

Sources of unemployment

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The persistently high unemployment rate in recent years has raised concerns about the underlying cause of the problem. The findings of this study suggest that the increase in the unemployment rate has been mainly associated with the cyclical weakness in the economy. Nevertheless, there are signs the natural rate of unemployment may have risen as the economy undergoes profound structural change.

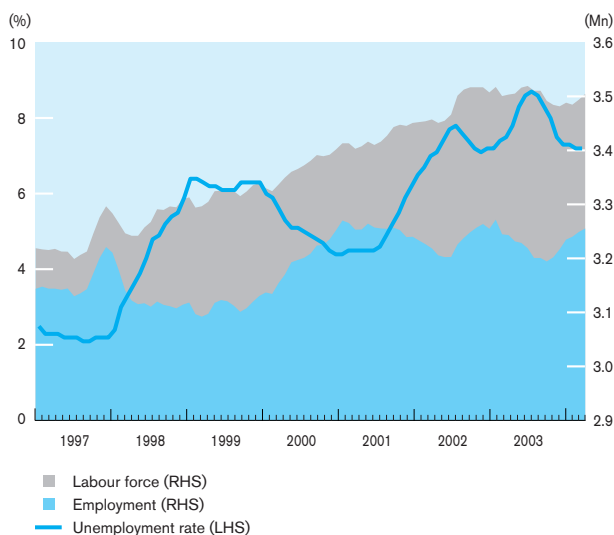
I. INTRODUCTION

An earlier study conducted by the Research Department of the HKMA, based on data up to 2000, concluded that most of the variations in the unemployment rate reflect cyclical conditions in the economy (Peng *et al.*, 2001). Amid the economic downturn, the rate rose significantly in recent years, reaching a record high of 8.7% in the three months ending July 2003 (Chart 1). It dropped subsequently to 7.1% in the three months ending April 2004 along with the strong recovery in economic activity, but remained considerably higher than that of previous years. The persistently high figures have raised concerns over the underlying sources of unemployment in the past few years and whether the

natural rate of unemployment has increased in response to the ongoing structural change in the labour market.

This article updates the earlier study, but provides a more in-depth analysis on the sectoral developments in recent years. The rest of the article is organised as follows. The next section presents some stylised facts of the labour market in Hong Kong. These include aggregate labour demand and supply trends and a disaggregate analysis by socio-economic group and industry. Section III discusses the structural change in the labour market and presents some estimates on the natural rate of unemployment. To this end, two alternative approaches are employed: equation system estimates and a Beveridge curve analysis. The last section sums up the findings.

CHART 1
Labour market developments



II. SOME STYLISED FACTS

Stylised facts of the Hong Kong labour market include labour demand and supply trends as well as the distribution of unemployment among different socio-economic groups and industries.

Determinants of unemployment

Peng *et al.* (2001) presents a framework of decomposing changes in the unemployment rate into contributions from factors including working-age population, labour force participation rate, and employment. In broad terms, changes in the former two determine labour supply, while employment growth reflects labour demand. An update of this

analysis suggests that increases in unemployment in recent years were mainly attributable to weak labour demand rather than supply factors. Specifically, fluctuations in the unemployment rate were mainly driven by changes in employment (Chart 2A). The latter, in turn, generally reflected output growth (Chart 2B).¹ In the past two decades, growth of capital stock affected employment growth adversely, but the magnitude of the effect was relatively small and stable. Improvements in total factor productivity also tended to reduce employment growth, with

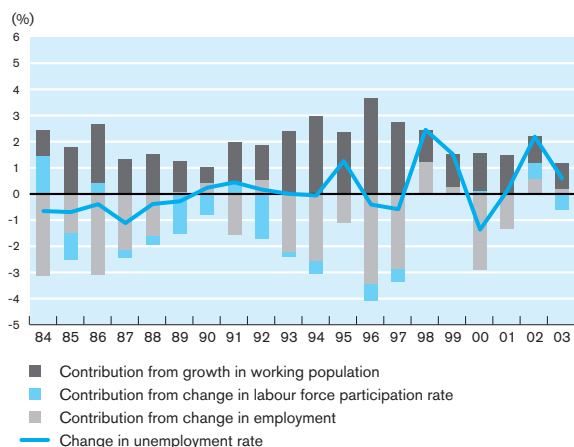
notable exceptions in 1985, 1998 and 2001, when total factor productivity declined along with the economic downturns, reflecting the pro-cyclical nature of productivity growth.

On the labour supply side, the growth of the labour force has decelerated in recent years, reflecting mainly slower growth in the working-age population. The participation rate has been broadly stable, as a fall in the male participation rate roughly offset an increase in the female participation rate (Chart 3).

CHART 2

Determinants of unemployment and employment

A. Change in the unemployment rate



Source: Staff estimates.

