)

2.10 The LPI for the information and communications showed an average annual increase of 3.5%. Coupled with an average annual increase of 0.8% in labour input, there was an average annual increase of 4.4% in real output. (Table 1)

2.11 把這二十年的時段分為兩個時期，即2000年至2009年及2010年至2019年，可以看到整體經濟中勞工生產力指數在前期的平均按年增長率（3.3%）高於後期的數值（2.1%）。 （圖1）

2.12 按選定主要經濟行業分析，除了運輸、倉庫、郵政及速遞服務業外，其他三類經濟行業的勞工生產力指數平均按年增長率在後期（即2010年至2019年）有所放緩。（圖1）

2.11 Breaking down the twenty-year span into two periods viz. 2000 to 2009 and 2010 to 2019, it is noted that the average annual growth of LPI for the whole economy in the earlier period (3.3%) was higher than that in the later period (2.1%). (Chart 1)

2.12 Analysed by selected major economic sectors, except for transportation, storage, postal and courier services, the average annual growth of LPIs for the other three economic sectors slowed down in the later period, that is, during 2010 to 2019. (Chart 1)

圖 1 整體經濟及選定主要經濟行業的勞工生產力指數的平均按年增長

Chart 1 Average annual growth of Labour Productivity Indices (LPIs) for the whole economy and selected major economic sectors

