Dispute Resolution

Singapore Court of Appeal Delivers Landmark Judgment on Doctrine of Mistake in Cryptocurrency-Related Contract Claim

Introduction

Rajah & Tann Singapore's financial services disputes team secured a win for one of the world's leading cryptocurrency trading companies, B2C2 Ltd ("**B2C2**"), before the Singapore Court of Appeal. In a ground-breaking decision (*Quoine Pte Ltd v B2C2 Ltd* [2020] SGCA(I) 02), Singapore's apex court addressed novel legal issues arising in the unregulated and "not for the faint hearted" world of cryptocurrency algorithmic trading. The ruling affirms the first instance decision of the Singapore International Commercial Court, in which cryptocurrency exchange operator Quoine Pte Ltd ("**Quoine**") was found liable for unilaterally reversing completed trades in Bitcoin and Ethereum.

The Court of Appeal's decision provides authoritative guidance on how courts should determine contractual terms and the knowledge and expectations of the parties in transactions involving algorithmic processes rather than traditional human decision-making. Specifically, the central issue was how the doctrine of unilateral mistake ought to apply, given that in algorithmic trading, parties do not know whether and on what terms an offer might be made and accepted until after their contracts have been entered into.

To this end, the four-Judge majority comprising Chief Justice Sundaresh Menon, Judges of Appeal Andrew Phang and Judith Prakash, and International Judge Robert Shenton French, preferred an approach of "incremental adjustment" over "fundamental redesign", and agreed with B2C2 that traditional principles governing unilateral mistake are well capable of dealing with the novel circumstances of algorithmic trading.

In contrast, the sole dissenting judgment of International Judge Jonathan Mance advocates what might be said to be a significant expansion of the doctrine of unilateral mistake in equity, propounding a test which asks what an honest and reasonable trader would have understood, given knowledge of the particular circumstances.

The Court of Appeal's decision is likely to serve as a portent of things to come in the burgeoning fields of smart contracts and artificial intelligence. On the regulatory front, the case buttresses the cry for the cryptocurrency trading industry to be uniformly regulated globally, in particular on key aspects such as

the relationship between customers and an exchange, margin trading, market making, and maintenance and segregation of customer assets.

B2C2 was represented by lead counsel, Danny Ong, along with Rajah & Tann's Sheila Ng, Zhuang Wenxiong and Jason Teo.

Brief Facts

Quoine operated a cryptocurrency exchange platform known as QUOINExchange ("**Platform**"), on which B2C2 traded as one of many customers via its proprietary algorithmic trading programme. Quoine also conducted market-making on its own Platform via its Quoter Programme, which created liquidity on the Platform by actively placing orders to buy and sell cryptocurrencies, and in so doing, helped to minimise market volatility on the Platform. The buy and sell contracts on the Platform, being algorithmic trades, were concluded without any direct human involvement.

Quoine failed to make certain necessary changes to critical operating systems on the Platform, setting off a chain of events, in particular the failure of its Quoter Programme, which eventually led to the transactions which were the subject of the dispute. These comprised 13 trades concluded between B2C2 and two other users of the Platform on 19 April 2017, where B2C2 sold Ethereum ("**ETH**") for Bitcoin ("**BTC**"), at a rate of about 10 BTC for 1 ETH ("**Disputed Trades**"). The rates at which the Disputed Trades were concluded were approximately 250 times the prevailing rate in the market of around 0.04 BTC for 1 ETH.

Upon discovering the Disputed Trades the next day, Quoine considered that the rates at which the trades were concluded were highly abnormal, and unilaterally cancelled the trades. The debit and credit transactions involving B2C2's and the Counterparties' accounts were also reversed.

B2C2 sued Quoine on the basis that its unilateral cancellation of the Disputed Trades and reversal of the settlement transactions were in breach of contract and in breach of trust. At first instance, International Judge Simon Thorley QC, sitting in the SICC, rejected all of Quoine's defences and allowed B2C2's claims for both breach of contract and breach of trust. Quoine appealed in full.

Contract Terms and Mistake in Contracts Formed by Computer Algorithms

The heart of Quoine's case, both below and on appeal, was its assertion that it was warranted in cancelling the Disputed Trades because, by application of the doctrine of unilateral mistake at common law and in equity, the contracts underlying the Disputed Trades ("**Trading Contracts**") should be vitiated.

