Answer **all** questions.

Question 1: The Not-So-Certain Economics of Electric Vehicles

Extract 1: Electric Vehicle Market

Electric vehicles (EVs) are essential to decarbonising transportation, with their numbers increasing due to rising global demand. While electric cars are significantly cheaper to run — potentially costing up to half as much per mile as similar-sized petrol or diesel vehicles — they are generally more expensive to purchase. To mitigate this cost barrier, many governments offer tax credits and other incentives, making EVs more accessible to a broader range of consumers.

Goldman Sachs Research now expects battery prices to fall to $99 per kilowatt hour (kWh) of storage capacity by 2025 — a 40% decrease from 2022. Analysts estimate that nearly half of this reduction will be driven by falling prices of EV raw materials, including lithium, nickel, and cobalt.

Expanding charging infrastructure and advancing battery technology are crucial to accelerating the adoption of EVs. In response to growing demand, cities are increasingly installing more charging stations in public spaces like grocery stores and airports, making EVs a more practical option for everyday use. Furthermore, advancements in battery technology are extending the range of EVs, making them more viable for longer commutes. The combination of improved battery performance and faster charging technology is also minimizing downtime for EV drivers, further enhancing the appeal of electric vehicles.

Adapted from: *World Economic Forum, 26 Oct 2022 & Goldman Sachs, 1 Nov 2023*

Extract 2: The True Cost of Electrifying Transportation

The transportation sector accounts for 29 percent of U.S. carbon emissions (and 24 percent worldwide), it's only natural that electrification of the vehicle fleet, paired with the rapid greening of electricity production, is widely viewed as key to containing climate risk.

Emissions from internal combustion engine [1] (ICE) vehicles are easy to understand. Combustion of fossil fuels creates global greenhouse gases (GHGs) and local pollution. In contrast, the emissions associated with electric vehicles (EVs) are more complex to measure. The electricity used to charge EVs is generated through a mix of technologies, including wind, solar, hydro, nuclear, and various fossil fuels. Therefore, the pollution associated with EVs depends on the marginal source of electricity - the power plant that adjusts its output in response to increased demand.

Local pollution from traditional vehicles primarily affects respiratory health but is also linked to reduced labour productivity and cognitive performance. EVs can reduce GHGs compared to ICEs in areas where natural gas is the dominant energy source for the electricity grid. However, in regions dependent on coal, particularly in colder climates, EVs can sometimes be more greenhouse gas-intensive. While ICE vehicles emit pollutants directly where they are driven, EVs generate local pollution at the power plants that supply electricity during charging. Thus, the environmental benefits of EVs are most pronounced in urban areas with clean grids (e.g., Los Angeles), but can be diminished or even negative in coal-dependent regions.

[1] An internal combustion engine is a machine that converts internal energy into mechanical energy through the combustion of fossil fuels.

It is also important to consider that congestion externalities and accidents represent the largest market failures associated with driving, surpassing the impact of GHGs and local pollutants. Furthermore, policies intended to promote EV adoption, such as single-occupancy access to carpool lanes and EV purchase subsidies, may inadvertently exacerbate congestion by increasing the number of vehicles on the road or reducing the effectiveness of carpool lanes.

Adapted from: *Milken Institute, 24 Jan 2022*

Extract 3: China's EV Industry Speeds Up

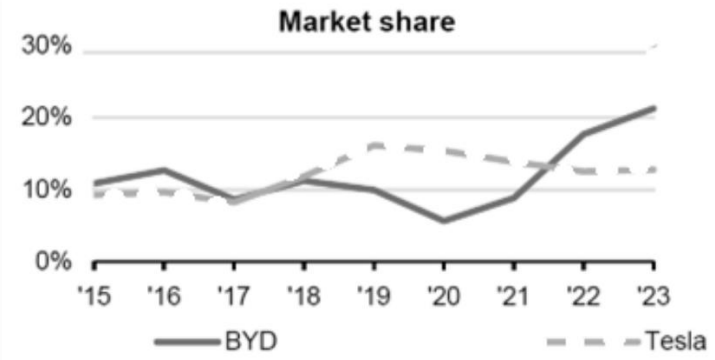
In the final quarter of 2023, BYD, a Chinese firm, surpassed Tesla as the world's biggest manufacturer of purely battery-powered vehicles, selling 526,000 of them to the American firm's 484,000. As the shift away from the ICE gathers pace, established carmakers are beginning to worry that Chinese upstarts might run them off the road.