B. Employment growth

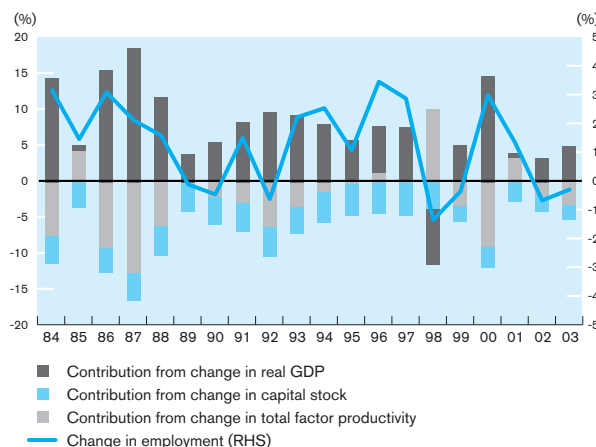
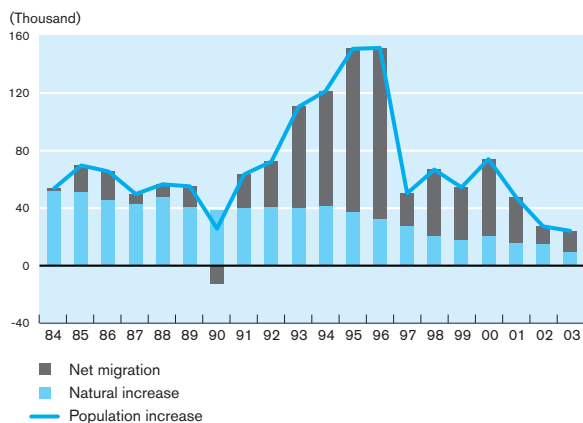


CHART 3

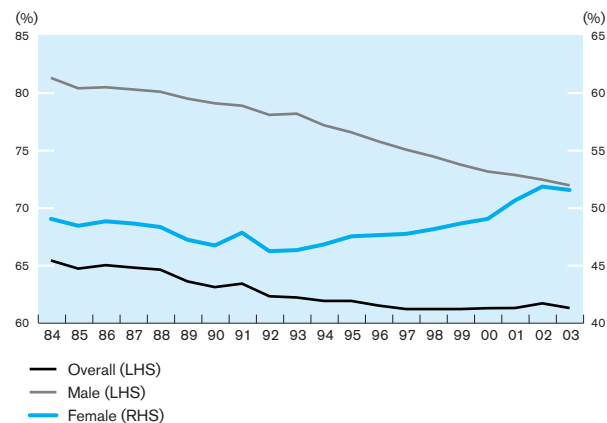
Changes in population and labour force participation rate

A. Population growth



Source: Census and Statistics Department.

B. Labour force participation rate



¹ Using a Cobb-Douglas production function with constant returns to scale, employment growth can be decomposed into contributions from growths in output, capital stock and total factor productivity (see Peng *et al.*, 2001).

Demographic analysis

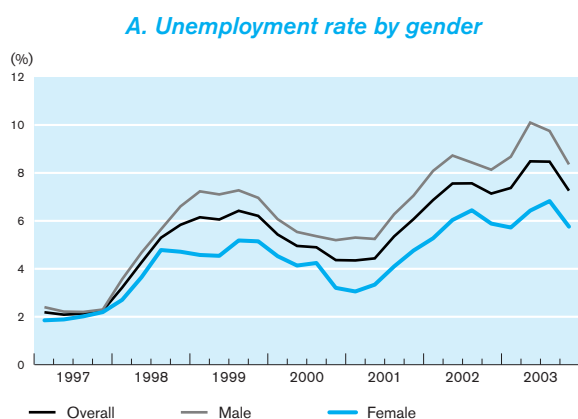
The distribution of unemployment has been uneven among different socio-economic groups and industries. Analyses of disaggregate data suggest that young people, male, and those with relatively low educational attainment have suffered more from the rise in the unemployment rate. In terms of industries, the unemployment rate has been the highest in the construction sector, followed by manufacturing and domestic trade and tourism.

Analysis by gender

The unemployment rate has been higher among male workers than female workers, with the former contributing around two-thirds of the changes in the overall unemployment rate in recent years (Chart 4). For male workers, slower employment growth has been the main factor causing increases in unemployment, while the decline in the participation rate helped limit the rise in unemployment (Chart 5A). In contrast, employment growth has been a positive factor reducing the unemployment rate for female workers, although labour force growth was even higher, leading to a rise in the unemployment rate (Chart 5B).

CHART 4

Unemployment rate by gender



Source: Census and Statistics Department and staff estimates.

