

T1W9 Class Test 2
How the Macroeconomy Works
Mark Scheme

- (a) Explain the factors that affect investment. [10]
(b) Discuss the effects of a rise in investment on actual and potential growth of different countries. [15]

Part (a)

Students are expected to explain interest rate and non-interest rate determinants of investments. They are also expected to use examples to substantiate their explanation.

Introduction:

Define investment : Investment is the act of

- acquiring new fixed capital assets like buildings, plants, equipment and machines (known as 'fixed capital formation') by firms, and
- the accumulating of stocks and inventories such as raw materials, semi-finished goods and finished goods held by the producer (known as 'changes in physical stocks') to be transformed into final goods and services.

Factors that affect investments in a country mainly fall under interest rate and non-interest rate factors. The main theory concerning determination of investment is the Marginal Efficiency of Investment.

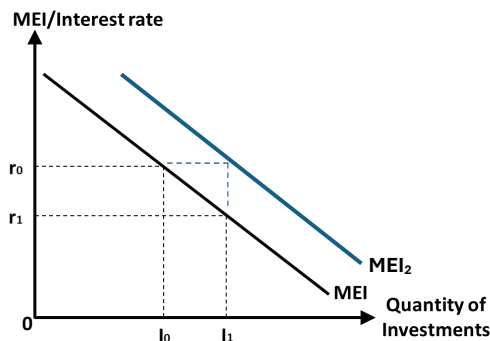
Body:

Requirement 1: Interest rate and how it affects investment

a) Changes in interest rates

According to the Marginal Efficiency of Investment (MEI) theory, there is an inverse relationship between interest rate and investment. The MEI refers to the expected rate of return (or profit) of an additional unit of investment while the rate of interest (r) refers to the cost of borrowing.

At any instance, there will be many investment opportunities (such as purchase of new machinery, expansion of factory space) with varying MEI or expected rate of returns. By ranking such investment opportunities from highest to lowest MEI, a downward-sloping MEI curve will be derived as seen in below figure.



Decision making from firm's POV: To decide whether to undertake an investment project, the rational firm will conduct a cost-benefit analysis. A firm will only invest if it makes a profit - meaning that the expected rate of return of investment (i.e. MEI) must be greater than or at least equal to the cost of borrowing for investment (i.e. the interest rate). If $MEI \geq r$, firms will undertake the investment. At a

higher rate of interest, if $MEI < r$, less investment project will be undertaken as they are less likely to be profitable.

When interest rate falls from r_0 to r_1 , there will be more investment projects that would yield a MEI or expected rate of return that is greater than or equal to the new lower interest rate and thus cause the level of investment to increase from I_0 to I_1 , reflected as movement down the MEI curve.

Requirement 2: Non-Interest rate factors affecting investment (Provide 2)

b) Changes in business confidence and expectations

Business confidence refers to how optimistic firms are about their future sales and the level of economic activity. Firms form their expectations by looking at the current state of the economy, political factors, and global situation. If firms become more optimistic about future sales and economic activity due to positive global/local outlook issued by the government, they will have greater confidence in their expected rate of return on investments.

Expected rate of return ↑ **at every given rate of interest** → invest more at every level of i/r → MEI **shifts right**

c) Changes in corporate tax rates

Government policies, particularly the reduction in corporate tax to increase competitiveness of doing business in a country. This tax, which is rendered on firms' profits will lead to rise in after-tax profits for firms operating in the country.

This increases firms' willingness and ability to invest, as expected returns on profits increased at every given rate of interest, leading to an increase in investment expenditure. MEI **shifts right**

d) Changes in technology

Improvements in technology stimulate investment spending. Technological improvement (such as improved production process) increase the productivity and efficiency of capital, allowing firms to produce more output or lower unit costs using the same amount of inputs → each investment project is expected to generate higher net profits in the future, leading to an increase in the expected rate of return on investment at every given rate of interest.

On top of that, the implementation of new technology often requires new capital - new machinery, equipment or software, raising the attractiveness and viability of investment projects. For instance, advances in the sharing economy have encouraged massive investments in new sectors -the use of idle assets such as cars and spare bedrooms has led to growth of Uber and Airbnb.

Consequently, firms are willing to undertake more investment at each interest rate → MEI **shifts right**

The above factors will result in a shift of MEI curve to the right (MEI to MEI_2): Even when interest rates are unchanged (r_0), a rightward shift of the MEI curve will increase investment from I_0 to I_1 .

Conclusion

In conclusion, changes in interest rate and non-interest rate factors will cause investment to rise or fall. The difference is whether it results in a movement along the MEI curve or a shift of the entire MEI curve.

Mark Scheme:

Knowledge, Application, Understanding and Analysis

L1	<i>For an answer with mostly irrelevant with few valid points made incidentally regarding investment and net exports. Contains conceptual errors.</i>	1-4
L2	<i>For an answer with some explanation of the factors affecting investment. Examples are not used consistently throughout the answer.</i>	5-7
L3	<i>For an answer with a clear and detailed explanation of the factors affecting investment with appropriate use of examples.</i>	8-10

Part (b): Discuss the effects of a rise in investment on actual and potential growth of different countries.