China dominates the manufacture of electric vehicles' most critical component, batteries. And China's vast domestic market allows local firms to benefit from economies of scale. However, Chinese firms face significant obstacles. Despite generous government subsidies, many new EV startups in China are not yet profitable.

Since late 2022, heightened competition among front-runners has led electric car prices to fall quickly. The price of compact electric cars and SUVs dropped by up to 10% in 2023 relative to 2022. In the first quarter of 2024, Tesla once again slashed prices, by up to 6%, forcing competitors to follow suit, despite shrinking gross margins, which are calculated as the difference between revenue and the cost of goods sold, divided by revenue. Subsequently, BYD implemented a 10-20% price reduction across its models.

In 2023, BYD significantly increased its R&D investment to 39.57 billion Yuan, a 4.7-fold rise from the previous year, surpassing Tesla's expenditure by 11.18 billion Yuan. This substantial investment highlights BYD's commitment to innovation, particularly in the New Energy Vehicle sector. Meanwhile, Tesla, continues to focus its R&D efforts on developing advanced eco-friendly technologies, expanding production of solar energy panels and batteries and investing in charging stations to support the broader adoption of EVs.

Figure 1: Share of global electric car markets by selected carmakers



Source: *Global EV Outlook 2024 & The Economist, 11 Jan 2024*

Extract 4: Rising Protectionism

The Biden administration's plan to slap heavy new tariffs on Chinese EVs and batteries would provide temporary protection for U.S. automobile industry jobs. Few Chinese-made EVs are currently sold in the U.S., so the immediate impact of higher tariffs on consumers would be minimal, according to analysts. However, the White House also plans to more than triple tariffs on Chinese EV batteries and parts to 25%. U.S automakers warn that without access to lower-cost batteries and materials from China, EVs could become prohibitively expensive for mainstream U.S. consumers.

Experts are divided over whether stronger tariff protection will help U.S. automakers in the long run, or work to the benefit of consumers. "The tariffs buy important time," said Michael Dunne, a consultant who has watched the Chinese automobile industry for years. "The U.S. is five to seven years behind China when it comes to electric vehicles and battery supply chains." China protected its automakers in the 1990s and 2000s, Dunne said. "U.S. political leaders could rightly say we are just borrowing a page from China's playbook."

Meanwhile, Washington is investing hundreds of billions of dollars to develop U.S. EV, solar, and other new industries. These provisions include grants, subsidies, tax credits, and direct purchases, with $2 billion allocated for domestic manufacturing and conversion grants to retrofit existing assembly facilities for low-carbon vehicle production. Additionally, $7 billion has been set aside to ensure domestic manufacturers have access to critical minerals and components necessary for battery production. The Inflation Reduction Act also provides $3 billion in credit subsidies for advanced technology vehicle manufacturing through the Department of Energy's Loan Programs Office. The U.S. government has expressed concerns that China's state-driven excess production capacity in these sectors threatens the viability of American companies, and the tariffs are intended to protect American jobs from a potential flood of cheap Chinese imports.

Adapted: *Reuters, 15 May 2024 & 23 May 2024 and Automotive Logistics, 1 Nov 2022*

Questions

(a) Explain **one** demand factor and **one** supply factor that influence the adoption of electric vehicles. [4]

(b) **(i)** Compare the market share of BYD and Tesla from 2015 to 2023. [2]

Extract 3 states that in the first quarter of 2024, Tesla once again slashed prices, by up to 6%, forcing competitors to follow suit, despite shrinking gross margins.

(ii) Explain the likely market structure of the EV industry. [2]

(iii) Discuss whether this pricing strategy is the best for Tesla to maintain profitability in view of rising competition from Chinese EV car manufacturers. [8]

(c) The transportation sector accounts for 29 percent of U.S. carbon emissions (and 24 percent worldwide).
With the use of a diagram, explain why the transport market fails. [4]

(d) Discuss whether imposition of tariff is the best strategy to protect employment in the American automobile industry. [10]

[Total: 30]

Suggested Answers:

(a) Explain **one** demand factor and **one** supply factor that influence the adoption of electric vehicles. [4]

Explain demand factor [2m]

The **shift in consumers' tastes & preferences** toward cost-effective and environmentally friendly transportation is a key demand factor driving the adoption of electric vehicles (EVs). EVs are significantly cheaper to operate compared to petrol or diesel vehicles, with the potential to cost up to half as much per mile. This lower running cost makes EVs an attractive option for consumers, especially when combined with government incentives like tax credits, which help to offset the higher initial purchase price.