Under the doctrine of unilateral mistake, a contract will be vitiated where one party enters into the contract while operating under a mistake as to a *fundamental* term of the contract, and the other non-

mistaken party has either *actual* or *constructive* knowledge of the mistaken party's error. In the context of algorithmic trading and contracts formed through the functions of automated computer programs, two novel issues arise:

(a) where both contracting parties' algorithms operated as they were meant to in producing the resulting contract, could one party nonetheless be said to have been labouring under a mistaken belief in entering into the contract?
(b) how should the law assess the state of knowledge of the non-mistaken party, in circumstances where no human is involved at the time of the formation of the contract?

Mistake must be to a fundamental term of the contract

As to the first question, Quoine's case on appeal was that the Counterparties believed they were buying ETH for BTC under contracts at prices which accurately represented or did not deviate significantly from the true market value and/or price of ETH relative to BTC on 19 April 2017 ("**Alleged Mistake**"). It was contended that this mistaken belief went to a *fundamental term* of the Trading Contracts. The Judge at first instance agreed with Quoine on both counts (but ultimately ruled against Quoine on the issue of knowledge of the mistake). On appeal, B2C2 sought to vary the Judge's decision on this point.

The majority agreed with B2C2 and overturned the Judge's finding, holding that whilst the Counterparties held the mistaken belief, such belief did not go to a *term* of the Trading Contracts.

A central consideration was the fact that the Trading Contracts were entered into pursuant to the actions of *deterministic* algorithms (i.e. algorithms that contract in a mechanistic fashion by reference to their data input, rather than through the application of 'artificial intelligence').

The majority held, in line with B2C2's submissions on appeal, that because the two algorithmic programs acted exactly as they had been programmed to act in arriving at the 10BTC:1ETH price, it could not be said that there had been a mistake as to the price at which the Trading Contracts were executed. At most, the Alleged Mistake was a *mistaken assumption* on the part of the Counterparties as to how the Platform would operate. Given the longstanding principle that mistaken assumptions are incapable of engaging the doctrine of unilateral mistake, this point alone would have been fatal to Quoine's appeal. This issue was not dealt with specifically in the minority judgment.

The majority decision is noteworthy in clarifying that, in the context of a contract formed by deterministic algorithms, in identifying whether there is an operative mistake as to the fundamental terms, the Court will have regard to whether the algorithms have acted as designed in producing the terms on which the relevant contract was concluded. If the relevant algorithms were programmed to produce a contract at a specific price upon being fed a specific input, it could hardly be said that a mistake as to price has occurred when those specific inputs and outputs were subsequently delivered.

Thus where a party engaged in algorithmic transacting considers a certain factor or limitation to be fundamental (such as where he desires to limit the contract price with reference to external market data),

the onus is on him to program the algorithm to take into account such factors or limitations, and prevent contracts exceeding such factors or limitations from being formed in the first place, rather than being content to operate on the assumption that such contracts will not arise.

Assessing knowledge where no human is involved at the time of contracting

The field of algorithmic trading and contracts formed by computers gives rise to a unique problem not readily encountered in 'traditional' contracts executed between human actors – how should the law assess the state of knowledge of the non-mistaken party in circumstances where no human is involved at the time of contract formation?

Quoine argued that the law ought to deal with the question of knowledge in such circumstances by reference to what the position would have been and what the contracting parties were likely to have known, intended and agreed if they had face-to-face negotiations at a hypothetical meeting on the "floor of the exchange" to enter into the Trading Contracts, at the time these were entered into.

The majority, agreeing with the Judge below, rejected Quoine's 'hypothetical meeting' approach, observing that it would be wholly artificial to recast the relevant matrix of fact, which was one where the contracting parties did not in fact know beforehand that they were going to enter into the Trading Contracts or their terms, and were content to abide by what the relevant algorithms did at least as long as this was within the ambit of their programmed parameters.

Instead, the majority assessed the question of knowledge with reference to three questions: *Whose* knowledge is to be assessed? At what *time* is the knowledge to be assessed? Finally, what is the *quality* of the knowledge required?

