

1 Microchips are a crucial element in the manufacturing of final goods such as cars and consumer electronics. COVID-19 pandemic in 2020 had lockdowns which resulted in bottlenecks in the supply chain for semiconductors and changed preferences to work-from-home. Global economic growth is projected at -4.9% in 2020.

(a) Explain why a significant shortage of microchips exists during COVID-19 pandemic in 2020. [10]

(b) Discuss whether consumers or producers are more likely to bear the cost of the change in microchip prices. [15]

Part (a) suggested answer

Introduction

- The events mentioned in the preamble caused an increase in demand and a decrease in supply of microchips thus resulting in a shortage of microchips.

Body:

Demand for microchips

- Due to the pandemic, global growth is projected to be at -4.9%. This means that most economies would be in a recession in 2020. There will be a decrease in the demand for car (output), the derived demand for microchips will decrease.
- However, the pandemic also brought about lockdowns and work from home arrangements. Due to the work from home arrangement, there is a change in taste and preference towards consuming more electronic products such as laptops, monitors and printers. As microchips is an input factor to manufacture the electronic products, with the increase in the demand for laptops (output), the demand for microchips will increase.
- The fall in income and the change in taste and preference have contradictory effects on the demand for microchips.
- The overall increase in demand for the microchips is illustrated by the rightward shift of the demand curve from D_0 to D_1 in Figure 1.

Fall in supply of microchips

- The supply of microchips has fallen due to the supply shock/government policy.
- With the COVID-19 lockdowns across different countries, the government policy has caused the supply of microchips to decrease as the producers are faced with supply chain disruptions and production constraints. Hence, supply of microchips decreases and is illustrated by the leftward shift in supply from S_0 to S_1 in Figure 1.

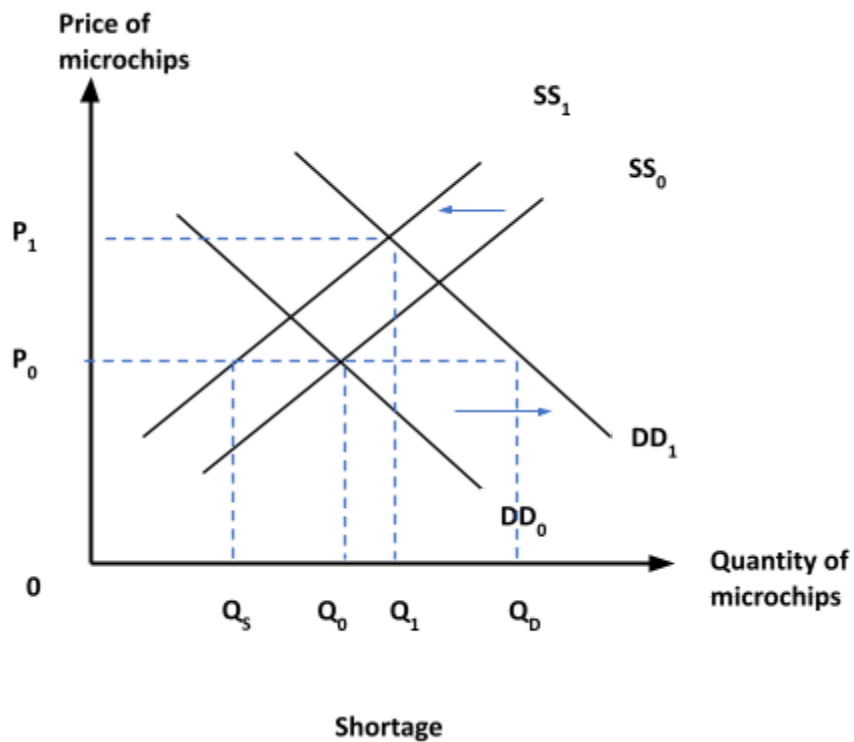


Fig 1: Market for microchips

Significant shortage of microchips

- The shortage of microchips is significant due to large increase in demand and large fall in the supply of microchips.
- Hence, the large extent of rightward shift in demand and leftward shift in supply have resulted in significant shortages of microchips.

Conclusion

- There is a significant shortage of microchips, due to the high demand and fall in supply.