Explain supply factor [2m]

A key supply factor influencing the adoption of electric vehicles (EVs) is the **significant reduction in battery costs, driven by advancements in technology and falling prices of essential raw materials** like lithium, nickel, and cobalt. Goldman Sachs Research forecasts a 40% drop in battery prices by 2025, largely due to these declining input costs. As battery prices decrease, the overall production costs for EVs also fall, enabling manufacturers to offer EVs at more competitive prices. This reduction in costs leads to an increase in the supply of EVs.

Markers' comments:

Majority of the students were able to identify one demand factor and one supply factor. Some students also explained these factors within the context of the EV market, demonstrating good application skills. However, several candidates spent unnecessary time describing the price adjustment process and the overall impact on equilibrium price and output, which were not required by the question.

(b) **(i)** Compare the market share of BYD and Tesla from 2015 to 2023. [2]

Similarity [1m]

Both BYD and Tesla have significantly increased their market share in the electric vehicle (EV) market from 2015 to 2023.

Differences [1m]

From 2018 to 2021, Tesla had a **larger market share** compared to BYD as Tesla was an early leader in the EV industry. However, from mid-2021, BYD began to surpass Tesla in the EV market share.

Markers' comments:

Most students were able to compare the similarities and differences in the market share of both firms. However, a minority approached the question by describing BYD's trend in isolation before discussing Tesla's, rather than providing a direct comparison between the two companies.

Extract 3 states that in the first quarter of 2024, Tesla once again slashed prices, by up to 6%, forcing competitors to follow suit, despite shrinking gross margins.

(ii) Explain the likely market structure of the EV industry. [2]

Identify [1m]
The EV industry is likely to be operating in a competitive **oligopoly** market structure.

Explain [1m]
A few large firms, such as Tesla and BYD, dominate the market, and their actions - like pricing and technological innovations - considerable influence the actions of other dominant firms.
OR
High Barriers to Entry: The significant investment required for R&D, coupled with the dominance of established firms and economies of scale enjoyed by major players, creates substantial barriers to entry for new firms, further reinforcing the oligopolistic nature of the market.
OR
Mutual interdependence refers to a key characteristic of an oligopolistic market structure, where the decisions and actions of one firm directly affect those of other competing firms. In an oligopoly, a few large firms dominate the market and are highly aware of each other's strategies—whether it's pricing, product development, or marketing. In the electric vehicle industry, firms like Tesla and BYD closely monitor each other's moves. If Tesla lowers its prices or introduces a new technology, BYD may need to adjust its strategy, whether by innovating or changing its pricing. This creates a situation where firms are not just competing but are also constantly responding to each other's actions, leading to a high degree

Markers' comments:
This question was generally well answered. Most students correctly identified the market structure and explained one supporting characteristic, demonstrating a good understanding of this concept.

(iii) Discuss whether this pricing strategy is the best for Tesla to maintain profitability in view of rising competition from Chinese EV car manufacturers. [8]

Question Interpretation

Command word	*Discuss whether*	Discuss (Two-sided)
Content	*Pricing strategy is the best to maintain profitability*	Profit = TR – TC Pricing strategy vs non-pricing strategy
Context	*Rising competition from Chinese EV car manufacturers*	Refer to Extract 3 & Figure 1

Introduction

Profit is defined as total revenue minus total costs (TR – TC). As competition from Chinese EV manufacturers like BYD threatens Tesla's supernormal profits, the company's strategy of significant price reductions aims to protect its profitability. To evaluate if this pricing strategy is the best for Tesla to maintain its profitability, it is important to consider both its benefits and drawbacks. Additionally, exploring alternative strategies, such as increasing investment in research and development (R&D) or enhancing product differentiation, is essential to find the most sustainable approach for Tesla's long-term profitability in a competitive market.