B. Contribution to changes by gender

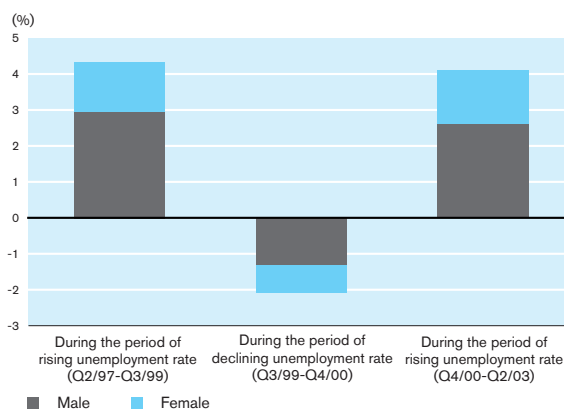
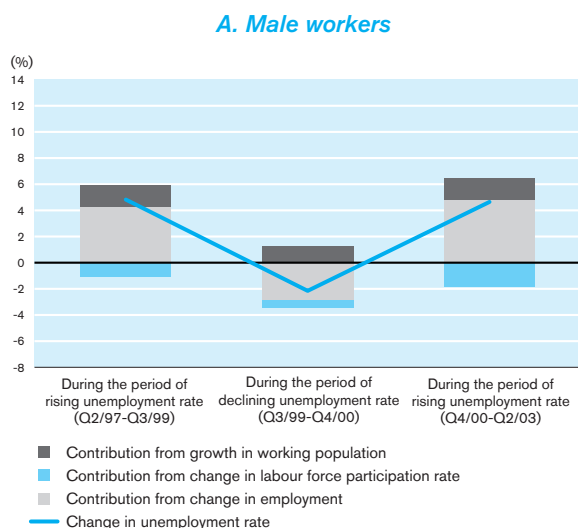
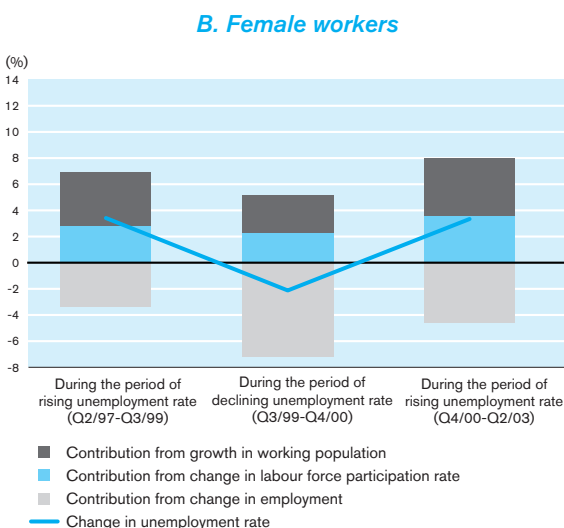


CHART 5

Determinants of changes in the unemployment rate



Source: Staff estimates.



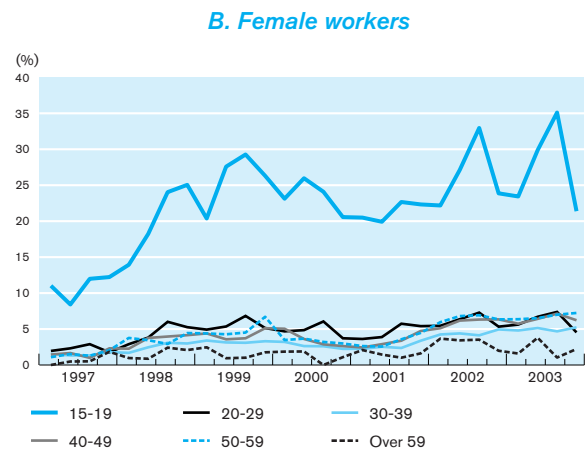
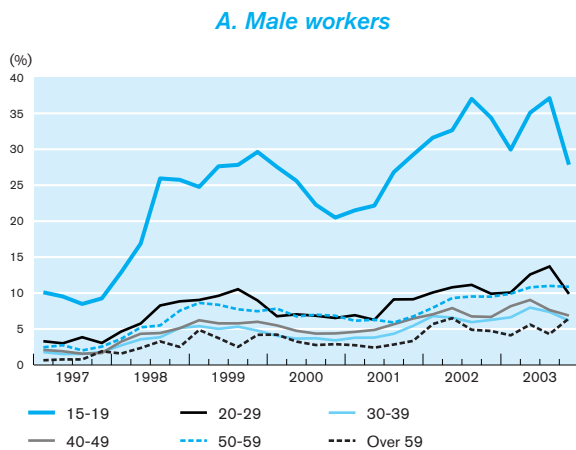
Analysis by age

The youth group has had the highest rate of unemployment among different age groups (Chart 6). However, because of its reduced share of the labour force, its contribution to the rise in the aggregate unemployment rate was relatively small (Chart 7). It is worth noting that the composition of unemployment by age group has changed for female workers. Specifically, the increase in the unemployment rate between Q2/1997 and Q3/1999

was mainly due to unemployed female workers of age 20-29, while the rise in unemployment between Q4/2000 and Q2/2003 was largely attributable to those between 30 and 49. The latter was due to a rise in the labour force that exceeded an increase in employment. The increase in the labour force of this age group was probably the result of the economic downturn. As traditional earners in the family lose jobs and as household income declines, other family members, including housewives, may join the labour force to offset income losses.

