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TO POST, OR NOT TO POST – THAT IS THE QUESTION: EMPLOYEE MONITORING AND EMPLOYEES' RIGHT TO DATA PROTECTION

by

ADRIENN LUKÁCS*

Nowadays social media have a growing importance in several areas of our lives. They are used for numerous objectives: self-expression, keeping in touch with acquaintances, communication or obtaining information about the latest events and news. During their use the individual shares a significant amount of personal data. This conduct can have serious implications for employment. The (prospective) employer is interested in the surveillance of these sites for several reasons, as he/she can easily gain insight into the individual's private life and obtain, without costs, detailed information about him/her. The legal problem arising is that the employee's fundamental rights – namely the right to privacy and the right to data protection – collide with the employer's legitimate interests.

The aim of the paper is to highlight the different rights and interests present on the two sides of the parties in the employment relationship; focusing on the employee's right to data protection and on the employer's legitimate interests in monitoring employees. As a result of the paper, I will draw attention to the legal problems lying behind social network background checks and monitoring. I will provide recommendations on how users and employers can continue using these sites while still preserving privacy.

KEY WORDS

Privacy, Data Protection, Social Network Sites, Employment Law, Employee Monitoring

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1. INTRODUCTION

Social media are of increasing importance in our everyday lives, they have become one of the main forms of communication and self-expression. It is easy to see that during their use an enormous amount of personal data is shared, which can have serious implications for the professional life of the individual. The aim of the paper is to analyse what data protection rights the employees dispose during the use of social network sites, what their interests are in using these sites and how these interests and rights collide with the employer's desire to monitor Facebook in order to enforce his/her legitimate interests. The paper focuses on the subject from the view of the European Union law, with special regard to the data protection directive and the data protection regulation. The original contribution of the paper is that it gives clarity to the present understanding of the problem and it examines exhaustively the data protection challenges arising during the use of social network sites, focusing specifically on the characteristics of the employment context. The overarching research question that I intend to answer is what special data protection questions arise during the different phases of the employment relationship and how the employee's right to data protection can be respected during employee monitoring.

As regards methodology, I conducted desktop research and I applied descriptive and analytical approach to examine the research subject. First, I am going to examine what the main interests and rights underlying the employee use of Facebook are, then I am going to examine why the (prospective) employer is interested in monitoring the (prospective) employee's activity on online social networks. In the next part I am going to review the main data protection problems and challenges regarding social network background checks and monitoring conducted by the employer, and in the last part of my paper I am going to provide possible solutions and recommendations towards the privacy friendly use of social network sites.

2. WHY DO EMPLOYEES USE FACEBOOK?

Nowadays we can experience the growing popularity of social network sites (hereinafter referred to as: SNS). In order to address the question of SNS use and privacy, first, I am going to examine our subject in a broader

context and I am going to look into the reasons that drive the individual to use these sites. Then I am going to present the legal framework applicable to privacy and data protection.

2.1 REASONS UNDERLYING THE USE OF SOCIAL NETWORK SITES

The first SNS – SixDegrees – appeared in 1997[1], and since then several others have followed.[2] *Boyd* and *Ellison* define SNSs as

> *"web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system."*[3]

Through the use of SNSs, users can create their own content, stay in touch with their friends, watch and share photos or videos, etc. – depending on the particular properties of the given SNS. All these activities come with the share of personal data. In my paper I will mostly use the example of Facebook, instead of SNSs in general, as it is the most popular SNS today, with the highest number of users worldwide.[4] All generations are present on Facebook,[5] meaning that employees and prospective employees use these sites just like any other individual.

SNSs have a significant role in our everyday lives. *Grimmelmann* argued that nowadays SNSs constitute an important tool for social interaction, as they can fulfil basic human needs like self-expression, communication and being part of a community.[6] *Clark* and *Roberts* note that technology has always had a significant impact on how people communicate

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1 Boyd, D. M. and Ellison, N. B. (2008) Social Network Sites: Definition, History and Scholarship. *Journal of Computer Mediated Communication*, 13 (1), p. 214.

2 On the (not exhaustive) list of SNSs see *List of social networking websites.* [online] Wikipedia. Available from: https://en.wikipedia.org/wiki/List_of_social_networking_websites [Accessed 9 November 2016].

3 Boyd, D. M. and Ellison, N. B. (2008) Social Network Sites: Definition, History and Scholarship. *Journal of Computer Mediated Communication*, 13 (1), p. 211.

4 Facebook had 1.79 billion monthly active users worldwide in 2016. Source: *Number of monthly active Facebook users worldwide as of 3rd quarter 2016 (in millions).* [online] Statista. Available from: https://www.statista.com/statistics/264810/number-of-monthly-active-facebook-users-worldwide/ [Accessed 17 January 2017].

5 On the distribution of users of different ages see these statistics of 2014: *Distribution of active Facebook users worldwide as of 4th quarter 2014, by age.* [online] Statista. Available from: https://www.statista.com/statistics/376128/facebook-global-user-age-distribution/ [Accessed 17 January 2017].

6 Grimmelmann, J. (2009) Saving Facebook. *Iowa Law Review*, 94 (4), p. 159.

(e.g. telegraph, telephone, the Internet, etc.) and SNSs should be considered as a next step of human interaction, therefore they shall receive adequate protection.[7] The individual can express himself/herself through different ways on these sites. It ensues from the very nature of these sites that, in order to use them properly, the sharing of personal information is needed.[8] SNSs seem to have changed what society considers to be private, as users from all over the world share personal data in a quantity and quality never seen before.[9] It is not only the SNSs themselves which encourage the user to use their services (and to share more and more data[10]), but the (informational) societal pressure is also an important factor. If everyone is present on these sites, staying away from them – in the age of information, when our life is centered on information – can entail serious disadvantages, as the user would not be able to use certain services and have the same possibilities as the other users.[11]

From a legal perspective, the *Council of Europe's Committee of Ministers* emphasized the importance of the Internet and SNSs in promoting the exercise and enjoyment of human rights and fundamental freedoms, stating that they can also enhance participation in social and political life and promote democracy and social cohesion.[12] The president of the French data protection authority, *Falque-Pierrotin* also emphasized the role of the Internet in promoting the exercise of individual and public liberties – especially freedom of expression and right to information – and argued that the exercise of these rights is inseparable from the question of privacy protection.[13] One employment specific example can be the exercise

[7] Clark, L. A. and Roberts, S. J. (2010) Employer's Use of Social Networking Sites. A Socially Irresponsible Practice. *Journal of Business Ethics*, 95 (4), pp. 508–509, 518.

[8] *Herbert* describes the phenomenon of electronic exhibitionism, which means *"the increasing worldwide phenomenon of individuals eviscerating their own privacy by affirmatively or inadvertently posting and distributing private and intimate information, thoughts, activities and photographs via email, text messaging, blogs, and social networking pages."* See Herbert, W. A. (2011) Workplace Consequences of Electronic Exhibition and Voyeurism. *IEEE Technology and Society Magazine*, 30 (3), p. 26.

[9] International Working Group on Data Protection in Telecommunications (2008) *Report and Guidance on Privacy in Social Network Services "Rome Memorandum"*, 3-4 March. Rome, Italy, 675.36.5., Available from: http://www.datenschutz-berlin.de/attachments/461/WP_social_network_services.pdf [Accessed 26 May 2017], p. 1.

[10] See for example González Fuster, G. and Gutwirth, S. (2008) Privacy 2.0? *Revue du droit des Technologies de l'Information,* (32), p. 352.

[11] Cseh, G. (2013) A közösségi portálok árnyoldalai. *Infokommunikáció és jog*, 10 (2), p. 90.

[12] Council of Europe (2012) *Recommendation CM/Rec(2012)4 of the Committee of Ministers to Member States on the Protection of Human Rights with Regard to Social Networking Services.* CM/Rec(2012)4, 4 April 2012.

[13] Falque-Pierrotin, I. (2012) La Constitution et l'Internet. *Les Nouveaux Cahiers du Conseil Constitutionnel*, (36, June), pp. 34–35.

of collective labour rights, as communication on SNSs might also serve the activity of trade unions, etc.

2.2 THE RIGHT TO PRIVACY AND THE RIGHT TO DATA PROTECTION ON SOCIAL NETWORK SITES

We could see that nowadays the use of SNSs has become a part of everyday life and they are useful tools in communication, self-expression and the exercise of certain fundamental rights. We could also see that the use of SNSs naturally comes with the share of personal data, so in my opinion if we accept SNSs as the new form of communication and self-expression, we cannot *automatically* say any more that the user himself/herself contributes to the destruction of his/her own privacy.[14] Therefore, SNSs deserve effective legal protection. Still, during the use of SNSs serious legal issues arise: namely, issues regarding the right to privacy and the right to data protection. The protection of the right to privacy and to data protection shall by all means be respected on these sites and not only because their insurance is a condition for being able to fully enjoy the possibilities given by SNSs. If users are afraid to use SNSs because of the fear that someone – in our case the employer – might use the information available on these sites, the freedom and fundamental rights of the individual will be impaired.[15]

The right to privacy and the right to data protection are not synonymous concepts, and in my article I will mainly focus on the data protection aspect. However, a very brief discussion of the right to privacy is also needed as data protection can be retraced to the right to privacy. Although privacy itself has its origins as early as in ancient societies, it only became a generally accepted right in the 19th–20th century.[16] More precisely, the right

[14] For example, in the case that Simms calls self-presentation, sharing should not count as privacy self-destruction, considering the changed social norms. On the difference between self-presentation and self-disclosure see Simms, M. (1994) Defining Privacy in Employee Health Screening Cases: Ethical Ramifications Concerning the Employee/ Employer Relationship. *Journal of Business Ethics*, 13 (5), pp. 315–325. Cited in: Clark, L. A. and Roberts, S. J. (2010) Employer's Use of Social Networking Sites. A Socially Irresponsible Practice. *Journal of Business Ethics*, 95 (4), p. 512.

[15] See more on why SNSs should be protected: Clark, L. A. and Roberts, S. J. (2010) Employer's Use of Social Networking Sites. A Socially Irresponsible Practice. *Journal of Business Ethics*, 95 (4), pp. 507–525.

[16] On the subject of the history and definition of the right to privacy see more in: Lukács, A. (2016) What is Privacy? The History and Definition of Privacy. In: Keresztes, Gábor (ed.): *Tavaszi Szél 2016 Tanulmánykötet I,* Budapest, 15- April. Budapest: Doktoranduszok Országos Szövetsége, pp. 256–265. Available from: http://www.dosz.hu/dokumentumfile/ TSZ_I_kotet_161114_574o.pdf [Accessed 4 May 2017].

to privacy appeared at the end of the 19th century, in the famous article of *Warren* and *Brandeis* in 1890, entitled "The Right to Privacy". To date, there is no uniform definition on what (the right to) privacy[17] is, in spite of the fact that numerous legal scholars made an attempt to define it: *Warren* and *Brandeis* defined the (right to) privacy in the above mentioned article as

> *"the right to be let alone".*[18]

Posner argued that

> *"one aspect of privacy is the withholding or concealment of information."*[19]

Westin stated that privacy is

> *"the claim of an individual to determine what information about himself or herself should be known to others",*[20]

while *Fried* defined privacy as

> *"[…] the control we have over information about ourselves."*[21]

Máté Dániel Szabó argued that

> *"privacy is the right of the individual to decide about himself/herself."*[22]

In the 1960s, with the appearance of computers, new legal protection was needed and the right to data protection appeared. Despite the high amount of attention paid to data protection, to date, there is still no uniform standpoint on the relation between the right to data protection and the right to privacy.[23] In my article I will stick to the opinion of *Jóri*, who interpreted the right to data protection as

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[17] The protection of privacy can appear in different aspects: the protection of information, human body, communication, location. (See Hajdú, J. (2005) *A munkavállalók személyiségi jogainak védelme.* Szeged: Pólay Elemér Alapítvány, p. 10.) In my article I will focus on informational privacy.

[18] Warren, S. D. and Brandeis, L. D. (1890) The Right to Privacy. *Harvard Law Review*, 4 (5), p. 193.

[19] Posner, R. A. (1978) The Right of Privacy. *Georgia Law Review*, 12 (3), p. 393.

[20] Westin, A. F. (2003) Social and Political Dimensions of Privacy. *Journal of Social Issues*, 59 (2), p. 431.

[21] Fried, C. (1968) Privacy. *The Yale Law Journal*, 77 (3), p. 482.

[22] Szabó, M. D. (2005) Kísérlet a privacy fogalmának meghatározására a magyar jogrendszer fogalmaival. *Információs Társadalom*, 5 (2), p. 46.

"a unique legal way to protect the private sphere of the individual",[24]

so it also aims to protect privacy, but this right can effectively ensure the protection of privacy in our digital era.[25]

Several *international documents* acknowledge the right to respect for private life and personal data protection both at the universal and at the regional level.[26] In the *European Union* the Charter of Fundamental Rights of the EU acknowledges as a fundamental right both the right to privacy (Article 7) and to data protection (Article 8). The right to data protection is further elaborated in Article 16 of the Treaty on the Functioning of the European Union and in the data protection directive (hereinafter referred to as: DPD)[27] and data protection regulation (hereinafter referred to as: GDPR).[28, 29] The requirements laid down in these documents are general dispositions, meaning they shall also be applied

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[23] Purtova, N. (2010) Private Law Solutions in European Data Protection: Relationship to Privacy, and Waiver of Data Protection Rights. *Netherlands Quarterly of Human Rights*, 28 (2), p. 181. See more on this subject Kokott, J. and Sobotta, C. (2013) The distinction between privacy and data protection in the jurisprudence of the CJEU and the ECtHR. *International Data Privacy Law*, 3 (4), pp. 222–228.; Gellert, R. and Gutwirth, S. (2013) The legal construction of privacy and data protection. *Computer Law and Security Review*, 29 (5), pp. 522–530.

[24] Jóri, A. (2009) *Az adatvédelmi jog generációi és egy második generációs szabályozás részletes elemzése.* Ph.D. Pécsi Tudományegyetem, Állam- és Jogtudományi Kar Doktori Iskola, p. 9.

[25] Ibid.

[26] Regarding the right to privacy, Article 12 of the *Universal Declaration of Human Rights* (United Nations, 1948), Article 17 of the *International Covenant on Civil and Political Rights* (United Nations, 1966), Article 8 of the *European Convention of Human Rights* (Council of Europe, 1950) and Article 7 of the *Charter of Fundamental Rights of the European Union* (2000) state that the right to privacy is a fundamental human right and everyone has the right for his/her private and family life, home and correspondence to be respected, and they have the right to protect themselves against an unlawful interference.

Regarding the right to data protection, the *Guidelines for the Regulation of Computerized Personal Data Files* (United Nations, 1990), the *OECD Guidelines on the Protection of Privacy and Transborder Flows of Personal Data* (1980) and *Recommendation of the Council concerning Guidelines governing the Protection of Privacy and Transborder Flows of Personal Data* (OECD, 2013) and the *Convention for the Protection of Individuals with Regard to Automatic Processing of Personal Data* (Council of Europe, 1981) shall be mentioned.

[27] Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the Protection of Individuals with Regard to the Processing of Personal Data and on the Free Movement of such Data. O*fficial Journal of the European Union*. (1995: L 281) 23 November. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ: L:1995:281: FULL&from=EN [Accessed 4 May 2017].

[28] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the Protection of Natural Persons with Regard to the Processing of Personal Data and on the Free Movement of such Data, and Repealing Directive 95/46/EC (General Data Protection Regulation) *Official Journal of the European Union.* (2016: L 119) 4 May. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2016:119:FULL&from= EN [Accessed 4 May 2017].

[29] It is not the aim of the present paper to distinguish between these two norms. Throughout my paper I will refer very briefly to both documents, as the GDPR already entered into force in 2016, but the DPD is still applicable till 2018.

to the case of SNSs and to data processing conducted by the employer. Focussing specifically on the employment context, several norms deal especially with the question of employee privacy/data protection.[30] Also, the European Court of Human Rights has an important case law in which the body acknowledged and developed the rules regarding employee privacy protection.[31]

Users are entitled to the right to privacy and to data protection during the use of SNSs. However, these rights are not absolute, the employer disposes certain legitimate interests which can prevail over the rights of the employees or can limit the use of SNSs. Before addressing the data protection challenges regarding the monitoring of employee SNS use, I am going to examine what kind of interests the employer has in monitoring the (prospective) employee's activity on SNSs.

3. WHY DO EMPLOYERS USE FACEBOOK?

Regarding the question of data protection and the employer's legitimate interests, it is obvious that employers would like to know as much as possible about their employees. This is not a new phenomenon, as one of the early examples the Ford Motor Company can be cited, where Henry Ford investigated the employees' lifestyles in detail at the beginning of the 20th century.[32] Since then, technology has become more sophisticated and made it easier to have access to all kinds of information about employees: it is enough to think of telephone and computer monitoring (e-mail and the Internet surveillance). On SNSs users share an enormous amount of personal data, from which the employer can draw consequences regarding the employees' professional aptitudes, loyalty, etc. By obtaining all this information, the employer can enforce different legitimate business interests. This is not a new phenomenon; SNSs only put the already existing interests into a different light by providing an unprecedented quantity

[30] See for example *"Protection of workers' personal data."* An ILO code of practice (International Labour Organization, 1997), *Recommendation no. R (89) 2 of the Committee of Ministers to member states on the protection of personal data used for employment purposes* (Council of Europe, 1989) and *Recommendation CM/Rec(2015)5 of the Committee of Ministers to member States on the processing of personal data in the context of employment* (Council of Europe, 2015).

[31] See for example the *Niemietz v. Germany* (1992), Application no. 13710/88, European Court of Human Rights, 16 December *Halford v. the United Kingdom* (1997), Application no. 20605/92, European Court of Human Rights, 25 June or the very recent *Bărbulescu v. Romania* (2016), Application no. 61496/08, European Court of Human Rights, 12 January.

[32] Sprague, R. (2011) Invasion of the Social Networks: Blurring the Line between Personal Life and the Employment Relationship. *University of Louisville Law Review*, 50 (1), p. 6.

and quality of personal data available online. Also – unlike the traditional methods of monitoring – new ways of monitoring (like SNSs) aim to monitor activities conducted outside the workplace and beyond working hours.[33] In my opinion, this is the characteristic that distinguishes most SNS monitoring from the traditional types of monitoring, and makes a more severe intrusion into the private sphere of the employee possible.

The starting point is that the employer aims to provide employment in order to achieve his/her economic goals, maximizing productivity and profitability. This has different aspects during the different phases of the employment relationship. It shall not be forgotten that during the enforcement of these interests the employees still dispose the right to privacy and to data protection. So the legal issue arising with regard to employee monitoring is that a collision can be found between the employee's rights and the employer's legitimate interests. There are fundamental rights and significant interests on both sides, so a balance of their enforcement must be found and respected during the creation of regulations and the application of monitoring.[34] I will present three phases, although they cannot be distinguished sharply: before, during and after the employment relationship.

3.1 BEFORE THE EMPLOYMENT RELATIONSHIP

During the hiring phase, the employer has the right to choose between the candidates and he/she is interested in contracting with the best candidate. He/she has the right to decide with whom to contract. By conducting an SNS background check, the employer can enforce this interest, as information available on SNSs can contribute to making the hiring decision. Information like inappropriate texts or comments, criticism of the previous employer, unsuitable photos, spelling mistakes, sharing of false information, or membership in certain groups can be very revealing.[35] Also, personality traits and moral convictions can influence the performance of work.[36]

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[33] Kajtár, E. (2015) Till Facebook Do Us Part? Social Networking Sites and the Employment Relationship. *Acta Juridica Hungarica*, 56 (4), p 269.

[34] Hajdú, J. (2005) *A munkavállalók személyiségi jogainak védelme.* Szeged: Pólay Elemér Alapítvány, p. 20.

[35] Sprague, R. (2011) Invasion of the Social Networks: Blurring the Line between Personal Life and the Employment Relationship. *University of Louisville Law Review*, 50 (1), p. 5.

[36] Abril, P. S., Levin, A. and Del Riego, A. (2012) Blurred Boundaries: Social Media Privacy and the Twenty-First-Century Employee. *American Business Law Journal*, 49 (1), p. 70.

Also, this information can be obtained in a very easy and inexpensive manner, especially when the candidate does not use the privacy settings. With the appearance of SNSs, the employer needs only a few clicks to access information which would not have been available for him/her (or only with great efforts and expenses, such as hiring a private detective) in the pre-Internet age. Another important issue is also evoked as not legitimate interests can be enforced, too: in practice, the employer might use these sites to discriminate among the candidates by basing the decision on protected characteristics.[37]

3.2 DURING AND AFTER THE EMPLOYMENT RELATIONSHIP

During the existence of the employment relationship, the employer might monitor SNS use at the workplace during working hours and outside the workplace beyond working hours. *During working hours* the use of SNSs can represent a huge loss of working time and productivity. While the employer has the obligation to pay the salary and to ensure proper working conditions, the employee has the obligation to perform the work. Naturally, the employer is interested in employing someone who performs the work satisfactorily,[38] and he/she has rights to ensure effective management. Ensuing from the nature of the employment contract, the employer is entitled to monitor whether the employee carries out his/her task and fulfils his/her duties correctly. Furthermore, he/she is interested in ensuring productivity and profitability.[39] So naturally he/she wants to control and monitor whether the employee is really working or hanging out on Facebook instead. This case is very similar to the problems regarding the use of the employer's computer for private purposes. For example, the European Court of Human Rights has recently confirmed the dismissal of an employee for personal use of the employer's

[37] See, for example Manant, M., Pajak, S. and Soulié, N. (2014) *Online social networks and hiring: a field experiment on the French labor market*. [in press] *Munich Personal RePEc Archive*. Available from: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2458468 [Accessed 2 February 2017].

[38] Miller, S. and Weckert, J. (2000) Privacy, the Workplace and the Internet. *Journal of Business Ethics*, 28 (3), p. 257.

[39] Persson, A. J. and Hansson, S. O. (2003) Privacy at Work – Ethical Criteria. *Journal of Business Ethics*, 42 (1), p. 65; Sprague, R. (2007) From Taylorism to the Omnipticon: Expanding Employee Surveillance Beyond the Workplace. *The John Marshall Journal of Information Technology & Privacy Law*, 25 (1), p. 4.

equipment (violating the company's internal regulation) in the *Bărbulescu v. Romania* case.[40]

The novelty of SNSs is that they make it possible to monitor – unlike the "traditional" monitoring of computer or the Internet use for personal purposes at the workplace – the activities of the employee conducted *outside the workplace and beyond working hours*. After working hours, the employees' online activity can also represent risks for the employer. The employer's reputation can be at stake either directly through too sharp posts or comments, or indirectly if the employee's not appropriate lifestyle can be associated with the employer's image. An example for too sharp criticism can be found in a French ruling, where an employee was dismissed because she insulted her supervisor in an abusive manner in a Facebook comment.[41] As regards not appropriate lifestyle, see for example the case of the American high school teacher, Ashley Payne, who was dismissed for posting pictures of herself holding a pint of beer and a glass of wine in her hand during her trip to Europe.[42] As *Abril et al.* pointed out:

> *"[c]onventional wisdom dictates that an employee is a representative of his/her organization in all areas of life."*[43]

The divulgation of trade secrets can also be an issue. The employees shall respect the reputation and the business secrets of the employer. Besides taking the necessary steps against these infringements (e.g. removing the content, etc.), the employer is also interested in making certain of the loyalty of his/her employees. Information obtained from SNSs can help the employer to make human resourcing decisions; the information acquired can help him/her to decide on promotions or dismissals.

After the termination of the employment relationship the interest in protecting the reputation and business secrets still exists, as the former employee can harm the employer's reputation or violate his/her trade secrets. SNSs can also play a role in monitoring whether the former

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[40] *Bărbulescu v. Romania.* (2016) Application no. 61496/08. European Court of Human Rights, 12 January.

[41] *Barbera v. Sté Alten Sir.* (2010) Application no. 10/00853. Conseil de Prud'hommes de Boulogne-Billancourt, 19 November.

[42] Oppenheim, R. (2013) *High School Teacher Files an Appeal in Case of Social Media Related Resignation.* [online] California Business Litigation Blog. Available from: https://www.californiabusinesslitigation.com/2013/05/high_school_teacher_files_an_a.html [Accessed 4 May 2017].