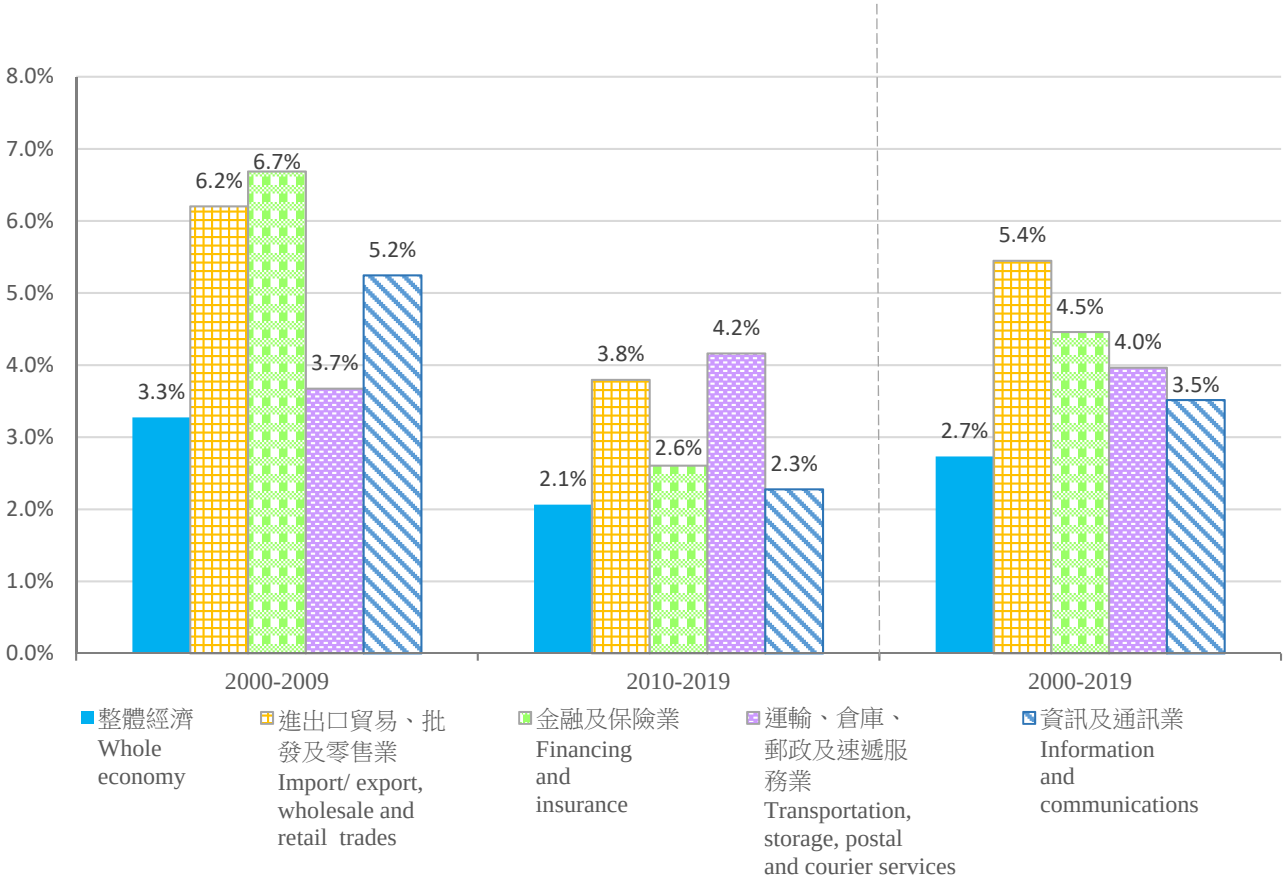

表 1　2000 年至 2019 年整體經濟及選定主要經濟行業的勞工生產力指數

Table 1　Labour Productivity Indices (LPIs) for the whole economy and selected major economic sectors, 2000 - 2019

	勞工生產力指數 (2015 年 = 100) LPI (Year 2015 = 100)				
		選定主要經濟行業 Selected major economic sectors			
年 Year	整體經濟 Whole economy	進出口貿易、批發及零售業 Import/export, wholesale and retail trades	金融及保險業 Financing and insurance	運輸、倉庫、郵政及速遞服務業 Transportation, storage, postal and courier services	資訊及通訊業 Information and communications
2000	63.8	41.6	46.5	54.2	58.8
2001	63.4	42.4	45.0	55.2	62.0
2002	64.6	45.0	46.6	58.7	64.8
2003	67.4	49.6	53.9	58.8	71.7
2004	70.9	54.2	63.0	63.2	76.8
2005	74.8	60.4	65.9	67.3	79.5
2006	79.5	66.2	75.0	70.4	83.1
2007	82.5	69.0	85.0	72.8	87.3
2008	85.5	76.0	81.6	76.5	87.4
2009	85.2	71.5	83.3	75.0	93.2
2010	88.6	81.5	84.6	78.6	92.6
2011	92.1	90.8	87.1	85.0	93.0
2012	93.0	92.6	88.5	87.5	92.8
2013	94.7	96.1	94.3	90.2	93.3
2014	98.5	99.6	99.5	96.3	95.8
2015	100.0	100.0	100.0	100.0	100.0
2016	102.1	102.8	101.3	107.0	102.6
2017	106.4	110.1	106.6	111.8	105.9
2018	107.1	113.1	107.7	116.0	108.7
2019	106.4	113.9	106.6	113.5	113.4
2000 年至 2019 年以環比物量計算的增加價值的平均按年變動百分率 Average annual percentage change of chain volume measures of value added during 2000 to 2019	+3.3	+4.8	+6.7	+3.5	+4.4
2000 年至 2019 年工作人時的平均按年變動百分率 Average annual percentage change of person-hours worked during 2000 to 2019	+0.6	-0.6	+2.2	-0.5	+0.8
2000 年至 2019 年勞工生產力指數的平均按年變動百分率 Average annual percentage change of LPI during 2000 to 2019	+2.7	+5.4	+4.5	+4.0	+3.5

闡釋勞工生產力指數數字的局限

2.13 在闡釋勞工生產力指數時要注意，這指數的計算方法是把實質生產指數除以勞工投入指數，因此會同時受到生產及投入兩者的計算誤差所影響。尤其在勞工生產力指數的變動率較小時，這些誤差對勞工生產力指數的影響可能會相對較大。

Limitations in interpreting LPI figures

2.13 Caution is needed in interpreting the LPI figures, which are derived by dividing a real output index by a labour input index and are therefore subject to errors in both the output and input measures. Such errors may have relatively large influence on the LPI figures when the rates of change in LPIs are small.

3. 勞工生產力增長的轉移比例分析

3.1 為了更深入了解生產力增長的動力，本文運用了「轉移比例分析」將勞工生產力拆解為兩個主要效應，即行業內效應和行業間轉移效應。一般而言，行業內效應反映了產業升級的影響，而行業間轉移效應則反映了經濟轉型的影響。

3.2 「轉移比例分析」的概念及方法載列於附錄 2。需要注意以下段落介紹的「轉移比例分析」 並未涵蓋一些沒有勞工投入的經濟活動，例如樓宇業權。因此，整體經濟的涵蓋範圍與上文的勞工生產力指數有所不同。

3.3 表 2 載列 2000 年至 2019 年整體勞工生產力增長，以及行業內效應和行業間轉移效應。

3.4 按不同時段分析，勞工生產力在 2000 年至 2015 年的三個時段均錄得雙位數增長，在 2015 年至 2019 年期間的增幅則收窄至 7.7%。（表 2）

3.5 值得注意的是，過去二十年來，行業內效應佔生產力增長的 85% 或以上。這顯示在參照期內，產業升級一直是帶動生產力正增長的關鍵因素。 （表 2）

3. Shift-Share Analysis of labour productivity growth

3.1 To gain a deeper understanding of the drivers of productivity growth, shift-share analysis is used to decompose labour productivity into two main effects, viz. within-industry effect, and between-industry shift effect. Generally, the within-industry effect reflects the impact of sectoral upgrading, whereas the between-industry shift effect depicts the impact of economic restructuring.