CHART 6

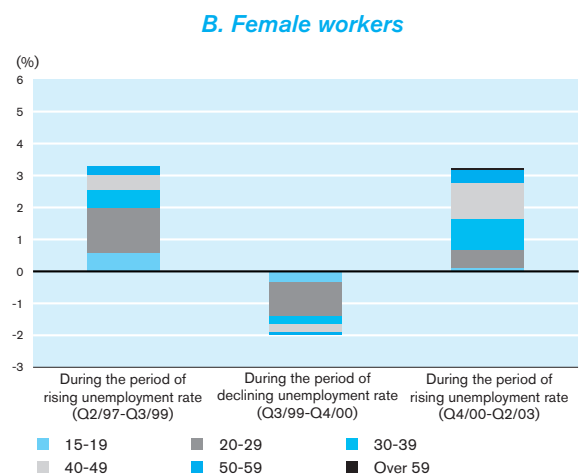
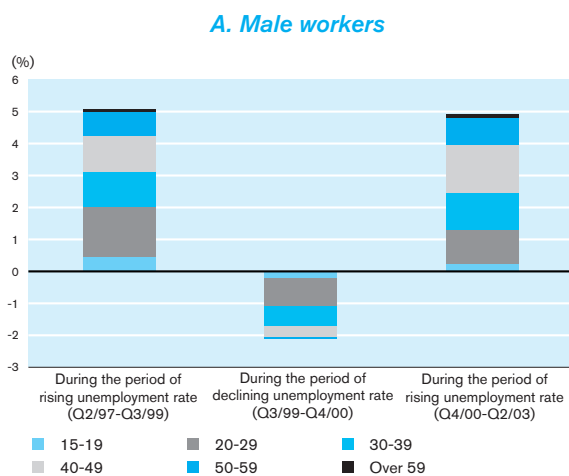
Unemployment rate by age group



Source: Census and Statistics Department.

CHART 7

Contribution to changes in the unemployment rate by age



Source: Staff estimates.

Analysis by educational attainment

The burden of the increase in unemployment has fallen disproportionately on workers with relatively little education (Chart 8). In particular, the unemployment rates of workers at secondary school level or below have risen to 8-12% in the most recent quarters.

Counterfactual simulations

The changes in the demographic structure in the past decade have helped ease the pressure on unemployment. Counterfactual simulations indicate higher unemployment rates if the composition of the labour force by gender, age, and educational attainment were assumed to be unchanged since 1990 (Chart 9). The improvement in educational attainment has had the largest impact, helping reduce the unemployment rate by about one percentage point which would otherwise have been the case as of Q4/2003. This is because the share of the labour force with educational attainment of

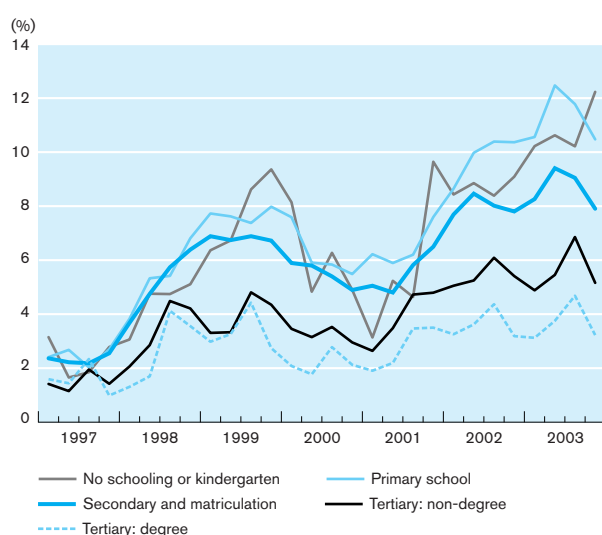
secondary school or below in the total labour force declined from 86% in 1990 to 73% in 2003.

Sectoral analysis

Analysis by economic sector

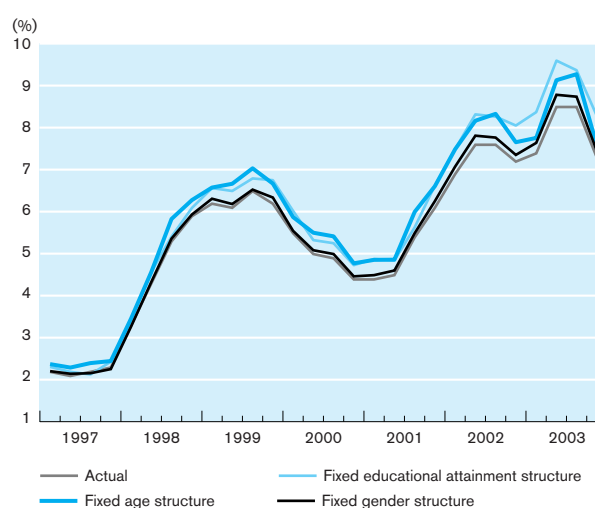
The unemployment rate is highest in the construction sector, reflecting the weak property market in recent years. It is followed by the manufacturing, and trade and tourism sectors (Chart 10A). The latter was mainly related to restaurants and hotels and wholesale and retail trade (Chart 10B). In the financing and business services sector, real estate and business services recorded the largest increase in the unemployment rate (Chart 10E). Financing and insurance also recorded increases in the unemployment rates, but remained at relatively low levels. In the personal service sector, public administration recorded the lowest and most stable unemployment rate, while miscellaneous services recorded the largest rise (Chart 10F).

CHART 8
Unemployment rate by educational attainment



Source: Census and Statistics Department.

CHART 9
Counterfactual simulations

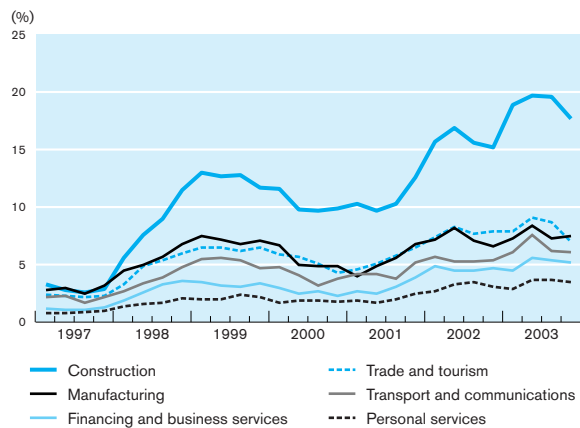


Source: Staff estimates.

