CSQ - Unemployment

**Lesson 8 – Essays – Inflation, Unemployment, Aims of Government, Policies – CSQ Q2**

**Technology and the Economy**

**Extract 4: What is the Fourth Industrial Revolution?**

The First Industrial Revolution used water and steam power to mechanise production. The Second used electric power to create mass production. The Third used electronics and information technology to automate production. Now a Fourth Industrial Revolution is building on the Third. The Fourth Industrial Revolution includes development of digital services and robotics technology such as artificial intelligence and machine learning.

Our lives are being shaken to their very core by technological change, with the Fourth Industrial Revolution transforming economies as never before. To appreciate the changes at hand, two interrelated aspects of the economy are particularly illustrative: growth and productivity on one hand, and employment on the other.

Source: World Economic Forum, 2016

**Extract 5: Is technological change creating a new global economy?**

Productivity is the most important determinant of long-term growth. Yet productivity growth has stagnated around the world, particularly since the great recession. An important question is how the Fourth Industrial Revolution will drive productivity in the years to come.

In theory, the application of new technologies to existing problems should improve efficiency and thus productivity. Technological innovations tend to raise labour productivity by allowing the existing workforce to do more with less, and by replacing existing workers with technology. They also usher in new products and processes that open up new sources of growth.

However, there is much debate on the likely size of the impact of the Fourth Industrial Revolution. On one hand, some experts believe that the productivity impact of the current technological revolution is almost over. On the other hand, other experts believe that the world will soon be experiencing faster growth due to a major surge in productivity.

Perhaps there are such divergent views because the impact of technology is so difficult to measure. The Ubers and Airbnbs of the world are clearly providing efficiency and productivity gains. Yet many of the benefits of these new activities are not accounted for in the calculation of GDP in the same way that private housework and childcare are neglected.

Source: World Economic Forum, 2016

**Extract 6: What happens when robots turn white-collar?**

Throughout the ages, technology has replaced human effort, which while good for productivity growth and growth overall, is disruptive for those workers who lose their jobs.

And with the Fourth Industrial Revolution, this is no longer just about repetitive factory jobs: new computing and robotics technologies now threaten many “mid-skill” professions that had seemed “safe territory”, such as accountants, taxi drivers and paralegals.

It has always been the case that technological innovation destroys some jobs and replaces them in turn with new ones, in a different activity and possibly in a different place. As technological innovation forges ahead, one can expect that low-skill activities will be progressively replaced by tasks that require creativity and social intelligence. The Fourth Industrial Revolution is different in that it is primarily middle-skilled labour that has been affected. And as the disappearance of “mid-skilled” causes the job market to become increasingly segregated into a “low-skill/pay” segment with increasing numbers of people competing for ever fewer jobs and a “high-skill/pay” segment with few highly-demanded workers, social tensions will inevitably rise.

Sources: World Economic Forum, 2016 and International Monetary Fund, 2017

**Table 2: Job vacancies in Singapore by occupational group (in thousands)**

Source: Ministry of Manpower, 2017

**Extract 7: Technological disruption may push up unemployment rate**

Singapore’s labour market faces challenging times ahead, and not just because of the slowing global economy.

The lacklustre sentiment has stunted job creation and prompted a wave of layoffs in the hardest-hit sectors, but more worrying is the prospect that an unemployment rate higher than what Singaporeans are used to might become the new normal.

Singapore’s unemployment rate – which now stands at 2.1 percent – has for decades been low by international standards. But it might be on track to rise in the face of unrelenting technological change that leaves old skills outmoded. The ones relevant to new realities may take a while to acquire.

In the short run, the slowing global economy will remain a key contributor to downbeat labour market sentiment. Beyond the current downturn, however, some structural challenges will persist for a longer time – including the gulf between the skills workers have and the ones that employers want.

In its latest macroeconomic review, the Monetary Authority of Singapore said skills mismatches in the labour market are on the rise. These are leaving laid-off workers – especially professionals, managers, executives and technicians (PMET) – struggling to find new jobs, the central bank noted.

