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Criminal forms of high frequency trading on the financial markets

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Section 90(1) of the UK Financial Services Act 2012 criminalises the creation of a false or misleading impression in financial markets. In the absence of any criminal prosecutions under this section to date, the potential scope of the new criminal offence remains moot especially in the context of high frequency trading where market participants develop trading strategies using algorithmic computer programs which are designed to profit from very small movements in share prices which have been generated by a series of high-speed purchases and sales, or short sales and subsequent purchases. Notwithstanding the fact that section 90 does not reference high frequency trading, the statutory language is sufficiently broad to capture high frequency trading strategies where it can be shown that they have created a false or misleading impression as to the price or value of the company share which has been, or is being, traded.

A. Introduction

In the wake of the American "Flash Crash" of 6 May 2010, during which the Dow Jones Industrial Average fell nearly 600 points in five minutes, only to recover most of its losses by the end of the trading day, regulators and prosecutors in global financial centres have faced calls to respond to high frequency trading (HFT): a super-fast, computer-based form of trading which has been perceived by some as a threat to market stability. Accounting for an estimated 60% of US and 30% of UK trading activity, HFT is now a well-integrated feature of the global market infrastructure.[1] The increased use of HFT strategies using complex algorithmic computer programs has also accelerated market activity across multiple exchanges and in private dark pools, leading to growing concerns that HFT has rendered financial markets both more fragile and more prone to pernicious manipulation.

Nearly five years after the Flash Crash, the US Department of Justice (DOJ) filed a criminal complaint against a London-based trader, Navinder Singh Sarao, in connection with his alleged role in the crash. The first prosecution in connection with the Flash Crash, the complaint of 11 February 2015 alleges that Sarao used abusive HFT practices, whilst trading from his parents' home, which helped destabilise markets and trigger the crash. More specifically, Sarao is said to have employed a manipulative algorithmic program designed to enter to buy or sell large quantities of e-Mini futures into exchange trading books, without any intention of executing these trades. It is alleged that the algorithm automatically cancelled these large orders before any execution, enabling Sarao to create the appearance of high demand or supply of e-Mini futures and causing prices to move in favour of his other, genuine trades. According to the DOJ, Sarao's "particularly intense" use of this algorithm enabled him to realise a profit of US$40 million and had the effect of "spoofing" the market as it created the appearance of great selling pressure on 6 May 2010. On the prosecution's case, this caused a "divergence" in the market for e-Mini futures, which spread to the rest of the equities market and culminated in the Flash Crash.[2] Arrested in London on 21 April 2015, at the time of writing Sarao is fighting extradition to the US. In the absence of any prior consideration in the UK of whether the criminal law addressing manipulation of the financial markets is broad enough to encompass the use of allegedly abusive HFT trading strategies, whether there was the necessary "dual criminality" at the time the alleged offences occurred to support the extradition is a potential issue in the case.

Against this background, the application of the new criminal offence set out in section 90(1) of the Financial Services Act 2012 (FSA) to certain types of HFT arises for consideration. The FSA was drafted in the aftermath of the global financial crisis and the Libor scandal, and was described as "the most important regulatory reform of financial services ever undertaken in this country".[3] Section 90(1) was one of a number of provisions which were intended to strengthen the market abuse regulatory regime by establishing new criminal offences directed at manipulative behaviour which adversely affected the stability of the financial markets.

B. Section 90

Section 90 criminalises an act, or course of conduct, which creates a false or misleading impression as to the market in or the price or value of any relevant investments. To quote the section in full:

"(1) A person ("P") who does any act or engages in any course of conduct which creates a false or misleading impression as to the market in or the price or value of any relevant investments commits an offence if –
  (a) P intends to create the impression, and
  (b) the case falls within subsection (2) or (3) (or both).
(2) The case falls within this subsection if P intends, by creating the impression, to induce another person to acquire, dispose of, subscribe for or underwrite the investments or to refrain from doing so or to exercise or refrain from exercising any rights conferred by the investments.
(3) The case falls within this subsection if –
  (a) P knows that the impression is false or misleading or is reckless as to whether it is, and
  (b) P intends by creating the impression to produce any of the results in subsection (4) or is aware that creating the impression is likely to produce any of the results in that subsection.
(4) Those results are –
  (a) the making of a gain for P or another, or
  (b) the causing of loss to another person or the exposing of another person to the risk of loss.
(5) References in subsection (4) to gain or loss are to be read in accordance with subsections (6) to (8).
(6) "Gain" and "loss" –
  (a) extend only to gain or loss in money or other property of any kind;
  (b) include such gain or loss whether temporary or permanent.
(7) "Gain" includes a gain by keeping what one has, as well as a gain by getting what one does not have.
(8) "Loss" includes a loss by not getting what one might get, as well as a loss by parting with what one has."
(9) In proceedings brought against any person ("D") for an offence under subsection (1) it is a defence for D to show—
  (a) to the extent that the offence results from subsection (2), that D reasonably believed that D's conduct would not create an impression that was false or misleading as to the matters mentioned in subsection (1),
  (b) that D acted or engaged in the conduct—
    (i) for the purpose of stabilising the price of investments, and
    (ii) in conformity with price stabilising rules,
  (c) that D acted or engaged in the conduct in conformity with control of information rules, or
  (d) that D acted or engaged in the conduct in conformity with the relevant provisions of Commission Regulation (EC) No 2273/2003 of 22 December 2003 implementing Directive 2003/6/EC of the European Parliament and of the Council as regards exemptions for buy-back programmes and stabilisation of financial instruments.
(10) This section does not apply unless—
  (a) the act is done, or the course of conduct is engaged in, in the United Kingdom, or
  (b) the false or misleading impression is created there.

Defences include that the defendant reasonably believed that the conduct would not create a false or misleading impression, or that he acted in accordance with various rules or regulations. Importantly, this includes acting in compliance with rules for the purposes of stabilising the price of investments.[4] Lastly, a connection to the United Kingdom is required to trigger the provision – either the act must be committed in the UK or, alternatively, the false or misleading impression must have been created in the UK.[5] A person convicted under section 90 faces a maximum jail sentence of seven years and an unlimited fine.[6]

Section 397(3) of the Financial Services and Markets Act 2000 (FSMA) had previously required proof of inducement before a person could be guilty of a criminal offence involving misleading impressions. This requirement constituted a significant obstacle for prosecutors in cases involving HFT. In fact, the regulator did not successfully prosecute any cases under section 397(3) for the creation of "false and misleading impressions" during its 12 years in force. Since much abusive HFT activity involves "skimming a few pennies" from others' transactions as opposed to specifically inducing the actions of others, the enlarged scope of section 90 brings this type of activity within the potential reach of the criminal law.

In order to establish the existence of the offence, a prosecutor will need to establish a number of different elements.

First, it needs to be shown that a person has done an "act" or engaged in a "course of conduct". This element is not the subject of any further elaboration or definition in the FSA. It is broadly drafted to suggest that an act or a course of conduct will embrace activity which involves providing orders to another to physically engage in an act, carrying out two or more acts over a period of time which together may contravene section 90, as well as engaging in a single act. Drafted this way, section 90 has the capacity to encompass certain trading strategies, such as those used by HFT traders which involve the placement of multiple transactions and orders, as although in isolation one act may not be of any consequence, taken cumulatively or simultaneously they may distort the market.

Secondly, once an act or a course of conduct is established, a prosecutor must prove that the act or course of conduct created "a false or misleading impression as to the market". Again, this phrase is not defined in the FSA. Drawing upon the regime for imposing civil sanctions, an act or a course of conduct which creates a false or misleading impression will be considered to be abusive. In FSMA, the definition of "market abuse" appears in section 118. Further, the predecessor authority to the Financial Conduct Authority (FCA) was required to produce a Code of Market Conduct (MAR 1) which would identify the types of practices that may be considered as market abuse.[7] While Schedule 1ZA to the FSA provides the FCA with the legislative power to issue codes under FSMA, there is no express incorporation of the MAR 1 as an interpretative guide to the market manipulation provisions of the FSA. To date, case law dealing with section 118 of FSMA has interpreted the phrase "false or misleading impression" consistently with the guidance contained in MAR 1.[8] Presumably, the meaning of this phrase which is at the very crux of section 90(1) of the FSA will be interpreted by the court in the same way. The key section of MAR 1 relating to the creation of false and misleading impressions is MAR 1.6. This sets out guidance as to what types of

behaviour are considered to be manipulative and what others are not and is liable to being updated by the FCA. It provides some examples of manipulating transactions that are said to constitute market abuse. These behaviours include, but are not limited to, trading practices which are known as wash trading, trading to manipulate closing prices, painting the tape, as well as entering orders but cancelling them before execution to give a false impression of demand or supply in the market.[9]

Thirdly, there is the mental ingredient which will need to be shown before a person can be convicted of the section 90 offence. This can be satisfied in one of five alternative ways, depending upon whether the defendant acted intentionally or recklessly.