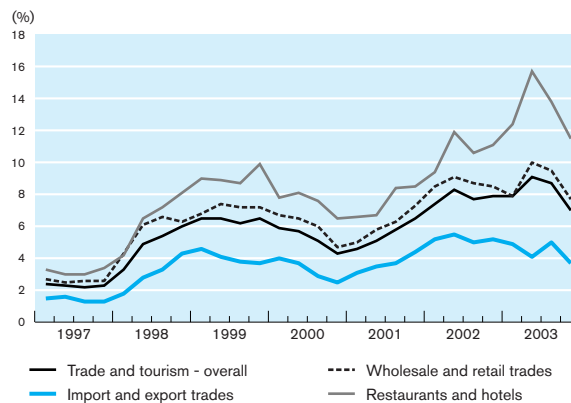
CHART 10

Unemployment rate by industry

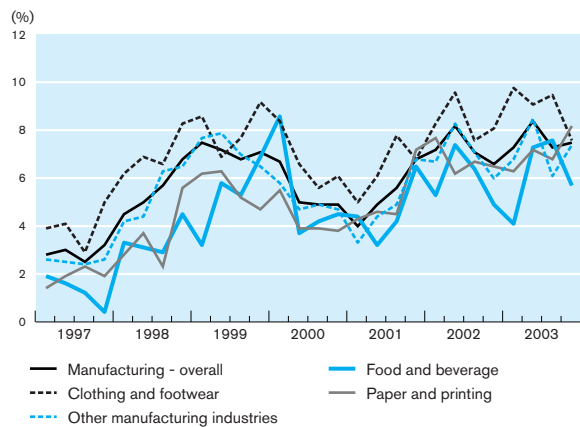
A. All industries



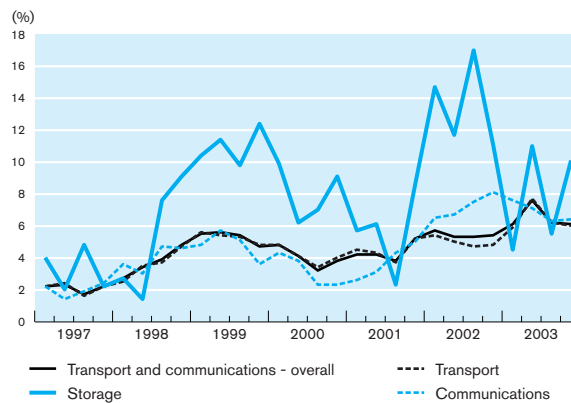
B. Trade and tourism



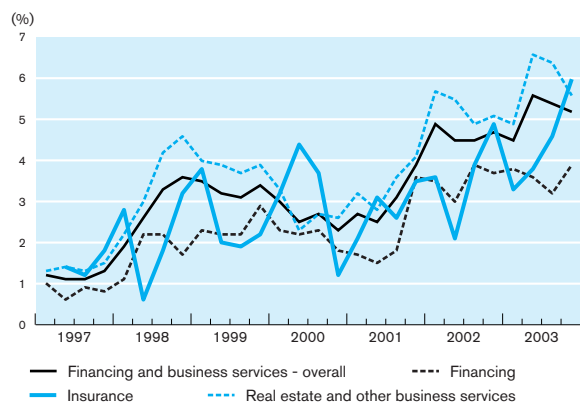
C. Manufacturing



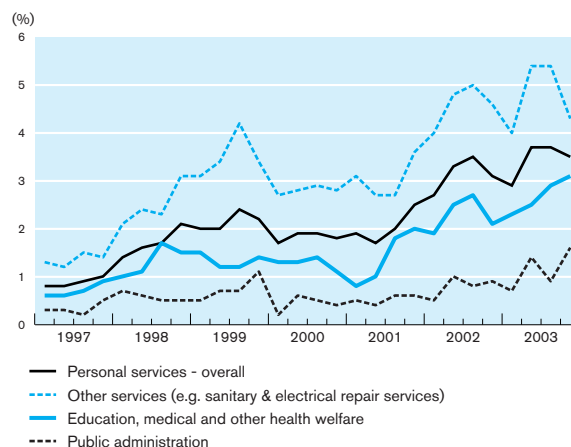
D. Transport and communications



E. Financing and business services



F. Personal services



Source: Census and Statistics Department.

Analysis by occupation

Occupations requiring relatively low skills recorded higher increases in the unemployment rate (Chart 11), in particular, craft and related workers, followed by service and shop sales workers and those in elementary occupations.²

CHART 11
Unemployment rate by occupation



Source: Census and Statistics Department.