Disruptive change has hit almost every industry, and jobs are evolving faster than ever. In addition, the Singapore economy is increasingly moving towards higher value-added, niche sectors – such as medical technology and data analytics – in a bid to maintain its competitive edge. These provide good jobs, but require specialised skills that most retrenched PMETs do not have. They also offer fewer jobs, given their small, specialised nature.

This means Singapore might have to get used to a higher rate of structural unemployment – caused by a mismatch between workers’ skills and those demanded by employers.

Source: The Straits Times, 2016

**Questions**

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| (a) (i) | Define labour productivity. | [1] |
| (ii) | Using Extract 5, explain how technological development would affect the production possibility curve (PPC) of an economy. | [2] |
| (b) | Explain the statement that “many of the benefits of these new activities (from technological development) are not accounted for in the calculation of GDP in the same way that private housework and childcare are neglected”. | [3] |
| (c) | With reference to Extract 6, explain how the Gini coefficient is expected to change with technological advances. | [4] |
| (d) (i) | Describe the trend in job vacancies in Singapore. | [2] |
| (ii) | To what extent is the above trend a result of the Fourth Industrial Revolution? | [8] |
| (e) | As an economic advisor to the Singapore government, evaluate the possible options to reduce unemployment in Singapore. | [10] |

**[Total: 30]**

**Suggested Answers**

**(a)(i) Define labour productivity. [1]**

Labour productivity is the average amount of output each unit of labour can produce

**(a)(ii) Using Extract 5, explain how technological development would affect the production possibility curve (PPC) of an economy. [2]**

Technological development would improve labour productivity through making labour more efficient or redundant. This would increase the productive capacity of an economy and shift the PPC outwards. The technological development has improved and expanded the availability of resources

**(b) Explain the statement that “many of the benefits of these new activities (from technological development) are not accounted for in the calculation of GDP in the same way that private housework and childcare are neglected”. [3]**

GDP is the value of the final goods and services produced within the geographical boundary of a country within a year.

Private housework and childcare tend not to be included in the GDP as they are goods that are not transacted in the market. Not recorded and monetized – but monetizing will raise national income and provide taxation.

Many of the benefits of technological improvements (e.g. rental services by Airbnb and Uber) are similarly not captured as they are not formally traded in a market.

**(c) With reference to Extract 6, explain how the Gini coefficient is expected to change with technological advances. [4]**

Technological advances described in Extract 6 have caused middle skilled labour to be replaced. This causes the supply of low-skilled labour to increase as mid-skilled labour can only enter the low-skilled labour market since they do not own the skills necessary in the high-skilled labour market.

Technological advances will also increase the demand for high-skilled labour as they are better able to make use of technology to be more productive. The rise in supply of low skilled labour would reduce the wages of low-skilled labour while the rise in demand for high skilled labour would increase the wages of the high-skilled.

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Hence, there would be larger income inequality and the Gini coefficient would increase.

**(d)(i) Describe the trend in job vacancies in Singapore. [2]**

The job vacancies have decreased in Singapore. The decrement was larger for PMETs than other occupations.

**(d)(ii) To what extent is the above trend a result of the Fourth Industrial Revolution? [8]**

Introduction: Fourth industrial revolution is the technological change that includes the development of digital services and robotics technology such as artificial intelligence and machine learning (Ext 1).

Thesis: Trend is a result of the Fourth Industrial Revolution

Trend of general decreasing vacancies can be a result of the Fourth Industrial Revolution. With the development of technology that replaces labour, there will be lower demand for labour. This means that there will be fewer vacancies (smaller shortage of labour).

The sharpest fall in vacancies in PMET vacancies can also be explained by the Fourth Industrial revolution. The Fourth Industrial Revolution has resulted in the sharpest fall in demand for mid-skilled labour (Ext 3). This corresponds to the fall in vacancies for PMETs being the sharpest since PMETs are mid-skill labourers.