On the question of *whose* state of knowledge is to be attributed to the parties at the time of a contract made through deterministic algorithms, the relevant inquiry cannot be directed at the parties themselves, who had no knowledge of or direct personal involvement in the formation of the contract. Agreeing with the Judge, the majority held that because a deterministic computer program or algorithm does what the programmer has programmed it to do, the proper approach is to work backwards from the output that emanated from the deterministic program, and examine the state of knowledge of the programmer.

As for the *time* for assessing that programmer's knowledge, the majority observed that the time of programming is when the programmer's knowledge is the most concrete, but the inquiry must extend past that point, all the way up to the point at which the contract is concluded. In this way, the inquiry would capture a situation where a programmer did not know of the mistake at the time of programming, but came to know of it later, albeit before the time of contracting. If the programmer nonetheless allowed the algorithm to continue running, he might well be taken to have intended to take advantage of the mistake and thus possess the requisite knowledge to engage the doctrine of unilateral mistake.

Finally, with regard to the *quality* of the requisite mistake, the majority observed that it would be artificial and unrealistic to require the programmer to have had prophetic knowledge of the specific and precise

details of the mistake that subsequently arose. Instead, it suffices to frame the enquiry in the following terms:

> "*When programming the algorithm, was the programmer doing so with actual or constructive knowledge of the fact that the relevant offer would only ever be accepted by a party operating under a mistake and was the programmer acting to take advantage of such a mistake*?"

Applying this analytical framework to the facts of the case, the majority considered the totality of the evidence and the Judge's factual findings, and found there was nothing to suggest that Mr Boonen, programmer of B2C2's Trading software, ever had actual or constructive knowledge of the Alleged Mistake on the part of the Counterparties.

The majority decision is notable for the significant clarity it has brought to the doctrine of mistake in contracts concluded by non-human actors. It is also relevant to note that the majority did not "fundamentally redesign" the doctrine of mistake, but instead refined its existing principles to account for the novel circumstances of this case.

Mance IJ's dissenting opinion on unilateral mistake

In contrast with the majority decision, the minority dissenting judgment of Mance IJ is notable for its very different approach in applying unilateral mistake to contracts concluded by deterministic algorithms. Mance IJ advocated an expanded scope of equitable mistake, which would account for what B2C2's actual state of mind *would have been*, given knowledge of the circumstances of the transactions as and when they occurred. On this hypothetical basis, Mance IJ observed that the evidence suggested that Mr Boonen *would have* known that the transactions had occurred by mistake, had he foreseen the transactions in advance or been involved at the time when the transactions occurred.

Mance IJ's radical approach to developing the law to account for the novel facts of the instant case may well lay the groundwork for further debate and development of the relevant principles in future disputes.

Cryptocurrency as Customer Assets Held on Trust

On B2C2's claim for breach of trust, on which it succeeded at first instance, the majority allowed Quoine's appeal on the basis that there was insufficient evidence that Quoine intended for the cryptocurrencies comprised in credit balances under customer accounts to be held on trust by Quoine. Instead, the evidence pointed to Quoine not having maintained or segregated assets representing such credit balances (as would otherwise have been required in respect of regulated trading in other financial products in Singapore and other key financial markets).

The Court of Appeal also had the opportunity to consider whether cryptocurrency, specifically Bitcoin, constituted a species of property capable of being held on trust. Whilst the majority declined to come to a final position on this question in the instant case, it was observed, upon a review of the authorities and academic opinion on this issue, that there was much to commend the view that cryptocurrencies may

be capable of assimilation into the general concepts of property, although questions remained as to the *type* of property that is involved.

Other Contractual Issues

Apart from the central issue of unilateral mistake, the majority also dealt with a number of other contractual issues.

On the question of the contractual relationships between Quoine as exchange operator and its customers, upon analysis of the relevant contract terms, the majority declined to find that Quoine interposed itself as middle-man to trades between customers, and accordingly declined to find that it was obliged to underwrite risk of default, which would have been the case if Quoine were a settlement agent in the context of a traditional securities' exchange.

The majority also upheld the Judge's findings that Quoine could not rely on certain express and alleged implied terms of its contract with B2C2 to reverse the Disputed Trades.