III. STRUCTURAL CHANGE AND THE NATURAL RATE OF UNEMPLOYMENT

There are indications that the natural rate of unemployment may have increased as the economy has undergone profound structural change. In recent decades, there has been a large shift in the labour force across industries — from manufacturing to the services economy (Table 1). This was reflected in the wide variation in the rates of growth in employment among different industries. Employment growth was highest in the financing, insurance, real estate and business services as well as the import and export trades sectors. On the other hand, employment in the manufacturing sector declined significantly in the past 20 years. As a result, employment in services, as a share of total employment, rose from 54% in 1983 to 83% in 2003.

In recent years, one of the indicators that points to a rise in the natural rate of unemployment is the increase in both the medium duration of unemployment and the share of long-term unemployment (those unemployed for six months or

TABLE 1
Employment growth by industry

	Share in total employment		Average annual growth (%)
	1983 (%)	2003 (%)	
Manufacturing	36	8	-5.7
Construction	8	8	1.5
Service Sector:	54	83	3.6
Trade & tourism	22	31	3.2
Wholesale & retail	9	10	2.0
Import & export trades	6	13	5.7
Restaurants & hotels	7	7	1.9
Social & personal services	19	26	3.2
Financing & business service	6	15	6.5
Transport & communications	8	11	3.1
Others	2	1	-2.9
Overall	100	100	1.4

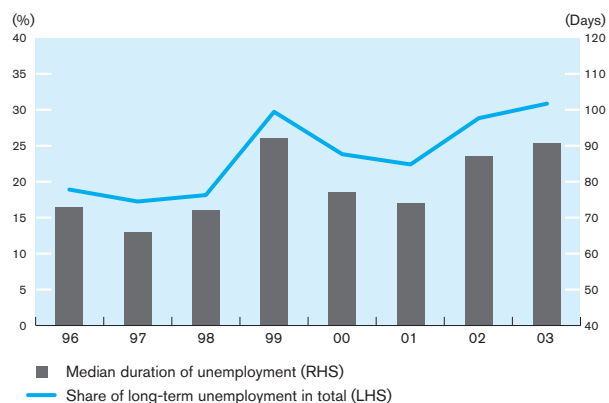
Source: Census and Statistics Department and staff estimates.

² Elementary occupations include, for example, street vendors, domestic helpers, messengers, security guards and construction labourers.

CHART 12

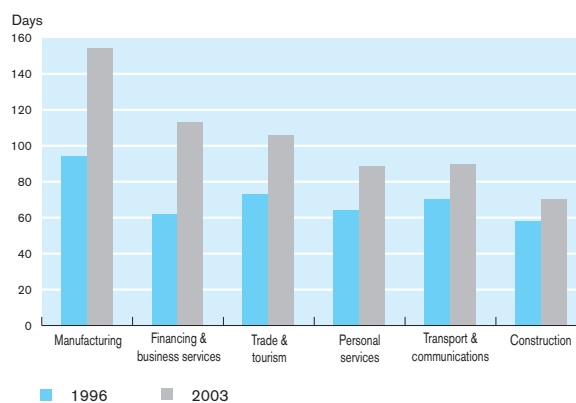
Duration of unemployment

A. Median duration of unemployment and share of long-term unemployment



Source: Census and Statistics Department.

B. Median duration of unemployment by industry



more) in the total unemployment figures (Chart 12). Although the rise, in part, reflected weak economic conditions, it may also be due to an increase in “frictional” unemployment. For example, workers who dropped out of the manufacturing sector may have encountered difficulties in finding jobs in other sectors through a lack of appropriate skills. The median duration of unemployment has been longest in manufacturing, because of the reduced employment opportunities in that sector.

In assessing whether, and by how much, the natural rate of unemployment has increased, two alternative approaches are used. One is an updating of the system equation estimates in Peng *et al.* (2001). The other employs the Beveridge curve, which is a widely used tool for assessing skill mismatch and structural unemployment.

Estimates

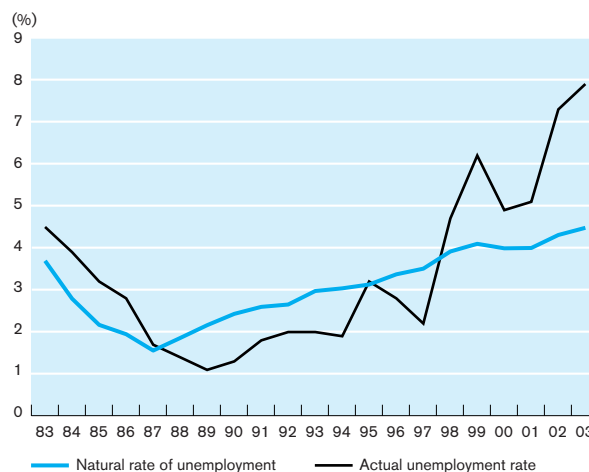
There are various approaches to estimate the natural rate of unemployment. One, using an equation system approach, was presented in Peng *et al.* (2001). Specifically, the system consists of four equations. The first equation relates the unemployment rate to its level in the previous period, a set of structural variables including the share of service employment in total employment and the share of young workers in total labour force, and a cyclical variable represented by the output gap. The second is a

Phillips curve relating growth of wages to price inflation in the previous period, productivity growth, and the gap between the actual and natural rate of unemployment. In the third equation, price inflation is determined by output gap, inflationary expectations, wage growth and changes in import prices. The final equation represents a Cobb-Douglas production function which relates output to labour and capital inputs, and total factor productivity. The latter was related to the share of service employment in total employment and a time trend, which is intended to capture any secure trend in total factor productivity.