3.2 The concepts and methodology of shift-share analysis are given in Annex 2. It should be noted that the shift-share analysis presented in ensuing paragraphs does not cover some economic activities without labour input such as ownership of premises. Hence, the coverage is somewhat different from the LPI for the economy as a whole as analysed in previous paragraphs.

3.3 Table 2 shows the overall labour productivity growth as well as within-industry effect and between-industry shift effect from 2000 to 2019.

3.4 Analysed by different time segments, labour productivity registered double-digit growth during the three time segments from 2000 to 2015, and narrowed to 7.7% during 2015 to 2019. (Table 2)

3.5 Notably, the within-industry effect accounted for 85% or above of productivity growth in the past two decades. This indicates that sectoral upgrading has been the key determinant contributing positively to productivity growth over the reference period. (Table 2)

表 2　　勞工生產力增長的轉移比例分析

Table 2　　Shift-Share Analysis on labour productivity growth

時段# Time Segment#	勞工生產力增長* Labour Productivity Growth* (%)	行業內效應 Within-industry Effect (%)		行業間轉移效應 Between-industry Shift Effect (%)			
				靜態轉移 Static	*動態轉移 Dynamic*	總計 Total	
2000 – 2005	15.0	12.9	[86.1]	*1.9*	*0.2*	2.1	[13.9]
2005 – 2010	18.5	15.8	[85.0]	*3.0*	*- 0.2*	2.8	[15.0]
2010 – 2015	14.4	13.5	[93.7]	*1.2*	*- 0.3*	0.9	[6.3]
2015 – 2019	7.7	6.8	[88.8]	*1.1*	*- 0.3*	0.9	[11.2]

註釋： # 最後一個時段（即 2015 – 2019 年）只涵蓋四年的勞工生產力增長，有別於其他時段涵蓋五年。

* 由於行業涵蓋範圍和分析框架的差異，此處列出的數字與從表 l 的整體經濟的勞工生產力指數直接計算的結果略為不同。

方括號中的數字分別表示行業內效應和行業間轉移效應在相應勞工生產力增長中所佔的百分比。

Notes : # The last time segment (i.e. 2015 - 2019) only covers labour productivity growth for four years, different from the 5 years covered in other time segments.

* The figures presented here are slightly different from the corresponding figures compiled directly from LPIs for the whole economy in Table 1 due to differences in industry coverage and analytical framework.

Figures in square brackets denote percentage shares of within-industry effect and between-industry shift effect to respective labour productivity growth.

3.6　另一方面，行業間轉移效應對生產力增長的貢獻較少。這亦不足為奇，因為香港在 1980 年代至 1990 年代已經歷了重大經濟轉型，並自 2000 年代初發展成為金融和服務中心。另一點值得注意的是，行業間轉移效應主要由靜態轉移效應主導，顯示靜態轉移效應對經濟轉型作出積極貢獻，推動更多勞動力資源轉移到生產力較高的行業。　（表 2）

3.6　On the other hand, the between-industry shift effect contributed a smaller share to productivity growth. This is not surprising as Hong Kong had experienced major economic transformations during 1980s to 1990s and has evolved as a financial and service hub since early 2000s. Another noteworthy point is that the between-industry shift effect is dominated by the static shift effect which contributed positively to economic restructuring with more labour resources shifting to industries with higher productivity. (Table 2).

4.　結語

4.1　上述分析顯示香港過去二十年勞工生產力基本保持正增長，而過去十年的增長勢頭有所放緩。從經濟結構角度分析，期內勞工生產力的增長主要是由行業升級帶動。要持續經濟的增長，人力資本的發展、人才的培養、技能的提升、創新科技、以及探索具發展潛力的新興市場是促進生產力增長的一些關鍵要素。

4.　Concluding remarks

4.1　The above analysis indicated that Hong Kong largely maintained positive labour productivity growth in the past 20 years, with the growth momentum moderated in the past decade. From the economic structure perspective, the labour productivity growth was mainly driven by sectoral upgrading. For sustainable economic growth, development of human capital, nurturing of talents, skills upgrading, innovation and technology, and exploration of niche markets with growth potential are some of the key elements to boost productivity growth.