[43] Abril, P. S., Levin, A. and Del Riego, (2012) Blurred Boundaries: Social Media Privacy and the Twenty-First-Century Employee. *American Business Law Journal*, 49 (1), p. 89.

employee respects the potential non-compete obligation or non-solicitation clause.[44]

These interests are acknowledged in the labour law regulation, too. Although they are not absolute, during their enforcement the employer shall respect the fundamental rights of the employees. However, during the enjoyment of these rights the employee shall also respect the employer's legitimate interest: a balance shall be found between the two parties. In the next part I am going to review the main data protection challenges arising during this collision of rights and legitimate interests.

4. QUESTIONS AND PROBLEMS

Although the collision of the employee's fundamental rights and the employer's legitimate interests has already existed, the appearance of SNSs raises new types of issues both on the employee's and the employer's side. These problems and questions shall be addressed before striking the balance between the employee's fundamental rights and the employer's legitimate interests. First, I am going to examine these challenges from the employee's perspective and then from the employer's view.

4.1 CHALLENGES POSED REGARDING THE EMPLOYEE'S RIGHTS

From the employee's side, attention shall be drawn to *the right to informational self-determination.* The right to informational self-determination requires that the individual is aware who processes his/her data, what kind of data and for what purposes.[45] The problem with SNS monitoring is that the employee loses control over his/her personal data for various reasons.

First, SNS background checks are invisible, it is quasi impossible for the employee to prove (or know) that the decision was based

[44] See for example Anderson, D. R. (2011) Restricting Social Graces: The Implications of Social Media for Restrictive Covenants in Employment Contracts. *Ohio State Law Journal*, 72 (4), pp. 881-908. and Warren, M. and Pedowitz, A. (2011) Social Media, Trade Secrets, Duties of Loyalty, Restrictive Covenants and Yes, the Sky is Falling. *Hofstra Labor and Employment Law Journal*, 29 (1), pp. 99–113.

[45] The right to informational self-determination first appeared in Germany with the famous population census judgement of the Federal Constitutional Court in 1983. In its decision the Court has adopted basic data protection principles, which later appeared in the DPD, too, as key principles. Source: Hornung, G. and Schnabel, C. (2009) Data protection in Germany I: The population census decision and the right to informational self--determination. *Computer Law and Security Review*, 25 (1), p. 87.

on the content found on SNSs, especially in the hiring phase.[46] Therefore the employee will not know what data the employer has access to, how he/she will interpret that information, the requirement of prior information and the principle of transparency guaranteed by the EU regulation will be infringed.[47] According to the principle of transparency, the employee shall be informed of the existence of the processing and be aware of the characteristics of the processing, and it shall be done in a concise, easily understandable manner.[48] This means that when the employer conducts a background check of candidates, or monitors the online activity of employees, he/she should inform them in advance that such processing will take place.

Second, it follows from the invisible nature of these searches that the employee cannot participate in the data processing and cannot exercise his/her rights. Both the DPD and the GDPR acknowledge the rights of the data subject (e.g. the right of access, right to information, right to objection, to rectification, to erasure).[49] The right of access guarantees that the employee has access to personal data concerning him/her, therefore

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[46] Kajtár, E. (2015) Till Facebook Do Us Part? Social Networking Sites and the Employment Relationship. *Acta Juridica Hungarica*, 56 (4), p. 278.

[47] Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the Protection of Individuals with Regard to the Processing of Personal Data and on the Free Movement of such Data. *Official Journal of the European Union.* (1995: L 281) 23 November. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:1995:281:FULL&from=EN [Accessed 4 May 2017], Section IV; Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the Protection of Natural Persons with Regard to the Processing of Personal Data and on the Free Movement of such Data, and Repealing Directive 95/46/EC (General Data Protection Regulation). *Official Journal of the European Union.* (2016: L 119) 4 May. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2016:119:FULL&from=EN [Accessed 4 May 2017], Article 5.1.(a), Article 12–14.

[48] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the Protection of Natural Persons with Regard to the Processing of Personal Data and on the Free Movement of such Data, and Repealing Directive 95/46/EC (General Data Protection Regulation). *Official Journal of the European Union.* (2016: L 119) 4 May. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2016:119:FULL&from=EN [Accessed 4 May 2017], Recital 60, 58.

[49] See more on the rights of the data subjects: Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the Protection of Individuals with Regard to the Processing of Personal Data and on the Free Movement of such Data. *Official Journal of the European Union.* (1995: L 281) 23 November. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:1995:281:FULL&from=EN [Accessed 4 May 2017], Sections IV-VII.; Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the Protection of Natural Persons with Regard to the Processing of Personal Data and on the Free Movement of such Data, and Repealing Directive 95/46/EC (General Data Protection Regulation). *Official Journal of the European Union.* (2016: L 119) 4 May. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2016:119:FULL&from=EN [Accessed 4 May 2017], Chapter III.

he/she can be aware of the processing and verify its lawfulness.[50] We will see in the next section that information obtained from SNSs are not reliable, therefore it is crucial to ensure the participation of the data subject in the processing, by guaranteeing the exercise of the above mentioned rights. The reliability of the information is closely connected to the data quality principles, which will be presented in the next section.

Third, it is also a problem that, although in a lot of cases personal data were made available by the user himself/herself, it is still possible that third persons post data about the individual. Thus it is not necessarily the user who contributes to the destruction of his/her own privacy, but third persons can also share content about the data subject without his/her consent; or even worse, without his/her knowledge.[51] In such cases the employee loses control over his/her e-reputation. Furthermore – although in a legal way it does not exempt the user – it constitutes a problem that users may not be aware of the functioning of SNSs and may be mistaken regarding the public or private nature of the published content,[52] publishing something presuming that it would be accessible only to a narrow circle of users – e.g. only to friends – but not to the employer. At the same time, considering that it is not uncommon for a user to have several hundreds of "friends", the content might be available to hundreds or thousands of users, depending on the chosen privacy settings.

A differentiation between the methods of obtaining data from SNSs shall be also made. The most obvious way of access is when the employer accesses the data when the data protection settings are set to public so he/she can have public access to the candidate's profile (either from outside the SNS or from the company's profile). However, the other practices cannot be forgotten: the employer can have access by logging

[50] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the Protection of Natural Persons with Regard to the Processing of Personal Data and on the Free Movement of such Data, and Repealing Directive 95/46/EC (General Data Protection Regulation). *Official Journal of the European Union.* (2016: L 119) 4 May. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2016:119:FULL&from=EN [Accessed 4 May 2017], Recital 63.

[51] Clark, L. A. and Roberts, S. J. (2010) Employer's Use of Social Networking Sites. A Socially Irresponsible Practice. *Journal of Business Ethics*, 95 (4), p. 516.; Smith, W. P. and Kidder, D. L. (2010) You've been tagged! (Then again, maybe not): Employers and Facebook. *Business Horizons,* 53 (5), p. 495.

[52] See more Sprague, R. (2011) Invasion of the Social Networks: Blurring the Line between Personal Life and the Employment Relationship. *University of Louisville Law Review*, 50 (1), p. 15.; Kajtár, E. and Mestre, B. (2016) Social networks and employees' right to privacy in the pre-employment stage: some comparative remarks and interrogations. *Hungarian Labour Law E-journal*, (1), pp. 24–25.

into another user's profile, or even by hacking, by requiring password, by making the employee change the privacy settings, or making him/her add the employer to his/her contacts, observing the profile in his/her presence, etc.[53] The hierarchal relation between the employee and the employer shall also be mentioned. The employer might take advantage of his/her position to gain access to certain content posted by the employees. For example, in the US case *Pietrylo v. Hillstone Restaurant* the employer accessed a private chat room where employees had a discussion, by obtaining the login credentials of one of the employee, who gave them to the employer in the fear of getting in trouble in the case of not complying with the request.[54] Also, as there are not yet clear social conventions about social media use[55] – for example, what should the employee do if the employer adds him/her as a friend? Can the employee ignore the friend request without consequences or is he/she "obliged" to accept it?

4.2 CHALLENGES POSED REGARDING THE ENFORCEMENT OF THE EMPLOYER'S LEGITIMATE INTERESTS

SNSs pose a risk not only for the employee, but also for the employer. From the employer's perspective, the main question regarding the respect of the employee's right to data protection is why the employer would *not* want to consult all this freely and easily accessible vast amount of data made available in most cases by the user himself/herself? The employer as a data controller shall comply with the obligations laid down by the data protection regime. It should not be forgotten that the application of these data protection requirements in practice depends on the exact circumstances of the given job.

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[53] Engler, P. and Tanoury, P. (2007) Employers Use of Facebook in Recruiting. In: Dan McIntosh, Ralph Drabic, Kristina Huber, Igor Vinogradov and Michael Bassick (eds.), *The Ethical Imperative in the Context of Evolving Technologies.* University of Colorado Leeds School of Business, pp. 65–66. Available from: http://www.ethicapublishing.com/ethical imperative.pdf [Accessed 13 July 2016].; Park, S. (2014) Employee Internet Privacy: A Proposed Act that Balances Legitimate Employer Rights and Employee Privacy. *American Business Law Journal*, 51 (4), p. 790.

[54] *Pietrylo v. Hillstone Restaurant Group.* (2009) Civil Case No. 06–5754 (FSH). United States District Court, D. New Jersey, 25 September.

[55] Van Eecke, P. and Truyens, M. (2010) Privacy and social networks. *Computer Law and Security Review*, 26 (5), p. 536.

Considering only the aspects which are the most problematic in relation to our topic: every data processing shall have a *finality*, meaning that data shall be collected

> *"for specified, explicit and legitimate purposes and not further processed in a manner that is incompatible with those purposes".*[56]

We could see in Part 3 *why* employers can be interested in monitoring activities on SNSs, in this section it will be examined *how* they can process employee personal data and what other requirements need to be respected. The data processing has to be *legitimate/lawful*, meaning that it has to have one of the legal grounds defined in Article 7 of the DPD or in Article 6 of the GDPR. In the case of the employment relationship, the consent as a legal ground can be problematic, as there is a hierarchal relationship between the parties, which can question the voluntary nature of the consent.[57] The legal ground that might apply in most cases is the legitimate interest of the controller. It means that the employer can process employees' personal data when the processing is necessary for the enforcement of his/her economic interests, except if the employees' rights override these interests.[58] So basically the employer's legitimate interests must be balanced with the employee's right to data protection.

The most important *principles of processing* which have relevance to our subject are that the data collected cannot be excessive and it shall be

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[56] Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the Protection of Individuals with Regard to the Processing of Personal Data and on the Free Movement of such Data. *Official Journal of the European Union.* (1995: L 281) 23 November. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:1995:281:FULL&from=EN [Accessed 4 May 2017], Article 6.1.(b); Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the Protection of Natural Persons with Regard to the Processing of Personal Data and on the Free Movement of such Data, and Repealing Directive 95/46/EC (General Data Protection Regulation). *Official Journal of the European Union.* (2016: L 119) 4 May. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2016:119:FULL&from=EN [Accessed 4 May 2017], Article 5.1.(b).

[57] Article 29 Data Protection Working Party (2001) *Opinion 8/2001 on the Processing of Personal Data in the Employment Context*, 5062/01/EN/Final WP 48, 13 September, p. 23.

[58] Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the Protection of Individuals with Regard to the Processing of Personal Data and on the Free Movement of such Data. *Official Journal of the European Union.* (1995: L 281) 23 November. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:1995:281:FULL&from=EN [Accessed 4 May 2017], Article 7.(f); Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the Protection of Natural Persons with Regard to the Processing of Personal Data and on the Free Movement of such Data, and Repealing Directive 95/46/EC (General Data Protection Regulation). *Official Journal of the European Union.* (2016: L 119) 4 May. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2016:119:FULL&from=EN [Accessed 4 May 2017], Article 6.1.(f).

adequate, relevant,[59] accurate and, when necessary, kept up to date.[60] These requirements are not satisfied in the case of SNS monitoring. First, the requirements of relevancy and non-excessiveness aim to ensure that as little data are collected as possible.[61] So the employer is entitled to process personal data that is directly related to the employment relationship. On SNSs a part of the personal information available does not have a (direct) connection to employment and is purely private, as mostly "private" SNSs (e.g. Facebook, Instagram, Twitter) are destined for private use, unlike the "professional" SNSs (e.g. LinkedIn). Typically, this information would not have been available (or only with great effort) to the employer in the pre-Internet age. The problem is that this "legally consultable" data and data which the employer cannot process legitimately (e.g. information related to protected characteristics) are inseparable on the profile of the user. Second, the principle of accuracy can be very important regarding identification, in order to avoid situations where the (prospective) employee is mistakenly associated with the SNS activity of someone else – especially if the employee has a very common name and/or there is no other publicly available personal data which can help to correctly identify him/her.[62] Completeness requires that the data

[59] Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the Protection of Individuals with Regard to the Processing of Personal Data and on the Free Movement of such Data. *Official Journal of the European Union.* (1995: L 281) 23 November. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:1995:281:FULL&from=EN [Accessed 4 May 2017], Article 6.1.(c); Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the Protection of Natural Persons with Regard to the Processing of Personal Data and on the Free Movement of such Data, and Repealing Directive 95/46/EC (General Data Protection Regulation). *Official Journal of the European Union.* (2016: L 119) 4 May. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2016:119:FULL&from=EN [Accessed 4 May 2017], Article 5.1.(c).

[60] Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the Protection of Individuals with Regard to the Processing of Personal Data and on the Free Movement of such Data. *Official Journal of the European Union.* (1995: L 281) 23 November. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:1995:281:FULL&from=EN [Accessed 4 May 2017], Article 6.1.(d); Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the Protection of Natural Persons with Regard to the Processing of Personal Data and on the Free Movement of such Data, and Repealing Directive 95/46/EC (General Data Protection Regulation). *Official Journal of the European Union.* (2016: L 119) 4 May. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2016:119:FULL&from=EN [Accessed 4 May 2017], Article 5.1.(d).

[61] Kajtár, E. and Mestre, B. (2016) Social Networks and Employees' Right to Privacy in the Pre-employment Stage: Some Comparative Remarks and Interrogations. *Hungarian Labour Law E-journal*, (1), p. 33.

[62] Tenenbaum, J. M. (2012) *Posting Yourself Out of a Posting: Using Social Networks to Screen Job Applicants in America and Germany.*[pre-print]. Available from: https://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID2062462_code1805294.pdf?abstractid=2020477&mirid=1 [Accessed 14 July 2016], p. 13.

processed should give a true picture of the individual.[63] Assessing information obtained from these sites might be misleading, as very often the information originally posted was intended for a different audience (e.g. inside jokes among friends), so it might be taken out of context, thereby giving a false impression of the user. The employee might not have been the author of the given content – a profile can be hacked by a third party,[64] or even friends can post, as a prank, in the name of the employee if the employee leaves his/her device unattended. Third, regarding the up-to-datedness, we must see that the Internet does not forget – it is also true in the case of SNSs. A decision should not be based on out-dated information, but on SNSs information from the past years of the individual is often available. This means that users cannot escape from their past mistakes and, for example, a funny photo taken in high school years ago can have an impact on the future carrier options, even if it is not relevant anymore.[65] In my opinion, for these reasons, information obtained from SNSs cannot be considered reliable. Although traditionally the vulnerability of the employee is the case, nowadays we also have to count with the *reversed vulnerability* of the employer. Employees can do a lot of damage to the employer during the use of the Internet and SNSs.[66] Because of the open nature of these sites, the possible audience of a negative or false comment on the employer can be quickly available to millions of people, causing serious damage to the employer's reputation. See, for example, the prank made by two employees of Domino's Pizza, which could seriously compromise the company's reputation in a few days.[67] The unforgiving nature of the Internet can cause issues for the employer, too, as these contents can remain available even after they are not relevant any more.

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[63] Péterfalvi, A. (ed.) (2012) *Adatvédelem és információszabadság a mindennapokban.* Budapest: HVG-ORAC, p. 83.

[64] See the scenario described in Sanders, S. D. (2012) Privacy is Dead: The Birth of Social Media Background Checks. *Southern University Law Review*, 39 (2), p. 243.

[65] On the importance of forgetting see Mayer-Schönberger, V. (2011) *Delete – The Virtue of Forgetting in the Digital Age.* Princeton and Oxford: Princeton University Press.

[66] Balogh, Zs. Gy., Polyák, G., Rátai, B. and Szőke, G. L. (2012) Munkahelyi adatvédelem a gyakorlatban. *Infokommunikáció és Jog*, 9 (3), pp. 96–97.

[67] Clifford, S. (2009) *Video Prank at Domino's Taints Brand.* [online] The New York Times. Available from: http://www.nytimes.com/2009/04/16/business/media/16dominos.html [Accessed 10 November 2016].

5. POSSIBLE SOLUTIONS

Regarding the possible solutions, it should be emphasized that the DPD and the GDPR are applicable to employee monitoring, the question is how these dispositions should be applied to the case of SNSs? The solution is twofold; it requires efforts both from the employer and the employee.

5.1 EMPLOYERS

First, it would be unrealistic to expect employers not to use this cheap, invisible and easy tool of obtaining information at all,[68] but it would be welcomed if the employer could realize that it is also in his/her own interests to comply with the data protection regulation for two reasons. On the one hand, in the case of non-compliance with the GDPR, employers can face administrative fines (in which field the GDPR became more severe)[69], and on the other hand, by respecting the employees' data subject rights and other safeguards, they can eliminate the risks associated with unreliable data. In the next section I will examine how the principles and the rights presented in the previous part of the paper can be complied with.

First of all, internal SNS policies might be adequate instruments to comply with the principle of transparency and the obligation of prior information. The Information Commissioner's Office in the UK issued a document in which, *inter alia*, the importance of policies and impact assessments was emphasized. These policies could serve the purpose of informing (prospective) employees on how their data would be processed. Depending on the given phase of the employment relationship, the content of this document can differ (see below), but it can be stated that the employees should be informed – in plain language, if relevant, illustrated with examples – regarding what data will be processed, by whom, for what reason, what their rights as data subjects are, how they can exercise them, etc. Employers should also conduct *impact assessments* –

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[68] Kajtár, E. (2015) Till Facebook Do Us Part? Social Networking Sites and the Employment Relationship. *Acta Juridica Hungarica*, 56 (4), p. 278.

[69] See Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the Protection of Natural Persons with Regard to the Processing of Personal Data and on the Free Movement of such Data, and Repealing Directive 95/46/EC (General Data Protection Regulation). *Official Journal of the European Union.* (2016: L 119) 4 May. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2016:119:FULL&from=EN [Accessed 4 May 2017], Article 83.

which instrument also appears in the GDPR[70] – to decide whether and how to conduct the monitoring. This assessment should include identifying the purposes of the monitoring, weighing the possible adverse effects, taking into consideration alternatives (e.g. traditional job interviews, period of probation, etc.), considering how the employer will comply with the obligations arising from the monitoring (e.g. the data protection obligations) and considering whether the monitoring is truly justified. A universal model cannot be established, as the monitoring also depends on the given particularities of the employer.[71] Training the employees on SNS use might also be an option.[72]

In my opinion, the use of data obtained from SNS monitoring should not be a general method because of the risks and challenges presented in Part 4. The employer's legitimate interests do not automatically outweigh the employee's right to data protection. As we could see, interests and rights shall be balanced, the processing of personal data must be truly necessary and appropriate guarantees/safeguards should be ensured. Conducting an impact assessment can also help to determine whether the monitoring is truly necessary. Laying down the rules of processing can facilitate compliance with the data protection regulation by making the processing organized/planned and transparent. I have mentioned that it is crucial to inform the current and the prospective employees that such a monitoring would occur, and to provide them with the possibility to exercise their rights as data subjects. Although it is often the employee who decides to share his/her personal data on SNSs (maybe without using the privacy settings), it does not mean that he/she has consented to the free processing of that data. The Hungarian National Data Protection Authority stated in a case regarding hiring – but it can also be applied to the cases of other decision making processes – that it would be unrealistic to expect employers not to consult the publicly available data on Facebook, but if they

[70] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the Protection of Natural Persons with Regard to the Processing of Personal Data and on the Free Movement of such Data, and Repealing Directive 95/46/EC (General Data Protection Regulation). *Official Journal of the European Union.* (2016: L 119) 4 May. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2016:119:FULL&from=EN [Accessed 4 May 2017], Article 35.

[71] Information Commissioner's Office (2011) *The Employment Practices Code.* Available from: https://ico.org.uk/media/for-organisations/documents/1064/the_employment_practices_code.pdf [Accessed 1 February 2017], pp. 61–63.

[72] Proskauer Rose LLP. (2014) *Social Media in the Workplace. Around the World 3.0.* 2013/14 survey. Available from: http://www.proskauer.com/files/uploads/social-media-in-the-workplace-2014.pdf [Accessed 2 February 2017], p. 23.

use that data during the decision making, the data protection requirements shall apply (especially the requirement of prior information and the data subject's rights).[73] By ensuring these rights, the misinterpretation of the data could also be avoided and the use of SNS data could truly contribute to the promotion of the employer's interests.

Beyond the above presented general statements, in the *phase of hiring*, SNS background checks should only be conducted when they are necessary, for example, when the nature of the given job or the type of employer justifies it (e.g. it is more probable that background checks can be justified if the position comes with high responsibility). These checks should be conducted in a uniform manner and in the late stage of the selection process.[74] The employer shall inform employees that a SNS background check will be conducted during the selection process, state precisely which sites will be checked and what is the lawful information that the employer aims to obtain. The employer can only use data which is publicly available, he/she should not ask for the candidate's password or log into his/her account with other methods or friend a candidate.[75] In order to solve the problem of the inseparability of private and work related information, it might be a solution if a third party – who will not participate in the decision making – conducts the background check and transmits only the work related information to the decision makers.[76]

Concerning the SNS use *during working hours* – a distinction shall be made between whether the employee uses the employer's or his/her own device. Regarding the employer's equipment – by analogy with the already regulated the Internet and e-mail monitoring at the workplace – the employer has the right to decide whether he/she allows the use of SNSs. The Article 29 Data Protection Working Party provides more detail in its *Working document on the surveillance of electronic communications in the workplace* regarding the Internet and e-mail monitoring

[73] Hungarian National Authority for Data Protection and Freedom of Information (2016), NAIH/2016/4386/2/V, August, pp. 3–4.

[74] Information Commissioner's Office (2011) *The Employment Practices Code.* Available from: https://ico.org.uk/media/for-organisations/documents/1064/the_employment_practices_code.pdf [Accessed 1 February 2017], p. 23.

[75] Mikkelson, K. (2010) Cybervetting and Monitoring Employees' Online Activities: Assessing the Legal Risks for Employers. *The Public Lawyer*, 18 (2), p. 6.

[76] Peebles, K. A. (2012) Negligent Hiring and the Information Age: How State Legislatures Can Save Employers from Inevitable Liability. *William and Mary Law Review*, 53 (4), pp. 1428-1429.; Sprague, R. (2011) Invasion of the Social Networks: Blurring the Line between Personal Life and the Employment Relationship. *University of Louisville Law Review*, 50 (1), p. 32.

at the workplace, which dispositions, in my opinion, should adequately be applied to the case of SNSs. In this document they emphasize that monitoring whether the employee complies with this restriction shall respect the data protection regulation, and the emphasis should be laid on prevention rather than on detection. For example, it is possible to ban these sites or to use warning windows which alert the employee, or check the time spent on these sites. The content itself should be accessed only in very exceptional cases.[77] Regarding the use of SNSs from the employees' own device is a different case. As a main rule, the employer can prohibit the use of these sites as the employee's obligation is to perform work and not to surf on these sites. However, in this case the monitoring of the device can be quite problematic.[78] In my opinion, the restriction should not concern the case of periods of rest, when the employee can use SNSs on his/her own device.

With regard to activities on SNSs *after working hours*, taking into account how severely one post can harm the employer's reputation and economic interests, the employer is entitled to restrict the employee's conduct on SNSs and has the right to control whether the employee complies. Again, the conditions for this should be laid down in an SNS policy, by taking into consideration the particularities of the workplace and giving clear examples to employees of what conduct is admissible and what is not. The restriction and monitoring cannot be limitless, the employer is obliged to respect the data protection requirements and other rights (e.g. the right to freedom of expression) during establishing the limitations and the way how to monitor compliance. The employer should educate or inform the employees regarding how they can lawfully formulate their opinion and what is not permissible, by providing clear and concrete examples.[79]

5.2 EMPLOYEES

Although the employees are entitled to legal protection, they can also make further steps in order to knowingly monitor their digital representations

[77] See more in Article 29 Data Protection Working Party (2002) *Working document on the surveillance of electronic communications in the workplace*, 5401/01/EN/Final WP 55, 29 May, p. 15, 24.