Introduction

Define key terms:

- Investments is the act of acquiring new fixed capital assets like buildings, plants, equipment and machineries by firms (also known as 'fixed capital formation'). Investment also includes the accumulation of stocks and inventories such as raw materials, semi-finished goods and finished goods held by the producer (also known as 'changes in physical stocks').
- Economic growth – sustained increase in real GDP.
 - Actual growth – increase in real NY/GDP
 - Potential growth – increase in productive capacity – increase in the level of output that can be produced in the economy when resources are fully utilized.

Interpret the question:

- An increase in investment would have a positive effect on both actual and potential growth.
- However, the extent of this impact will differ between countries:
 - developing vs developed countries
 - welfare states vs non-welfare states
 - any other categorization

Body:

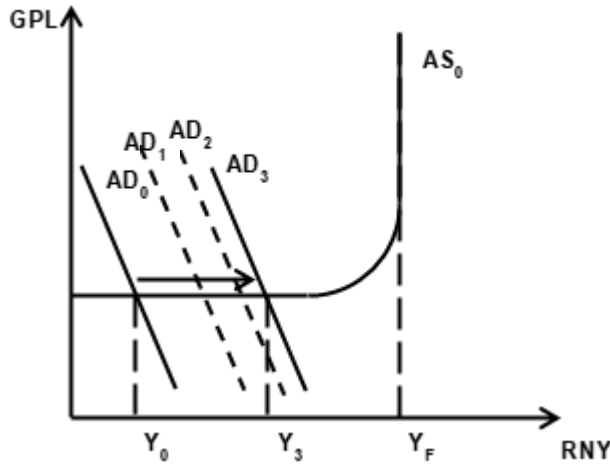
Requirement 1: Discuss the effects of rise in investment on actual growth of countries

Thesis: Rise in investment will lead to actual growth (rise in equilibrium real NY)

Explain multiplier effect:

- [Trigger] Rise in investment will cause an increase in AD.
- As I is a component of AD, AD would increase from AD₀ to AD₁.
- The increase in AD would start a multiplier process, which is based on the principle that spending creates income and income generates spending.
- [Inventory adjustment]: The increase in AD causes a drawdown on inventories/or shortage and hence, signal to firms to increase production.
- Firm then hire more factors of production from households, and in paying households factor incomes, causes national income to increase.
- [Repeated rounds]: As national income increases, households spend part of their income on consumption, causing an increase in induced consumption. This leads to further increases in AD and increase in national income.
- [Leakages]: However, the increase in consumption is smaller each round due to withdrawals (savings, taxes and imports) as not all of the income is spent.

- This continues until the initial increase in AD is completely withdrawn from the circular flow, and where the initial increase in investments is equal to the total increase in withdrawals.
- [Multiplier outcome]: Thus, the increase in investments will cause a more than proportionate increase in real national income from Y_0 to Y_3 .



**Students should draw the AD-AS with dashed lines to show the stages of the multiplier process*

R1 AT: Different countries → different extent of increase in RNY/Actual growth for given change in I

Students should explain at least 1 limitation

1. Different size of the multiplier of different countries

- The multiplier is a numerical coefficient by which a change in AD is multiplied to give a final change in real national income
- $K = 1/(MPS + MPM + MPT)$
- In some countries the size of the multiplier may be small.
 - For example, in Singapore, the marginal propensity (MPS) to save is high.
 - This is because there are mandatory savings schemes like CPF and consumer behaviour driven by cultural factors might mean savings rates are higher than in other countries.
 - There is also a high marginal propensity in imports (MPM) as Singapore is heavily reliant on imports. This is because we are a small resource scarce economy that needs to import significant quantities of factors of production. These include oil, food, sand, metals etc.
- With a small multiplier, this means that increase in investment is more quickly withdrawn from circular flow.
- Smaller cycles of spending and re-spending will result in national income not increasing as significantly compared to if the multiplier was larger.
- Hence, an increase in investment will not affect the equilibrium level of national income as significantly in countries with a smaller multiplier, compared to other countries where multiplier is more pronounced such as in the US with relatively smaller MPS (lack value of thrift, consumerism) and MPM (large country with resources).

2. Different state of the economy/Spare Capacity

For given increase in I and size of k ,

- When there is ample spare capacity, the full k -effect can take place → the impact of real NY is more significant than

- When there is lack of spare capacity, the rise in I will lead to inflationary pressures/rise in GPL due to bottlenecks in production, and diminishing returns, which dampens the k -effect $\rightarrow$ the impact of real NY will be smaller. If at full employment – no change in RNY .
- Typically, developing countries such as India and Vietnam will not be near full employment, with ample spare capacity while developed countries such as Germany and Japan tend to be near full employment where resources are nearly fully utilized (unless it is in a recession).