As for Quoine's reliance on the doctrines of common mistake and unjust enrichment, the majority similarly agreed with B2C2's submissions and the first instance decision. As to common mistake, given the absence of evidence that B2C2 was itself mistaken in entering into the contracts, the plea necessarily failed. As to unjust enrichment, Quoine's case on unjust enrichment relied on the same points raised in relation to its already-rejected case on unilateral mistake.

Conclusion

The decision in *Quoine Pte Ltd v B2C2 Ltd* [2020] SGCA(I) 02 is set to become the seminal judgment on the law of mistake in modern contracting, whereby human involvement is diminishing and being 'outsourced' to automated computer systems. Though the case involved cutting-edge modern technology, the decision shows that time-honoured legal principles are of continuing relevance even in novel situations potentially far removed from the circumstances in which such principles were developed. True to its common law roots, the Court's approach is often one of incremental development, rather than radical redesign.

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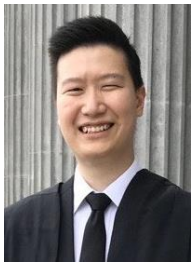

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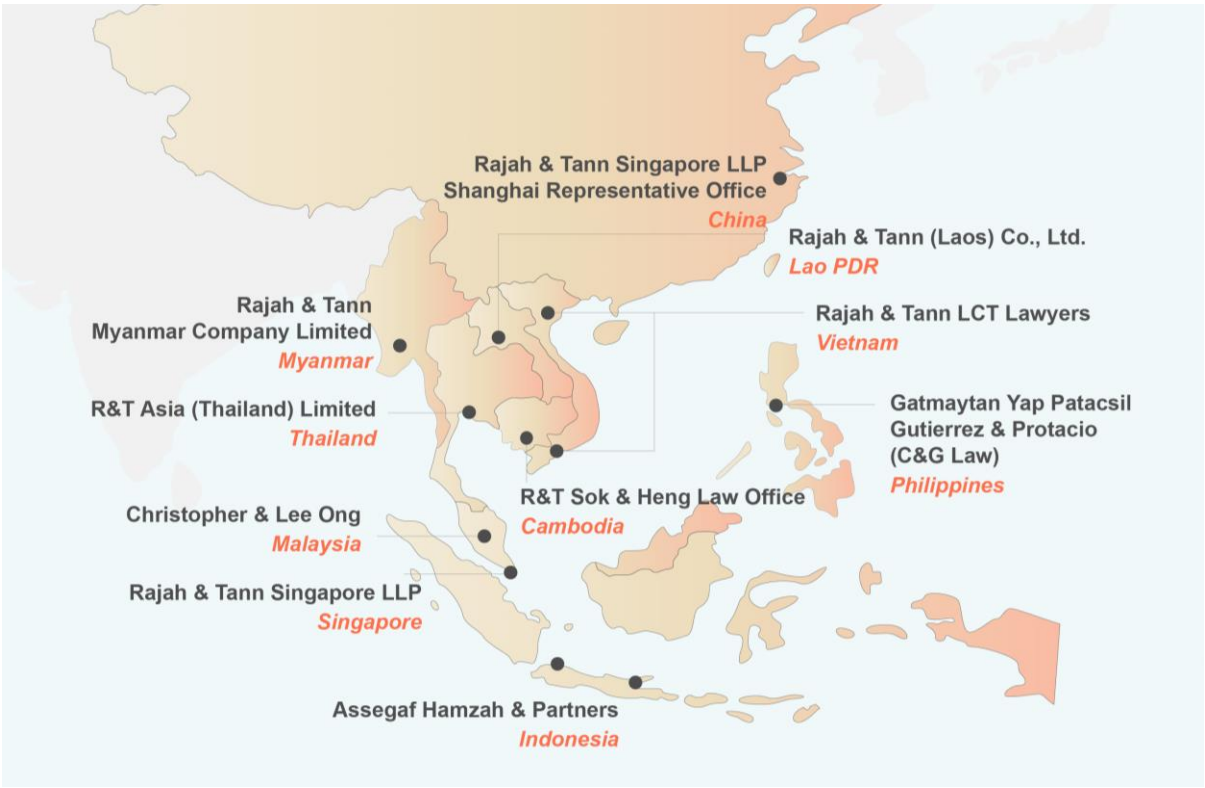

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