R1: This pricing strategy is the best for Tesla to maintain profitability in view of rising competition from Chinese EV car manufacturers.

Pricing strategy: In response to heightened competition, Tesla has implemented significant price reductions of up to 6% in early 2024, as reported in Extract 3. This strategy aims to sustain Tesla's market share and competitive position despite increased pressure from rivals.

Rising competition from Chinese EV car manufacturers

- ➔ [EA - Graphical] Demand for Tesla, a dominant EV firm, decreases. The demand become more price elastic as more substitutes emerge. With a lower and more price elastic demand as denoted by AR_1, profit maximizing output & price will decrease to Q_1 & P_1 respectively. The emergence of more substitutes makes the demand for Tesla EVs more elastic, as consumers are more likely to switch brands based on price changes. By lowering prices, Tesla adjusts to this increased price elasticity and maintains its appeal to cost-conscious consumers.
- ➔ Assuming cost to be constant, the supernormal profits that Tesla earn falls from P_0ABC_0 to P_1DEC_1.

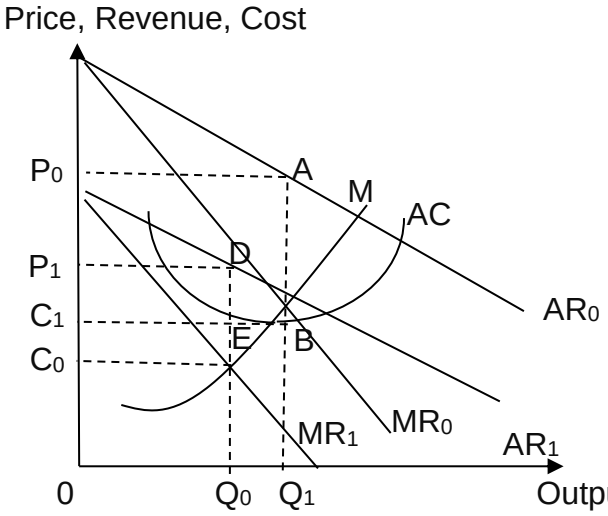


Figure 1: Fall in profits due to rising competition from Chinese EV car manufacturers

Limitations of This Pricing Strategy

- Erosion of Profit Margins: While reducing prices can help maintain market share, it may also lead to lower profit margins. Continuous price cuts can erode Tesla's profitability if the reduction in price outweighs the increase in sales volume. If profit margins become too thin, it could undermine Tesla's ability to sustain its operations and fund future innovations.
- Short-Term Focus: The pricing strategy addresses immediate competitive pressures but may not provide a long-term solution. Relying solely on price reductions could lead to a cycle of competitive price cutting that harms overall profitability without creating lasting competitive advantages.

R2: Other strategy is the best for Tesla to maintain profitability in view of rising competition from Chinese EV car manufacturers.

Alternative Strategy: Increased Investment in Research and Development (R&D)

According to Extract 3, BYD has significantly increased its R&D investment in 2023, surpassing Tesla's spending by a considerable margin. This substantial focus on R&D underscores BYD's commitment to innovation and strengthens its competitive position in the EV market. Tesla could adopt a similar strategy to bolster its own market stance and profitability.

1. Impact on Cost
   Increased investment in R&D leads to higher immediate expenditures, which can strain Tesla's short-term financial resources. However, successful R&D has the potential to drive advancements in production efficiency, the use of cost-effective materials, and improved operational processes. Over time, these innovations can significantly reduce long-term production costs, potentially offsetting the initial investment and providing a return on the increased expenditure.

2. Impact on Revenue
   Investing in R&D can lead to the development of advanced technologies and innovative models, allowing Tesla to differentiate itself from competitors, command premium prices, and capture a larger market share. This results in less price-elastic demand for Tesla's cars and increases overall revenue. Additionally, R&D-driven innovations can open new market opportunities, strengthen Tesla's competitive edge, and drive sustained revenue growth by attracting a broader consumer base over time.

Limitations:

- Short-Term Financial Strain: The higher costs associated with increased R&D investment may impact Tesla's profitability in the short term, as funds are diverted from other areas.
- Uncertain Outcomes: The success of R&D investments is not guaranteed. There is a risk that innovations may not achieve the desired market impact or generate sufficient returns to justify the initial expenditures.

