



ANDERSON SERANGOON JUNIOR COLLEGE
JC2 PRELIMINARY EXAMINATION
Higher 3

ECONOMICS

9809/01

Paper 1

23 September 2025

No Additional Materials are required.

3 hours 15 mins

READ THESE INSTRUCTIONS FIRST

An answer booklet will be provided with this question paper. You should follow the instructions on the front cover of the answer booklet. If you need additional answer booklets, ask the invigilator for a continuation booklet.

Section A

Answer **all** questions.

Section B

Answer **two** questions.

The number of marks is given in brackets [] at the end of each question or part question.

This document consists of **7** printed pages and **1** blank page.

Section A

Answer **all** questions in this section.

1 Issues in Cryptocurrency

Extract 1: What is Cryptocurrency (Crypto)?

A cryptocurrency is a digital or virtual currency secured by cryptography, which makes it nearly impossible to counterfeit or double-spend. It is a form of digital asset based on a network that is distributed across a large number of computers. This decentralized structure allows them to exist outside the control of governments and central authorities. Some experts believe blockchain and related technologies will disrupt many industries, including finance and law. The advantages of cryptocurrencies include cheaper and faster money transfers and decentralized systems that do not collapse at a single point of failure. The disadvantages of cryptocurrencies include their price volatility, high energy consumption for mining activities, and use in criminal activities.

Source: Investopedia, assessed 3 December 2024

Extract 2: Why Investors buy Crypto

In a little more than a decade, investors have transformed cryptocurrency from a technocuriosity into a trillion-dollar-plus opportunity that has the potential to one day reshape the global economy. A new study by Harvard Business School professor Marco Di Maggio shows that on average, cryptocurrency investors have higher household incomes, live in wealthier and more educated ZIP codes, like to gamble, frequently use credit cards, and often overdraft their checking accounts.

Moreover, these investors are drawn by the lure of potentially higher returns in a “lottery-style payoff” than the returns expected from traditional investments. Plus, the COVID-19 stimulus money led new investors to experiment with cryptocurrencies, according to the study. Yet while crypto investors might have a higher risk tolerance than more typical investors, they make decisions based on the same variables as other investors in traditional asset markets.

At the same time, the industry finds itself in the spotlight of regulators who are exploring ways to tighten control of the fledgling market. In addition, despite the growth of cryptocurrency, many consumers and businesses remain sceptical.

A study of 59 million United States (US) consumers

Di Maggio and a team of economists analysed the bank account and credit card transactions of more than 59 million US consumers between January 2010 and May 2021. They then supplemented this massive database with demographic data, such as income ranges and places of residence.

Two surges in crypto’s popularity

The heart of the paper sought to answer a fundamental question: Who invests in crypto?

- Booming interest in Bitcoin in 2017 drove new investors into cryptocurrency at a rate of about 10,000 people per month.

- Three years later, a second surge brought in new investors but at a slower rate of about 5,000 investors per month.
- During both periods, investors devoted about 3 percent of deposits and 6 percent of spending to purchasing cryptocurrency.
- Sixty percent of crypto transactions are made by investors earning more than \$75,000, while those earning \$45,000 or less accounted for another 20 percent of the transactions.

What to know about cryptocurrency investors

Di Maggio's findings offer some key insights about the world of cryptocurrency investing:

- **More people are embracing crypto.** Managers who have been contemplating whether it makes sense for their companies to start accepting cryptocurrency as a form of payment may want to consider doing so. Since the study suggests that crypto investing has edged into the mainstream, it means businesses are likely to see more consumer demand for spending of crypto as a currency in lieu of dollars and cents.
- **Crypto may offer inflation protection.** Many in the investment community have argued that cryptocurrencies, Bitcoin in particular, provide a hedge against inflation because they are not subject to the decisions of a government or central bank, and feature a limited supply schedule that make Bitcoin resemble digital gold.
- **Investors often don't stick with crypto for the long haul.** Investors seem more willing to cash out of crypto investments than traditional investments, a sign that some are drawn by the promise of a lottery-style payout.