- Alternative 1: the defendant intended to induce another person to engage, or refrain from engaging, in market activity.
- Alternative 2: the defendant knew the impression was false or misleading and intended to make a gain, or cause loss.
- Alternative 3: the defendant knew the impression was false or misleading, and was aware that creating the impression was likely to make a gain, cause a loss, or a risk of loss.
- Alternative 4: the defendant was reckless as to whether the impression was false or misleading and intended to make a gain, or cause loss.
- Alternative 5: the defendant was reckless as to whether the impression was false or misleading, and was aware that creating the impression was likely to make a gain, cause a loss, or a risk of loss.

C. High frequency trading

With these constituent elements of the criminal offence in mind, a question is raised as to whether activity on the financial markets involving HFT strategies strays into the territory of false or manipulative conduct. After all, in one sense, it might be thought that the very essence of a HFT strategy is to move the price or value of company shares on the financial markets to a trader's advantage. This, of course, is a very superficial perspective and before providing a more considered response to the question it is necessary to gain a better understanding of exactly what HFT and HFT strategies involve.

The broad consensus is that HFT is not a well-defined activity but a set of practices that share an emphasis on high-speed trade execution, computer-driven trading and order-routing strategies, and holding few or no open positions at the end of the day.[10] A broad range of firms use HFT strategies including traditional broker-dealers, private proprietary trading firms, and large hedge funds.[11] All-electronic exchange infrastructure has enabled traders to drastically reduce latency, or the time it takes to receive information from an exchange, when making a trading decision and transmitting the order back to the exchange.[12] Exchanges now sell HFT operators' co-location and direct market access (DMA) rights. The former, HFT operators' co-location, allows traders to place their servers in the same data centre as the exchange's matching engine; the latter permits traders to place trades directly on exchange limit order books with no human intervention. Exchanges also sell direct data feeds that allow traders access to quote data more quickly than the general public. As a result, HFT activity occurs in the "millisecond environment", where "the entire event/analysis/action cycle has been reduced for some traders to a couple of milliseconds".[13] The traders with the lowest latency can exploit opportunities faster than other market participants, yielding a steady stream of small profits. The rise of HFT trading has also driven the development of "dark pools", which are proprietary, opaque trading venues that do not reveal best-priced orders to the public and in which all participants are anonymous. Large investment banks have competed strenuously in recent years to host the largest dark pool, marketing them as environments in which institutional investors can execute large block orders at better prices than on transparent exchanges, since their orders would be hidden from predatory HFT algorithms. A recent spate of litigation alleges that this marketing was in bad faith and that dark pools are actually teeming with HFT activity.[14]

Despite the controversy surrounding HFT, it is not intrinsically manipulative. HFT firms may use high-speed computers to execute strategies that predate the technology enabling ultra-low latency trading. Indeed, there is evidence that HFT activity facilitates price discovery by rapidly linking together disparate trading venues, increases liquidity during normal market conditions, and decreases transaction costs.[15] These developments are not without risk, however. Increased HFT activity seems to make markets more vulnerable to periods of severe illiquidity, and some critics argue that much of the apparent liquidity in normal times is illusory.[16] Moreover, market participants have also observed behaviour that suggests some HFT operators are employing potentially abusive strategies, seeking to capitalise on the increased speed and more fragmented market structure of today's financial markets.[17]

D. HFT strategies

It follows from this analysis that any engagement between section 90(1) of the FSA and HFT strategies will involve situations where a trader is using the strategy to falsify or mislead the financial markets. The key question, of course, is where the line between offensive and inoffensive strategies is to be drawn. Although the HFT industry is notoriously secretive and many of the precise details of strategies are closely guarded, the outlines of some potentially abusive strategies are available. These include techniques which have been described as "layering" or "spoofing", "quote stuffing", "momentum ignition" and "electronic front running" ("pinging" or "scalping").