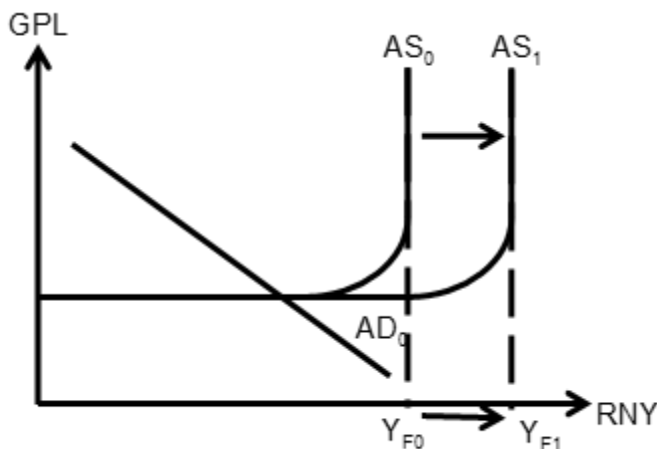
Evaluation:

1. Although investment increases AD , the extent of actual growth depends on the economy's cyclical position. For example, during the COVID-19 recovery, countries such as the United States experienced strong output expansion when investment rose because unemployment and idle capacity were high. In contrast, economies like Singapore, which returned quickly to near full employment, faced labour shortages, so additional investment contributed more to wage and cost pressures than large increases in real output.
2. Investment-driven growth strategies may be less reliable for small open economies compared to large domestic-market economies. Countries such as the United States can rely more on internal demand transmission, whereas highly open economies may require complementary export growth for investment to translate into significant actual growth.

Requirement 2: Discuss the effects of rise in investment on potential growth of countries

Thesis: The rise in Investment will increase potential growth of countries (rise in Y_F)

- A rise in investments will increase a country's productive capacity in various ways:
 - Investment – accumulation of fixed capital assets such as machinery and plants. This will increase the quantity of FOP in the country - rise in the capacity to produce more goods and services $\rightarrow$ AS will rise (rightward shift of the AS curve) $\rightarrow Y_F$ rises from Y_{F0} to Y_{F1}
 - If the rise in I leads to a rise in capital-labour ratio (capital deepening), there will be an increase in efficiency/productivity $\rightarrow$ rise in quality of FOP. More goods and services can be produced with given FOP $\rightarrow$ AS will rise (rightward shift of the AS curve) $\rightarrow Y_F$ rises
 - Students may also argue that the rise in investments may also result in fall in COP and rise in AS due to more efficient capital goods (downward shift of the AS curve). But do note that the focus for this part of the analysis is on potential growth.



Possible AT: Different extent / reduction in potential growth [Different countries]

- If the increase in I is low such that it is below the depreciation of capital stock (reduction in value of physical assets (machinery, buildings) over time due to wear, tear, and obsolescence → Net investment falls → fall in K -stock → fall in Y_F
- Rise in I may lead to a fall in potential growth if investments are made in pollutive industries in the country or at the expense of deforestation etc. causing a depletion of natural resources – Unsustainable Economic Growth.
- Not all investment improves productive capacity to the same extent: Some countries may invest in unproductive projects, prestige infrastructure, or declining industries. The rise in capital stock may be limited in these instances.

R2 EV: Different countries → different extent of increase in potential growth for given change in I

1. Different types of Investments

- If capital goods are more of the same, no change in technology → smaller increase in Y_F as compared to capital goods with higher level of technology – higher increase in Y_F
- Domestic investment → smaller increase in Y_F as compared to Foreign Direct Investments → larger increase in Y_F due to transfer of skills and technology typically associated with FDIs.

2. Different skill level of labour force

- Countries with skilled labour force e.g. Singapore, Germany and Japan → high technology absorption rate → better able to utilise newly acquired capital goods → higher increase in Y_F
- Countries with low skilled labour force e.g. Myanmar, Laos → low technology absorption rate → less able to utilize newly acquired capital goods → lower increase in Y_F

Conclusion and Overall Evaluation

- Increase in investments will lead to both actual and potential growth in most if not all countries. Even if countries are at full employment, the increase in potential growth will allow countries to achieve actual growth in the longer run.
- However, the extent of increase in actual growth and potential growth in different countries will differ and is dependent on a few factors as explained earlier:
 - Size of the multiplier in different countries
 - Availability of spare capacity
 - Extent of increase in I → what caused the rise in I in the first place?
- Suggestion of type of countries that will achieve a higher rate of actual growth and potential growth.

Mark Scheme:

Knowledge, Application, Understanding, Analysis		
L1	• Little / non-existent use of economic theory / framework in the explanation. • Limited scope and depth of explanation	1 – 4
L2	• Lack of scope – did not look at both actual and potential growth. • Insufficient depth of explanation – no multiplier process when explaining the impact on RNY. Poor links made to productive capacity.	5 - 7
L3	• A well-developed answer with good use of economic terminology and AD-AS diagrams.	8 - 10

	• Answer has good scope, application and good depth of explanation.	
Evaluation		
E1	An unexplained judgement/conclusion that is not linked to the context of the question:	1 - 2
E2	Evaluative assessment supported by economic analysis Some substantiation of an evaluative comment and/or conclusion	3 - 4
E3	Well explained evaluative judgements PLUS a summative conclusion e.g. impact of different countries differ because the characteristics and state of economies are different.	5