[78] Proskauer Rose LLP. (2014) *Social Media in the Workplace. Around the World 3.0.* 2013/14 survey. Available from: http://www.proskauer.com/files/uploads/social-media-in-the-workplace-2014.pdf [Accessed 2 February 2017], pp. 7–8.

[79] Proskauer Rose LLP. (2014) *Social Media in the Workplace. Around the World 3.0.* 2013/14 survey. Available from: http://www.proskauer.com/files/uploads/social-media-in-the-workplace-2014.pdf [Accessed 2 February 2017], p. 23.

and to actively practice their right to informational self-determination. First, they should use the privacy settings in order to control which audiences can have access to the content on their profiles.[80] For example, Facebook gives users the possibility to use differentiated privacy settings – in theory it is possible that every friend of the user has access to a different content on the profile. By effectively using the privacy settings, it would be possible to shape the online identity into an "employer friendly" version, where the employer (or users with whom the employee is not friends) can only have access to one part of the information. Second, the user should also control his/her digital identity by monitoring what information is available regarding him/her on the Internet – for example, typing his/her name into a search engine or monitoring whether third persons have posted information relating to him/her.[81] If he/she is aware of the content which the employer might have access to, he/she can make the necessary steps to remove that content.[82]

Third – not forgetting about the open nature of SNSs – choosing the appropriate form of communication is absolutely crucial. Before sharing something, the employee should think over what the right form for the given content is: would he/she want to share – for example, holiday pictures – in an album accessible to all Facebook users, or "only" to all of his/her friends, or in a private group destined for communication with the closest friends, or in a private message? They should also consider what to post, as they might be confronted with that information in a different situation – for example, the employer might access those holiday pictures during the recruitment process.[83] There exists a so-called Grandmother rule, which can help users to post appropriate material to SNSs, as according to this rule, users should only share information on SNSs that they would feel comfortable to share with their grandmother.[84]

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[80] CNIL (2011) *Maîtriser les informations publiées sur les réseaux sociaux.* [online] 10 January 2011. Available from: https://www.cnil.fr/fr/maitriser-les-informations-publiees-sur-les-reseaux-sociaux [Accessed 26 February 2017].

[81] CNIL (2011), *L'e-réputation en questions.* [online] 24 August 2011. Available from: https://www.cnil.fr/fr/le-reputation-en-questions-0 [Accessed 24 January 2017].

[82] Byrnside, I. (2008) Six Clicks of Separation: The Legal Ramifications of Employers Using Social Networking Sites to Research Applicants. *Vanderbilt Journal of Entertainment and Technology Law*, 10 (2), p. 474.

[83] 30th International Conference of Data Protection and Privacy Commissioners (2008), *Resolution on Privacy Protection in Social Network Services.* Strasbourg, 17 October 2008, p. 2.

[84] Byrnside, I. (2008) Six Clicks of Separation: The Legal Ramifications of Employers Using Social Networking Sites to Research Applicants. *Vanderbilt Journal of Entertainment and Technology Law*, 10 (2), p. 474.

Last, I have to mention the content itself. Although, as we could see, employees are entitled to the right to data protection during SNS use, it must be emphasized that it does not mean that they are free to post anything, they still have to respect certain rules. Naturally, the employees are obliged to respect, e.g. the reputation and trade secrets of the employer, so they have to keep in mind that they are not completely free to post anything they want. Acting with rationality and with prudence is crucial;[85] as the French professor, *Ray* noted, an individual in the 21st century must also dispose a digital IQ.[86] Therefore employees should ask themselves the question "to post or not to post" and think twice before hitting the post button.

6. CONCLUSION

The paper discussed the question of SNS use in the employment context with regard to the right to personal data protection. The aim of the research was to examine what special data protection questions or challenges arise during the different phases of the employment relationship, what factors and how should be considered during the balancing of the employer's legitimate interests and the employee's right to data protection.

Answering the question where the balance should be struck between the employer's interests and the employee's rights: in the phase of hiring the prospective employee's rights should prevail. The question of SNS monitoring during working hours is relatively well regulated by analogy with computer/the Internet monitoring – with the employer entitled to determine the rules of SNS use. With respect to the activity conducted beyond the workplace – in the light of the employee's obligations and the severity of the possible damage that can be done to the employer – the balance should be tipped in favour of the employer's legitimate interests.

In my opinion, one of the greatest challenges regarding the subject is the invisibility of SNS monitoring. As the employer might (and often will) check the employee's profile without even notifying him/her, the guarantees set out in the regulations may not be enforced and important data protection rights might be impaired. Regarding the (prospective)

[85] Nivelles, V. (2014) Les entreprises à l'épreuve des réseaux sociaux. *Jurisprudence Sociale Lamy*, (377–378, 23 December), p. 13.

[86] Ray, J.-E. (2011) Facebook, le salarié et l'employeur. *Droit Social*, (2), p. 133.

employee, we could see that this might cause negative consequences to him/her. At the same time, this invisibility generates the biggest controversy in the subject, as it is very noble to define all these data protection rights that the individual is entitled to, but let us be honest: why the employer would want to trouble himself/herself with respecting these regulations when he/she can – "in secret" – gain access to a vast amount of useful information easily and freely? We could see that during the inspection of SNSs not only the individual's rights might be impaired, but not respecting the regulation might also lead to the processing of unreliable, inaccurate, out-of-date data, which is also contrary to the interest of the employer. Employers should realize that they are also interested in the lawful and fair processing of data, and after this "general acknowledgement", both the employer and the employee can and should make further efforts – as I presented in Part 5.

This is a very complex subject, which can be examined from different angles, and I chose to present the arising challenges linked to the different phases of the employment relationship. However, numerous unanswered questions still exist: these can and should serve as a basis for future research and be elaborated in detail in time. Due to space limitations I had to draw the limits here, but even the data protection issues of each phase could constitute a separate paper. Also, matters not discussed in this paper should be analysed in the future, for example, the "soft" impacts of SNS monitoring (e.g. erosion of trust) or questions related to the practice of collective labour law rights.

LIST OF REFERENCES

[1] 30th International Conference of Data Protection and Privacy Commissioners (2008), *Resolution on Privacy Protection in Social Network Services.* Strasbourg, 17 October 2008.

[2] Abril, P. S., Levin, A. and Del Riego, A. (2012) Blurred Boundaries: Social Media Privacy and the Twenty-First-Century Employee. *American Business Law Journal*, 49 (1), pp. 63–124.

[3] Anderson, D. R. (2011) Restricting Social Graces: The Implications of Social Media for Restrictive Covenants in Employment Contracts. *Ohio State Law Journal*, 72 (4), pp. 881–908.

[4] Article 29 Data Protection Working Party (2001) *Opinion 8/2001 on the Processing of Personal Data in the Employment Context*, 5062/01/EN/Final WP 48, 13 September.

[5] Article 29 Data Protection Working Party (2002) *Working document on the surveillance of electronic communications in the workplace*, 5401/01/EN/Final WP 55, 29 May.

[6] Balogh, Zs. Gy., Polyák, G., Rátai, B. and Szőke, G. L. (2012) Munkahelyi adatvédelem a gyakorlatban. *Infokommunikáció és Jog*, 9 (3), pp. 95–104.

[7] *Barbera v. Sté Alten Sir.* (2010) Application no. 10/00853. Conseil de Prud'hommes de Boulogne-Billancourt, 19 November.

[8] *Bărbulescu v. Romania.* (2016) Application no. 61496/08. European Court of Human Rights, 12 January.

[9] Boyd, D. M. and Ellison, N. B. (2008) Social Network Sites: Definition, History and Scholarship. *Journal of Computer Mediated Communication*, 13 (1), pp. 210–230.

[10] Byrnside, I. (2008) Six Clicks of Separation: The Legal Ramifications of Employers Using Social Networking Sites to Research Applicants. *Vanderbilt Journal of Entertainment and Technology Law*, 10 (2), pp. 445–477.

[11] Clark, L. A. and Roberts, S. J. (2010) Employer's Use of Social Networking Sites. A Socially Irresponsible Practice. *Journal of Business Ethics,* 95 (4), pp. 507–525.

[12] Clifford, S. (2009) *Video Prank at Domino's Taints Brand.* [online] The New York Times. Available from: http://www.nytimes.com/2009/04/16/business/media/16dominos.html [Accessed 10 November 2016].

[13] CNIL (2011) *Maîtriser les informations publiées sur les réseaux sociaux.* [online] 10 January 2011. Available from: https://www.cnil.fr/fr/maitriser-les-informations-publiees-sur-les-reseaux-sociaux [Accessed 26 February 2017].

[14] CNIL (2011) *L'e-réputation en questions.* [online] 24 August 2011. Available from: https://www.cnil.fr/fr/le-reputation-en-questions-0 [Accessed 24 January 2017].

[15] Council of Europe (2012) *Recommendation CM/Rec(2012)4 of the Committee of Ministers to Member States on the Protection of Human Rights with Regard to Social Networking Services.* CM/Rec(2012)4, 4 April 2012.

[16] Cseh, G. (2013) A közösségi portálok árnyoldalai. *Infokommunikáció és jog*, 10 (2), pp. 90–95.

[17] Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the Protection of Individuals with Regard to the Processing of Personal Data and on the Free Movement of such Data. *Official Journal of the European Union.* (1995: L 281) 23 November. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF /?uri=OJ:L:1995: 281:FULL &from=EN [Accessed 4 May 2017].

[18] *Distribution of active Facebook users worldwide as of 4th quarter 2014, by age.* [online] Statista. Available from: https://www.statista.com/statistics/376128/facebook-global-user-age-distribution/ [Accessed 17 January 2017].

[19] Engler, P. and Tanoury, P. (2007) Employers Use of Facebook in Recruiting. In: Dan McIntosh, Ralph Drabic, Kristina Huber, Igor Vinogradov and Michael Bassick (eds.), *The Ethical Imperative in the Context of Evolving Technologies.* University of Colorado Leeds School of Business. Available from: http://www.ethicapublishing.com/ethical imperative.pdf [Accessed 13 July 2016], pp. 61–74.

[20] Falque-Pierrotin, I. (2012) La Constitution et l'Internet. *Les Nouveaux Cahiers du Conseil Constitutionnel*, (36, June), pp 31–44.

[21] Fried, C. (1968) Privacy. *The Yale Law Journal*, 77 (3), pp. 475–493.

[22] Gellert, R. and Gutwirth, S. (2013) The legal construction of privacy and data protection. *Computer Law and Security Review*, 29 (5), pp. 522–530.

[23] González Fuster, G. and Gutwirth, S. (2008) Privacy 2.0? *Revue du droit des Technologies de l'Information,* (32), p. 351–361.

[24] Grimmelmann, J. (2009) Saving Facebook. *Iowa Law Review*, 94 (4), pp. 1137–1206.

[25] Hajdú, J. (2005) *A munkavállalók személyiségi jogainak védelme.* Szeged: Pólay Elemér Alapítvány.

[26] Herbert, W. A. (2011) Workplace Consequences of Electronic Exhibition and Voyeurism. *IEEE Technology and Society Magazine*, 30 (3), pp. 25–33.

[27] Hornung, G. and Schnabel, C. (2009) Data protection in Germany I: The population census decision and the right to informational self-determination. *Computer Law and Security Review*, 25 (1), pp. 84–88.

[28] Hungarian National Authority for Data Protection and Freedom of Information (2016) case NAIH/2016/4386/2/V., August.

[29] Information Commissioner's Office (2011) *The Employment Practices Code.* Available from: https://ico.org.uk/media/for-organisations/documents/1064/the_employment_ practices_code.pdf [Accessed 1 February 2017].

[30] International Working Group on Data Protection in Telecommunications (2008) *Report and Guidance on Privacy in Social Network Services "Rome Memorandum"*, 3-4 March. Rome, Italy, 675.36.5., Available from: http://www.datenschutz-berlin.de/attachments/ 461/WP_ social_network_services.pdf [Accessed 26 May 2017].

[31] Jóri, A. (2009) *Az adatvédelmi jog generációi és egy második generációs szabályozás részletes elemzése.* Ph.D. Pécsi Tudományegyetem, Állam- és Jogtudományi Kar Doktori Iskola.

[32] Kajtár, E. (2015) Till Facebook Do Us Part? Social Networking Sites and the Employment Relationship. *Acta Juridica Hungarica*, 56 (4), pp. 268–280.

[33] Kajtár, E. and Mestre, B. (2016) Social Networks and Employees' Right to Privacy in the Pre-employment Stage: Some Comparative Remarks and Interrogations. *Hungarian Labour Law E-journal*, (1), pp. 22–39.

[34] Kokott, J. and Sobotta, C. (2013) The distinction between privacy and data protection in the jurisprudence of the CJEU and the ECtHR. *International Data Privacy Law*, 3 (4), pp. 222–228.

[35] *List of social networking websites.* [online] Wikipedia. Available from: https://en.wikipedia.org/wiki/List_of_social_networking_websites [Accessed 09 November 2016].

[36] Lukács, A. (2016) What is Privacy? The History and Definition of Privacy. In: Keresztes, Gábor. (ed.): *Tavaszi Szél 2016 Tanulmánykötet I*, Budapest, 15-17 April. Budapest: Doktoranduszok Országos Szövetsége, pp. 256–265. Available from: http://www.dosz.hu/dokumentumfile/TSZ_I_kotet_161114_574o.pdf [Accessed 4 May 2017].

[37] Manant, M., Pajak, S. and Soulié, N. (2014) *Online social networks and hiring: a field experiment on the French labor market.* [in press] Munich Personal RePEc Archive. Available from: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2458468 [Accessed 2 February 2017].

[38] Mayer-Schönberger, V. (2011) *Delete – The Virtue of Forgetting in the Digital Age.* Princeton and Oxford: Princeton University Press.

[39] Mikkelson, K. (2010) Cybervetting and Monitoring Employees' Online Activities: Assessing the Legal Risks for Employers. *The Public Lawyer*, 18 (2), pp. 3–7.

[40] Miller, S. and Weckert, J. (2000) Privacy, the Workplace and the Internet. *Journal of Business Ethics*, 28 (3), pp. 255–265.

[41] Nivelles, V. (2014) Les entreprises à l'épreuve des réseaux sociaux. *Jurisprudence Sociale Lamy*, (377–378, 23 December 2014), pp. 9–13.

[42] *Number of monthly active Facebook users worldwide as of 3rd quarter 2016 (in millions).* [online] Statista. Available from: https://www.statista.com/statistics/264810/number-of-monthly-active-facebook-users-worldwide/ [Accessed 17 January 2017].

[43] Oppenheim, R. (2013) *High School Teacher Files an Appeal in Case of Social Media Related Resignation.* [online] California Business Litigation Blog. Available from: https://www.californiabusinesslitigation.com/2013/05/high_school_teacher_files_an_a.html [Accessed 4 May 2017].

[44] Park, S. (2014) Employee Internet Privacy: A Proposed Act that Balances Legitimate Employer Rights and Employee Privacy. *American Business Law Journal*, 51 (4), pp. 779–841.

[45] Peebles, K. A. (2012) Negligent Hiring and the Information Age: How State Legislatures Can Save Employers from Inevitable Liability. *William and Mary Law Review*, 53 (4), pp. 1397–1433.

[46] Persson, A. J. and Hansson, S. O. (2003) Privacy at Work – Ethical Criteria. *Journal of Business Ethics*, 42 (1), pp. 59–70.

[47] Péterfalvi, A. (ed.) (2012) *Adatvédelem és információszabadság a mindennapokban.* Budapest: HVG-ORAC.

[48] *Pietrylo v. Hillstone Restaurant Group.* (2009) Civil Case No. 06–5754 (FSH). United States District Court, D. New Jersey, 25 September.

[49] Posner, R. A. (1978) The Right of Privacy. *Georgia Law Review*, 12 (3), pp. 393–422.

[50] Proskauer Rose LLP. (2014) *Social Media in the Workplace. Around the World 3.0.* 2013/14 survey. Available from: http://www.proskauer.com/files/uploads/social-media-in-the-workplace-2014.pdf [Accessed 2 February 2017].

[51] Purtova, N. (2010) Private Law Solutions in European Data Protection: Relationship to Privacy, and Waiver of Data Protection Rights. *Netherlands Quarterly of Human Rights,* 28 (2), pp. 179–198.

[52] Ray, J.-E. (2011) Facebook, le salarié et l'employeur. *Droit Social,* (2), pp. 128–140.

[53] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the Protection of Natural Persons with Regard to the Processing of Personal Data and on the Free Movement of such Data, and Repealing Directive 95/46/EC (General Data Protection Regulation) *Official Journal of the European Union.* (2016: L 119) 4 May. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2016:119: FULL&from=EN [Accessed 4 May 2017].

[54] Sanders, S. D. (2012) Privacy is Dead: The Birth of Social Media Background Checks. *Southern University Law Review*, 39 (2), pp. 243–264.

[55] Smith, W. P. and Kidder, D. L. (2010) You've been tagged! (Then again, maybe not): Employers and Facebook. *Business Horizons*, 53 (5), pp. 491–499.

[56] Sprague, R. (2007) From Taylorism to the Omnipticon: Expanding Employee Surveillance Beyond the Workplace. *The John Marshall Journal of Information Technology & Privacy Law*, 25 (1), pp. 1–36.

[57] Sprague, R. (2011) Invasion of the Social Networks: Blurring the Line between Personal Life and the Employment Relationship. *University of Louisville Law Review*, 50 (1), pp. 1–34.

[58] Szabó, M. D. (2005) Kísérlet a privacy fogalmának meghatározására a magyar jogrendszer fogalmaival. *Információs Társadalom*, 5 (2), pp. 44–54.

[59] Tenenbaum, J. M. (2012) *Posting Yourself Out of a Posting: Using Social Networks to Screen Job Applicants in America and Germany.* [pre-print]. Available from: https://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID2062462_code1805294.pdf?abstractid=2020477&mirid=1 [Accessed 14 July 2016].

[60] Van Eecke, P. and Truyens, M. (2010) Privacy and social networks. *Computer Law and Security Review*, 26 (5), pp. 535–546.

[61] Warren, M. and Pedowitz, A. (2011) Social Media, Trade Secrets, Duties of Loyalty, Restrictive Covenants and Yes, the Sky is Falling. *Hofstra Labor and Employment Law Journal*, 29 (1), pp. 99–113.

[62] Warren, S. D. and Brandeis, L. D. (1890) The Right to Privacy. *Harvard Law Review*, 4 (5), pp. 193–220.

[63] Westin, A. F. (2003) Social and Political Dimensions of Privacy. *Journal of Social Issues*, 59 (2), pp. 431–453.

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ON AUTHOR, COPYRIGHT AND ORIGINALITY: DOES THE UNIFIED EU ORIGINALITY STANDARD CORRESPOND TO THE DIGITAL REALITY IN WIKIPEDIA?

by

AURELIJA LUKOŠEVIČIENĖ*

This article is contributing to the future of copyright law debate by exploring the recently harmonised originality standard in the EU copyright law and its suitability to a creative sharing community of Wikipedia. It shows that the "free creative choices" and "author's personal" touch criteria established by the CJEU might be unsuitable not only because of practical concerns, but also because the understanding of "author" they are based on does not match the understanding possessed by Wikipedia community. The concepts of author (or rather author and Wikipedian) are compared through three key elements: author's relationship with work, author's relationship with others and presumptions about author's personality and creative process.

KEY WORDS

Copyright Law, Concept of Author, Originality, Wikipedia

1. INTRODUCTION

One of the seemingly never-ending debates in the context of copyright law in the recent years is its further development and adaptation to the digital technologies and the Internet. This debate is especially complicated not only because the potentials of current technology makes it harder (or even impossible) to control copying and dissemination of copyrighted works, but also because in the digital environment the traditional limits between

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the three central actors, namely those of authors, users, and intermediaries, are blurring and shifting and the content of these concepts is changing.

One of the biggest tensions, which this article is also set to address, is the one between authors and users that is visible especially when looking into phenomena like User Generated Content (UGC). Here, even those who are traditionally considered as "*users*" are producing their own creative works, and those who could be traditionally called "*authors*" engage in non--traditional (even if only because of their scope) creative practices and partly or completely refuse the protection of copyright law. Moreover, the distinction between authors and users in the Web 2.0 environment is often sensitive to ideological context and even employed to diminish the status and protection of on-line creators.[1]

There is a body of research trying to place the UGC creators somewhere in the author/user scale and calling them prosumers[2], mini creators[3], or similar. Attempts have also been made to understand these actors more in terms of "*authors*" and explore what makes them different from the classic (often called "*romantic*") model of authorship and what makes them oppose the traditional copyright monopoly.[4] This article will concentrate on the latter approach and will use the example of Wikipedia, analysing it as a community of "*authors*". Taking as its legal background the EU copyright law and one of its cornerstones – the recently unified standard of originality – this article will compare the Wikipedians to the authors of the EU copyright law and will elaborate what originality could mean in the cases of digital communities like Wikipedia.

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1 Erickson, K. (2014) User illusion: ideological construction of 'user-generated content' in the EC consultation on copyright. *Internet Policy Review*, 3 (4).

2 Bruns, A. (2006) *Blogs, Wikipedia, Second Life and Beyond. From Production to Produsage,* New York: Peter Lang.

3 Kawashima, N. (2010) The rise of 'user creativity' – Web 2.0 and a new challenge for copyright law and cultural policy. *International Journal of Cultural Policy*, 16 (3).

4 See Dusollier, S. (2003) Open Source and Copyleft: Authorship Reconsidered. *Columbia Journal of Law & the Arts*, 26 (3); Zhu, C. W. (2014) A regime of droit moral detached from software copyright? – the undeath of the 'author' in free and open source software licensing. *International Journal of Law and Information Technology*, 22 (4); Halbert, D. (2014) *The State of Copyright: the Complex Relationships of Cultural Creation in a Globalised World,* New York: Routledge, pp. 181–200.

2. AUTHOR AND ORIGINALITY AS HARMONISED EU COPYRIGHT STANDARD

There is little doubt that originality is one of the main concepts in copyright law. It is the criterion which ultimately determines if a creative work expressed in a tangible form is worthy of copyright protection. Differently from literary and every-day usage of the term, in the context of copyright law, originality is more related to "*origination*", not uniqueness.[5] On the other hand, in addition to requirement of origination, i.e. requirement for a work to "*originate*" from the author directly and not to be copied, both the continental and the common law copyright traditions also ask for something more, namely, creativity, skill, effort or judgement which were exercised in the process of origination.[6] In effect, the process which the author went through to create a work, and his or her[7] personal qualities and skills become part of investigation for originality assessment. Accordingly, the way the "*author*", his creative process and his role in the society are seen becomes one of the key determinants for what is protected by copyright law. This can be also observed in connection to the recently harmonized originality standard in the EU.[8]

This harmonisation of the standard of originality started in 2009 with the CJEU *Infopaq* case and then continued with *BSA, Football Association Premier League, Painer,* and finally, *Football Dataco* in 2012. In its decisions, the Court not only established the 'free creative choices' and, in *Painer*, 'personal touch' as the cornerstones for awarding copyright protection to a creative work of any kind, but also used arguments allowing

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[5] Van Gompel, S. (2014). Creativity, autonomy and personal touch. A critical appraisal of the CJEU's originality test for copyright. In: van Eechoud, M. (ed.) *The Work of Authorship.* Amsterdam University Press.

[6] See, for instance, Torremans, P. (2007) Legal Issues Pertaining to the restoration and re--constitution of manuscripts, sheet music, paintings and films for marketing purposes. In: Torremans, P. (ed.) *Copyright Law. A Handbook for Contemporary Research.* Cheltenham: Edward Elgar, p. 31, for description of "*two requirements*" of the UK originality standard or Quaedvlieg, A. (2014) The tripod of originality and the concept of work in Dutch and European copyright. *GRUR Int.,* 63 (12), for a model of three elements of originality for analysing Dutch and EU standards. See also Peifer, K.-N. (2014) "Individualität" or Originality? Core concepts in German copyright law. *GRUR Int.,* 63 (12).

[7] From here on in the rest of the article the default pronouns of „she" and „hers" will be used when refering to „author". This is mainly in order to, together with the arguments in the text itself, challenge the readers own concept of author which is often expressed through pronouns indicating male gender.

[8] Most now agree that the standard of originality is now de facto harmonized in the EU copyright law. See Rosati, E. (2013) *Originality in EU Copyright. Full Harmonization through Case Law*, Cheltenham: Edward Elgar.

certain insights on the type of author the EU copyright law is being set out to protect.