Note: Will accept price rigidity, as illustrated by the kinked demand curve, as an alternative point for why this pricing strategy is not the best for Tesla.

Evaluative Comment

- Short-Term vs Long-Term
  The pricing strategy effectively addresses immediate competitive pressures by boosting short-term revenue and maintaining market share. However, this approach poses risks to long-term profitability due to reduced profit margins and potential brand dilution. On the other hand, the R&D strategy, while requiring a substantial initial investment, focuses on long-term profitability through innovation, cost reductions, and improved market differentiation.
- Risk vs. Reward
  The pricing strategy involves risks such as diminishing returns and potential price wars, which could negatively impact profitability and market stability. Conversely, the R&D strategy, despite its higher initial costs, offers the potential for sustained growth and competitive advantage, with the possibility of significant long-term rewards through enhanced product offerings and operational efficiencies.

Conclusion

The R&D strategy is generally more favorable for sustaining profitability in the long term due to its potential for innovation-driven growth and cost reductions. While the pricing strategy can provide short-term relief from competition, it risks long-term profitability through margin erosion and brand devaluation. Balancing both strategies—using price adjustments to address immediate competition while investing in R&D for long-term growth—may be the most effective approach for Tesla.

Markers' comments:

This question was not well attempted. Stronger responses explained the immediate impact of Tesla's price reductions, demonstrating good understanding of demand elasticity in the EV market. Additionally, these responses included clear graphical analysis that illustrated the shift in AR and its implications on the supernormal profit earned. However, the majority of responses lacked balance, often focusing too heavily on pricing strategies without adequately addressing the alternative strategies proposed. While some candidates did mention the limitations of the pricing strategy, many could have strengthened their arguments by incorporating more specific examples or case studies relevant to the EV industry.

Level	Knowledge, Application/Understanding, and Analysis	Marks
L2	For a well-developed answer that has: ● **good scope and balance** – this pricing strategy is the best for Tesla to maintain profitability; and ● **good application to context** – uses the case material where appropriate, to apply to the rising competition from Chinese EV car manufacturers. **Max 4m** – one sided discussion	4 – 6
L1	For an under-developed answer that: ● lacks scope and balance – only explains how pricing strategy enable Tesla to maintain profitability ● lacks application to context – limited application to rising competition from Chinese EV car manufacturers	1 – 3
Level	**Evaluation**	**Marks**
E	● A well-reasoned judgement on whether the pricing strategy is the best for Tesla to maintain profitability.	1 – 2

(c) The transportation sector accounts for 29 percent of U.S. carbon emissions (and 24 percent worldwide).
With the use of a diagram, explain why the transport market fails. [4]

Explain Qp [1m]
Market failure arises because individuals consider only their private costs and benefits, overlooking spillover effects on third parties. In the free market, decisions are made based on Marginal Private Benefit (MPB) and Marginal Private Cost (MPC). Private equilibrium is achieved where MPB equals MPC, resulting in a quantity of Qp. This equilibrium does not account for broader societal impacts, such as environmental pollution and congestion.