*Source: adapted from: Ben Rand,
Why Mainstream Investors Buy Crypto, 17 August, 2023*

Extract 3: Information asymmetry

Bitcoin transactions are influenced by prevailing social sentiment in the market, leading to information asymmetry. This sentiment often forms on social platforms that cater to market participants. Some buyers may have access to trading-relevant information, while sellers may lack it, because the information is intentionally withheld or simply unavailable. The reverse scenario can also occur, where sellers possess an informational advantage over buyers.

Asymmetric information has existed in financial markets for many years, and many participants tend to think of information as not being evenly distributed across participating traders (both buyers and sellers) (Spencer, 2000). Information asymmetry for Bitcoin has been stronger than for stocks (Park and Chai, 2020). Informed traders tend to transact based on economic policy uncertainty and privileged information about digital currency prices.

Bitcoin trade is prone to information asymmetry because the related information has not had enough time to accumulate into a consistent single-source, large-scale data corpus so it can be fully studied (Lindman et al. 2017). Thus, traders have difficulty obtaining data they need. Second, information disclosure systems to mitigate information asymmetry among traders also have not been effectively established. Third, the market is inherently imperfect. So, information is not always distributed equitably (Easley et al., 2010) and information asymmetry is unavoidable.

Source: adapted from: K. Kim and R. Kauffman, information asymmetry, 2024

Extract 4: Bitcoin Mining in Kazakhstan

Kazakhstan's largest Bitcoin mine, Enegix, is located in Ekibastuz city, deep into the country's rust belt, a region marked by aging infrastructure and Soviet-era architecture. When fully operational, Enegix's facility consumes 150 megawatts of power, five times the peak demand of Ekibastuz itself. Abundant coal and the withering of industrial production after the collapse of the Soviet Union left the area with an electricity surplus. Eventually Bitcoin miners cottoned onto that fact, and in 2017, they started to arrive. Not only was power cheap, but there was almost limitless land and a surfeit of unused industrial buildings that mines could inhabit.

Kazakhstan's miners took advantage of tax breaks and cheap power, and illegal miners also exploited Kazakhstan's crony politics and lax governance to operate below the surface—which overloaded the country's energy grid. By the end of 2021, the mining industry was consuming more than 7% of the entire generating capacity of Kazakhstan, a country of 19 million people. The surge tipped the grid over from surplus into deficit. Power shortages led to localised blackouts in parts of the country, exacerbating existing tensions over corruption, nepotism, and the rising cost of fuel. In January 2022, these issues boiled over into mass protests. Within weeks, the government effectively cut miners off from the national grid, bringing the boom to an abrupt end.

Critics of Bitcoin mining say that what happened in Kazakhstan was inevitable. This is an industry that is often drawn to geopolitical gray areas and borderlands, where it exploits weak political systems, extracts value, and exacerbates social divisions. While its defenders say it is a high-tech export business that could create the foundations of a new economy, the benefits, in terms of jobs and social contributions, seem at best ephemeral. The industry simply came and went, draining hundreds of millions of dollars in state subsidies, enabling corruption, squatting on the energy grid, and burning thousands of tons of coal per day.

The Kazakhstan government hopes its crypto story isn't over yet. Even as miners were shutting down and moving out, officials were attempting an ambitious reinvention of the industry, rolling out a red carpet for crypto exchanges and investors in an attempt to turn the country into a global crypto finance hub. The government believes this is a way to kick-start its finance and technology sectors. But it could face an uphill battle.

Because there was no legal way to convert Bitcoins to ordinary currency, most of those being mined were dropping into wallets overseas, meaning that as the cryptocurrency's price surged to more than \$65,000 in November 2021, it was the international owners who were booking the gains.

Source: adapted from: Peter Guest, Bitcoin mining, 12 January 2023

Extract 5: Crypto Mining's Connection to Conflict

Why is the crypto industry so energy-intensive? Some cryptocurrencies rely on something called “proof-of-work” mechanisms to validate transactions. This is done by crypto “miners”, who use computers to solve mathematical problems to monitor and validate new crypto transactions. The aim of each miner is to solve these mathematical equations before others so that they can be paid out a set number of cryptocurrency for their work.

The electrical energy required to complete a single transaction for Bitcoin, the world's most popular cryptocurrency, could power the average US household for nearly 27 days and has a carbon footprint equal to nearly one million VISA card transactions.