In the landmark *Infopaq*[9], the court set out to give an autonomous interpretation for "*reproduction*" and "*reproduction in part*" which in turn led it to consider the notion of "*work*" in the context of "*InfoSoc*" Directive. The CJEU concluded that it means

> "*subject matter which is original in the sense that it is its author's own intellectual creation*"[10]

and stressed that when it comes to a news article, its originality is achieved through the form and the manner of presentation and author's linguistic expression.[11] All of these original elements are to be protected by copyright law and accordingly, any part of the work which contains these elements has to be protected as well. The CJEU concluded that where protection was sought for text extracts from news articles (parts of original text), it was through choice, sequence, and combination of words that intellectual creation could be achieved.[12]

In *BSA*[13], the CJEU faced a question of whether a graphic user interface can be protected by copyright as an expression of the software itself and ruled that the Computer Programs Directive gives protection to certain parts of software but not the user interface.[14] However, graphic user interface can be protected in its own right if it is an original work, following the *Infopaq* criteria, concluded the Court. In this case,

> *"the specific arrangement or configuration of all the components which form part of the graphic user interface"*[15]

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[9] *Infopaq International A/S v. Danske Dagblades Forening* (2009) Case no. C-5/08. Court of Justice of the European Union, ECR I-06569.

[10] *Infopaq International A/S v. Danske Dagblades Forening* (2009) Case no. C-5/08. Court of Justice of the European Union, ECR I-06569, para. 37.

[11] *Infopaq International A/S v. Danske Dagblades Forening* (2009) Case no. C-5/08. Court of Justice of the European Union, ECR I-06569, para. 44.

[12] *Infopaq International A/S v. Danske Dagblades Forening* (2009) Case no. C-5/08. Court of Justice of the European Union, ECR I-06569, para. 45.

[13] *Bezpečnostní softwarová asociace – Svaz softwarové ochrany v. Ministerstvo kultury* (2010) Case no. C-393/09. Court of Justice of the European Union, ECR I-13971.

[14] *Bezpečnostní softwarová asociace – Svaz softwarové ochrany v. Ministerstvo kultury* (2010) Case no. C-393/09. Court of Justice of the European Union, ECR I-13971, para. 41.

[15] *Bezpečnostní softwarová asociace – Svaz softwarové ochrany v. Ministerstvo kultury* (2010) Case no. C-393/09. Court of Justice of the European Union, ECR I-13971.

were named as possibly original, but not those, which are determined by their technical function only.[16] In other words, merely following the requirements of technical function, an author cannot achieve "*intellectual creation*", since his creativity is not possible to express in an original manner, concluded the CJEU.[17]

The next decision to come in 2011 was *Football Association Premier League*[18] where the CJEU had to deal with, among other things, a question of whether Premier League matches could be copyrighted in their own right. The Court held that a football game couldn't be a work in copyright sense, because it lacks originality. It concluded that sporting events are subject to rules and leave

"no room for creative freedom for the purposes of copyright"[19].

In the end of the same year, the Court also decided on *Painer*[20] which involved unauthorised actions towards a school portrait picture of a child. The Court, among other things, had to rule on whether the picture in question could be protected by copyright at all since the degree of formative freedom when creating such portrait picture is rather restricted.[21] Here the CJEU once again explained ability to make free and creative choices as the key condition for originality[22] and regarding portrait photographs, it outlined that these can be exercised through choice of background, subject's pose, lighting, framing of the photo, angle

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[16] *Bezpečnostní softwarová asociace – Svaz softwarové ochrany v. Ministerstvo kultury* (2010) Case no. C-393/09. Court of Justice of the European Union, ECR I-13971, paras. 48–49.

[17] *Bezpečnostní softwarová asociace – Svaz softwarové ochrany v. Ministerstvo kultury* (2010) Case no. C-393/09. Court of Justice of the European Union, ECR I-13971, para. 50.

[18] *Football Association Premier League Ltd, NetMed Hellas SA, Multichoice Hellas SA v. QC Leisure, David Richardson, AV Station plc, Malcolm Chamberlain, Michael Madden, SR Leisure Ltd, Philip George Charles Houghton, Derek Owen, and Karen Murphy v. Media Protection Services Ltd* (2011) Joined cases nos. C-403/08 and C-429/08. Court of Justice of the European Union, ECR I-10909.

[19] *Football Association Premier League Ltd, NetMed Hellas SA, Multichoice Hellas SA v. QC Leisure, David Richardson, AV Station plc, Malcolm Chamberlain, Michael Madden, SR Leisure Ltd, Philip George Charles Houghton, Derek Owen, and Karen Murphy v. Media Protection Services Ltd* (2011) Joined cases nos. C-403/08 and C-429/08. Court of Justice of the European Union, ECR I-10909, para. 98.

[20] *Eva Maria Painer v. Standard Verlags GmbH and others* (2011) [unreported] Case no. C-145/10. Court of Justice of the European Union, 7 March.

[21] *Eva Maria Painer v. Standard Verlags GmbH and others* (2011) [unreported] Case no. C-145/10. Court of Justice of the European Union, 7 March, para. 85.

[22] *Eva Maria Painer v. Standard Verlags GmbH and others* (2011) [unreported] Case no. C-145/10. Court of Justice of the European Union, 7 March, para. 89.

of the view, atmosphere created and developing techniques.[23] Quoting the court:

> *"By making those various choices, the author of a portrait photograph can stamp the work created with his 'personal touch'."*[24]

This was enough to recognise the picture original, even though the actual choices exercised by the author in this case did not make the picture distinguishable from most other school portrait pictures.

Finally, in *Football Dataco*[25], the Court dealt with a question of originality of fixture list of matches to be played in English and Scottish football leagues in a year. Here, the CJEU explicitly dismissed the traditional common law "*skill and labour*" standard stating that even significant labour and skill are not enough to proclaim a database original.[26] Neither "*adding important significance*" to the data would be enough for this purpose either.[27] The Court, referring, to all the previous originality cases, reiterated that originality is about making "*free and creative choices*" and stamping "*personal touch*" on the final work and no amount of labour or investment can replace that.[28]

Turning to the presumptions and expectations for the "*author*" one can read in and between the lines of these decisions, they all speak about creativity as the basis of copyright protection. This, however, is not any kind of creativity, but original creativity, or rather creativity expressed in an original manner. It is important to repeat here that "*original*" has nothing to do with aesthetics, uniqueness or any other merit or quality – this is a specific legal construction hiding behind the same word as used

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[23] *Eva Maria Painer v. Standard Verlags GmbH and others* (2011) [unreported] Case no. C-145/10. Court of Justice of the European Union, 7 March, para. 91.

[24] *Eva Maria Painer v. Standard Verlags GmbH and others* (2011) [unreported] Case no. C-145/10. Court of Justice of the European Union, 7 March, para. 92.

[25] *Football Dataco Ltd, Football Association Premier League Ltd, Football League Ltd, Scottish Premier League Ltd, Scottish Football League, PA Sport UK Ltd v. Yahoo! UK Ltd, Stan James (Abingdon) Ltd, Stan James plc, Enetpulse ApS* (2012) [unreported] Case no. C-604/10. Court of Justice of the European Union, 1 March.

[26] *Football Dataco Ltd, Football Association Premier League Ltd, Football League Ltd, Scottish Premier League Ltd, Scottish Football League, PA Sport UK Ltd v. Yahoo! UK Ltd, Stan James (Abingdon) Ltd, Stan James plc, Enetpulse ApS* (2012) [unreported] Case no. C-604/10. Court of Justice of the European Union, 1 March, para. 46.

[27] Ibid.

[28] *Football Dataco Ltd, Football Association Premier League Ltd, Football League Ltd, Scottish Premier League Ltd, Scottish Football League, PA Sport UK Ltd v. Yahoo! UK Ltd, Stan James (Abingdon) Ltd, Stan James plc, Enetpulse ApS* (2012) [unreported] Case no. C-604/10. Court of Justice of the European Union, 1 March, para. 38.

in non-legal fields.[29] Thus, originality in the EU copyright law as interpreted by the CJEU means creativity expressed through intellectual process of *free* creative choices, which in its turn means that these choices cannot be constricted by technical requirements or rules (like in *BSA* or *Football Association Premier League*). It remains to be seen to what extent different kinds of other restrictions on creative choices present in normal creative process (such as constrains of methods, materials, intended audience, contractual relationships, etc.)[30] could be considered as falling outside originality in the future interpretations of the standard. In any case, the main presumption about the creativity of the author here is rather clear – there has to be an unrestricted space where intellectual[31] choices and decisions can be made by the author. The actual choices exercised by the creator and the final result are not that relevant, as the Court clearly indicates in *Painer*, where even a barely distinctive portrait picture is proclaimed original since there was significant creative freedom the author could have exploited. Therefore, the most valuable and protected is author's power and the ability to shape the surrounding world into a creative work.[32] There being no additional requirements for quality and rather weak emphasis on the final work, this power is presumably something that every human being possesses and everyone can be an "*author*".

On the other hand, even though the emphasis is clearly on the possibility for free creative choices, the CJEU in *Painer* also introduced something that at least to some extent speaks about the *relationship of the author with the final work* – the "*personal touch*" requirement. In the line of the above analysis, however, the *Painer* decision presented it more like a consequence of free creative choices, than a separate criterion to be investigated when determining originality.[33] In some way, the idea that anyone exercising creativity is bound to leave personal touch on a work introduces the idea

[29] Lavik, E., van Gompel, S. (2013) On the Prospects of Raising the Originality Requirement in Copyright Law: Perspectives from the Humanities. *Journal, Copyright Society of the U.S.A.*, 60 (3), p. 387, and van Gompel, S., Lavik, E. (2013). Quality, Merit, Aesthetics and Purpose: An Inquiry Into EU Copyright Law's Eschewal of other Criteria than Originality. *Revue Internationale du Droit d'Auteur (RIDA)*, 236.

[30] See van Gompel, S. (2014) Creativity, autonomy and personal touch. A critical appraisal of the CJEU's originality test for copyright. In: van Eechoud, M. (ed.) *The Work of Authorship.* Amsterdam: Amsterdam University Press.

[31] Even though it is quite curious to call "*intellectual*" something that is quite the opposite of making decisions on the most effective way to accomplish a task.

[32] Something that is, for instance, an interpretation of the EU originality standards that the Dutch courts seem to have, see van Gompel, S. 2014. Creativity, autonomy and personal touch. A critical appraisal of the CJEU's originality test for copyright. In: van Eechoud, M. (ed.) *The Work of Authorship.* Amsterdam: Amsterdam University Press.

that everyone is unique, which together with the previously identified presumption of "*free*" individual choices lands the current standard of originality somewhere close to the "*romantic author*" figure.[34] On the other hand, the seeming presumption that everyone is unique is quite different from the more elitist "*creativity of the few*" understanding that the model of the romantic author is usually accused of. Still, it remains to be seen if this "*personal touch*" criterion will not be used to qualify the very low and egalitarian "*space of free creative choices*" standard with assessment of the work and its "*personal*" (i.e. non-generic) nature after all. This is how this standard has always been understood in, for instance, in the French copyright law.[35]

Such construction of originality also gives a glimpse on how the Court envisions the *relationship of the author to the rest of the society* – this is the author and her free creativity that is in the centre, the final work as such does not necessarily have to be of any use to the rest of the world. The preamble of "*InfoSoc*" directive states that there is a need of high level of protection in order to secure reward for the author[36] – something that is later repeated in *Infopaq* and other cases. This reward, however, is there to "*ensure maintenance and development of creativity*" (recital 9), finance authors' works (recital 10), and "*safeguard the independence and dignity of artistic creators*" (recital 11). The "*consumers*" and "*public at large*" are also interest groups mentioned in the "*InfoSoc*" preamble[37], but only once explicitly (and several more times when refereeing to "*public interest*"), and therefore seem to have a rather secondary importance. As can be expected, this is a standard and understanding rather different from "*limited monopoly for the benefit of the public*" perspective often found

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[33] *Eva Maria Painer v. Standard Verlags GmbH and others* (2011) [unreported] Case no. C-145/10. Court of Justice of the European Union, 7 March, para. 92.

[34] See, for instance Jaszi, P. (1994) On the Author effect: Contemporary Copyright and Collective Creativity. In: Woodmansee, M., Jaszi, P. (eds.) *The Construction of Authorship. Textual Appropriation in Law and Literature.* Durham: Duke University Press. For detailed analysis of the scholarship on "*romantic author*" see Lavik, E. (2014) Romantic authorship in copyright law and the uses of esthetics. In: van Eechoud, M. (ed.) *The Work of Authorship.* Amsterdam: Amsterdam University Press.

[35] Rosati, E. (2013) *Originality in EU Copyright. Full Harmonization through Case Law.* Cheltenham: Edward Elgar, p. 71.

[36] Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the Harmonisation of Certain Aspects of Copyright and Related Rights in the Information Society, *Official Journal of European Union* (L 167/10) 22 June, Recitals 9-11.

[37] Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the Harmonisation of Certain Aspects of Copyright and Related Rights in the Information Society, *Official Journal of European Union* (L 167/10) 22 June, Recital 9.

in Anglo-American copyright justifications.[38] Hence, the usefulness for the rest of the society is understood through maintenance of "*creativity*", authors' continuous work and their protection, but not in terms of economic or other type of efficiency. Accordingly, in *Football Dataco* the CJEU explicitly rejected the "*skill and effort*" or the "*sweat of the brow*" doctrine of originality – presumably this is not something that the EU copyright and the Court consider as sufficiently important to protect. The author is not someone who necessarily works hard – even something as 11 words can be original in the standard of *Infopaq*. In addition, as also explicitly confirmed in *Football Dataco*, even if the final work has utility to the public, even if "*important significance*" was added to the raw data by the aspiring author, she will not be considered "*author*" by the EU copyright law, unless the process of "*free creative choices*" can be confirmed.

Consequently, one sees a complex picture of author that the analysis of the CJEU cases is drawing in the context of originality. On the other hand, three main aspects, namely, 1) author's relationship with the work, 2) author's relationship with society, and 3) presumptions about author's creative process including her personal qualities can be seen as three main topics the court elaborated on in the reviewed decisions. As presented in the beginning of the text, the article will now turn to Wikipedia to compare the presumptions and requirements for Wikipedians and to see how Wikipedia then fits in into the picture of "*authors*" and "*creativity*" that the CJEU is drawing.

3. ORIGINALITY IN THE DIGITAL CONTEXT, THE CASE OF WIKIPEDIA

3.1 THE PHENOMENON OF WIKIPEDIA

Wikipedia, as presented in the website of the project itself, is

> *"a multilingual, web-based, free-content encyclopedia project supported by the Wikimedia Foundation and based on a model of openly editable content"*[39].

[38] See, for example, Samuelson, P. (2003–2004) Should Economics Play a Role in Copyright Law and Policy? *University of Ottawa Law & Technology Journal*, 1 (2).

[39] (2017) *Wikipedia: About*. [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:About [Accessed 10 February 2017].

In other words, this is a project based on voluntary collaborative contributions aimed at creating a free encyclopaedia which can be edited by anyone accessing it (anonymously or not, depending on the choice of the editor). The official statistics shows that as for August 2016 there were over 29 million registered editors,[40] around 13,5 million edits[41] were made and there were more than 10 000 of registered contributors who made more than 100 edits that month.[42] In total, it makes for an enormous group of people working on a common goal and impressive amounts of hours invested by contributors, especially the very active ones.[43] The main normative framework connecting all the contributors of the project are the "*Five Pillars*"[44] which reflect the most fundamental principles all other Wikipedia guidelines and policies derive from. These are the rules that are valid globally and are to be respected in all project's language communities. Aside from that, each of them has a degree of freedom to self-organise and even though the rules and principles are often similar among them, there are certain differences too, and this is why the research that will follow next will be in relation to English language Wikipedia only.

As explained in the introductory part, this article will consider "*Wikipedian*" not from the perspective of user, prosumer or similar, but, will try to see her as an "*author*" and compare her with the "*author*" formulated in the CJEU judgements above. In this respect, it is interesting to observe that people creating text on Wikipedia are in the community itself called many different things: authors[45], Wikipedians[46], contributors[47], and even users[48], without much controversy or, seemingly, deeper reflection. This

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[40] (2017) *Wikipedia: Statistics.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Statistics [Accessed 10 February 2017].

[41] (2017) *Wikipedia Statistics.* [online] Available from: https://stats.wikimedia.org/EN/TablesDatabaseEdits.htm [Accessed 10 February 2017].

[42] (2017) *Wikipedia Statistics,* [online] Available from: https://stats.wikimedia.org/EN/TablesWikipediansEditsGt100.htm [Accessed 10 February 2017].

[43] Sundin, O. (2010) Janitors of Knowledge: constructing knowledge in the everyday life of Wikipedia editors. *Journal of Documentation*, 67 (5).

[44] (2017) *Wikipedia: Five Pillars.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Five_pillars [Accessed 10 February 2017].

[45] (2017) *Wikipedia: Authors of Wikipedia.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Authors_of_Wikipedia [Accessed 10 February 2017].

[46] (2017) *Wikipedia: Wikipedians.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Wikipedians [Accessed 10 February 2017].

[47] (2017) *Wikipedia: Who writes Wikipedia?.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Who_writes_Wikipedia%3F [Accessed 10 February 2017].

[48] See, for example (2017) *Wikipedia: Wikipedians.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Wikipedians [Accessed 10 February 2017].

might show that there simply is no clear consensus in the community on how the person contributing to it should be called, but perhaps also that such joint name is not needed – there could be other methods to distinguish who is in the community and who is outside it. Academic studies, on the other hand, seem to be using "*author*" more often to describe Wikipedia contributors,[49] but other names like editors, contributors, Wikipedians, participants, etc.[50] On the other hand, in academic and empirical studies Wikipedia is also often called a "*UGC phenomenon*", UGC site or something along these lines[51] and the contributors are called simply users[52]. In this article, for instance, the choice was made to use "*Wikipedian*" as the predominant concept to describe Wikipedia contributors in order to draw attention to the Wikipedian as an autonomous phenomenon distinct from and possible to compare with the legal "*author*".

The first material sign that Wikipedian might mean something slightly different from "*author*" in the EU copyright law and that even the standard of originality might differ between these two contexts are the rules of attribution of Wikipedia[53]. These rules put forward that the first choice for proper attribution is to provide an URL to the relevant Wikipedia site but in case this is impossible, there is also an option of listing all authors of a specific article (presumably the Wikipedians provided in the history/log of edits). The preference for URL referencing is understandable, because of the sheer number of contributors one would need to list and also because the log contains all possible edits, including vandalism, bulk deletions, things like, for instance, inclusion of one comma, etc. Taking this into

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[49] For instance Pentzold, C. (2010) Imagining the Wikipedia community: What do Wikipedia authors mean when they write about their 'community'. *New Media & Society*, 13 (5); or Halatchliyski, I., Moskaliuk, J., Joachim, K., Cress, U. (2014) Explaining authors' contribution to pivotal artefacts during mass collaboration in the Wikipedia's knowledge base. C*omputer Supported Cooperative Learning*, 9 (1), pp. 97–115.

[50] Examples of studies using different notions: Lai, C.-Y., Yang, H.-L. (2014) The reasons why people continue editing Wikipedia content – task value confirmation perspective. *Behaviour & Information Technology*, 33 (12); also Sundin, O. (2010) Janitors of Knowledge: constructing knowledge in the everyday life of Wikipedia editors. *Journal of Documentation,* 67 (5); and others.

[51] See, for instance, Nov, O. (2007) What Motivates Wikipedians. *Communications of the ACM*, 50 (11); Yang, H.-L., Lai, C.-Y. (2010) Motivations of Wikipedia Content Contributors. *Computers in Human Behavior*, 26 (6), pp. 1377–1383.

[52] For instance in Xu, B., Li, D. (2015) An empirical study of the motivations for content contribution and community participation in Wikipedia. *Information & Management*, 52 (3).

[53] Can be found in several sites containing community rules including: (2017) *Wikipedia: Reusing Wikipedia Content.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Reusing_Wikipedia_content [Accessed 10 February 2017], or (2017) *Wikipedia: Copyrights.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Copyrights [Accessed 10 February 2017], under "Re-users' rights and obligations".

consideration, the rule of attribution allows omitting minor and irrelevant contributions – something that might seem similar to originality threshold in copyright law. However, there are also clear differences from the copyright law, giving a hint on the nature of Wikipedian "*originality*" already. First of all, the rule explicitly excludes irrelevant contributions (with no reference to their extent) – so those that, for instance, did not follow the topic of the article. Moreover, it does not exclude major but merely technical contributions (like, finding sources, adding references, adding tags, large scale formatting and other technical tasks that form a big part of a work of Wikipedian[54]) nor any changes of content even as small as one word.[55] As a contrast, the CJEU in the cases above provided that creative activities restrained by technical requirements and rules do not qualify as original and so merely making the text fit the format requirements of Wikipedia would normally not be an act of authorship in the EU copyright law. Lastly, the rule, arguably, does not exclude non--minor contributions which might be now almost or completely re-written by someone else and therefore not present in the article anymore – something that would only fall under copyright protection only if joint authorship criteria would be satisfied.[56]

All of this gives the impression that "*Wikipedian*" is a more inclusive concept than copyright "*author*", at least when it comes to one aspect of authorship, namely, attribution. The article will now follow to examine and compare other aspects of authorship already identified in the CJEU judgements: 1) author's relationship with the work, 2) author's relationship with society, and 3) presumptions about author's creative process including her personal qualities.

3.2 WIKIPEDIAN'S RELATIONSHIP WITH WORK

The question to answer when looking at this aspect is "*what kind of relationship with the work is expected and valued in Wikipedia community?*".

[54] Sundin, O. (2010) Janitors of Knowledge: constructing knowledge in the everyday life of Wikipedia editors. *Journal of Documentation*, 67 (5).

[55] More about what is considered minor and what is a major edit can be found at (2017) *Help: Minor edit*. [online] Available from: https://en.wikipedia.org/wiki/Help:Minor_edit [Accessed 10 February 2017].

[56] Description of the problems of establishing authorship in the context of online collaborative projects like Wikipedia can be found in Phillips, J. (2009) Authorship, ownership, wikiship: copyright in the 21st century. In: Derclaye, E. (ed.) *Research Handbook on the Future of EU Copyright*. Cheltenham: Edward Elgar.

In the context of the EU copyright law, or rather the CJEU decisions on originality, author's relationship with her work was described in the form of "*personal touch*" that the author gives to it and the general emphasis on author's independence, dignity and possibilities for her to exercise her creativity through the protection of law.

Looking into Wikipedia and the relationship individual Wikipedians have to their work, there have been a great number of studies carried out on the motivations of contribution to this project during the time of its existence.[57] As could be expected, they predominantly found intrinsic motivations[58], as fun (enjoyment/pleasure), ideology (of openness), values (related to altruistic and humanitarian concerns for others) being key for contribution. Extrinsic motivations such as reputation, reciprocity and self-development (improvement of skills and knowledge) were among those positively correlating with sharing behaviour, but usually to a lesser extent than the intrinsic ones. In other words, most authors of Wikipedia contribute because it feels good to do it, because they consider that they are helping society by making information freely available and easily accessible or because they have strong ideological conviction on that knowledge needs to be free. The motivation that comes with the presence of community itself, like recognition, reciprocity, and wish to improve one's knowledge about a certain subject also play an important role, but perhaps not as important as in, for instance, Open Source communities.[59] Creative autonomy or rewards in order to be able to continue creative work seemingly do not have significant presence in the relationship Wikipedians have with their

[57] See, for instance, Xu,B ., Li, D. (2015) An empirical study of the motivations for content contribution and community participation in Wikipedia. *Information & Management,* 52 (3), Yang, H.-L., Lai, C.-Y. (2010) Motivations of Wikipedia Content Contributors. *Computers in Human Behavior,* 26 (6), pp. 1377–1383; Lai, C.-Y., Yang, H.-L. (2014) The reasons why people continue editing Wikipedia content – task value confirmation perspective. *Behaviour & Information Technology,* 33 (12); Nov, O. (2007) What Motivates Wikipedians. *Communications of the ACM,* 50 (11); Yang, H.-L., Lai, C.-Y. (2010) Motivations of Wikipedia Content Contributors. *Computers in Human Behavior,* 26 (6), pp. 1377–1383; Parasarnphanich, P., Wagner, C. (2011) Explaining the Sustainability of Digital Ecosystems based on the Wiki Model Through Critical-Mass Theory. *IEEE Transactions on Industrial Electronics*, 58 (6); and others.