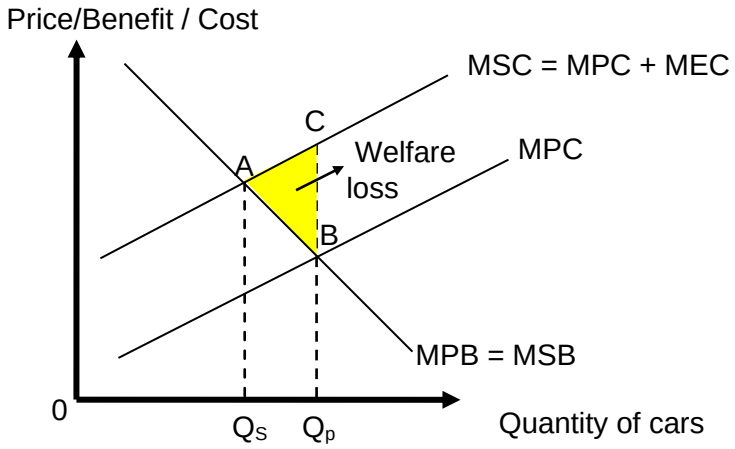


Figure 2: Negative externality arises in transport market

Explain MEC [1m]
Negative externalities, such as pollution from private vehicles, cause Marginal Social Cost (MSC) to exceed Marginal Private Cost (MPC). Specifically, MSC is represented by MSC = MPC + Marginal External Cost (MEC), where MEC > 0. For instance, internal combustion engine (ICE) vehicles emit greenhouse gases (GHGs) and pollutants affecting health and productivity. While electric vehicles (EVs) may reduce GHGs in areas with cleaner energy sources, their overall impact depends on the electricity mix. In regions relying on coal, EVs can sometimes have higher emissions than ICE vehicles, contributing to a higher MSC compared to MPC.

Explain Qs [1m]
The divergence between MSC and MPC results in an over-production of private transport relative to the socially optimal level. Due to negative externalities, the MSC exceeds MPC, which leads to excessive production and consumption compared to what would be socially optimal.

Explain Qs < Qp and the Welfare Loss [1m]
Since Qp > Qs, there is over-production. At Qp, MSC is greater than MSB, meaning the societal cost of producing Qp exceeds the societal benefit. For instance, local pollution from ICE vehicles and congestion costs associated with increased vehicle numbers create additional societal costs. Reducing production or consumption to Qs would be more beneficial for society. The welfare loss, or deadweight loss, is represented by the area between MSC and MSB from Qs to Qp, showing the total loss to society from over-production.

Markers' comments:
Most candidates demonstrated an understanding of the concept of negative externalities. However, there is room for improvement in their theoretical explanations of deadweight loss. Candidates should aim to provide more detailed graphical analysis on deadweight loss.

(d) Discuss whether imposition of tariff is the best strategy to protect employment in the American automobile industry. [10]

Question Interpretation

Command word/phrase	*Discuss whether*	Give a balanced analysis before coming to a well-reasoned judgment on the best strategy to adopt.
Content	*Imposition of tariff… protect employment*	The tariff diagram should be used to explain how domestic production is boosted, thereby, protecting employment. An alternative strategy should be discussed.
Context	*American automobile industry*	

Introduction

When evaluating whether the imposition of tariffs is the best strategy to protect employment in the American automobile industry, it is crucial to consider the immediate and long-term effects of such a policy. Tariffs, as a form of protectionism, are often implemented to shield domestic industries from foreign competition, thereby safeguarding jobs. However, the effectiveness of tariffs in achieving sustained employment protection is debatable. This discussion will explore how tariffs might protect the American automobile industry in the short run, the potential negative impacts on consumers and broader economic efficiency, and alternative strategies, such as supply-side policies, that could offer more sustainable employment protection in the long run.

R1: Imposition of tariff is the best strategy to protect employment in the American automobile industry

The imposition of tariffs on imports, particularly on automobiles and related components, serves as a protectionist measure designed to shield domestic industries from foreign competition. In the context of the American automobile industry, implementing tariffs could be a viable strategy to protect jobs. By increasing the cost of imported vehicles, tariffs encourage consumers to opt for domestically produced cars. This shift in demand can lead to higher domestic production, thereby securing existing jobs and potentially creating new employment opportunities within the industry.

Benefits of Tariffs in Protecting Employment:

1. Increased Domestic Production: Tariffs increase the price of imported EVs from Pw to Pw+t, which can make domestic EVs more price competitive. Thus incentivising Amercians to purchase American-made vehicles, boosting domestic production from $0Q_1$ to $0Q_2$. The rise in domestic production reduces the quantity demanded for imports from Q_1-Q_4 to Q_2-Q_3, assuming the demand for imports is price elastic. The

resulting reduction in import expenditure, coupled with an increase in domestic production, provides a buffer against job losses and structural unemployment.