An update of the empirical analysis suggests that the natural rate of unemployment rose from 2-3% in the late 1980s to 3½-4½% in recent years (Chart 13).

CHART 13

Natural rate of unemployment



Source: Staff estimates.

However, the estimate may be biased upwards by the record high actual unemployment rate at the end of the sample period. Furthermore, most of the rise occurred in the earlier part of the 1990s, and the natural rate has been relatively stable in recent years. Indeed, the comparison of the actual and natural rates of unemployment suggests that the more recent rise in the unemployment rate mainly reflected changes in its cyclical component, in line with the general economic conditions.

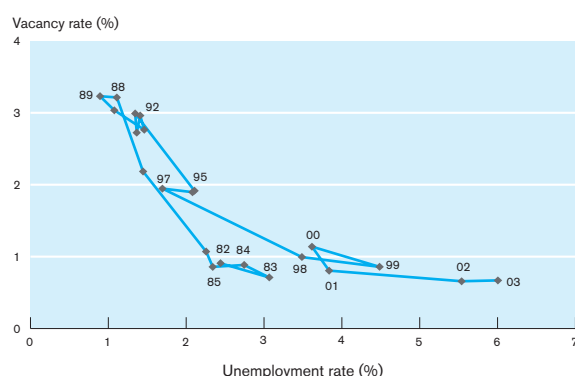
Beveridge curve analysis

The Beveridge curve, which relates unemployment to vacancies, is one of the useful tools for analysing aggregate labour market dynamics. It provides information about the functioning of the labour market and the shocks that affect it. It is useful to think of an economy in which, at any instant, many jobs become profitable and many jobs become unprofitable. To find workers for the newly profitable jobs, firms post vacancies. Workers in jobs that become unprofitable are laid off and look for new jobs. The complex process through which workers and jobs look for, and find, each other can be viewed as the matching process. The efficiency of the matching process is an important factor that determines the natural rate of unemployment.

CHART 14

Beveridge curves

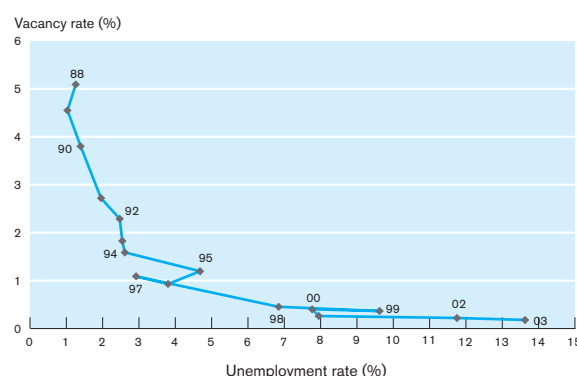
A. Service sector^a



a. Includes the trade & tourism, transport & communications, financing & business services and personal services sectors.

Source: Staff estimates.

B. Non-service sector^b



b. Includes the manufacturing and construction sectors. Data on vacancies for the construction sector are not available prior to 1998.

The economy is subject to two types of shocks with quite different effects. Changes in the level of economic activity (or aggregate demand shocks) drive unemployment and vacancies in opposite directions, resulting in a downward-sloping curve. Reallocation shocks (changes in the intensity of reallocation related to structural changes in the economy) lead instead to movements along an upward-sloping curve, that is, parallel movements in unemployment and vacancies. Thus, a plot of the unemployment rate against the vacancy rate is a simple and yet useful tool to assess the nature of shocks that have affected the labour market.

The Beveridge curves for the service and non-service sectors in Hong Kong are downward sloping, implying a reasonably well behaved relationship (Charts 14A and B). This suggests that demand shocks or changes in cyclical conditions are likely to be the main forces that have affected the labour market in the past two decades. Nevertheless, Chart 14A shows an outward shift of the curve in recent years, when compared with the 1980s, implying an increased “friction” in the job matching process, pointing to a rise in the natural rate of unemployment in the service sector. The following presents a simple model that helps provide evidence that the relationship between unemployment and vacancies in the service sector has shifted over time.³

³ The analytical framework follows closely that employed by Gerlach (2004). There is no evidence that the relationship has shifted for the non-service sector using the same methodology. However, the results may be distorted by the unavailability of data for the early 1980s.

The above scatter plot suggests a non-linear relationship between unemployment and vacancies in the service sector. Thus, it is plausible to assume that there is a linear relationship between the logarithms of the unemployment rate and vacancy rate, which is represented by the following equation:

$$\log(\text{unemployment}) = 1.13 - 0.85 \log(\text{vacancies}) + \text{residual} \quad (1)$$

where the t-statistics for the constant and slope parameter are 10.3 and 7.0 respectively, the adjusted R-squared is 0.83, and the Durbin-Watson statistics is 0.4. Chart 15A shows that the resulting relationship is fairly good. To further explore whether this relationship has shifted over time, a residual plot is then produced (Chart 15B). The chart shows that the residuals are all negative in the first half of the sample, and almost all positive in the second part. This suggests that there is a gradual shift in the relationship over time.