[58] For more information on self-determination theory and intrinsic and extrinsic motivations see Ryan, R. M., Deci, E. L. (2000) Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions. *Contemporary Educational Psychology*, 25 (1), pp. 54–67; Deci, E. L., Ryan, R. M. (1985) *Intrinsic Motivation and Self-Determination in Human Behaviour,* New York: Springer.

[59] Oreg, S., Nov, O. (2008) Exploring motivations for contributing to open source initiatives: The roles of contribution context and personal values. *Computers in Human Behavior*, 24 (5); Ye, Y., Kishida, K. (2003) Toward an Understanding of the Motivation of Open Source Software developers. *ICSE '03 Proceedings of the 25th International Conference on Software Engineering.*

work. The predominance of intrinsic rather than extrinsic motivations, on the other hand, still draws focus to value for autonomy and appreciation for personal beliefs, choices and decisions. There certainly is a connection between Wikipedians and "*authors*" as portrayed through the EU originality standard, just that the emphasis is not on creativity, but other values like enjoyment or openness.

On the other hand, Wikipedia community rules that define acceptable content and that which has no chance of passing the communal peer-review complement the picture of Wikipedian's relationship with her work. The "*Five Pillars*"[60] and the "*Rules of writing articles*"[61] contain the following requirements for content:

- Neutral point of view (meaning that articles have to be objective and present a wide array of different opinions of others).
- Verifiability (meaning that all statements have to be backed by reliable sources, especially the controversial ones).
- No original research (which requires authors to present the existing knowledge without adding any new and unsupported theories or analyses).

In essence, all these principles are not much different from the standards that would be applicable to any other encyclopaedia. The Encyclopaedia Britannica describes similar features of encyclopaedias as a whole, including the fact that most of them are compilation works created by many contributors working together.[62] Something that sets Wikipedia apart is, however, its special need for verifiability, namely, external references, which create trust not only among the contributors but also between the reader and the authors.[63] In addition, there are opinions that the "*Neutral point of view*" principle is stronger in Wikipedia than in the traditional encyclopaedias[64], most likely for the same reason of trust between readers and authors which is more easy to establish in the case

[60] (2017) *Wikipedia: Five Pillars.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Five_pillars [Accessed 10 February 2017].

[61] (2017) *Help: Introduction to Policies and Guidelines/2.* [online] Available from: https://en.wikipedia.org/wiki/Help:Introduction_to_policies_and_guidelines/2 [Accessed 10 February 2017].

[62] Preece, W. E. and Collison, E. L. (2016) *Encyclopaedia: Reference Work* [online] Available from: https://global.britannica.com/topic/encyclopaedia [Accessed 10 February 2017].

[63] See Sundin, O. (2010) Janitors of Knowledge: constructing knowledge in the everyday life of Wikipedia editors. *Journal of Documentation*, 67 (5), for detailed analysis on how referencing "*stabilises knowledge*" on Wikipedia.

of printed encyclopaedia: traditional encyclopaedias are usually more readily accepted for a source of impartial knowledge. Taken together with restrictions of creative choices present in the genre of encyclopaedia as such, it can be concluded that no, or very little, creative effort, freedom of choice or similar continental originality standards are involved when creating Wikipedia. In the same vein, something like "*personal touch*" is neither expected nor really desirable in Wikipedia at all. What seems to be the most important in the "*Five Pillars*" and other rules is the final product, its neutrality and usability, not the creative process of the author.

Looking at the formal requirements of Wikipedia and dismissing the motivations of creators, the traditional common law "*skills and effort criterion*" is closer to the requirements for content in Wikipedia. The work of neutrally compiling well-referenced representation of human knowledge is rather technical and non-creative, but requiring investment of time, skill and judgement.[65] Nevertheless, the discussion about motivations of Wikipedians clearly show that this result can be achieved in different ways and that rules and requirements in Wikipedia are flexible enough or even perhaps especially fitting to accommodate them. In other words, opposite from the EU copyright law that values process and individual autonomy over the result (there may or may not be "*personal touch*" imprinted on the final product), Wikipedia community has clear requirements on the result, but very little to say about the choices to be made. At the same time, even the result valued by Wikipedia community is very different from the result of creative choices envisioned in the EU copyright law. It is functional, useful and personality-neutral. After all, Wikipedia is a process, not really a finalised work. It is always in a state of a work-in-progress most articles being constantly edited and rewritten in certain predictable patterns.[66] Therefore such notions as "*personal touch*"

[64] Bruns, A. (2006) *Blogs, Wikipedia, Second Life and Beyond. From Production to Produsage,* New York: Peter Lang, p. 113.

[65] The same can be observed in the process of becoming an administrator, for instance – most likely these are people who have put a lot of investment of skill and effort and are well known for their contributions. See (2017) *Wikipedia: Guide to requests for adminship.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Guide_to_requests_for_adminship [Accessed 10 February 2017]. This can also be said about perhaps the only formal reward in Wikipedia – a barnstar, which are awarded for "*hard work and due diligence*" (2017) *Wikipedia: Barnstars.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia: Barnstars [Accessed 10 February 2017].

[66] (2017) *Wikipedia: Authors of Wikipedia* [online] Available from: https://en.wikipedia.org/wiki/ Wikipedia:Authors_of_Wikipedia [Accessed 10 February 2017], also, Cardon, D. (2012) Discipline but not Punish: The governance of Wikipedia. In: Massit-Follea, F., Meadel, C., Monnoyer-Smith, L. (eds.) *Normative Experience in Internet Politics.* Paris: Presses Des Mines.

are abstract in this context – whose personal touch and at what point of time should we be looking for?[67]

3.3 WIKIPEDIAN'S RELATIONSHIP WITH OTHERS

From the analysis of the EU originality it could be deduced, that the relationship of the author with society is mostly about the author, not that much about society. The previous section demonstrated, that Wikipedia community, on the opposite, values utility and openness of knowledge above the freedom of choices for the creator. This is, in addition, confirmed by the CC-BY-SA Creative Commons license Wikipedia is using[68] and by their commitment to creation of "*free encyclopedia*"[69] accessible to everyone. Moreover, the Wikipedian Creative Commons license also comes with "*share-alike*" condition, which requires any new work incorporating materials from Wikipedia to be licensed under exactly the same CC-BY-SA license. Of course, to a great extent this provision helps to protect the free content from enclosure, but it also gives an edge to the seeming altruism and devotion of the Wikipedia community to the general public. Clearly, the mission of Wikipedia is not only to give, it is also to actively spread a certain ideological attitude towards knowledge as such and make sure that the giving is in some way reciprocated. This is one of the few rights that the authors of Wikipedia hold after signing the initial copyright protection away.[70]

However, even more detailed picture of the Wikipedia emerges when one more aspect of the relationship with others – the relationship within the community is investigated. This aspect of the "*relationship with others*" is not even discussed in the EU originality analysis above as in this context the relationship with a certain creative community (or a group of other authors in the case of joint authorship) could be only important to assess

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[67] Also see van Gompel, S. (2014) Creativity, autonomy and personal touch. A critical appraisal of the CJEU's originality test for copyright. In: van Eechoud, M. (ed.) *The Work of Authorship.* Amsterdam: Amsterdam University Press, elaborating on this point.

[68] *Creative Commons: Attribution-ShareAlike 3.0 Unported (CC BY-SA 3.0).* [online] Available from: https://creativecommons.org/licenses/by-sa/3.0/deed.en [Accessed 10 February 2017].

[69] The official Wikipedia slogan is "*The free encyklopedia that anyone can edit*", see (2017) *Wikipedia* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia [Accessed 10 February 2017].

[70] The right to demand from others to keep their works free is not part of the original bundle of copyright. It is a right that can be said to have been "*invented*" by the Open Access movement and realised through different open licenses.

if there was no significant obstruction to the freedom of creative choices[71]. In Wikipedia, this type of relationship is much more important.

The same Creative Commons license is also the key to "*anyone can edit*" principle in Wikipedia[72] and is the legal basis for the internal relationships in the community. Only through editing someone else's work one can become a Wikipedian and it's this condition which makes any piece of text in Wikipedia an object of a rigorous peer-review by anyone who is interested. The license is, however, only the first step – there is an impressive amount of additional communal norms dealing with internal relations. Even though there are different opinions[73], the prevalent view is that normative structure of Wikipedia is a relatively stable and very complex system that has a number of common features with any traditional bureaucracy.[74] However, the most important here is that among the different rules, policies, guidelines, manuals and other internal normative material in Wikipedia site the joining "*red thread*" is collaboration.[75] Collaboration is the key feature even of the normative structure itself, as one of the main rules, or rather, ideological principles of Wikipedia is that there are no rules[76] and most questions are solved seeking consensus from everyone involved. Moreover, this is not an aim in itself – this is likely the most effective way to combine the creation of a reliable end product and make community functional in the long term (especially having in mind that all the contributions are made on a voluntary basis).

In fact, collaboration in Wikipedia is as important, and sometimes even more important, than the rules on quality of the content. J. M. Reagle in his

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[71] An example could be a case where the tasks for the author were very limited or defined strictly so that only insufficient freedom of choice would be possible.

[72] (2017) *Wikipedia: Who writes Wikipedia?*. [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Who_writes_Wikipedia%3F [Accessed 10 February 2017].

[73] D. Wielsch, for instance, calls all the norms in Wikipedia nothing more than User Generated Content as well, which is constantly edited and remade. In Wielsch, D. (2010) Governance of Massive Multiauthor Collaboration. Linux, Wikipedia, and Other Networks: Governed by Bilateral Contracts, Partnerships, or Something in Between? *JIPITEC*, 1 (2).

[74] Joyce, E., Pike, J. C., Butler, B. S. (2012) Rules and Roles vs. Consensus: Self-Governed Deliberative Mass Collaboration Bureaucracies. *American Behavioral Scientist*, 57 (5); and Heaberlin, B., DeDeo, S. (2015) The Evolution of Wikipedia's Norm Network. *Future Internet*, 8 (2).

[75] Heaberlin, B., DeDeo, S. (2015) The Evolution of Wikipedia's Norm Network. *Future Internet*, 8 (2).

[76] The number 5 of the "five pillars" (2017) *Wikipedia: Five Pillars*. [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Five_pillars [Accessed 10 February 2017].

comprehensive review of Wikipedia's collaboration phenomenon[77] identifies two key features making the collaboration possible: the "*Neutral Point of View*" principle[78] and the good faith requirement (and presumption)[79]. The Neutral Point of View is a principle stipulating equal respect to all points of view on a specific topic, not merely equal coverage of different views and sources, and as such dictates certain epistemic perspective to be taken by a Wikipedian.[80] The Good Faith principle asks to see the humanity of the other and to always assume that edits, mistakes, and all statements are made in a good faith. Dealing with the same questions of collaboration, D. Cardon gives specific emphasis to the rule of "*No Personal Attacks*" which is one of the key rules when it comes to dispute resolution. "*No personal Attacks*" essentially means that any comments must be made only in relation to content, not the contributor, which allows to foster good faith and collaborative atmosphere with least risk of someone being insulted.[81] In a system like that, the outcome of a dispute is oriented towards consensus and compromise, not the "*absolute truth*"[82], all views and all contributors have to be respected. Consequently, in Wikipedia, sanctions are few and formal dispute resolution seldom needed.[83]

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[77] Reagle, J. M. J. (2010). *Good Faith Collaboration. The Culture of Wikipedia,* Cambridge: MIT Press.

[78] (2017) *Wikipedia: Neutral Point of View.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Neutral_point_of_view [Accessed 10 February 2017].

[79] (2017) *Wikipedia: Assume Good Faith.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Assume_good_faith [Accessed 10 February 2017]. This principle is, indeed, often referenced in discussions in Wikipedia and is a key in most of its dispute resolution recommendations and procedures: (2017) *Wikipedia: Assume the Assumption of Good Faith.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Assume_the_assumption_of_good_faith [Accessed 10 February 2017].

[80] Reagle, J. M. J. (2010) *Good Faith Collaboration. The Culture of Wikipedia.* Cambridge: MIT Press, pp. 53–59.

[81] Cardon, D. (2012) Discipline but not Punish: The governance of Wikipedia. In: Massit-Follea, F., Meadel, C., Monnoyer-Smith, L. (eds.) *Normative Experience in Internet Politics.* Paris: Presses Des Mines.

[82] "Wikipedia is not about winning" – state the guidelines on dispute resolution: (2017) *Wikipedia: Dispute Resolution.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Dispute_resolution [Accessed 10 February 2017], (2017) *Wikipedia: Neutral Point of View.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Neutral_point_of_view [Accessed 10 February 2017].

[83] Cardon, D. (2012) Discipline but not Punish: The governance of Wikipedia. In: Massit-Follea, F., Meadel, C., Monnoyer-Smith, L. (eds.) *Normative Experience in Internet Politics.* Paris: Presses Des Mines. There is a formal Arbitration Committee but only for questions the community was unable to resolve by itself (2017) *Wikipedia: Arbitration Committee.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Arbitration_Committee [Accessed 10 February 2017].

When the internal relationship in the community is almost as important as the quality of the product itself, it can be speculated that the rules of good faith, neutral point of view and no personal attacks are by themselves requirements for the Wikipedian. Quality and compliance with standards are important to usability of the end product and further the agenda of the openness of knowledge, however, without collaboration even the good contributions and smart contributors can be pushed out from Wikipedia.

3.4 PRESUMPTIONS ABOUT WIKIPEDIAN'S PERSONALITY AND CREATIVE PROCESS

As was demonstrated, the CJEU dealing with the questions of originality in the EU copyright law makes certain presumptions about the author's creative process and her personality. As also already discussed, in Wikipedia, it is the end product and the community which take the central stage. Still, as in the EU copyright cases explored above, the presumptions about author are more explanations on why the formal normative requirements for the creative output and the creative process are the way they are, not criteria by themselves. Analysing these presumptions helps to understand the other elements and finishes the picture of the author.

First of all, an important question to answer is whose presumptions about the Wikipedia contributors are important? In the analysis of EU originality above, the presumptions by the CJEU were scrutinised, but there is no authoritative body that interprets and makes decisions in Wikipedia – it's the community itself. The elements already analysed show a clear difference between Wikipedia and the EU copyright law. In such community as Wikipedia, the romantic notions of isolated creativity and uniqueness of each creator become meaningless. However, the various motivations of Wikipedia contributors and their ideological engagement do show a certain image of the self, typical Wikipedia contributor exhibits, which is in some respects not less romantic.[84]

According to S. Dusollier, for instance, the nature of the creative process in Open Source and copyleft movements is akin to the model proposed

[84] Chon, M. (2012) The Romantic Collective Author. *Vanderbilt Journal of Entertainment and Technology Law*, 14 (4), pp. 829–849.

by the post-modernists.[85] The famous post-modern manifesto of the "*death of the author*" deconstructed the text and the author, proclaimed the text to be "*open*" and the reader as an equal (or even more important) participant in creation of meaning.[86] S. Dussolier argues that the collaborative nature and the seemingly unconditional surrender of the Open Source work to the user and an invitation to contribute to the meaning is exactly in the vein of the post-modernist view. Something that can be clearly applicable to the Wikipedia community as visible from the previous sections. Chen Wei Zhu, on the other hand, points out that even in collaborative communities there are definitely still points where the author connects to her work, attribution (which is also the right kept by all Wikipedia contributors through the Creative Commons license) being one of them.[87] Zhu, following R. Kwall[88] identifies the Open Source author as a "*steward*" who acknowledges that his ability to create comes from the outside (the OS community) and who feels the need to give back to the same community afterwards.

Both of these accounts seem to have insights explaining the certain features of Wikipedia community as well. However, the "*author is not important at all*" approach does not fit the requirements of attribution still present in Wikipedia, nor the strong communal culture and insistence on observation of strict community rules. "*Steward*" model, on the other hand, does not really explain fun and enjoyment as being predominant motivations for contributing as shown in the section 3.1 above. If both of these models and the observations in the previous sections are combined, though, we see ideology of openness, removal of the "*author*" away from the central stage and steward-like surrender of the control of text to society and community, but still an individual, a Wikipedian, who is actively choosing this path of creativity, actively participating in a community, and enjoying it in the process. The author in Wikipedia is not dead, she is transformed into something that is perhaps best called

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[85] Dusollier, S. (2003) Open Source and Copyleft: Authorship Reconsidered. *Columbia journal of law & the Arts*, 26 (3).

[86] Barthes, R. (1967) The Death of the Author. *Aspen,* 5 (6); Foucault, M. (1979) What is an Author? *Screen,* 20 (1), pp. 13–33; etc.

[87] Zhu, C. W. (2014) A regime of droit moral detached from software copyright? – the undeath of the 'author' in free and open source software licensing. *International Journal of Law and Information Technology*, 22 (4).

[88] Kwall, R. R. (2010) *The Soul of Creativity. Forging Moral Rights Law for the United States.* Standford: Standford Law Books.

a "*sharer*". According to Oxford English dictionary, sharer means someone who shares something or shares in something[89] and Wikipedian is exactly that, in both meanings of the word. Moreover, it stipulates that the person wants and has something to share. "*Sharer*" can easily accommodate the ideology of openness within and outside the community as well as the personal agency of this transformed author: sharing requires someone to do it and does not exclude reciprocity nor respect among all parties involved (as opposed to, for instance, gift giving). Such "*revelation*" might be borderline banal, as sharing as a phenomenon is the factor characterising the Web 2.0 environment. This simple solution, however, allows going to the heart of the problem: a Wikipedian is a sharing author. How can copyright law accommodate that?

4. CONCLUSIONS

The simple answer to this question raised in the last paragraph is, of course, allowing the author to keep only the attributes of copyright that suit her needs and providing conditions for free sharing. The Creative Commons license mentioned above takes care of all that. Going deeper into the structure of copyright law, however, as in this case – into the standard of originality – makes it much harder to provide a clear answer.

As elaborated above, originality in the context of the EU copyright law after the harmonisation by the CJEU is the main criterion for protection of a creative work. This is a criterion that ultimately determines if the creator of the work in question receives the copyright and all the rights related to it, including the right to call oneself an "*author*". As was demonstrated, the "*author*" which this standard of originality is directed towards is not really the same as the concept in the Wikipedian context. How, then is originality understood in Wikipedia and how would it compare with the legal standard provided by the CJEU?

Originality in the case of the sharing Wikipedia author, or, so to say, the basis for "*protection*" or basis for something to stay in Wikipedia, has a lot to do with Wikipedian community and participation in it. It is through the community that the rules on what Wikipedia is and what amounts to good quality are negotiated, established and amended. This is

[89] Oxford University Press. (2013) *Oxford English Dictionary Online.* [online dictionary]. Available from: http://www.oed.com.ludwig.lub.lu.se/viewdictionaryentry/Entry/177541 [Accessed 10 February 2017].

the consensus of the community that is important when deciding what is to be deleted and what is to be kept, sometimes even more important than the quality or compliance to other formal guidelines and principles. The community also does not, in general, care what is the motivation of the individual author, nothing is presumed or expected as long as the quality, consensus and ideology of openness are observed. At the same time, neither does community care about what standard of originality copyright law has, the contributions which formally do not need to be "*signed away*" through a license (like contributions technical in their nature) have no difference in treatment from the ones which are covered by copyright protection. As outlined above, Wikipedia community and its individual members have sharing (including internal collaboration) and openness as the main jointly recognised principles.

If to put all this into the perspective of the originality standard in the EU copyright law, it would then be not "*author's own intellectual creation*" and "*free creative choices*" that should be in the focus in Wikipedia. To be accepted to Wikipedia, a work or a contribution has to have a certain kind of "*utility*" instead. Utility here means not only to the readers and the whole society, but also to the health of the community as a whole. This principle then is able to encompass everything – neutrality, verifiability, ideology of openness, sharing long term sustainability and consensus in the community, etc.

More concretely, if copyright law would aspire to meet the needs of such intrinsically motivated, self-organising sharing communities like Wikipedia, originality standard as the basis of protection should look much more like the common law standard where skill, effort and the value of the final product are emphasized. The path of following the continental copyright and putting author and her creative process in the centre seems to be moving away from the authors of Wikipedia and presumably other similar creators working in such online sharing communities.

On the other hand, the real meaning and the extent of this "*utility*" Wikipedia is basing authors' participation on, needs to be explored further. The project of Wikipedia – the community as well as the result of its work – is always changing and is never finalised. Technology, community and the final product are integrated to form an almost inseparable whole: it is the openness of the technology and the aspiration for encyclopaedia that makes the community necessary and, at the same time, possible. The mere

fact that some contributions are irrelevant, outright wrong, obscene or large portions of text are routinely deleted[90] (in other words, the absolute openness of the text) makes it necessary for contributors to organise, constantly track the changes others make and simply return to Wikipedia repeatedly to make sure their contribution is not unduly replaced or distorted. The reality that anyone can add their view makes it necessary for all views to be represented neutrally. The sheer practicality of achieving cooperation of at least those who are driven by similar ideology and goals makes the community structure necessary. One could go on and on like this pointing out the connections between the different layers in Wikipedia, but the most important here is that in this context contributions of any kind are valuable. Moreover, all of them are recorded and stay in the history of the page forever. Without the malicious contributions Wikipedia would not be the same.[91] More importantly, all contributions will be rewritten or changed or deleted some day, many of the edits made in 2006 are now only present as a historical record in the history section of a relevant Wikipedia page. In such environment what is useful? Or rather, what is not?

Clearly, a limit needs to be drawn, as not all of these activities are even called "*contributions*", nor are their originators called Wikipedians. However, this could also indicate that originality might, differently from the EU copyright law, not be the main and only criterion for calling someone an "*author*". On the other hand, even if a limit based on the level of utility would be drawn, it could mean that the recognition of the input of the broader community, i.e. even those whose contributions do not give significant utility to the community or society, might still be an important aspect of Wikipedian community.[92] Further studies on this would not only give more insights on how the EU copyright law could better accommodate the needs of sharing online communities like Wikipedia, but also might

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[90] The extent and reoccurrence of these events is well revealed and illustrated in Viegas, F. B., Wattenberg, M., Dave, K. (2004) Studying Cooperation and Conflict between Authors with history flow Visualisations. *CHI '04 Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, pp. 575–582.

[91] This, in fact, can be well illustrated also by the split views community continues to have about possible introduction of obscenity filters in Wikipedia Laat, P. B. (2012) Coercion or empowerment? Moderation of content in Wikipedia as 'essentially contested' bureaucratic rules. *Ethics and Information Technology*, 14 (2), pp. 123–135.

[92] Evidenced, for instance, by the fact that all of the contributions stay in the Wikipedia site's log.

help to give guidance into how the EU copyright law could be more sensitive to community or social context always surrounding any author.[93]

LIST OF REFERENCES

[1] (2017) *Help: Introduction to Policies and Guidelines/2.* [online] Available from: https://en.wikipedia.org/wiki/Help:Introduction_to_policies_and_guidelines/2 [Accessed 10 February 2017].

[2] (2017) *Help: Minor edit.* [online] Available from: https://en.wikipedia.org/wiki/Help:Minor_edit [Accessed 10 February 2017].

[3] (2017) *Wikipedia* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia [Accessed 10 February 2017].

[4] (2017) *Wikipedia: About.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:About [Accessed 10 February 2017].

[5] (2017) *Wikipedia: Arbitration Committee.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Arbitration_Committee [Accessed 10 February 2017].

[6] (2017) *Wikipedia: Assume Good Faith.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Assume_good_faith [Accessed 10 February 2017].

[7] (2017) *Wikipedia: Assume the Assumption of Good Faith.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Assume_the_assumption_of_good_faith [Accessed 10 February 2017].

[8] (2017) *Wikipedia: Authors of Wikipedia.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Authors_of_Wikipedia [Accessed 10 February 2017].

[9] (2017) *Wikipedia: Barnstars.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Barnstars [Accessed 10 February 2017].

[10] (2017) *Wikipedia: Copyrights.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Copyrights [Accessed 10 February 2017].

[11] (2017) *Wikipedia: Dispute Resolution.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Dispute_resolution [Accessed 10 February 2017].

[12] (2017) *Wikipedia: Five Pillars.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Five_pillars [Accessed 10 February 2017].

[93] See, for instance, Zemer, L. (2007) *The Idea of Authorship in copyright*, Adershot: Ashgate. For a discussion about copyright's lack of sensitivity to author's relationship with surrounding social fabrics during her creative process.