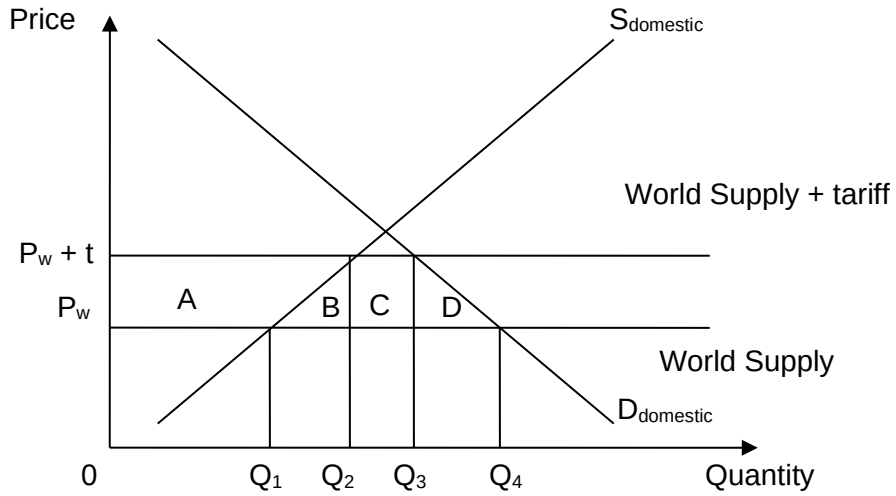


Figure 3: Effects of imposition of Tariffs

2. Reduced Structural Unemployment: By giving domestic EV industries time to adjust, tariffs help reduce structural unemployment caused by global competition. Workers have the opportunity to retrain and transition to other sectors, mitigating the impact of job losses in the short term. As domestic EV industries stabilize and develop, they can eventually catch up with more established foreign competitors, gaining comparative advantage and potentially increasing employment and economic growth in the long run.

Limitations

- Imported Cost-Push Inflation: Tariffs can trigger cost-push inflation by raising the price of imported raw materials. When production costs increase without a corresponding rise in productivity, this shifts the aggregate supply curve to the left. As a result, general price levels rise while real national output falls, potentially leading to inflation and economic instability. For instance, the proposed significant tariffs on Chinese EV batteries and components are expected to increase production costs for U.S. automakers. This can increase the prices of electric vehicles (EVs), making them less affordable for consumers and potentially slowing down the adoption of green technologies.
- Consumer Welfare Loss: Tariffs on imported goods raise prices, which can negatively affect consumer purchasing power and overall welfare. Higher costs for EVs and their components may make these products less affordable, hindering their widespread adoption. This not only impacts consumers directly but can also impede progress towards environmental sustainability by slowing the transition to greener technologies.
- Complacency and Inefficiency: Protectionist measures can lead to complacency within domestic industries by reducing the pressure to innovate. Without the competitive stimulus from foreign firms, American automakers may become less motivated to invest in research and development, which can weaken their global competitiveness and hinder long-term industry growth.

- Retaliation and Trade Wars: The imposition of tariffs can provoke retaliatory actions from other countries, leading to trade wars that may harm the broader economy. For example, if China responds with counter-tariffs on American exports, U.S. exporters could face reduced demand for their products, resulting in job losses across various sectors and negatively affecting the overall economic environment.

R2: Developing Comparative Advantage is the best strategy to protect employment in the American automobile industry

Instead of relying solely on tariffs, a more sustainable approach could involve policies aimed at developing the industry's comparative advantage, particularly in the burgeoning EV market.

U.S. Government Investment in Green Industries: Alongside the implementation of tariffs, the U.S. government is making significant investments to bolster domestic electric vehicle (EV) and green technology sectors. These investments include:

- $2 billion for retrofitting assembly plants to produce low-carbon vehicles.
- $7 billion to secure critical minerals and components necessary for battery production.
- $3 billion in credit subsidies to support advanced technology vehicle manufacturing.

These investments are designed to enhance the competitiveness of the domestic industry, particularly in the face of strong global competition from China's EV sector.

Supply-Side Policies: To protect and enhance employment in the American electric vehicle (EV) industry, implementing targeted supply-side policies is crucial. These policies should aim to build the industry's comparative advantage and foster long-term growth. Key strategies include:

1. Subsidies for R&D:
   - Process R&D Subsidies: Investment in process R&D can lead to advancements in EV manufacturing technologies. By supporting research into more efficient production methods and innovative battery technologies, these subsidies help lower domestic production costs. For instance, funding research into advanced battery manufacturing processes can make American-made EVs more cost-effective and competitive compared to international offerings.
   - Product R&D Subsidies: Supporting product R&D encourages innovation in EV technology. Subsidies for developing longer-range batteries, advanced safety features, and improved vehicle performance can enhance the appeal and functionality of domestic EVs. This not only boosts the attractiveness of American EVs but also strengthens their position in the global market. Impact on Export Competitiveness and Domestic Production:

   ➔ Lower production costs from process R&D subsidies enable domestic EV producers to price their vehicles more competitively on the global market, potentially leading to increased export revenue and a reduced reliance on imports, which positively impacts the trade balance. ➔ create more jobs within the industry

2. Education and Retraining Programs

   Investing in targeted education and retraining programs is essential for equipping the workforce with the skills needed in the EV sector, including battery assembly,

electric powertrain systems, and smart vehicle technologies. These programmes enhance labour mobility by preparing workers for various high-tech roles, reducing structural unemployment. Improved skills lead to increased productivity, which lowers unit production costs, boosts product quality, and strengthens the competitiveness of the domestic EV industry, supporting its overall growth.

Limitations

- Potential for Market Distortions: Subsidies and investments may lead to market distortions if not carefully managed. Excessive reliance on subsidies can create inefficiencies and reduce incentives for firms to innovate independently.
- Budgetary Constraints: Large-scale government investments and subsidies require significant public funding. Budgetary constraints may limit the scope and scale of such measures, impacting their effectiveness.
- Risk of Complacency: Protectionist measures such as subsidies can sometimes lead to complacency among domestic producers. Without the pressure of global competition, firms may be less motivated to innovate and improve efficiency, potentially weakening long-term competitiveness.

Evaluative Comment

In the short run, tariffs can be effective in protecting jobs by providing immediate relief to struggling industries. They address urgent economic issues and can shield domestic employment from immediate foreign competition. However, tariffs carry potential drawbacks, such as market inefficiencies, increased consumer costs, and possible long-term damage to economic welfare. While tariffs offer quick fixes, they may distort market dynamics and reduce overall consumer well-being.

On the other hand, developing a strong comparative advantage through targeted investments in technology and human capital provides a more sustainable solution for long-term employment protection. Supply-side policies, such as investing in education and R&D, tackle the root causes of unemployment and competitiveness issues by improving the fundamentals of the EV industry and enhancing workforce skills. Although these measures require time to yield results, they build a more resilient and competitive industry for the future.

While tariffs offer immediate relief, supply-side policies generally offer more robust long-term benefits. A balanced approach that combines both strategies could be most effective. Short-term tariffs can provide necessary protection, while long-term investments in R&D and workforce development address structural issues, fostering sustained growth and job security.

Conclusion

In summary, tariffs provide immediate relief to industries facing short-term challenges but can lead to inefficiencies and higher costs. Supply-side policies, such as investments in innovation, education, and R&D, are more sustainable, addressing long-term competitiveness and employment. Combining both approaches—using tariffs for short-term stability and focusing on innovation for long-term growth—can offer a balanced solution for economic resilience and industry advancement.

Markers' comments:

Some candidates provided clear explanations of how the imposition of tariffs can reduce structural unemployment in the American automobile industry. However, several responses fell short, as some candidates offered rehearsed answers that did not adequately address the specific context of the question. Additionally, a few candidates confused the discussion with AD/AS analysis , which detracted from the focus on tariffs. Candidates are encouraged to ensure their responses are directly relevant to the question and to avoid conflating different economic concepts.

Level	Knowledge, Application/Understanding, and Analysis	Marks
L2	For a well-developed answer that has: ● **good scope** – analyses two strategy- tariffs and supply-side strategy; and ● **good balance** – explains both the workings and limitations of the strategies; and ● **good rigour** – uses diagram(s) where appropriate; and ● **good application to context** – uses the case material where appropriate, to support analysis **Max 4m** – one strategy **Max 6m** – without addressing to American automobile industry	4 – 7
L1	For an under-developed answer that: ● lacks scope – analyses only one strategy; and/or ● lacks balance – analyses only the workings or limitations of the strategies; and/or ● lacks rigour – descriptive explanation little use of diagram; and/or ● lacks application to context – limited use of case material to support analysis	1 – 3
Level	**Evaluation**	**Marks**
E2	● A well-reasoned judgement on whether imposition of tariff is the best strategy to protect employment in the American automobile industry.	2 – 3
E1	● Make a stand on which strategy is better	1