Mark scheme

| Levels | Descriptors |
|--------------------------------|---|
| L3 8 - 10 | <p>For an answer that demonstrates knowledge, understanding, application and analysis:</p> <p>EXCELLENT breadth that considers the following economic concepts in explaining multiple and balanced perspectives, viewpoints, relationships and factors. ALL points chosen should be of relevance and significance in answering the question.</p> <p>EXCELLENT depth in economic analysis that reflects the following in ALL explanations.</p> <ul style="list-style-type: none"> ✓ Accurate use of economic concepts, clear elaboration, and precise use of economic terminologies, language and phrasing. <p>The answer should also be supported by:</p> <p>Well-labelled and well-referred to diagram(s) / tool(s) of analysis drawn with precision (where appropriate).</p> <p>Relevant examples and accurate use of facts.</p> <p>Logical structure.</p> |
| L2 5 - 7 | <p>For an answer that demonstrates knowledge and understanding but lacks application and analysis:</p> <p>At least GOOD breadth that considers the following economic concepts in explaining multiple and balanced perspectives, viewpoints, relationships and factors. MOST points chosen should be of relevance and significance in answering the question.</p> <p>At least GOOD depth in economic analysis that reflects the following in MOST explanations.</p> <ul style="list-style-type: none"> ✓ Accurate use of economic concepts, clear elaboration, and precise use of economic terminologies, language and phrasing. <p>The answer should also be supported by:</p> <p>Diagram(s) / Tool(s) of analysis that may not be well-labelled, may not be well-referred to and may not be drawn with precision (where appropriate).</p> <p>Example(s).</p> <p>Logical structure.</p> |
| High L1 3 - 4 | <p>For an answer that demonstrates knowledge but lacks understanding, application and analysis:</p> <p>INSUFFICIENT breadth that considers the following economic concept(s). Point(s) chosen may be of relevance but may not be of significance in answering the question.</p> <p>INSUFFICIENT depth in economic analysis that may reflect the following:</p> <ul style="list-style-type: none"> • Lack of accuracy in the use of economic concepts, lack of clarity in elaboration, and lack of precision in the use of economic terminologies, language and phrasing. |
| Low L1 1 - 2 | <p>For an answer that:</p> <p>Is irrelevant in analysis but may contain an introduction that addresses the question or contains no economic analysis but may contain a few statements that are relevant to the concepts required to answer the question.</p> <p>Contains fundamental conceptual errors in analysis.</p> |

Part (b) suggested answer

Introduction

- The increase in microchips costs will be a burden on the consumers of cars and consumer electronics and cause a fall in consumers' surplus.
- The cars and consumer electronics manufacturers also have to bear part of the increase in costs, though the full impact on the cars and consumer electronics manufacturers also requires a closer look at the impact of increase in price of microchips on their total revenue of car and consumer electronics.
- Whether or not the consumers or the producers of cars and consumer electronics bear a greater burden depends on the relative price elasticity of demand and price elasticity of supply.

Body

Body 1: Explain the impact of increase in microchips costs on the consumers and producers of microchips

- The increase in price of microchips will have an impact on the consumers of microchips (smartphone/laptop/car manufacturers) and the producers of microchips.
- For consumers of microchips (smartphone/laptop/car manufacturers), there is lack of substitutes available for microchips and high degree of necessity to use microchips to produce their output. Hence, demand for microchips is relatively price-inelastic, as illustrated by the demand curve DD in Figure 1 below.
- In contrast, supply of microchips is likely to be price elastic due to shorter manufacturing time period and the existence of spare capacity. Hence, producers of microchips may be able to respond quickly to the higher market prices by increasing the quantity supplied of microchips of by increasing production. This is illustrated by the supply curve in Figure 1 below.
- In Figure 1 below, the per unit cost increase is given by bP_1 , where consumers bear a greater incidence of price increase of P_0P_1 and the producers bears a smaller incidence of bP_0 .