附錄 1　勞工生產力指數的概念和編製方法
Annex 1 Concepts and Methodology of compiling Labour Productivity Index (LPI)

編製方法

1. 勞工生產力指數的計算方法是將實質生產指數除以勞工投入指數。概念上，勞工生產力指數計算方法如下：

$$\frac{VA_t/VA_0}{HW_t/HW_0}\times 100$$

其中 VA_t = t 期內以環比物量計算的增加價值；

VA_0 = 0 期內以環比物量計算的增加價值；

HW_t = t 期內的總工作人時；及

HW_0 = 0 期內的總工作人時。

數據來源

2. 用以編製各行業類別的勞工生產力指數中的實質生產，是以國民經濟核算架構中按環比物量計算的增加價值來量度。增加價值量度某一經濟活動的生產淨值，即以所生產的貨品及服務的價值，減去生產過程中的中間投產消耗（例如原料及物料的價值、租賃服務及商用服務）的價值。

3. 勞工投入是以工作人時量度，即把就業人數乘以平均實際工作時數計算。平均實際工作時數數據來自「綜合住戶統計調查」，而各行業類別的就業人數主要是根據就業綜合估計數字所得。

4. 就編製整個經濟體的勞工生產力指數而言，所採用的實質生產數字是指以環比物量計算的本地生產總值。至於勞工投入數字，則根據整體的就業綜合估計數字，以及來自「綜合住戶統計調查」的平均實際工作時數計算。

Compilation methodology

1. LPI is compiled by dividing a real output index by an index of labour input. Conceptually, it is compiled as:

$$\frac{VA_t/VA_0}{HW_t/HW_0}\times 100$$

where VA_t = chain volume estimate of value added in period t;

VA_0 = chain volume estimate of value added in period 0;

HW_t = total person-hours worked in period t; and

HW_0 = total person-hours worked in period 0.

Data Sources

2. For sectoral LPIs, real output is measured by the chain volume estimates of value added as compiled in the national accounting framework. Value added measures the net output of an economic activity, i.e. the value of goods and services produced less the value of intermediate consumption (e.g. value of materials and supplies, rental services and business services) used in production.

3. Labour input is measured by the person-hours worked, which is calculated as the product of the number of persons engaged and the average actual hours of work. Data on the average actual hours of work are obtained from the General Household Survey (GHS), while the number of persons engaged in each sector is mainly based on the Composite Employment Estimates (CEE).

4. For compiling the LPI for the economy as a whole, the real output used is the chain volume measure of GDP, while labour input is based on the CEE of the whole economy together with the average actual hours of work based on GHS.

選定主要經濟活動

5. 在香港，就以下的選定主要經濟活動編製勞工生產力指數：

(i) 製造業；

(ii) 電力及燃氣供應；自來水供應；污水處理、廢棄物管理及污染防治活動；

(iii) 進出口貿易、批發及零售業，包括：

- 進出口貿易業；
- 批發及零售業；

(iv) 運輸、倉庫、郵政及速遞服務業，包括：

- 運輸及倉庫業；

(v) 住宿[1]及膳食服務業；

(vi) 資訊及通訊業；

(vii) 金融及保險業，包括：

- 金融業；
- 保險業。

6. 由於以下原因，在現有的方法下，本處並不為其他經濟活動編製勞工生產力指數：

(i) **概念因素**，例如以投入成本及勞工投入方法估算的以環比物量計算的公共行政及專業、科學及技術活動的增加價值有所局限；及

(ii) **實際因素**，例如某些行業的就業數字的涵蓋範圍並不完備。

資料發布

7. 上一年度的選定經濟行業的勞工生產力指數臨時數字在當年七月發布，而修訂數字則在十月發布。讀者可從政府統計處網頁內(www.censtatd.gov.hk/hkstat/sub/sp70_tc.jsp?tableID=103&ID=0&productType=8)下載較長數列的選定經濟行業的勞工生產力指數。

1 住宿服務包括酒店、賓館、旅舍及其他提供短期住宿服務的機構單位。

Selected Major Economic Activities

5. In Hong Kong, the following major economic activities are selected for compiling LPIs:

(i) manufacturing;

(ii) electricity and gas supply; water supply; sewerage, waste management and remediation activities;

(iii) import/export, wholesale and retail trades, including:

- import and export trade;
- wholesale and retail trades;

(iv) transportation, storage, postal and courier services, including:

- transportation and storage;

(v) accommodation[1] and food services;

(vi) information and communications;

(vii) financing and insurance, including:

- financing;
- insurance.