[13] (2017) *Wikipedia: Guide to requests for adminship.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Guide_to_requests_for_adminship [Accessed 10 February 2017].

[14] (2017) *Wikipedia: Neutral Point of View.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Neutral_point_of_view [Accessed 10 February 2017].

[15] (2017) *Wikipedia: Reusing Wikipedia Content.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Reusing_Wikipedia_content [Accessed 10 February 2017].

[16] (2017) *Wikipedia: Statistics.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Statistics [Accessed 10 February 2017].

[16] (2017) *Wikipedia: Wikipedians.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Wikipedians [Accessed 10 February 2017].

[17] (2017) *Wikipedia: Who writes Wikipedia?.* [online] Available from: https://en.wikipedia.org/wiki/Wikipedia:Who_writes_Wikipedia%3F [Accessed 10 February 2017].

[18] Barthes, R. (1967) The Death of the Author. *Aspen*, 5–6.

[19] *Bezpečnostní softwarová asociace – Svaz softwarové ochrany v. Ministerstvo kultury.* (2010) Case no. C-393/09. Court of Justice of the European Union, ECR I-13971.

[20] Bruns, A. (2006) *Blogs, Wikipedia, Second Life and Beyond. From Production to Produsage*, New York: Peter Lang.

[21] Cardon, D. (2012) Discipline but not Punish: The governance of Wikipedia. In: Massit-Follea, F., Meadel, C., Monnoyer-Smith, L. (eds.) *Normative Experience in Internet Politics.* Paris: Presses Des Mines.

[22] Chon, M. (2012) The Romantic Collective Author. *Vanderbilt Journal of Entertainment and Technology Law*, 14 (4).

[23] *Creative Commons: Attribution-ShareAlike 3.0 Unported (CC BY-SA 3.0).* [online] Available from: http://creativecommons.org/licenses/by-sa/3.0/deed.en [Accessed 10 February 2017].

[24] Deci, E. L., Ryan, R. M. (1985) *Intrinsic Motivation and Self-Determination in Human Behaviour*, New York: Springer.

[25] Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the Harmonisation of Certain Aspects of Copyright and Related Rights in the Information Society, *Official Journal of European Union* (L 167/10) 22 June.

[26] Dusollier, S. (2003) Open Source and Copyleft: Authorship Reconsidered. *Columbia Journal of Law & the Arts*, 26 (3).

[27] Erickson, K. (2014) User illusion: ideological construction of 'user-generated content' in the EC consultation on copyright. *Internet Policy Review*, 3 (4).

[28] *Eva Maria Painer v. Standard Verlags GmbH and others.* (2011) [unreported] Case no. C-145/10. Court of Justice of the European Union, 7 March.

[29] Foucault, M. (1979) What is an Author? *Screen*, 20 (1).

[30] *Football Association Premier League Ltd, NetMed Hellas SA, Multichoice Hellas SA v. QC Leisure, David Richardson, AV Station plc, Malcolm Chamberlain, Michael Madden, SR Leisure Ltd, Philip George Charles Houghton, Derek Owen, and Karen Murphy v. Media Protection Services Ltd.* (2011) Joined cases nos. C-403/08 and C-429/08. Court of Justice of the European Union, ECR I-10909.

[31] *Football Dataco Ltd, Football Association Premier League Ltd, Football League Ltd, Scottish Premier League Ltd, Scottish Football League, PA Sport UK Ltd v. Yahoo! UK Ltd, Stan James (Abingdon) Ltd, Stan James plc, Enetpulse ApS.* (2012) [unreported] Case no. C-604/10. Court of Justice of the European Union, 1 March.

[32] Heaberlin, B., DeDeo, S. (2015) The Evolution of Wikipedia's Norm Network. *Future Internet*, 8 (2).

[33] Halatchliyski, I., Moskaliuk, J., Joachim, K., Cress, U. (2014) Explaining authors' contribution to pivotal artefacts during mass collaboration in the Wikipedia's knowledge base. *Computer Supported Cooperative Learning*, 9 (1).

[34] Halbert, D. (2014) *The State of Copyright: the Complex Relationships of Cultural Creation in a Globalised World*, New York: Routledge.

[35] *Infopaq International A/S v. Danske Dagblades Forening* (2009) Case no. C-5/08. Court of Justice of the European Union, ECR I-06569.

[36] Jaszi, P. (1994) On the Author effect: Contemporary Copyright and Collective Creativity. In: Woodmansee, M., Jaszi, P. (eds.) *The Construction of Authorship. Textual Appropriation in Law and Literature*. Durham: Duke University Press.

[37] Joyce, E., Pike, J. C., Butler, B. S. (2012) Rules and Roles vs. Consensus: Self-Governed Deliberative Mass Collaboration Bureaucracies. *American Behavioral Scientist*, 57 (5).

[38] Kawashima, N. (2010) The rise of 'user creativity' – Web 2.0 and a new challenge for copyright law and cultural policy. *International Journal of Cultural Policy*, 16 (3).

[39] Kwall, R. R. (2010) *The Soul of Creativity. Forging Moral Rights Law for the United States.* Standford: Standford Law Books.

[40] Laat, P. B. (2012) Coercion or empowerment? Moderation of content in Wikipedia as 'essentially contested' bureaucratic rules. *Ethics and Information Technology*, 14 (2).

[41] Lai, C.-Y., Yang, H.-L. (2014) The reasons why people continue editing Wikipedia content – task value confirmation perspective. *Behaviour & Information Technology*, 33 (12).

[42] Lavik, E. (2014) Romantic authorship in copyright law and the uses of esthetics. In: van Eechoud, M. (ed.) *The Work of Authorship*. Amsterdam: Amsterdam University Press.

[43] Lavik, E., van Gompel, S. (2013) On the Prospects of Raising the Originality Requirement in Copyright Law: Perspectives from the Humanities. *Journal, Copyright Society of the U.S.A.*, 60 (3).

[44] Nov, O. (2007) What Motivates Wikipedians. *Communications of the ACM*, 50 (11).

[45] Oreg, S., Nov, O. (2008) Exploring motivations for contributing to open source initiatives: The roles of contribution context and personal values. *Computers in Human Behavior*, 24 (5).

[46] Parasarnphanich, P., Wagner, C. (2011) Explaining the Sustainability of Digital Ecosystems based on the Wiki Model Through Critical-Mass Theory. *IEEE Transactions on Industrial Electronics*, 58 (6).

[47] Peifer, K.-N. (2014) "Individualität" or Originality? Core concepts in German copyright law. *GRUR Int.*, 63 (12).

[48] Pentzold, C. (2010) Imagining the Wikipedia community: What do Wikipedia authors mean when they write about their 'community'. *New Media & Society*, 13 (5).

[49] Phillips, J. (2009) Authorship, ownership, wikiship: copyright in the 21st century. In: Derclaye, E. (ed.) *Research Handbook on the Future of EU Copyright.* Cheltenham: Edward Elgar.

[50] Preece, W. E. and Collison, E. L. (2016) *Encyclopaedia: Reference Work* [online] Available from: https://global.britannica.com/topic/encyclopaedia [Accessed 10 February 2017].

[51] Quaedvlieg, A. (2014) The tripod of originality and the concept of work in Dutch and European copyright. *GRUR Int.*, 63 (12).

[52] Reagle, J. M. J. (2010) *Good Faith Collaboration. The Culture of Wikipedia.* Cambridge: MIT Press.

[53] Rosati, E. (2013) *Originality in EU Copyright. Full Harmonization through Case Law,* Cheltenham: Edward Elgar.

[54] Ryan, R. M., Deci, E. L. (2000) Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions. *Contemporary Educational Psychology*, 25 (1).

[55] Samuelson, P. (2003–2004) Should Economics Play a Role in Copyright Law and Policy? *University of Ottawa Law & Technology Journal,* 1 (2).

[56] Sundin, O. (2010) Janitors of Knowledge: constructing knowledge in the everyday life of Wikipedia editors. *Journal of Documentation,* 67 (5).

[57] Torremans, P. (2007) Legal Issues Pertaining to the restoration and reconstitution of manuscripts, sheet music, paintings and films for marketing purposes. In: Torremans, P. (ed.) *Copyright Law. A Handbook for Contemporary Research.* Cheltenham: Edward Elgar.

[58] Van Gompel, S. (2014) Creativity, autonomy and personal touch. A critical appraisal of the CJEU's originality test for copyright. In: van Eechoud, M. (ed.) *The Work of Authorship.* Amsterdam: Amsterdam University Press.

[59] Van Gompel, S., Lavik, E. (2013) Quality, Merit, Aesthetics and Purpose: An Inquiry Into EU Copyright Law's Eschewal of other Criteria than Originality. *Revue Internationale du Droit d'Auteur (RIDA),* 236.

[60] Viegas, F. B., Wattenberg, M., Dave, K. (2004) Studying Cooperation and Conflict between Authors with history flow Visualisations. *CHI '04 Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, pp. 575–582.

[61] Wielsch, D. (2010) Governance of Massive Multiauthor Collaboration. Linux, Wikipedia, and Other Networks: Governed by Bilateral Contracts, Partnerships, or Something in Between? *JIPITEC,* 1 (2).

[62] Xu, B., Li, D. (2015) An empirical study of the motivations for content contribution and community participation in Wikipedia. *Information & Management*, 52 (3).

[63] Yang, H.-L., Lai, C.-Y. (2010) Motivations of Wikipedia Content Contributors. *Computers in Human Behavior,* 26 (6).

[64] Ye, Y., Kishida, K. (2003) Toward an Understanding of the Motivation of Open Source Software developers. *ICSE '03 Proceedings of the 25th International Conference on Software Engineering*, pp. 419–429.

[65] Zemer, L. (2007) *The Idea of Authorship in copyright.* Adershot: Ashgate.

[66] Zhu, C. W. (2014) A regime of droit moral detached from software copyright? – the undeath of the 'author' in free and open source software licensing. *International Journal of Law and Information Technology*, 22 (4).

SYMPOSIUM ISSUE:

THE BRITISH ACADEMY
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PROJECT TITLED

'CREATING A LEGAL AND REGULATORY
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BETWEEN STOCK EXCHANGES:
A COMPARATIVE STUDY
OF THE UK AND TAIWAN'

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FINTECH IN THE EXCHANGE INDUSTRY: POTENTIAL FOR DISRUPTION?

by

MANUELA GERANIO*

The recent growth of financial technology ventures involves several types of financial players, including stock exchanges. Many of them are exploring blockchain applications to their multiple business lines, focusing in particular on post trading activities. Potential benefits include the reduction in counterparty risk and post trading costs as well as the increase of liquidity and transparency. At current stage exchanges are mainly exploring the technology looking for proofs of concept, with the exception of some more advanced projects like at Nasdaq and ASX. The mass adoption will require longer efforts and is expected to come in a decade, at least. Fintech developments are receiving strong attention also by regulators and international organizations, given the potential of distributed ledger technology for both competition enhancement and cyber risk reduction. A coordination between market players and regulators is essential to guarantee the effective implementation of new technologies, as their benefits can be delivered only in presence of a common framework and a proper management of risks.

KEY WORDS

Fintech, Blockchain, Distributed Ledger, Smart Contract, Stock Exchanges

1. INTRODUCTION

In recent years global investments in financial technology (Fintech) have boosted, totaling more than 24 billion in 2016.[1] The "*Fintech Revolution*" is expected to have a disruptive effect on the financial intermediation

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1 KPMG. (2016) The *Pulse of Fintech Q4 2016*. [online] Available from: https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2017/02/pulse-of-fintech-q4-2016.pdf [Accessed 1 March 2017].

industry, making finance more cost efficient, consumer friendly and transparent.[2] The main sectors involved include banking, payment services, insurance, asset management as well as stock exchanges, which are the focus of this contribution.

Fintech developments have attracted potential new players from the tech field (i.e. Google, Amazon, Apple) as well as from the telecommunication (i.e. At&T, Verizon, Vodafone) which in the next future could fulfill the needs traditionally satisfied by banks and other financial players. As such, also traditional incumbent in the financial industry were forced to heavily invest and start new ventures to assess the potential of the new technologies, in order to defend their own business from incoming competitors.

In the case of stock exchanges, the main Fintech innovation is expected to come from the implementation of the distributed ledger technology or blockchain to run market infrastructures in a more shared and transparent way. According to the World Economic Forum[3], more than 25 countries are investing in blockchain, filing more than 2,500 patents and investing $1.3 billion.[4] By 2027, it is expected that 10 % of global GDP will be stored via distributed ledger technology.

In order to defend their business from new potential competitors in the tech and telecommunication industry, all major exchanges have been particularly proactive in exploring blockchain. They are creating start up to investigate the technology (i.e. London Stock Exchange, Chicago Mercantile Exchange, Deutsche Borse) and developing applications to build brand new market infrastructures or partially replace current ones (i.e. Nasdaq and Australian Stock Exchange).[5]

Regulators and international organizations are also paying strong attention to the field, given not only the competition enhancing potential but also the different exposure to cyber risks possibly associated with the distributed ledger technology. Indeed new technologies allow

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2 *Economist*. (2015) The Fintech Revolution, 9 May.

3 World Economic Forum (2015) *The Future of Financial Services.* [online] Available from: http://www3.weforum.org/docs/WEF_The_future__of_financial_services.pdf [Accessed 23 September 2016].

4 One of the major developer of the technology is R3, a consortium involving over 80 of the world's largest financial institutions to develop ground-breaking commercial applications for the financial services industry.

5 Rizzo, P. (2016) *Ten Stocks and Commodities Exchanges Investigating Blockchain*. [online] Available from: https://www.coindesk.com/10-stock-exchanges-blockchain/ [Accessed 23 September 2016].

a more transparent and shared accountancy of assets, eliminating the risks associated with the single ledger approach in use nowadays. At the same time unexplored sources of risks could also arise, especially from the cyber environment on which the blockchain is shaped.[6]

The paper is organized as follows: the second paragraph presents the blockchain technology, while the third one focuses on potential applications to the exchange industry. Section four highlights necessary steps for practical implementation, section five describes early projects in place, while section six concludes.

2. BLOCKCHAIN TECHNOLOGY

Basically, a blockchain is a public digital register shared by all parties participating to a distributed network. The blockchain records and stores every transactions that occurs in the network, creating an irrevocable and auditable transaction history. Originally developed for Bitcoin (but different from it) such technology has large potential to be implemented on several financial fields, including payment systems and market infrastructures.[7]

Technically the blockchain is a "*chain of blocks*" in which each block contains information about a certain number of transactions and can be added chronologically to the database (thus forming a "*chain*") only after it has been validated by the computers on the network ("*nodes*"), together with a reference to the preceding block.[8] A copy of the updated blockchain is then stored on all the network members' computers, making it pretty difficult to change or alter any detail in the "*transaction history*" by any single players. Since the master record is shared by all network members, the blockchain can survive the loss of one node as the registration is always reported on all counterparties shared registry. The blockchain technology offers thus a built-in redundancy that prevents from loss or deliberate alteration of records by one single member of the network.[9]

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[6] ESMA. (2016) *The Distributed Ledger Technology Applied to Securities Markets, Discussion Paper n. 773, June*. [online] Available from: https://www.esma.europa.eu/sites/default/files/library/2016-773_dp_dlt.pdf (hereinafter referred to as *"ESMA, 2016"*)

[7] Stafford P. (2016) Banks struggle to make blockchain fast and secure. *Financial Times*, 26 September.

[8] Fico P. (2016) *Virtual Currencies and Blockchains: Potential Impacts on Financial Market Infrastructures and on Corporate Ownership*. Available from SSRN: https://ssrn.com/abstract=2736035

[9] Differently, in a database managed by a unique central authority an attack to the latter will automatically damage all the records.

The "*distributed ledger database*" enable all the members participating to the network to know almost in real time assets' ownership because each of them has access to the shared registry in which all trades and related ownership changes have been recorded. It is important to highlight that the digital ledger attributes each transaction to a public identifier (i.e. a public key or a code) but they cannot be traced back to a specific person or institution by anyone other than the identifier's owner (by the use of a private key).[10] Therefore, on the one side transparency is granted to the network participants, as they can always be aware of their counterparties transaction history and holdings, without the need and the costs charged by a third party certificator (such as a bank, an auditor or a central counterparty). At the same time data encryption and the adoption of combined public and private keys allow them to maintain safety and privacy.[11]

Blockchains may be based either on a public or private network.[12] A public network is an open, peer-to-peer framework, accessible to anyone that wishes to join. As there is no central authority, the network relies on the same participants in order to record and verify transactions according to a certain protocol. Differently, private networks are permissioned networks, so that only trusted parties that have been granted access can join them. In addition, different entities may have varying levels of authority to transact and view data. As such, in private networks a greater control is maintained over users.

Since many of the problems associated with *Bitcoins* (fraudulent activity, money laundering) depend from the circumstance that the underlying blockchain is a public network, all main implementations of the distributed ledger for the security markets are currently designed on private networks.[13] Indeed, in a permissioned blockchain model[14] data validation and access to data can be limited to selected members only (such as traders,

[10] Cuccuro P. (2017) Beyond Bitcoin: an Early Overview on Smart Contracts. *International Journal of Law and Information Technology*, V0, p. 1–17.

[11] Not everybody agrees that the privacy enabled by the use of private keys and encryption will be enough (see also Esma, 2016). Indeed in many situations the identity of a market participant, although technically unknown, could be inferred from its trading patterns recorded in the system.

[12] FINRA. (2017) *Distributed Ledger Technology: Implications of Blockchain for the Securities Industry, January*. [online] Available from: http://www.finra.org/industry/blockchain-report

[13] For example, the R3 consortium is fully based on a permissioned approach. For further details see https://www.r3.com/ [Accessed 5 March 2017].

[14] See also Cuccuro P. (2017) Beyond Bitcoin: an Early Overview on Smart Contracts. *International Journal of Law and Information Technology*, V0, p. 1–17.

banks or other qualifies counterparties) in order to minimize naive or fraudulent behaviors.[15] Some of the advantages of a pure open system have been given up so as to guarantee a safe and orderly cyber environment for financial infrastructures.

A further issue of the blockchain technology is that it facilitates the use of "*smart contract*", i.e. digital, computable contracts where the performance and enforcement of contractual conditions occur automatically, without the need for human intervention.[16] Such program strings are self-executing routines that implement a contractual agreement among parties (such as the payment of periodic coupons on a bond or the execution of a derivative contract) without the need of a middleman intervention (such as a bank or a central counterparty). Smart contracts could enhance the enforcement of contract terms and the automation of back office processes, reducing in turn errors and legal disputes and possibly administrative costs.

An example could help to better understand the potential application of the blockchain technology in the financial markets, namely in the security clearing. Figure 1 compares the actual process for clearing financial transactions through a centralized ledger, i.e. the clearing house of an exchange (on the left) with the possible alternative process enabled by a distributed ledger (on the right). Traditionally the clearing house is fundamental to minimize the counterparty risk since once a trade has been agreed between two counterparties the clearing house will act as the buyer to every seller and the seller to every buyer. As such the clearing house centralizes the management of each transaction: registers each trade on a centralized ledger, nets out opposite positions held by traders if any and absorbs related risks. Such function facilitate trading and contribute to liquidity as buyers and sellers do not need to ascertain the credit worthiness of their counterparty, they just need to trust the clearing house (typically owned by the exchange in which the transaction occurred). For its services, the clearing house charge a fee and also requires counterparties to deposit a guarantee (either in cash or in low risk assets) to prove they will honor their obligations. Differently, with the distributed ledger technology (left side of Figure 1) all buyers and sellers can access to the transactions

[15] For example, fraudulent activity could consist in recording fictitious transactions and altering the consensus process (see also ESMA, 2016).

[16] Wright, A., De Filippi, P. (2015) *Decentralized blockchain technology and the rise of lex cryptographia*. Available from SSRN: https://ssrn.com/abstract=2580664

history, as recorded and updated trade by trade on a common register locally held and synchronized among all players in real time. The activity of a central clearing house becomes unnecessary, since each counterparty can ascertain the assets ownership while proper routines can automatically clear out buyers and sellers positions and manage the cash transfers needed to regulate each trade. Since the system works in real time, the post trading duration could reduce form actual standards, thus minimizing also the need for guarantees. Costs and times for post trading activity are therefore expected to reduce substantially, while transparency will increase without affecting execution certainty.

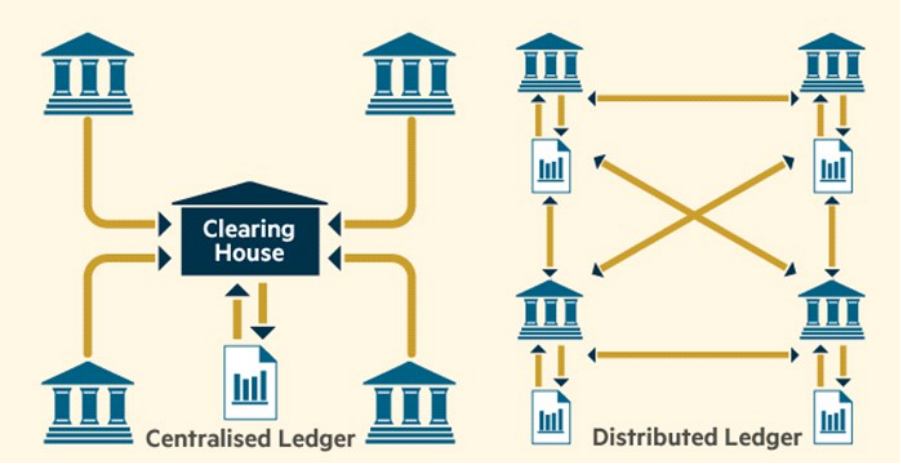

Figure 1: The potential impact of blockchain in the clearing activity[17]

Several benefits are associated with the implementation of the blockchain technology, including disintermediation, higher quality of data, reliability and lack of a central point of attack. Transaction are thus expected to become cheaper, faster but also more reliable and transparent, as processed on an integer peer-to-peer transmission system (see Table 1). At the same time many obstacles and challenges need to be addressed to ensure that all advantages will materialize. From the technological point of view, market applications of the blockchain are still in their infancy and need to be verified and tested for both effectiveness and cyber security. Moreover, a relevant increase in computational capability is needed, as distributed ledgers require substantial amounts of computer power

[17] Stafford P. (2016) Banks struggle to make blockchain fast and secure. *Financial Times*, 26 September.

to validate transactions. As for the regulatory environment, it just started to cope with the new paradigm and thus it will need time to design an appropriated regulatory framework and integrate it with current laws. The practical adoption will require also a cultural change for users and operators, as they need to familiarize with the new technology, shifting practices to a decentralized network, and to integrate existing systems to the new one. This would require time for learning and also substantial investments in the short run, even if on behalf of future savings.

Benefits	Challenges
Disintermediation & trustless exchange Two parties are able to make an exchange without the oversight or intermediation of a third party, strongly reducing or even eliminating counterparty risk. Users are in control of all their information and transactions.	**Nascent technology** Resolving challenges such as transaction speed, the verification process, and data limits will be crucial in making blockchain widely applicable.
High quality data Blockchain data is complete, consistent, timely, accurate, and widely available.	**Uncertain regulatory status** Because modern currencies have always been created and regulated by national governments, blockchain face a hurdle in widespread adoption by pre-existing financial institutions if its government regulation status remains unsettled.
Durability, reliability, and longevity Due to the decentralized networks, blockchain does not have a central point of failure and is better able to withstand malicious attacks.	**Large energy consumption** The Bitcoin blockchain network's miners are attempting 450 thousand trillion solutions per second in efforts to validate transactions, using substantial amounts of computer power.
Process integrity Users can trust that transactions will be executed exactly as the protocol commands removing the need for a trusted third party.	**Control, security, and privacy** While solutions exist, including private or permissioned blockchains and strong encryption, there are still cyber security concerns that need to be addressed before the general public will entrust their personal data to a blockchain solution.
Transparency and immutability Changes to public blockchains are publicly	**Integration concerns** Blockchain applications offer solutions that

viewable by all parties creating transparency, and all transactions are immutable, meaning they cannot be altered or deleted.	require significant changes to, or complete replacement of, existing systems. In order to make the switch, companies must strategize the transition.
Faster transactions Blockchain transactions can reduce transaction times to minutes and are processed 24/7.	**Cultural adoption** Blockchain represents a complete shift to a decentralized network which requires the buy-in of its users and operators.
Lower transaction costs By eliminating third party intermediaries and overhead costs for exchanging assets, blockchains have the potential to greatly reduce transaction fees.	**Cost** Blockchain offers tremendous savings in transaction costs and time but the high initial capital costs could be a deterrent.