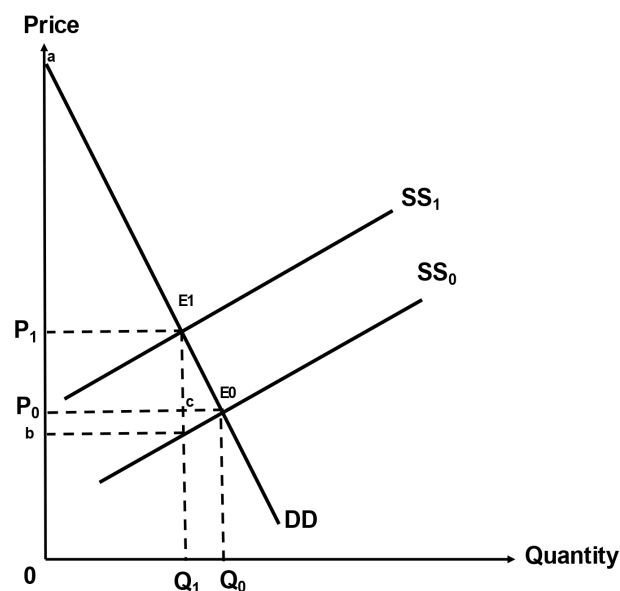


Figure 1: Impact of increase in microchips costs on the consumers and producers of microchips

In the consumer electronics (as smartphones and computers) market, consumers rather than the producers may bear a greater burden of the increase in costs of microchips.

- For smartphones and computers, there is a high degree of necessity to use these devices for education, communication and entertainment. Hence, demand consumer electronics is relatively price-inelastic, as illustrated by the demand curve DD in Figure 1.
- In contrast, supply of consumer electronics is likely to be price elastic due to shorter manufacturing time period and the existence of spare capacity. Hence, producers of consumer electronics may be able to respond quickly to the higher market prices by increasing the quantity supplied of consumer electronics of by increasing production. This is illustrated by the supply curve in Figure 1 below.
- In Figure 1 below, the per unit cost increase is given by bP_1 , where consumers bear a greater incidence of price increase of P_0P_1 and the producers bears a smaller incidence of bP_0 .

Evaluative conclusion

- The extent of burden of an increase in microchips costs on consumers and producers depends on the relative price-elasticity of demand (PED) and price-elasticity of supply of the goods itself.
- The extent of burden of an increase in microchips costs on consumers and producers depends on the extent of shift of supply given the differing relative importance of microchips in terms of the total cost of car or consumer electronics.

Mark scheme

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| L2 5 - 7 | <p>For an answer that demonstrates knowledge and understanding but lacks application and analysis:</p> <p>At least GOOD breadth that considers the following economic concepts in explaining multiple and balanced perspectives, viewpoints, relationships and factors. MOST points chosen should be of relevance and significance in answering the question.</p> <p>At least GOOD depth in economic analysis that reflects the following in MOST explanations.</p> <ul style="list-style-type: none"> ✓ Accurate use of economic concepts, clear elaboration, and precise use of economic terminologies, language and phrasing. <p>The answer should also be supported by:</p> <p>Diagram(s) / Tool(s) of analysis that may not be well-labelled, may not be well-referred to and may not be drawn with precision (where appropriate).</p> <p>Example(s).</p> <p>Logical structure.</p> |
| High L1 3 - 4 | <p>For an answer that demonstrates knowledge but lacks understanding, application and analysis:</p> <p>INSUFFICIENT breadth that considers the following economic concept(s). Point(s) chosen may be of relevance but may not be of significance in answering the question.</p> <p>INSUFFICIENT depth in economic analysis that may reflect the following:</p> <ul style="list-style-type: none"> • Lack of accuracy in the use of economic concepts, lack of clarity in elaboration, and lack of precision in the use of economic terminologies, language and phrasing. |
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| Levels | Descriptors |
|-------------|--|
| E3 4 - 5 | <p>For an evaluation that contains</p> <p>A synthesis of earlier economic arguments to arrive at relevant judgements/decisions (i.e. answer the question).</p> <p>Well-explained criteria-based evaluative comments supported by accurate and clear analysis to provide fairness in views.</p> <p>A good summative conclusion.</p> |
| E2 2 - 3 | <p>For an evaluation that contains</p> <p>Relevant judgement(s)/decision(s) (i.e. answer the question) that may not follow from earlier economic arguments.</p> <p>Criteria-based evaluative comment(s) supported by analysis to provide fairness in views but the comment(s) may not be well-explained, may be unclear and/or may be inaccurate at times.</p> |
| E1 1 | <p>For an evaluation that contains</p> <p>Relevant but unexplained evaluative judgement(s)/statement(s) i.e. evaluative judgement(s)/statement(s) not supported by analysis or</p> <p>A relevant conclusion.</p> |