6. Under the existing methodology, the other economic activities are not selected for the compilation of LPI due to:

(i) **conceptual reasons**, e.g. limitations in chain volume measure of public administration and professional, scientific and technical activities estimated by input cost and labour input methods; and

(ii) **practical reasons**, e.g. incomplete coverage of employment figures for some activities.

Data Dissemination

7. Provisional figures of LPIs for selected economic sectors for previous year are published in July of current year while revised figures are published in October. Readers may download longer series of LPIs of selected economic sectors from the webpage of C&SD (www.censtatd.gov.hk/hkstat/sub/sp70.jsp?tableID=103&ID=0&productType=8).

1 Accommodation services cover hotels, guesthouses, boarding houses and other establishments providing short term accommodation.

附錄 2　勞工生產力增長的「轉移比例分析」的概念和方法
Annex 2 Concepts and methodology of Shift-Share Analysis on Labour Productivity Growth

1. 以下是勞工生產力增長的「轉移比例分析」的公式：

1. The formula of shift-share analysis on labour productivity growth is as follows:

$$\underbrace{\frac{LP_t - LP_0}{LP_0}}_{\text{勞工生產力的增長率 Labour Productivity Growth Rate}} = \underbrace{\sum_{i=1}^{n}\left[\left(\frac{LP_{it}-LP_{i0}}{LP_{i0}}\right)\times\frac{VA_{i0}}{VA_0}\right]}_{\text{行業內效應 Within-industry Effect}} + \underbrace{\overbrace{\sum_{i=1}^{n}\left[\frac{LP_{i0}}{LP_0}\times\left(\frac{L_{it}}{L_t}-\frac{L_{i0}}{L_0}\right)\right]}^{\text{靜態轉移效應 Static}} + \overbrace{\sum_{i=1}^{n}\left[\left(\frac{LP_{it}-LP_{i0}}{LP_0}\right)\times\left(\frac{L_{it}}{L_t}-\frac{L_{i0}}{L_0}\right)\right]}^{\text{動態轉移效應 Dynamic}}}_{\text{行業間轉移效應 Between-industry Shift Effect}}$$

其中 LP_t = t 期內整體經濟的勞工生產力

LP_0 = 0 期內整體經濟的勞工生產力

L_t = t 期內經濟體的總工作人時

VA_0 = 0 期內經濟體的總增加價值

i = 經濟體內第1至 n 的行業

where LP_t = labour productivity for the whole economy in period t

LP_0 = labour productivity for the whole economy in period 0

L_t = total person-hours worked in the economy in period t

VA_0 = total value added of the economy in period 0

i = 1,…n industry in the economy

2. 行業內效應是在假定行業勞工份額不改變，即假定經濟結構保持固定的情況下，衡量每個行業內生產力增長對整體勞工生產力增長的影響。

2. The within-industry effect measures the impact of productivity growth within each industry on overall labour productivity growth, assuming that industries' labour shares are unchanged (i.e. the structure of the economy is assumed to remain fixed).

3. 行業間轉移效應衡量勞動力重新分配對整體生產力的影響。它可以分為靜態轉移效應及動態轉移效應。

3. The between-industry shift effect measures the effect of labour re-allocation on overall productivity. It can be broken down into static shift effect and dynamic shift effect.

4. 靜態轉移效應是在假設每個行業的生產力水平不變的情況下，衡量行業間勞動力流動對整體勞工生產力的影響。如果生產力較高的行業吸引更多的勞動力資源，從而增加其在總就業中的比重，則該效應為正；相反則為負。

4. The static shift effect measures the impact on overall labour productivity resulting from movement of labour among industries, assuming that the level of productivity in each industry is unchanged. It is positive if industries with higher productivity attract more labour resources and hence increase their share of total employment, and vice versa.

5. 動態轉移效應衡量各行業勞工生產力和勞動力變化之間的相互作用。具體來說，它衡量不同行業的擴張／收縮相互作用所產生的正／負效率。如果生產力增長較高（較低）的行業增加（減少）其在總勞工中的份額，則該效應為正；而當擴張行業的勞工生產力增長率低於平均水平或生產力較高的行業在總勞工中所佔份額下降，則為負。

5. The dynamic shift effect measures the interaction of changes in labour productivity and labour force across industries. To be specific, it measures the extent to which positive/negative efficiency gains interact with the expansion/contraction of different industries. It is positive if industries with higher (lower) productivity growth increase (reduce) their share in total employment, and negative when expanding industries have below average labour productivity growth or if industries with higher productivity growth have declining shares in total employment.