Such massive energy demands have led to energy and climate issues posed by crypto mining facilities. In some cases, crypto mining companies are turning to renewable energy sources. This is driven partly by requests from states, such as Quebec and New York, which have temporarily paused all new mining operations unless they are powered by renewables. The hope is that deploying renewables may help to offset some of the carbon emissions produced by crypto mining.

But crypto companies are also reading the room. Over 200 companies and individuals signed the Crypto Climate Accord, an effort to move the entire industry to net-zero emissions by 2030. However, the extent to which renewable energy is powering crypto mining and thereby reducing its environmental impact is up for debate.

Certain countries friendly to crypto mining will continue to adopt new restrictions in an attempt to limit carbon emissions and hedge negative energy impacts. Starting in 2022, Kazakhstan imposed extra taxes on crypto miners and briefly shut down internet access to disrupt mining. These steps signal the government's push for stricter environmental and regulatory compliance in the industry. However, experts believe the move will significantly alter the incentives for those looking to deploy capital inside Kazakhstan.

Meanwhile, crypto miners will continue to seek out new opportunities and move to locations that provide cheap and readily available energy, and will target countries where weak governance and corruption may make regulations less likely. Crypto mining companies are already seeking out other nations in Central Asia and parts of Africa, such as Virunga National Park in the Democratic Republic of Congo.

To address the issue of crypto mining above and beyond energy, government entities must first be tasked with tracking the environmental impacts of crypto mining, such as a carbon fee based on shadow prices to quantify the economic cost of environmental remediation. This may lead to a more robust comparison between the boon and ban of crypto mining.

Given the knock-on effects of national regulations, there must also be some form of global governance to prevent crypto miners from simply seeking out new regions with accessible energy resources and poor regulation. One avenue is through increased collaboration across global enforcement bodies, such as the Egmont Group, as well as information sharing and capacity building. International standard-setting bodies — including the G7, G20, the Organisation for Economic Co-operation and Development — must also play a role.

*Source: Where Cryptocurrency, Water and Conflict Collide,
United States Institute of Peace, 16 March 2023*

- (a) With reference to Extract 2, explain how different risk attitudes influence individuals' decisions towards cryptocurrency investments. [6]
- (b) With reference to the extracts, explain two different types of market failure associated with Bitcoin. [6]
- (c) Discuss the extent to which issues arising from Bitcoin mining in Kazakhstan can be resolved by allocating property rights to the parties involved. [8]
- (d) Discuss the impact of crypto mining on a country's sustainable development using the capital approach. [10]

[Total: 30]

Section B

Answer **two** questions from this section.

- 2 Discuss whether the presence of decision-making biases undermines the assumption of rationality in consumer behaviour and evaluate the relative usefulness of traditional and behavioural economics in guiding policy decisions. [35]

- 3 Geopolitical tensions between the United States (US) and China since 2018 have created uncertainty in global markets, disrupting supply chains and trade flows. For large firms, particularly multinational corporations (MNCs), maintaining a competitive advantage is crucial.

In view of the geopolitical tensions between the US and China, evaluate the strategies that might be adopted by a MNC to maintain competitive advantage in the market. [35]

- 4 Green spaces, such as neighbourhood parks, park connectors and mall rooftop gardens contribute to urban liveability and help cities adapt to climate risks. Some green spaces are provided for by the government, while others are treated as club goods and produced by the private sector. Even for such club goods, there is room for government intervention to incentivise private actors to maximise the benefits of such green spaces while minimising their negative effects, such as externalities and social injustice.

Discuss why some green spaces are provided for by the government while others are left to the free market, and assess the potential impacts of government intervention to maximise the benefits or minimise the costs of green spaces on its economic aims. [35]

- 5 Policies targeting the poor may result in economic inefficiencies and distortions that retard growth.

Explain how the pursuit of inclusivity might limit the ability of the economy to grow and discuss the best way to achieve inclusive growth in light of this problem. [35]

- 6 The circular economy aims to decouple economic activity and growth from the consumption of finite resources by keeping products in use for as long as possible and transforming these back into inputs. The ideal state is for production and consumption process to go in a continuous loop, resulting in net-zero waste outcome.

Discuss if the circular economy approach would effectively reduce resource depletion and environmental degradation. [35]

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