1. Layering

"Layering the order book" (also known as "spoofing") is a form of market abuse that predates computer trading but has taken on new forms in the era of HFT. Indeed, the only two HFT cases brought by the FCA under the civil market abuse provision, section 118(5) of FSMA, involved layering. When conducting a layering operation, a trader

places large orders on to the public order book to create the impression of large demand or supply for a security, with the intention of driving the prevailing market price in a particular direction. Crucially, these orders are placed with the intention of cancelling them prior to execution, creating a misleading impression of the depth of demand or supply in the market, thereby moving prices. For example, a trader might place a small resting order to buy a particular security at the prevailing best bid. The trader would then place several large sell orders at prices just above the best offer, creating the impression that there was a large supply of the security coming on to the exchange, mimicking an institutional investor's large sell order. The level of trading, and the prices at which company shares are traded, are determined by computer algorithms to which the trader has access. Other algorithms in market would then react to this information by moving the prevailing prices down. As soon as the trader's resting buy order is executed, they immediately cancel the large sell orders, allowing the market to rebound to equilibrium. This entire procedure might be as quick as 300 milliseconds and can allow the trader to buy the security for a couple pennies less than had the trader not created the false impression of supply.[18] Then, to close out this small position at a higher price, the trader would layer the order book in reverse, placing a resting sell order around the best offer. They would then enter a series of buy orders just below the best bid, creating an impression of a large demand for the security. This would drive the market price up to the resting sell order, which would be executed for a small profit. Within a few milliseconds of execution, the trader would then cancel the buy orders, allowing the market to return to equilibrium. Using HFT technology, this round-trip can be executed in less than a second. Although it yields a small profit, once a layering algorithm is perfected it can be repeated rapidly at little cost, building up large, low risk profits over time.

2. Quote stuffing

With direct market access, HFT firms can send electronic messages directly to an exchange's matching engine. Quote stuffing refers to the practice of sending enough orders, cancellations, or updates to an exchange to overload its finite message handling capacity.[19] This "spam" clogs the exchange infrastructure, slowing access for other market participants, whose orders are delayed reaching the exchange. Creating a lag in data availability for other market participants enhances the latency arbitrage opportunities available to HFT firms. Specifically, it could allow an HFT firm to pocket the difference between the fresh prices it can see on direct feeds and the stale prices visible to other market participants. Moreover, by initiating and cancelling orders at frequencies above 6,000 messages per second, it becomes impossible for other participants to execute trades against these messages.[20]

3. Momentum ignition

Momentum ignition uses a series of orders to induce or exacerbate a price movement in the hope of inducing another algorithm in the market to trade along with this momentum.[21] Securities markets are known to show serial correlation over short time horizons, potentially making an algorithmic "follow the momentum" strategy profitable.[22] Whereas a layering algorithm profits from small gyrations of the bid–ask spread, momentum ignition is an attempt to move a security's price enough to trigger other algorithms in the market to follow the momentum, magnifying the initial price movement. This can briefly drive prices away from fundamental values, allowing the manipulator to execute a transaction at a favourable price. By trading early in this process, an HFT operator stands to profit if other algorithms follow the early price moves and the surge of momentum takes off.

4. Pinging/Scalping

Large buy-side investors can attempt to reduce the price impact of their block orders by using techniques such as iceberg orders, which break up the large order into a series of smaller ones. Sophisticated HFT algorithms can detect these strategies and then begin "pinging" inside the best price currently displayed to determine whether the investor has less aggressively priced reserve orders which are not displayed. The HFT pings consist of "immediate or cancel" orders moving closer to the iceberg's displayed price in an attempt to find the hidden reserve orders' limit price. This knowledge enables the HFT to employ predatory strategies such as the "tow the iceberg" strategy to "scalp" a few cents of each share by forcing execution closer to the order's limit price.[23] This strategy increases the large order's price impact, allowing the HFT firm to profit by serving as the institutional investor's counterparty at a slightly different price. The presence of these "predatory algos" has created substantial demand for software that permits buy-side investors to hide their orders more effectively, though this effort merely continues the arms race.[24]

E. Regulating HFT

Mindful of the scope of these abusive practices, UK regulators have increased their scrutiny of HFT operators. In late 2013, the FCA finalised *Coscia*, its first enforcement action against a HFT trader for market abuse, relying on section 118 of FSMA.[25] *Coscia* followed an earlier case known as *Swift Trade* in which the FCA's predecessor, the Financial Services Authority, took similar action against an algorithmic trading firm for market abuse. Both cases involved the use of a "layering" strategy and proceedings were brought under section 118 (5) FSMA prior to the introduction of section 90. More recently, the FCA took action for a similar form of abusive trading in the *Da Vinci* case.