Table 1: Main benefits and challenges of blockchain technology[18]

Given its characteristics and products (immateriality of goods traded, electronification of trading, high level of information asymmetries, commercial relations involving often unknown counterparties) the financial sector became one of the first and more natural context for the development and launch of blockchain applications. Early examples involve cryptocurrencies, such as the Bitcoin, which registered mixed results.[19] More recent projects concern the payment system (such as Ripple, a distributed ledger for international payment which is collecting growing attention by traditional banks), crowdfunding and issuing platforms, and clearing and settlement services providers.

3. POTENTIAL APPLICATIONS OF BLOCKCHAIN FOR EXCHANGES

From their foundation in the early 1600s stock exchanges provide a safe and reliable infrastructure that facilitates the transfer of financial resources between savers and borrowers (equities and bonds) as well as the distribution of risk according to preferences (derivatives). The exchange industry expedites such exchanges by reducing information asymmetries and transaction costs.[20] Moreover, exchanges perform

[18] Deloitte. (2016) *Insights: Blockchain technology*. [online] Available from: https://www2.deloitte.com/nl/nl/pages/innovatie/artikelen/blockchain-technology-9-benefits-and-7-challenges.html [Accessed 5 March 2017].

[19] Swan , M. (2015) *Blockchain* Ed. O'Reilly.

[20] Geranio, M. (2016) *The Evolution of the Exchange Industry*. Springer.

a regulatory function that guarantees the selection of participants (either listed companies or trading members), the orderly and fair execution of trades and the fulfillment of the related post trading activities (i.e. clearing and settlement operated by a central counterpart).

Blockchain has the potential to further reduce such asymmetries and costs and to replace the central counterpart with a peer-to-peer mechanism. As a consequence, stock exchanges represent one of the major fields that the new technology is expected to impact. Hence it is not a case that all major stock exchanges are already investing to get a better understanding of the blockchain prospective and to implement first applications.

In order to appreciate the possible impact of the distributed ledger technology to an exchange it may be useful to briefly recall the main activities that sequentially compose the life of a security, that is issuing, trading and post trading.

The issuing or primary market phase involve the issue of equities (or bonds), the offer and distribution of securities among the public and the collection of funds from investors. Such activities are completed by the issuing company, usually assisted by banks, legal consultants and providers of administrative services. If the offer is proposed to the large public of investors relevant regulatory and transparency duties have also to be fulfilled, together with obligations of the exchange in which the security is eventually expected to get listed. Indeed, listing activity implies that the entity where the issuer is seeking to be admitted conducts due diligence to assess that the latter is adequately fit and has the attributes investors are looking for.

Trading or secondary market phase involves matching and executing orders received from buyers and sellers either on an official exchange or on an alternative trading system (ATS). Nowadays, trading is fully electronic: orders reach the matching engine of the exchange or ATS via dedicated transmission lines that guarantee maximum speed[21] (in the order of microseconds) and minimum costs (given the strong competition among official exchanges and ATS). Smart order routers assist traders in deciding which market is best to execute each transaction by collecting and combining information on available order books

[21] More than 5000 trades can occur in a second!

and automatically send the order. It is estimated[22] that more than 50 % of trading is nowadays put in place by algo trading, i.e. software programs that do not require human intervention to implement the trading strategy.

Post trading involves several activities, namely clearing, settlement and custody services. In the clearing process, trades are registered and aggregated to establish the respective obligations of the buyer and the seller. Each counterparty's position is netted out by summing up all their buy and sell orders in order to reduce settlement values. Details of the deal such as security identification code, the settlement date and venue, and so forth, are prepared to enable settlement. Clearing houses might also offer other services, such as acting as central counterparty (the buyer to every seller and the seller to every buyer). In doing so, a clearing house replaces the original bilateral contract with two bilateral contracts and guarantees the trade. This aspect takes on special value in the case of derivatives contracts, where no cash flow is due from counterparties before maturity. To cover this risk, the CCP requires traders to post a certain amount of collateral. Settlement is the process by which the legal ownership in the traded asset is transferred and the corresponding payment is made. Giving the existence of network externalities and economies of scale generated by custody activity,[23] often settlement services are offered jointly by the custodian, using a vertically--integrated structure to perform both activities. Custody is carried out by a depositary, which acts as a "*securities bank*" that holds physical securities in custody as well as accounts of their ownership. Many depositories offer registration as an additional service (i.e. notary services, proxy voting, information on corporate actions, etc.). At the moment this function is a natural monopoly because regulation requires that the shareholders' register for each security shall be kept at a single institution, which is usually selected by the issuer.[24] As a consequence, equity custodians are typically based in the same country where the shares are listed.[25] Overall, post-trade services are highly regulated and major changes in the industry are typically the result of regulator intervention.

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[22] World Federation of Exchanges and Iosco. (2016) *Financial Market Infrastructures and Distributed Ledger Technology,* August. [online] Available from: https://www.world-exchanges.org

[23] Linciano, N., Siciliano, G., and Trovatore, G. (2005) *L'industria dei servizi di regolamento delle Operazioni in Titoli Quaderni di Finanza Consob*, n. 58, May.

[24] Ibid.

Given the above discussed phases that occurs during the life of a security, blockchain applications for exchanges are expected to focus mainly in the post trading field and possibly in the issuance of new securities, while small room is left in the issuing and trading business. Indeed the distributed ledger technology does not allow to reach, at least at the moment, levels of speed and efficiency comparable to those already in place in the trading platforms of exchanges and ATS. In addition, since with the blockchain possession of assets is a pre-requisite for transacting, short selling and margin finance[26] may be no longer feasible. Also algo--trading and in particular high frequency traders[27] may find it difficult to develop their strategies, since they will need to wait (for even just a few seconds) for each settlement cycle before they can transact again and this would give rise to a substantial slowdown in their rate of activity.[28] So far, applications of the distributed ledger including the trading activity have been developed only for less traded securities (such as the SIX platform launched for bonds[29]) or new born shares (such as T0 platform in the US[30]).

Differently, post trading is expected to be the most important area for the implementation of fintech in financial market infrastructures. On the one side the new technology will allow a true redesign of current procedures for clearing, settlement and custody, no more anchored to the presence of a central counterpart. On the other side, up to now post trading field has been the least exposed to competition in the exchange industry, as it could benefit from a sort of natural monopoly granted by available technology and regulation. Blockchain could disrupt such monopoly, promoting higher efficiency, shorter duration and cost reduction in post trading processes.[31]

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[25] For example the Central Security Depositor (CSD) in Italy is Monte Titoli, in France Euroclear Paris, in Germany Clearstream and in Spain Iberclear. See Chan et al. (2007) *The Securities Custody Industry*, ECB Occasional Paper Series No. 68, August.

[26] Trading strategies typically employed by hedge funds.

[27] High frequency traders use sophisticated algorithms to place orders on several markets at the same time, taking advantage of the extreme speed in order execution.

[28] Euroclear and Oliver Wyman (2016) *Blockchain in Capital Markets*. [online] Available from: http://www.oliverwyman.com/our-expertise/insights/2016/jan/blockchain-in-capital-markets.html.

[29] SIX. (2017) *SIX Securities Services Develops Distributed Ledger-Based Bond Issuing Solution* [online] Available from: https://www.six-securities-services.com/en/shared/news/2017/dss-news-170322-distributed-ledger.html [Accessed 31 March 2017].

[30] Tzero. (2017) *Distributed Ledger Platform for Capital Markets* [online] Available from: https://tzero.com/ [Accessed 31 March 2017].

[31] Pinna A. and Ruttemberg W. (2016) *Distributed ledger technologies in securities post-trading*, ECB Occasional Papers, n. 172, April.

Nowadays the post trade process can be expensive and slow: commonly it takes 2 days to process through a number of intermediaries. Blockchain has the potential to overcome such frictions and provide alternatives to improve management of clearing, settlement and custody (see Figure 2). The adoption of a distributed ledger among market participants could allow a real time clearing for cash transactions, eliminating any manual process and related errors and avoiding the intervention of a central clearing house (and related costs and risks). Indeed, both sides in a transaction will have access to pre-trade transparency details that their counterpart will be able to meet the terms of the deal, and settlement will happen almost instantly. This in turn will eliminate collateral requirements, being the settlement instantaneous (from T+2 to T+0). Efficiency will improve, as cash and assets transfers will be recorded on the same ledger. Differently, for derivatives contracts a clearing mechanism will still be needed for the whole length of the contract, but the new technology will allow to optimize netting procedures, reducing counterparty risks, facilitating a more efficient use of collaterals and diminish capital requirements for clients.

Custody services will also be simplified, thanks to higher transparency and process automation made available by the distributed ledger technology. New services, including proxy votes and collateral management, could be offered to clients.

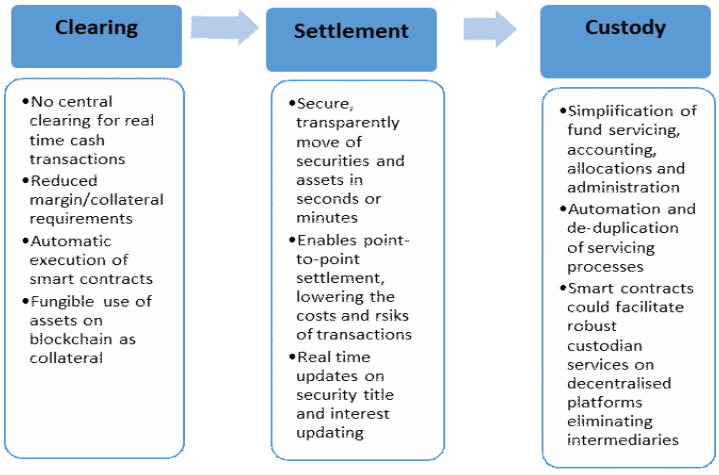

Figure 2[32]: Possible impact of blockchain in post trading activites

[32] Santander Innoventures, Oliver Wyman and Anthemis. (2015) *The Fintech 2.0 Paper: Rebooting Financial Services*. [online] Available from: http://santanderinnoventures.com/fintech2/

Overall, the reduction in time, expenses and counterparty risk associated with blockchain adoption in post trading should result in relevant cost cutting: equity analysts[33] estimate a 25% reduction in post trading costs, equivalent to a 7% decrease in aggregated costs of European exchanges. The Australian Stock Exchange, which is implementing a blockchain solution for their clearing services, estimated it will lead to a 15% reduction in total exchange costs. In addition, further positive side effects are expected, such as a possible increase in liquidity and transactions motivated by the most effective management of counterparty and market risks.[34]

Higher transparency and auditability of the transaction history is strongly welcomed also by financial regulators and supervisors (ESMA, 2016), which could be granted special access rights to the distributed ledger in order to better exercise their duties. At the same time, the supervision of a network could be more complex than that of central market infrastructures. Moreover, legality and enforceability of the records kept on the blockchain also need to be carefully considered, in the light also of differences in securities and company laws across countries.[35]

As for the issuing activity, the distributed ledger technology could provide new solutions for issuing securities in cryptographically secured digital form, breaking down some of the barriers to entry in financial market for small and medium enterprises (mimicking the impact that crowdfunding had on smaller ventures). This in turn could also facilitate at a second stage the development of a secondary trading market via blockchain, given the limited scope and liquidity of the securities involved. Some examples are already under construction, as reported in the fifth paragraph.

4. STEPS FOR BLOCKCHAIN DEVELOPMENT IN CAPITAL MARKETS

The adoption of blockchain in capital markets requires several steps and time. Mass adoption is not expected before 2025, even if it is estimated that in 2027 10 % of global GDP will be stored on blockchain.[36]

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[33] JP Morgan Cazenove. (2016) *Blockchain: A Revolutionary Technology Too Important to Ignore*, Europe Equity Research, 23 May.

[34] Ibid.

[35] See also ESMA, 2016.

First, the technology requires further exploration and proofs of concept, with initial investments to explore effective capabilities, scalability, data privacy, performance, identity management and standardization formats. Such phase is already under way, thanks also to the large venture capital involvement in the field, but common procedures still need to be agreed. To guarantee robustness and fair performance very high standards need to be set for the blockchain, together with reliable protocols for integration with existing non-blockchain systems (i.e. risk management platforms). Security issues deserve a special attention, as the risk of intentional security breaches could have unknown consequences. Indeed, if the distributed nature of the ledger does provide some protection (hacking the system would require collusion across the network), it also multiplies the possible points attacked or damaged by an external hacker (i.e. through the execution of an intentionally broken smart contract).

The implementation of smaller scale applications is the second stage. It is needed to allow appreciation of costs, benefits and risks as well as to raise awareness of economic benefits to a wider arena of players. In the case of exchanges, the use of blockchain has already been applied to asset classes with limited trading volume. Projects like Nasdaq Linq and SIX bond market are first examples in this direction.[37]

The third step then will imply the involvement of regulatory authorities, which in many cases already started to investigate the technology to assess its impact also in terms of audit and compliance benefits. Strict collaboration between regulators and the industry will be fundamental to update the legal framework and grant regulatory approval to the new infrastructures. New principles may be needed where blockchain technologies become an integral part of the market infrastructure, and where consensus protocols are run through an international network of participants. Given the global nature of financial services, the agreement will be required across different jurisdictions. A special issue concerns the immutable nature of transactions registered on the blockchain: some technical solution should be identified to allow amendment of wrong registrations caused by errors or fraudulent behaviors, given the wide systemic impact they would otherwise have on all the network participants.

[36] See also World Economic Forum (2015) *The Future of Financial Services.* [online] Available from: http://www3.weforum.org/docs/WEF_The_future__of_financial_services.pdf [Accessed 23 September 2016].

[37] As discussed in paragraph 5.

Once main regulatory issues will have been resolved, the implementation in mainstream asset classes and services will be feasible. At the beginning this will be done in parallel with existing systems (e.g. in clearing), while only after technology has been fully assimilated and tested in practice mass adoption will follow.

Two aspects, out of the numerous operational ones needed to support the effective blockchain implementation, appear particularly relevant.[38] On the one side a robust cash ledger should be put in place to overcome failures of existing cryptocurrencies (such as the Bitcoin). Indeed, in order to achieve full *"Delivery Versus Payment"* in settlement (as in actual post trading systems) the blockchain should be able to process central bank money. Some players[39] are yet investigating in the field in order to either create a digital alternative to fiat currency or find a way to use commercial bank money systems.

On the other side, given the global nature of the financial markets, it will be necessary to establish standards to allow interoperability between different blockchain networks that will be promoted by various market players (stock exchanges, clearing houses, custodians) and for different asset classes (equities, bonds, derivatives). Cooperation among players become thus fundamental to gather full benefits from the new technology implementation. In addition, as distributed ledger technology is expected to expand in progressive steps, interoperability with the existing systems is also important to allow the diffusion of the new protocols without altering market operations. In the long run, interoperability could also foster interconnections among financial markets in different countries, facilitating international trading and diversification not only among most developed financial centers but also in those emerging markets that are willing to adopt the technology and reshape their regulatory framework accordingly.

Given the large impact expected on clearing and settlement, consequences can be expected on the business models used by exchanges to manage the post trading activity.[40] Currently, some exchanges adopt a vertical model ("*silo*")[41], in which post trading activity are integrated

[38] See also ESMA, 2016.

[39] Such as the Bank of England.

[40] Mainelli M. and Milne A. (2015) *The Impact and Potential of Blockchain on the Securities Transaction Lifecycle,* Swift Institute Working Paper n. 7.

[41] For example Deutsche Borse.

and performed by the same stock exchange in which trading occurs. Other marketplaces rely on a horizontal model[42], in which the customer can opt for different providers of postrading services. It is not easy to forecast if the blockchain technology would clearly favor one out of the two models. On the one side the use of a distributed ledger evokes a more open and thus horizontal approach, which would largely benefit from the interoperability among different networks. On the other side, the application of blockchain will imply both high investments and smaller margins for exchanges that provides post trading services. As such incumbents might try to maintain strict control on their permissioned distributed ledgers, at least in the first years, in order to assess the reliability of the network but also to defend their own financial results.

Overall the path to effective implementation of distributed ledger is still long and uncertain.[43] In addition to main hurdles identified above (technology, regulatory and legal barriers, lack of safe cryptocurrencies, interoperability with existing systems), the presence of vested interests in the preservation of the existing system could delay the adoption of the new technology. Incumbents in the market infrastructure industry (exchanges, central counterparties and depositors, traders and investment banks) could indeed lose their market position and margins from the introduction of the blockchain. The pressure exercised by new entrants in the field is relevant but probably not enough to induce a definite and fast movement of main market players towards the distributed ledger philosophy. A concurrent action by regulators and public authorities could therefore definitely be necessary to support the concrete adoption of the new technology, as it historically happened with other major innovations in the financial field.

5. RECENT EXPERIENCES

Despite its quite recent development, first application of blockchain technology started to appear in latest years. Here's in the following some of the main examples.

In late 2015 Nasdaq launched the Linq blockchain technology dedicated to the issue and trading of securities of private companies (a good testing field, since trading is limited and usually occurs between a tight circle

[42] For example Euronext.

[43] See also World Federation of Exchanges and Iosco (2016).

of investors). The company *Chain.com* was the first able to use the platform to issue shares to a private investor, documenting a major advance in the application of blockchain technology. Nasdaq enabled the issuer to digitally represent a record of ownership using Nasdaq Linq (a cloud based management tool), while significantly reducing settlement time and eliminating the need for paper stock certificates. A few more companies joined the platform in the following months, and Nasdaq confirmed its strong interest in the distributed ledger technology to be applied also to public markets in the next future. Indeed, at the same time, Nasdaq is developing distributed ledger technology to improve proxy voting, company registration and public-pension registration at the Tallinn Stock Exchange, Estonia's only regulated secondary securities market, as well as the Estonia Central Securities Depository (ECSD).

An alternative example for the issuing field comes from a new entrant in the financial industry: Overstock, an e-commerce corporation that became the first to issue its own corporate bonds on a self-developed blockchain, eliminating the possibility of naked short selling and reducing settlement time to near zero. Six months after the bonds' issue, Overstock earned regulatory approval to issue also equities through its blockchain. In September 2016, the company announced it was partnering with Keystone Capital to work with regulators on further developments for its platform.

In January 2016 the Australian Stock Exchange (ASX) acquired a 10 million stake in Digital Asset Holding, a New York based start up to promote R&D on blockchain applications. A few months later ASX announced to have completed the first version of a potential distributed ledger-based replacement for its existing settlement system. The process involved working with regulatory bodies in Australia as well as relevant exchange stakeholders. ASX is now weighing how to go about replacing its existing settlement system, known as CHESS, with the new blockchain prototype. ASX expects to conclude investigations and implement the new system by 2018.

A further example released in 2016 comes from SIX Securities Services (Switzerland's post-trade market infrastructure) that has developed a blockchain powered service covering the full bond trading life cycle from issuance to settlement. The prototype enables the issuing of bonds as smart contracts that specify at what dates coupon payments are made,

for what amounts and when repayments occur.[44] The smart contract is connected to the chain where buyers can allocate money to the bond by paying in digitalised currency. SIX Securities Services said the benefits of using blockchain technology include having one source of data stored on the ledger and significant cost reductions from the removal of operations and reconciliation processes.

The central securities depositories of Russia (NSD, National Settlement Depository) also revealed in 2016 to be at work with a tech startup to test the exchange and transfer of blockchain assets. In addition, they signed an agreement with South Africa depository (Strate) to work together on a shared ledger technology project focused on proxy voting.

Blockchain innovations involve also commodities market. In 2016 the Royal Mint, a 1,000-year-old institution owned by HM Treasury, has partnered with with Chicago Mercantile Exchange (CME Group) to build and launch a digitised gold offering called Royal Mint Gold (RMG). The innovative product, launching in 2017, will see The Royal Mint issue RMG as a digital record of ownership for gold stored at its highly-secure on-site bullion vault storage facility. CME Group will develop, implement and operate the product's digital trading platform. Taken together, this new service will provide an easier, cost-effective and cryptographically secure alternative to buying, holding and trading spot gold.

In addition to industry players, concrete signals of interest in the blockchain technology has surged also from regulators and supranational institutions.

Throughout 2016, Central banks became significantly more interested in utilizing blockchain's potential, particularly in the area of settlement. The Bank of England, European Central Bank, Bank of Japan and the US Federal Reserve all announced they were conducting exploratory research into the potential adoption of blockchain, indicating a strong preference to try and foster a culture of digital innovation going forward.[45]

One of the most active regulators in the field has been the Bank of England. First, it has founded FinTech Accelerator in partnership with firms working with new technology to explore how innovations could be used in central banking. In particular, the central bank is testing

[44] See also SIX(2017).

[45] Bank of America Merrill Lynch. (2016) *How Will Blockchain Change European Market Structure?* Exchanging Views.

an artificial intelligence system with the Canadian startup MindBridge AI to spot abnormalities in financial transactions and explore the benefit of machine learning technology for analyzing the quality of regulatory data input. It has also partnered with San Francisco-based startup Ripple, to trial a blockchain-based technology that would make cross-border payments and the movement of currencies more immediate. A further long term research programme of the Bank of England concerns the implications of a central bank issuing a digital currency.

G20 countries documents released in 2017 also recognize the potential of Blockchain technologies to build an inclusive global digital economy that is auditable, secure and transparently accountable to the world's citizens.[46] Hence, G20 countries are expected to take the lead in initiating several concrete steps to support public and private sector blockchain innovations and establish internationally agreed regulatory frameworks to interface with them.

6. CONCLUSION

Stock exchanges are currently investing in blockchain technology to maintain their competitive position in the security industry. Main impacts are expected to be on post trading business. Settlement and custody will be the most impacted areas, since the distributed ledger will streamline and shorten the process for holding and exchanging assets. Clearing will also benefit by providing faster margining and risk management, especially for derivatives.

Differently, trading will remain on exchanges and ATS as the actual technology is much faster than blockchain and it is not in the interest of stock exchanges (and of a relevant portion of their clients, such as high frequency traders) to implement the new technology.

Some incumbent players and new entrants in the field are also launching applications in the issuing sector, and some possibility to trade as well, focusing on least served market segments, such as small and medium enterprises, for which extreme speed in transactions is not a relevant issue.

Undoubtedly fintech has a huge potential to rewrite many processes in the financial markets, once technological and regulatory issues will be

[46] Maupin J. (2017) The *G20 Countries Should Engage with Blockchain Technologies to Build an Inclusive, Transparent, and Accountable Digital Economy for All*. G20 Insight. Available from: http://www.g20-insights.org/policy_briefs/g20-countries-engage-blockchain-technologies-build-inclusive-transparent-accountable-digital-economy/

solved. If it will succeed also in disrupting entry barriers and vested interests of incumbent players is less easy to say, as it will depend upon the efforts put in place by new entrants but also from the sustain that the new technology will receive from regulators and public authorities. First steps taken on this direction authorize an optimistic view.

LIST OF REFERENCES

[1] Bank of America Merrill Lynch. (2016) *How Will Blockchain Change European Market Structure?* Exchanging Views, February.

[2] Cuccuro P. (2017) Beyond Bitcoin: an Early Overview on Smart Contracts. *International Journal of Law and Information Technology*, V0, p. 1–17.

[3] Deloitte. (2016) *Insights: Blockchain Technology*. [online] Available from: https://www2.deloitte.com/nl/nl/pages/innovatie/artikelen/blockchain-technology-9-benefits-and-7-challenges.html [Accessed 5 March 2017].

[4] Dietz M. et al. (2015) *Cutting Through the FinTech Noise* McKinsey Available from: http://www.mckinsey.com/industries/financial-services/our-insights/cutting-through-the-noise-around-financial-technology.

[5] *Economist.* (2015) The Fintech Revolution, 9th May.

