



UNITED NATIONS  
UNIVERSITY  
CRIS

Institute on Comparative Regional Integration Studies



## Future Trends Series - GR:REEN Project

### Title of the report

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**The Future of Computer Trading in Financial Markets; An International Perspective**

### Area

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Science and Technology

### Reporter

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Foresight (Government Office for Science)

### Type of the Reporter

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National Research Programme under the UK Government

### Periodically updated?

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No

### First issued year

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2012

### Latest update

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2012

### Official website

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<http://www.bis.gov.uk/foresight>

### Language available

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English

### Short summary

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"First, the pace of technological change, coupled with the ever-increasing complexity of financial trading and markets, makes it difficult to fully understand the present effect of HFT (High Frequency Trading)/AT (Algorithmic Trading) on financial markets, let alone to develop policies and regulatory interventions that are robust to developments over the next decade. Second, there is a relative paucity of evidence and analysis to inform new regulations, not least because of the time lag between rapid technological developments and research into their effects. This latter point is of particular concern, since good regulation clearly needs to be founded on good evidence and sound analysis. Therefore, the key aim of this Project has been to assemble and analyse the available evidence concerning the effect of HFT on financial markets. Looking back through recent years and out to 2022, it has taken an independent scientific view. The intention has been to provide advice to policy makers."

### Key trends

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- "There will be increasing availability of substantially cheaper computing power, particularly through cloud computing: those who embrace this technology will benefit from faster and more intelligent trading systems in particular";
- "Special purpose silicon chips will gain ground from conventional computers: the increased speed will provide an important competitive edge through better and faster simulation and analysis, and within

transaction systems”;

- “Computer-designed and computer-optimised robot traders could become more prevalent: in time, they could replace algorithms designed and refined by people, posing new challenges for understanding their effects on financial markets and for their regulation”;
- “Opportunities will continue to open up for small and medium-sized firms offering ‘middleware’ technology components, driving further changes in market structure: such components can be purchased and plugged together to form trading systems which were previously the preserve of much larger institutions”;
- “The extent to which different markets embrace new technology will critically affect their competitiveness and therefore their position globally: The new technologies mean that major trading systems can exist almost anywhere. Emerging economies may come to challenge the long established historical dominance of major European and US cities as global hubs for financial markets if the former capitalise faster on the technologies and the opportunities presented”;
- “The new technologies will continue to have profound implications for the workforce required to service markets, both in terms of numbers employed in specific jobs, and the skills required”;
- “Markets are already ‘socio-technical’ systems, combining human and robot participants. Understanding and managing these systems to prevent undesirable behaviour in both humans and robots will be key to ensuring effective regulation”;
- “While overall liquidity has improved, there appears to be greater potential for periodic illiquidity.”

## Suggestions

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- “European authorities, working together, and with financial practitioners and academics, should assess (using evidence-based analysis) and introduce mechanisms for managing and modifying the potential adverse side-effects of CBT (Computer Based Trading) and HFT”;
- “Coordination of regulatory measures between markets is important and needs to take place at two levels:
  - ◇ Regulatory constraints involving CBT in particular need to be introduced in a coordinated manner across all markets where there are strong linkages.
  - ◇ Regulatory measures for market control must also be undertaken in a systematic global fashion to achieve in full the objectives they are directed at”;
- “Legislators and regulators need to encourage good practice and behaviour in the finance and software engineering industries. This clearly involves the need to discourage behaviour in which increasingly risky situations are regarded as acceptable, particularly when failure does not appear as an immediate result”;
- “Standards should play a larger role. Legislators and regulators should consider implementing accurate, high resolution, synchronised timestamps because this could act as a key enabling tool for analysis of financial markets”;
- “In the longer term, there is a strong case to learn lessons from other safety-critical industries, and to use these to inform the effective management of systemic risk in financial systems”;
- “The development of software for automated forensic analysis of adverse/extreme market events would provide valuable assistance for regulators engaged in surveillance of markets”;
- “Unlocking the power of the research community has the potential to play a vital role in addressing the considerable challenge of developing better evidence-based regulation relating to CBT risks and benefits and also market abuse in such a complex and fast-moving field”;
- “The above measures need to be undertaken on an integrated and coordinated international basis in order to realise the greatest added value and efficiency. One possible proposal would be to establish a European Financial Data Centre.”

## Methodology

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Research from primary sources and modelling

Reference to other trends reports? If yes, which reports?

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