1. Swift Trade

On 6 May 2011, the Financial Services Authority imposed an £8 million fine on Peter Beck, CEO and President of Swift Trade Inc for engaging in market abuse contrary to section 118(5) of FSMA,[26] which remains to date the largest fine ever imposed in the UK for algorithmic market manipulation. Incorporated in Canada, Swift Trade operated an algorithmic

trading platform that was used by its network of traders worldwide. Between 1 January 2007 and 4 January 2008, Swift Trade used a quintessential layering strategy: large orders were placed on one side of the LSE's electronic order book for shares at prices unlikely to attract counter-parties and which Swift Trade did not intend to execute. This activity created a false market impression as the share price moved to reflect the perceived shift in supply and demand. Capitalising on this movement, Swift Trade executed smaller trades on the opposite side of the orders, before rapidly deleting the initial orders. This behaviour was then repeated in reverse. Though price movements were not significant, repetition enabled Swift Trade to realise a profit of approximately £1.75 million. The Court of Appeal[27] agreed with the Financial Services Authority and the Upper Tribunal (Tax and Chancery Chamber)[28] at first instance that Swift Trade had "systematically and deliberately engaged in a form of manipulative trading activity known as layering".[29] The outcome highlighted section 118(5)'s scope to capture certain automated trading strategies, as well as pursue trading firms without a physical presence in the UK for market abuse.

2. Coscia

Around two years later, on 3 July 2013 the FCA imposed a penalty of £598,993 on Michael Coscia, a high-frequency trader with 25 years' experience, and his US-based company Panther Energy Trading LLC (Panther) for engaging in market abuse under section 118(5) of FSMA by deliberately manipulating commodities futures on the ICE Futures Europe Exchange (ICE), a UK-regulated market. Coscia had designed an algorithm that, as in *Swift Trade*, was based around a "layering" strategy. The strategy was used hundreds of times per day, with Coscia placing thousands of false orders enabling him to trade futures contracts. Coscia utilised DMA to execute this strategy on the ICE for a period of six weeks in 2011 to make a profit of US$279,920. According to the FCA, Coscia's large orders created "false impressions of liquidity rather than genuine market supply and demand",[30] and his techniques were deliberately designed to "cheat" the market and undermine its integrity.[31] Penalties and disgorgement orders totalling more than US$3 million were imposed on Coscia in the US by the Commodities Futures Trading Commission (CTFC) and Chicago Mercantile Exchange for similar manipulative conduct in the US future markets.[32] The DOJ also indicted Coscia on criminal commodities fraud charges, marking the US's first criminal prosecution under the anti-spoofing provisions of the Dodd-Frank Wall Street Reform Act.[33] Overall, the outcome in *Coscia* demonstrates the capacity for close cooperation between the UK and US regulators and, in the case of the UK, highlights the willingness of the FCA to investigate and sanction manipulative behaviour in markets other than the equity market.

3. Da Vinci

At the time of writing, judgment is awaited in the High Court, Chancery Division. The FCA has sought a permanent injunction as well as a financial penalty against the traders.