For this reason, a time trend is added into equation (1) to take into account the shift over time:

$$\log(\text{unemployment}) = 0.79 - 0.79 \log(\text{vacancies}) + 0.03 \text{Trend} + \text{residual} \quad (2)$$

where the t-statistics for the constant and slope parameter and time trend are 35.1, 23.8, and 14.1 respectively, the adjusted R-squared is 0.96, and the Durbin-Watson statistics is 2.0. This provides evidence that the natural rate of unemployment in the service sector has risen in the period considered. Specifically, the point estimate of the natural rate of unemployment for the sector rose from 1 1/2% to 2 3/4% between 1982 and 2003 (Chart 16).⁴

CHART 16
Estimate of the natural rate of unemployment for service workers

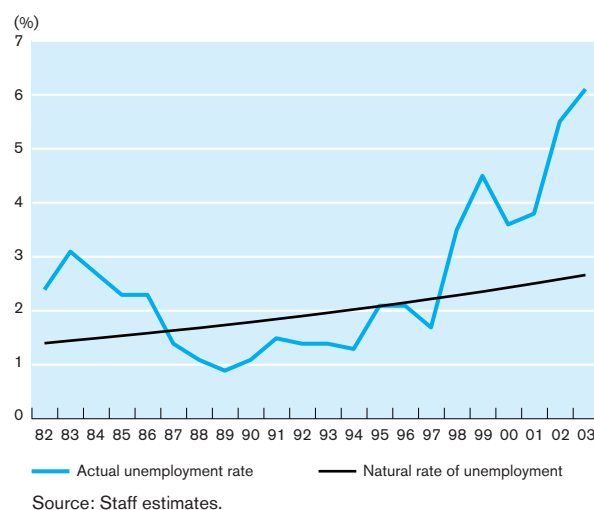
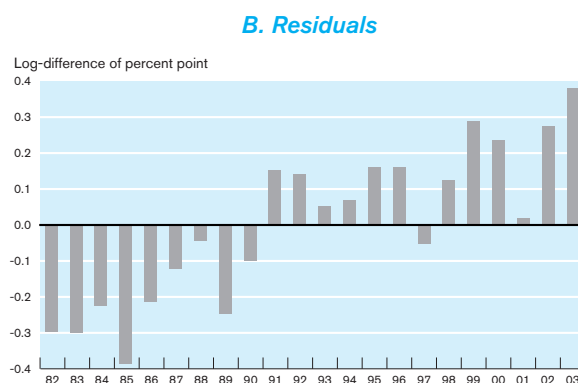
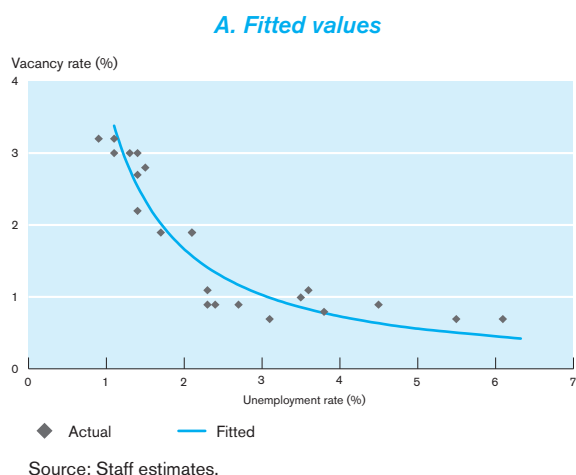


CHART 15
Estimate of the Beveridge curve for the service sector



⁴ Technically, the natural rate of unemployment is assumed to be the expected unemployment rate when the vacancy ratio is equal to its mean.

In summary, the developments in the relationship between unemployment and vacancies suggest that the aggregate demand shocks are more important forces affecting labour market conditions in Hong Kong than the structural changes in the economy, although the natural rate of unemployment has increased.

IV. CONCLUSION

This article reviews the sources of increase in unemployment in recent years. Specifically, employment growth, which mainly reflects output growth, has been a driving force in the fluctuations in the unemployment rate. Analysis of disaggregate data suggests that young people, male, and those with relatively low educational attainment have suffered more from the rise in the unemployment rate. However, changes in the demographic structure over the past two decades have helped ease the pressure on unemployment with higher educational standards having the greatest impact. In terms of industries, the construction sector has suffered the most, followed by manufacturing and domestic trade and tourism.

Assessments based on two alternative approaches point to an increase in the natural rate of unemployment in past decades. An update of the system equation estimate indicates that the aggregate natural rate of unemployment rose from 2-3% in the late 1980s to 3¹/₂-4¹/₂% in recent years, but remained significantly below the actual unemployment rate. Furthermore, an analysis of the Beveridge curve suggests that the natural rate of unemployment in the service sector has risen in the past two decades, leading to an increase in the aggregate natural rate of unemployment. Nevertheless, the great bulk of the increase in unemployment can be explained by the cyclical weakness of the economy. It is therefore plausible the unemployment rate will decline considerably along with the strong recovery in the economy.

REFERENCES

Gerlach, Stefan (2004), "Has the Beveridge Curve for Skilled Workers Shifted?", HKMA internal research note, January 2004.

Peng, Wensheng, Lillian Cheung and Kelvin Fan (2001), "Sources of Unemployment: Recent Developments and Prospects", *HKMA Quarterly Bulletin*, November 2001.