Anti-thesis: Trend is not a result of the Fourth Industrial Revolution

However, the trend of a general decrease may be due to global slowdown instead (Ext 4). The global slowdown would mean that foreign consumers would purchase fewer of Sg’s X. Also, foreign firms would be more pessimistic causing less FDI inflows into Sg. Fall in X and I 🡪 fall in AD 🡪 lower national output 🡪 lower demand for workers (fewer vacancies) – demand deficient / cyclical unemployment

Additionally, a reduction in vacancies may not reflect a fall in demand for workers. It might be due to the vacancies being filled up faster than they are being created

Conclusion

While the fourth industrial revolution probably is a contributing factor to the fall in vacancies, it is unlikely to be the only factor since the period clearly contributes to a global slowdown. To determine the extent to which it caused the fall in vacancies, more information such as the profile of job applicants (to identify if there is a skill mismatch) and the GDP growth rate (to identify how deep the recession is) would be needed.

**(e) As an economic advisor to the Singapore government, evaluate the possible options to reduce unemployment in Singapore. [10]**

Introduction

Current situation in Singapore is that structural and demand deficient unemployment are expected to increase (Ext 4)

**Policy Option #1: Re-training schemes**

To reduce structural unemployment, subsidise re-training schemes so that workers can pick up skills that are relevant to the industry (e.g. skillsfuture). Reduction in skills mismatch 🡪 reduction in structural unemployment

Limitation

Retraining takes time, and this is a problem especially if jobs are evolving faster. Workers may find that by the time they pick up the new skills, the jobs they are trained for have evolved yet again. The new jobs are more specialised and not many of these may be created. Not everyone who gets retrained will get a new job.

Lack of investment to create production – leads to lack demand for labour – lack of jobs for employment – difficult to create high-valued employment

**Policy Option #2: Expansionary Fiscal Policy**

To reduce demand deficient unemployment, expansionary FP can be used. Increase in G 🡪 increase AD. Reduction in Y and corp taxes 🡪 increase in disp Y and after tax profits for firms 🡪 increase in C and I 🡪 increase in AD. Increase in AD 🡪 increase in NY via the k process.

Increased NY (national output) 🡪 increased demand for labour 🡪 reduction in demand-deficient unemployment

Solve the fresh graduate unemployment rate – provide public services to induce employment – raise the public services – raise SOL – direct and immediate approach to eradicate unmployment

Limitation

Sg has a small multiplier due to the high MPW due to high MPS from having a compulsory saving scheme (CPF) and high MPM from being dependent on imports. A small multiplier would mean that the increase in national output would be limited and hence the reduction in demand-deficient unemployment would be limited too.

Additionally, given the gloomy economy, the reductions in taxes would likely to stimulate only small increase in C and I, causing the final reduction on demand deficient unemployment to be limited.

**Policy Option #3: Depreciation**

To reduce demand deficient unemployment, a depreciation of the exchange rate can be used. Depreciation 🡪 reduction in Px and increase in Pm 🡪 rise in Qx and fall in Qm 🡪 assuming MLC (Marshal-Lerner) holds, (X-M) increases 🡪 increase in AD 🡪 increase in NY via the k process.

Increased NY (national output) 🡪 increased demand for labour 🡪 reduction in demand-deficient unemployment

Limitation

Effect may be limited as Sg is dependent on imported raw materials and components. Increased Pm 🡪 increased COP 🡪 Px would not fall by the full extent of the depreciation 🡪 limited effect on X-M and hence limited effect on AD, NY, and unemployment.

Given a slowing global economy, depreciation may be seen as a protectionist measure and foreign countries may retaliate by imposing tariffs on Sg’s X instead. Fall in X 🡪 fall in AD 🡪 NY 🡪 rise in demand deficient unemployment

Conclusion

Each option has its limitations and a combination of policies may be the best way forward for Singapore as the policies could be complementary. Re-training and expansionary fiscal could be complementary as subsidising re-training could be a form of government expenditure. Additionally, the two could be complementary as they target different types of unemployment. Expansionary fiscal policy and depreciation could be complementary as using them simultaneously would mean that the currency would not need to be depreciated as much, which would reduce the risk of retaliation.