F. HFT and section 90

1. Layering

These cases demonstrate the regulator's definitive position that layering is a form of market abuse. However, in each instance the regulator opted to bring civil proceedings under section 118 of FSMA rather than commence a criminal prosecution under section 397 of the FSMA, or today section 90 of the FSA. This was undoubtedly a deliberate decision, given that action brought under section 118 of FSMA did not require proof that the misleading impression induced someone else to undertake a transaction as required by section 397. Instead, it was necessary to show no more than that, on the balance of probabilities, a regular user of the market would regard the behaviour as falling short of reasonable expectations of acceptable market practice. However, the regulator was able to present evidence in each case that the layering activity was abusive and intentional. In *Swift Trade*, the Tribunal agreed unanimously: "The conduct was deliberate, manipulative market abuse in the form of 'layering' and was not undertaken in accordance with recognized market practice".[34] Analysis of the trading algorithms used in *Coscia* and *Swift Trade* indicates that both Mr Beck and Mr Coscia were aware, or at least ought to have been aware, that the intentional and repeated deployment of the layering algorithms would yield private gains. Thus, if section 90 had been in force when the FCA was considering the commencement of action, it is likely that there would have been sufficient evidence to at least commence a criminal prosecution for market manipulation. Clearly, section 90 applies to at least one HFT abusive strategy, namely layering.

2. Quote stuffing

It is also likely that section 90 will extend to embrace other abusive HFT strategies. As described above, quote stuffing involves flooding an exchange with orders and cancellations so other market participants are left to trade off slower data feeds. This creates opportunities for HFT operators to pocket the spread between the current market prices and the delayed picture of the market visible to slower retail orders. Accordingly, at the time of the execution of a trade, this delayed feed creates a false impression of the market. While the additional latency may only be a fraction of a second, this is sufficient for an HFT operator to profit at the expense of retail orders.[35] The resulting gain for the quote-stuffer is a direct result of this false impression, and thus this conduct is also open to being captured by section 90. There is evidence at both the EU and UK levels that authorities view quote stuffing as manipulative. The FCA's Code of Market Conduct MAR 1.6.9 suggests that the FCA would view the bids submitted in a quote stuffing episode as manipulative because they "change the representation of the best bid or offer prices in a financial instrument … or more generally the representation of the order book available to market participants, and are removed before they are executed".[36] Although this is a UK regulatory document, it appears to be consistent with the Europe-wide view.[37]

3. Momentum ignition

The situation with regard to momentum ignition is no different. Although there have not been any UK prosecutions of HFT operators for momentum ignition, activity involving momentum ignition strategies could have been captured under section 397 of FSMA and arguably will be captured under section 90 of the FSA. Unlike with order book layering, these other algorithms' trades only occurred because of the impression that prices were increasing. A trader employing a momentum ignition strategy might buy a position in a security and then transmit a flood of purchase orders intended to increase the best bid price. If this movement is sufficient to trigger other follow-the-momentum algorithms present in the market, then the trader will begin to buy, driving the price up further.[38]After a time, the trader will close out his position at a profit. Thus, classic momentum ignition may have fallen within the scope of section 397 and it is likely also to fall within the scope of section 90, as the follow-the-momentum algorithms would not have initiated their transactions in the absence of the impression of high demand and an increasing price for the security.

4. Pinging/Scalping

However, pinging or scalping as a component of a liquidity detection strategy fall into a different category and will not incur criminal liability under section 90, since these strategies do not rely on the creation of false or misleading impressions. While the European Securities and Markets Authority lists "ping orders" as a potentially abusive HFT tactic, they do not, in themselves, appear to be manipulative transactions according to the FCA's MAR 1.[39]

5. Cancelled orders

Many of the abusive HFT tactics, including layering and quote stuffing, involve placing trade orders on to exchange order books with the intent to cancel them prior to execution. Much of the public criticism of HFT focuses on this tactic, noting that the rise of HFT since 2006 has corresponded to large increases in the volume of quote messages, while the volume of trade executions has remained relatively flat.[40] The Code of Market Conduct MAR 1.6.9(6) also identifies cancellations as one of the "factors to be taken into account in determining whether or not a person's behaviour amounts to market abuse".[41] However, cancellations are not, in themselves, necessarily abusive. For example, market makers need to be able to cancel resting orders as market prices move, lest they become stale and are executed at a loss.[42] Fortunately, there is little reason to think that the FCA's interpretation of market abuse to include submitting orders with the intention of withdrawing them before execution will criminalise cancellations to the point of interfering with market maker activity. Quotes provided pursuant to bona fide market making activity would not have been transmitted with the necessary manipulative intent, so it would not attract criminal liability. In general, the requirement for prosecutors to prove manipulative intent, the obligation for the FCA to conduct market abuse prosecutions with a view to the public interest, and the fact that these are quite resource intensive combine to suggest that section 90 does not excessively criminalise HFT activity.

G. Conclusion

Amendments to the UK financial regulatory regime, including the new offences in the FSA, represent a strengthening of the UK's market abuse deterrence regime. Although there is a need for important clarification on the reach of section 90, particularly in the form of guidance in relation to the definition of a false or misleading impression and the requisite mental elements for prosecution, its breadth suggests that the UK now has a workable legislative tool to counter market manipulation in its many manifestations. Although targeted at preventing Libor manipulation, section 90 has the capacity to capture predatory HFT strategies that have previously eluded the criminal law, thereby bringing the UK's regulatory regime into the twenty-first century – an era in which HFT dominates trading activity. The introduction of section 90, which renders a market participant criminally liable if he creates a "false or misleading impression" with the intent to gain or cause another to lose, is an important aspect in the expansion of the UK's criminal market manipulation regime. Further, section 90's ability to capture abusive tactics in the quickly evolving world of securities trading represents something of a departure from the traditional UK approach of using narrow criminal offences to police financial markets. Since financial market participants are so adept at changing tactics to side-step specific legal prohibitions, this expansive language may be necessary, but presumably it will be tempered by prosecutorial discretion. It remains to be seen whether the enlargement of the criminal liability will initiate a change in the way in which HFT traders operate in the UK financial markets. ■

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[25] *Supra*, n 18.
[26] See Financial Services Authority, *Decision Notice 2011: 7722656 Canada Inc formerly carrying on business as Swift Trade Inc* (6 May 2011), https://www.fca.org.uk/your-fca/documents/decision-notices/fsa-decision-notice-2011-7722656-canada-inc-formerly-carrying-on-business-as-swift-trade-inc, accessed on 7 May 2015 and Financial Conduct Authority, *Final Notice 2014: 7722656 Canada Inc formerly carrying on business as Swift Trade Inc* (24 January 2014), https://www.fca.org.uk/static/documents/final-notices/7722656-canada-inc.pdf, accessed on 7 May 2015.
[27] *7722656 Canada Inc (formerly carrying on business as Swift Trade Inc) and Peter Beck v FCA & Anor* [2013] EWCA Civ 1662.
[28] *7722656 Canada Inc (formerly carrying on business as Swift Trade Inc) and Peter Beck v FSA* [2013] Lloyd's LR(FC) 381.
[29] Financial Services Authority, *supra*, n 26, [2.1].
[30] Financial Conduct Authority, *supra*, n 18, [28].
[31] Financial Conduct Authority press release issued 22 July 2013, "FCA Fines US Based Oil Trader US$903K for Market Manipulation", http://www.fca.org.uk/news/fca-fines-us-based-oil-trader, accessed on 7 May 2015.
[32] Commodities Futures Trading Commission press release issued 22 July 2013, "CFTC Orders Panther Energy Trading LLC and Its Principal Michael J Coscia to Pay $2.8 Million and Bans Them for Trading for One Year, for Spoofing in Numerous Commodity Futures Contracts", http://www.cftc.gov/PressRoom/PressReleases/pr6649-13, accessed on 7 May 2015.
[33] *United States of America v Michael Coscia*, Criminal Indictment. US District Court, Northern District of Illinois, 14CR551 (1 October 2014).
[34] *Supra*, n 28.
[35] NxResearch, "Retail Trades Disadvantaged by Direct Feeds" (2014), http://www.nanex.net/aqck2/4665.html, accessed on 7 May 2015.
[36] *Supra*, n 9, MAR 1.6.9(6).
[37] This section of the MAR is taken directly from European Commission Directive 2003/124/EC of 22 December 2003 implementing the Directive 2003/6/EC of the European Parliament and of the Council as regards the definition and public disclosure of inside information and the definition of market manipulation.
[38] *Supra*, n 10, 56.
[39] European Securities and Markets Authority, *Guidelines on Systems and Controls in a Highly Automated Trading Environment*, Consultation Paper ESMA/2011/224 (2011), 27.
[40] NxResearch, "The Rise of the HFT Machines" (date unknown), http://www.nanex.net/aqck/2804.html, accessed on 7 May 2015.
[41] *Supra*, n 9, MAR 1.6.9(6).
[42] *Supra*, n 1, 14.