[6] ESMA. (2016) *The Distributed Ledger Technology Applied to Securities Markets*, Discussion Paper n. 773, June. Available from: https://www.esma.europa.eu/sites/default/files/library/2016-773_dp_dlt.pdf

[7] ESMA. (2017) *The Distributed Ledger Technology Applied to Securities Markets*. Report, February. Available from: https://www.esma.europa.eu/sites/default/files/library/dlt_report_-_esma50-1121423017-285.pdf

[8] Euroclear and Oliver Wyman. (2016) *Blockchain in Capital Markets.* Available from: http://www.oliverwyman.com/our-expertise/insights/2016/jan/blockchain-in-capital-markets.html

[9] Fico P. (2016) *Virtual Currencies And Blockchains: Potential Impacts on Financial Market Infrastructures and on Corporate Ownership*. Available from SSRN: https://ssrn.com/abstract=2736035

[10] FINRA (2017), *Distributed Ledger Technology: Implications of Blockchain for the Securities Industry*, January. Available from: http://www.finra.org/industry/blockchain-report

[11] Geranio M. (2016) *The Evolution of the Exchange Industry.* Springer.

[12] Chan et al. (2007) *The Securities Custody Industry*, ECB Occasional Paper Series No. 68, August.

[13] JP Morgan Cazenove. (2016) *Blockchain: A Revolutionary Technology Too Important to Ignore*, Europe Equity Research, 23 May.

[14] KPMG (2016), The *Pulse of Fintech Q4 2016.* [Online] Available from: https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2017/02/pulse-of-fintech-q4-2016.pdf [Accessed 1 March 2017].

[15] Lee L. (2016) New Kids on the Blockchain: How Bitcoin's Technology Could Reinvent the Stock Market *Hastings Business Law Journal* Vol. 12 Winter No. 2.

[16] Linciano N., Siciliano G. and Trovatore G. (2005) *L'industria dei servizi di regolamento delle operazioni in titoli* Quaderni di Finanza Consob, n. 58, May.

[17] Mainelli M. and Milne A. (2015) *The Impact and Potential of Blockchain on the Securities Transaction Lifecycle*, Swift Institute Working Paper n. 7.

[18] Malinova K. and Park A. (2016) *Market Design with Blockchain Technology.* Available from SSRN: https://ssrn.com/abstract=2785626

[19] Maupin J. (2017) *The G20 Countries Should Engage With Blockchain Technologies to Build an Inclusive, Transparent, and Accountable Digital Economy for All.* G20 Insight. Available from: http://www.g20-insights.org/policy_briefs/g20-countries-engage-blockchain-technologies-build-inclusive-transparent-accountable-digital-economy

[20] Murck P. (2017) Who Controls the Blockchain? *Harvard Business Review,* April.

[21] Pinna A. and Ruttemberg W. (2016) *Distributed Ledger Technologies in Securities Post--trading*, ECB Occasional Papers, n. 172, April.

[22] Rizzo P. (2016) *Ten Stocks and Commodities Exchanges Investigating Blockchain.* Available from: https://www.coindesk.com/10-stock-exchanges-blockchain/ [Accessed 23 September 2016].

[23] Santander Innoventures, Oliver Wyman and Anthemis (2015), The *Fintech 2.0 Paper: Rebooting Financial Services.* Available from: http://santanderinnoventures.com/fintech2/

[24] SIX (2017) *SIX Securities Services Develops Distributed Ledger-Based Bond Issuing Solution.* [online] Available from: https://www.six-securities-services.com/en/shared/news/2017/dss-news-170322-distributed-ledger.html [Accessed 31 March 2017].

[25] Stafford P. (2016) Banks Struggle to Make Blockchain Fast and Secure, *Financial Times,* 26 September.

[26] Swan M. (2015) *Blockchain* Ed. O'Reilly.

[27] Tzero. (2017) *Distributed Ledger Platform for Capital Markets* [online] Available from: https://tzero.com/ [Accessed 31 March 2017].

[28] World Economic Forum (2015) *The Future of Financial Services*, June. Available from: http://www3.weforum.org/docs/WEF_The_future__of_financial_services.pdf [Accessed 23 September 2016].

[29] World Economic Forum (2015) The *Future of Fintech: a Paradigm Shift in Small Business Finance*, October. Available from: http://www3.weforum.org/docs/IP/2015/FS/GAC15_The_Future_of_FinTech_Paradigm_Shift_Small_Business_Finance_report_2015.pdf

[30] World Federation of Exchanges and Iosco (2016) *Financial Market Infrastructures and Distributed Ledger Technology*, August. Available from: https://www.world-exchanges.org

[31] Wright A. De Filippi P. (2015) *Decentralized Blockchain Technology and the Rise of Lex Cryptographia*. Available from SSRN: https://ssrn.com/abstract=2580664

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ETF, STOCK EXCHANGE INTERCONNECTION AND THE LOOMING PROBLEMS

by

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The growing presence of the exchange-traded fund (ETF) has been a crucial development on the investment scene since its advent in the mid-1990s. The surge of popularity for ETFs, as well as the phenomenal pace of their growth, is a fact that can be observed everywhere in stock market trading. This paper examines the legal rules, the types and workings of ETFs, and their role in promoting stock exchange interconnection.

The surge of ETFs does not come without its questions and concerns, however. With the analysis provided in this article, the potential problems, mostly notably the systemic risk showcased in the flash crash of August 24, 2015, and the inherent problem of derivative investing, are discussed. This paper concludes with a careful balancing of the benefits and perils presented by this innovative investment product.

KEY WORDS

ETF, Index-Tracking, Actively Managed ETF, Platform Connectivity, Derivative Investing and Passivity, August 24, 2015 Flash Crash

1. INTRODUCTION

The growing presence of the exchange-traded fund (ETF) has been a crucial development on the investment scene since its advent in the mid-1990s. Its remarkable popularity derives from two key components of its design. First, an ETF focuses on a large portfolio, which usually tracks to a well--defined index so as to diversify the credit risk posed by any one company.

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Second, it provides a convenient alternative for ordinary investors to buy into foreign markets when an ETF links to indexes associated with foreign stock exchanges. This link plays a similar role, functionally, to other cross listing that has occurred since the 1990s and can be viewed as part of the wave of stock exchange interconnection that has taken place more recently. Furthermore, a lower management fee and the good liquidity of an ETF also serve to attract investors.

The surge of popularity for ETFs does not come without its questions and concerns, however. Two major challenges among them are worth discussing. First, as ETFs are traded like stocks with an open quote every minute or every few seconds, a disparity between the price of an ETF and the prices of its underlying securities is possible and likely to happen regularly. In this sense, the existence of active arbitrageurs is a key element required to close the pricing gap between the underlying securities and the ETF, and thus prevents a price deviation that would ruin the ETF's tracking feature. However, the legal and market mechanisms that support arbitrage may not always be in place in all markets, and this constitutes a potential threat to an ETF's long-term success and overall stability. Second, and more fundamental for ETFs as investment instruments, the derivative nature of ETF investment slowly deteriorates the proprietary research that focuses on the new information discovery of companies. With ETFs' growing market size, this feature, in the long run, risks eroding the backbone of modern finances and endangers underlying assumptions that purport the existence of an efficient capital market. In other words, the legitimacy of financial investment faces a serious modern enemy in its derivative form – ETFs.

This paper proceeds as follows. Part 2 explains ETFs' legal design and working mechanisms, and ETFs' advantages in linking different markets in an effective and economical way. Part 3 briefly introduces the current development of the ETF market and its newest products. Part 4 discusses the challenges that the growing presence of ETF products face and the potential problems they bring to the investment scene. All of these challenges, in the view of this paper, warrant more careful scrutiny and comprehensive reassessment, as ETFs are becoming a powerful as well as an indispensable investment tool in the present day of financial market trade. Part 5 concludes.

2. AN ETF'S WORKING MECHANISMS: TYPES AND CONSTRUCTION

2.1 GENERAL BACKGROUND AND LEGAL ARCHITECTURE

Historically, the ETF was introduced to the market in the United States in 1993. The first ETF in the United States – the SPDR Trust, which tracked Standard & Poor's 500 Composite Stock Price Index – was structured as a unit investment trust, or UIT, and traded on the American Stock Exchange.[1] The first open-end-fund ETF was introduced later, in 1996.[2] In the first decade after its advent, investor interest in ETF products was modest. However, starting in 2004, the ETF market grew rapidly. Between 2004 and 2013, ETFs experienced an astonishing rate of growth, roughly 28 percent annually in their second decade of existence.[3] By December 2012 ETF assets under management in the United States had reached $1.34 trillion,[4] and the number went up even further, to approximately $2.1 trillion in 2015, an increase of almost 57 percent in two years.[5] The pace of growth is especially stunning when compared to the total growth of mutual fund assets. Between 2001 and 2014, the overall growth of mutual fund assets was a cumulative 127 percent. ETFs grew by 2,279 percent over the same period.[6]

In the United States, ETFs, like their cousins the mutual funds, are structured either as (1) investment companies that are legally classified as open-end companies or as (2) UITs.[7] Though similar in legal structure,

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1 U.S. Securities and Exchange Commission. (2001) *Concept Release: Actively Managed Exchange-Traded Funds*, Investment Company Act Release No. 25258. Available from: https://www.sec.gov/rules/concept/ic-25258.htm.[Accessed 14 September 2017].

2 Ibid.

3 Ross, S. (2016) How Big Is the Global ETF Market? Investopedia. Available from: http://www.investopedia.com/articles/etfs/071216/how-big-global-etf-market-blk-stt.asp [Accessed 14 September 2017]. The global ETF market shows a similar trend. According to Ross's article for Investopedia, *"Worldwide ETF assets nearly doubled between 2008 and 2010, from $715 billion to $1.313 trillion. The figure was $2.254 trillion by 2013. By the beginning of 2016, total global ETF assets were valued at $ trillion."*

4 Yoder, J. & Howell, B. J. (2013) Actively Managed ETFs: The Past, Present, and Future. *Journal of Business & Securities Law.* 13 (2), pp. 231–232.

5 Statista. (2017) *ETFs – Statistics & Facts.* [online] Available from: https://www.statista.com/topics/2365/exchange-traded-funds/ [Accessed 14 September 2017].

6 Ross, S. (2016) How Big Is the Global ETF Market? *Investopedia*. Available from: http://www.investopedia.com/articles/etfs/071216/how-big-global-etf-market-blk-stt.asp [Accessed 14 September 2017].

7 U.S. Securities and Exchange Commission. (2013) *Exchange-Traded Funds (ETFs)*. [online] Available from: https://www.sec.gov/answers/etf.htm. [Accessed 14 September 2017]. For further information about UITs, see U.S. Securities and Exchange Commission. (2013) *Unit Investment Trusts (UITS)*. [online] Available from: https://www.sec.gov/answers/uit.htm [Accessed 14 September 2017].

an ETF differs from a traditional mutual fund in two key respects: a) ETF shares are sold on the national stock exchange for trading; b) ETFs are not redeemable for net asset value.

Regardless of the legal structure it adopts, any given ETF works in essentially the same manner.[8] The basic working mechanisms are as follows: First, an ETF issues shares in blocks, known as "creation units" to institutions, which generally consist of 25,000 to 50,000 individual ETF shares.[9] Second, institutional investors or brokerage houses (often referred as an "authorized participant" in an ETF context) that want to purchase creation units need to purchase them with a "portfolio deposit", which consists of a basket of securities that mirrors the composition of the ETF's portfolio or equals the aggregate net asset value (NAV) of the ETF shares in the creation unit.[10] Third, after acquiring a number of creation units, those institutions use secondary markets to sell smaller blocks or individual shares to retail investors.[11]

In the United States, ETFs need to comply with the Investment Company Act of 1940 and a host of laws and regulations in this category. Due to the attributes of its high transparency and relatively low management risk, ETFs generally will seek from the SEC exemptions from certain provisions of the Investment Company Act of 1940. In most cases, these include exemptions from (1) the obligation of registering as an open-end investment company or an UIT, (2) the obligation to sell or redeem securities at the price of a NAV, and (3) the rule prohibiting in--kind purchases or redemptions with affiliated persons, among others.[12] The review process for these applications is a lengthy one and often takes more than a year.[13]

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[8] Most ETFs are now organized as open-end management investment companies. See Yoder, J. & Howell, B. J. (2013) Actively Managed ETFs: The Past, Present, and Future. *Journal of Business & Securities Law.* 13 (2), pp. 236.

[9] Ibid, pp. 233.

[10] Because ETF products often track an index (i.e. as a basket of securities or other investment targets), calculating the NAV of the underlying securities thus becomes the way to determine the value of ETF shares in the secondary market.

[11] U.S. Securities and Exchange Commission. (2013) *Exchange-Traded Funds (ETFs)*. [online] Available from: https://www.sec.gov/answers/etf.htm [Accessed 14 September 2017].

[12] For more detailed discussion about the law and rules involved, see U.S. Securities and Exchange Commission. (2001) Concept Release: Actively Managed Exchange-Traded Funds, Investment Company Act Release No. 25258. Available from: https://www.sec.gov/rules/concept/ic-25258.htm [Accessed 14 September 2017].

[13] Yoder, J. & Howell, B. J. (2013) Actively Managed ETFs: The Past, Present, and Future. *Journal of Business & Securities Law.* 13 (2), pp. 237.

In the European Union, an ETF is labeled an undertaking for collective investment in transferable securities (UCITS) and needs to follow the Undertakings for Collective Investment in Transferable Securities Directive (UCITS Directive), which was adopted in 2009.[14] On December 18, 2012, the European Securities and Market Authority (ESMA) published guidelines on ETFs and other UCITS issues (ESMA/2012/832) to implement the UCITS Directive.[15] Primarily, the focus shifts from the formation to the actual management of ETFs, especially enhanced transparency (protection to investors) and stability (impacts to the whole system).[16]

Meanwhile, to facilitate cross-border sale of ETFs, an international standard-setting endeavor is also under way. For example, the International Organization of Securities Commissions published Principles for the Regulation of Exchange Traded Funds: Final Report in 2013. It carefully examines regulations and regulatory concerns across member jurisdictions, which mainly include problems of disclosure regarding ETF classification, portfolio, costs/expense, and strategies, conflicts of interest, and management of counterparty risk. The goal is to assist national regulators in addressing common issues in a more coherent way and to provide a useful policy analytical structure to attend to the ETF market's shared concerns.[17]

2.2 INDEX-TRACKING FEATURE AND TYPES

As an investment tool, initially, ETFs were designed to track the performance of a major market index or specific equity indexes;

[14] Council Directive 2009/65/EC. *Official Journal of European Union* (2009/L 302) 13 July. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32009L0065 [Accessed 14 September 2017]. Council Directive 2014/91/EU, of the European Parliament and of the Council of July 23, 2014, Amending Directive 2009/65/EC On the Coordination of Laws, Regulations, and Administrative Provisions Relating to UCITS as Regards Depositary Functions, Remuneration Policies, and Sanctions, *Official Journal of European Union* (2014/L 257) 23 July. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32014L0091 [Accessed 14 September 2017]. See also, European Commission, Strengthening Global Competitiveness of EU Investment Funds. (2016) *EUR-Lex*. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=URISERV:mi0037 [Accessed 14 September 2017].

[15] European Securities and Market Authority (2012), *Guidelines for Competent Authorities and UCITS Management Companies*. ESMA/2012/832EN. Available from: https://www.esma.europa.eu/sites/default/files/library/2015/11/2012832en_guidelines_on_etfs_and_other_ucits_issues.pdf [Accessed 14 September 2017]. A revised guideline was issued in 2014 (ESMA/2014/937). Available from: https://www.esma.europa.eu/sites/default/files/library/2015/11/esma-2014-0011-01-00_en_0.pdf [Accessed 14 September 2017].

[16] Ibid.

[17] Board of the International Organization of Securities Commissions. (2013) *Principles for the Regulation of Exchange Traded Funds: Final Report*, p. 5. Available from: http://www.iosco.org/library/pubdocs/pdf/IOSCOPD414.pdf [Accessed 14 September 2017].

that type of ETF – an index-based ETF – continues to be the predominant type of ETF offered and sold.[18] The indexes tracked can be major market indexes or other low-volume indexes alternatively. No matter whether it tracks an index in its entirety or uses representative sampling, the goal of such an ETF is to emulate an underlying index or a sample. In this sense, it reiterates the same logic established when Vanguard led the mutual fund industry revolution by introducing the first index fund – First Index Investment Trust – in 1976.[19]

An index-based ETF can track a foreign index by forming a basket of foreign securities in its portfolio. For investors, investing in an ETF that tracks a foreign index provides an easy alternative to investing directly in another country, especially when they want to hedge their investment risk in a particular country but do not equip with the adequate resource in choosing any particular company in that foreign country nor easy access to that market. The ability to access foreign markets is a powerful investment tool. Obviously it broadens the range of investment possibilities, which means there will be more good-quality companies that an investor can choose from and better portfolio management as a result. Furthermore, an index-based ETF diversifies national risk (high-growth countries versus low-growth countries) as well as currency exposure (when US dollars move inversely relative to most of the foreign currencies). This hedging function enables a better composition in terms of risk management. In this regard, an index-based ETF, like other index investing, allows investors to invest in a less-familiar country and opens the door for less-sophisticated investors to make overseas investments. This broadening horizon of investment in turn benefits both capable businesses (cheaper capital) and lay investors (more investment opportunity).

Nowadays, ETFs have evolved into a variety of investment tools. Targets of ETF investment have expanded from equity to include fixed-income products, commodities, currency, and real estate.[20] Specialty funds came on the scene at a later stage. Leveraged funds and inverse funds

[18] U.S. Securities and Exchange Commission. (2012). Investor Bulletin: Exchange-Traded Funds (ETFs). *SEC*. Available from: https://www.sec.gov/investor/alerts/etfs.pdf [Accessed 14 September 2017].

[19] Bogle, J. C. (2006) The First Index Mutual Fund: A History of Vanguard Index Trust and the Vanguard Index Strategy. *Vanguard*. Available from: https://www.vanguard.com/bogle_site/lib/sp19970401.html [Accessed 14 September 2017].

[20] Ashworth, W. (2017) 6 Popular ETF Types for Your Portfolio. *Investopedia*. Available from: http://www.investopedia.com/articles/exchangetradedfunds/11/ten-popular-etf-types.asp [Accessed 14 September 2017].

are synthesis funds that provide larger or inverse risk/return ratio, which caters to particular types of investors.[21] Actively managed ETFs, which seek to outperform their index-tracking peers, also started to gain traction and created some uncertainty regarding their regulation, as they work against the original passive nature of the index-based design.

2.3 PLATFORM CONNECTIVITY, PRICE DISPARITY, AND ARBITRAGE

The essential innovation of an ETF is that it possesses two key features of the mutual fund: investing in a basket of targets instead of some individual companies and having the ability to cross national borders or trading platforms easily. By this means, investors achieve better default risk allocation by spreading their financial resources across a group of companies in different markets.[22] In other words, having a diversified investment with a purchasing focus that stipulates a group criterion is one competitive advantage of the mutual fund. As the ETF inherits this feature, a similar effect can be obtained with lower cost compared to directly purchasing stock from companies in the basket or investment portfolio.

However, portfolio diversification and the ability to access foreign companies/markets easily are not enough to account for the ETF's popularity, as a similar level of diversification can be easily obtained by ordinary mutual fund investment, too. The additional factors in ETFs' rise in popularity include the fact that ETFs enjoy a better degree of liquidity, similar to most stock traded on the stock exchange, and consequently more accurate valuation as a result. Because ETFs are traded on a stock exchange and have intra-day quotes, a continuous quoting system makes ETF pricing more efficient and more reflective of all related intra-day activities and thus more efficient in terms of effective trading as a result. What is more, compared to traditional index-tracking mutual funds, a lower management fee has helped ETFs gain their foothold in a competitive asset management market. In other words, compared

[21] Ibid.

[22] Generally, default risk means the chance that an individual or a company will be unable to pay its debt or meet other monetary obligations. The reasons that default occurs can be attributed to two main groups of reasons: one, mismanagement of the debtor's own finances or, two, a change in the macro-environment that cannot be attributed directly to the debtor. Compared with investing in single target, spreading one's investment across as many targets as possible reduces the overall default risk because mismanagement, it may be assumed, is not likely to happen across the board and all at once.

to a mutual fund, investing in foreign ETFs generally gives investors a lower management fee and more instant execution.

Combining the best of two worlds does not come without a price, however. Conceptually, an ETF is a separate security with different issuers. It only reflects the economic value of the underlying securities when all things proceed ideally (or put differently, efficiently). When that happens, the ETF's price should accurately reflect the real-time economic value of the underlying securities or other investment it represents. By its legal structure, an ETF is an independent investment that does not legally link back to those underlying securities or equal ownership of those securities. Since the ETF and the underlying securities are two different securities traded in different venues or time zones, different trading scenarios or local market conditions may have two sets of supply and demand and thus two prices. In other words, price disparity is always likely, in theory as well as in practice.[23]

To facilitate better price equivalence, or to eliminate a tracking difference in ETF industry jargon, a well-functioning ETF needs a group of effective arbitrageurs (mostly large brokers or institutions that are willing to assume the role of market maker) for two purposes. First, arbitrageurs, when buying low and selling high, provide much-needed liquidity to the ETF market, which is critical to retail investors and the local market as well. Second, arbitrage activities help close the price gap with underlying securities by buying or selling an ETF when an ETF's price goes under or over the underlying securities.

Although arbitrageurs play a critical role in the ETF market, the incentive mechanism or economic return for arbitrageurs is, ironically, not very clear. When too few participants join in this arbitrage, a growing difference in pricing is likely to be the outcome. When this happens, more arbitrageurs enter to take advantage of the larger profit opportunity in arbitraging. In this sense, presumably, the concern over a suboptimal level of arbitrageur participation might in fact be self-correcting. However, actual fine-tuning in the real world is still an issue for further observation, especially in markets where ETF block participation is low.

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[23] This price disparity is sometimes called "tracking difference". See, Board of the International Organization of Securities Commissions. (2013) *Principles for the Regulation of Exchange Traded Funds: Final Report*. p. 4. Available from: http://www.iosco.org/library/pubdocs/pdf/IOSCOPD414.pdf [Accessed 14 September 2017].

3. CURRENT STATUS REVIEWED

The rising popularity of ETF products is one conspicuous development in the world of investment. A closer look at the data and the market trends allows us to forecast the prospects and challenges for ETFs that lie ahead.

3.1 HISTORICAL DATAAND CURRENT STATUS: GIANTS AT THE GATE

As discussed earlier, the ETF market started to take off in 2004 and has grown exponentially in the United States ever since. Between 2004 and 2013, ETFs grew at the astonishing rate of roughly 28 percent annually.[24] By 2008 ETF assets under management in the United States was $498 billion. By 2012 the number was up to $1.21 trillion.1 The number reached USD$2.47 trillion by December 2016, a fivefold increase in eight years.[25]

The global market shows a similar trend. ETFs have accrued over USD$3 trillion assets under management as of the end of 2016, across 4,808 funds,[26] and are traded on over 60 exchanges.[27] In Europe, assets under management in European ETFs amounted to USD$143 billion in 2008, $331 billion in 2012, and $542 billion at the end of December 2016.[28] The average annual growth rate in ETF assets exceeded 40 percent from 2006 to 2015, outpacing the already astonishing US market.[29]

The top five ETF product providers, ranked by global assets, are iShares issued by BlackRock (market share 36.8 percent, assets under management reached USD$1,304 billion in August 2016), Vanguard (market share 18.2 percent, assets under management USD$647 billion), SPDR ETFs (market share 15.2 percent, assets under management USD$538 billion),

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[24] Ross, S. (2016) How Big Is the Global ETF Market? *Investopedia*. Available from: http://www.investopedia.com/articles/etfs/071216/how-big-global-etf-market-blk-stt.asp [Accessed 14 September 2017].

[25] Statista. (2017) *ETFs – Statistics & Facts*. [online] Available from: https://www.statista.com/topics/2365/exchange-traded-funds/ [Accessed 14 September 2017].

[26] ETFGI. *ETFGI.com*. Available from: http://etfgi.com/index/cookie [Accessed 14 September 2017].

[27] Hassine, M. (2016) European ETF Market Outlook for 2016. *Lyxor Asset Management*. Available from: http://www.lyxor.com/uploads/tx_bilyxornews/European_ETF_Market_Outlook_for_2016.pdf [Accessed 14 September 2017].

[28] ETFGI. *ETFGI.com*. Available from: http://etfgi.com/index/cookie [Accessed 14 September 2017].

[29] Hassine, M. (2016) European ETF market outlook for 2016. *Lyxor Asset Management*. Available from: http://www.lyxor.com/uploads/tx_bilyxornews/European_ETF_Market_Outlook_for_2016.pdf [Accessed 14 September 2017].

and much smaller PowerShares and Nomura AM.[30] BlackRock and Vanguard, two leading ETF managers, marked a record year in 2016, as the former attracted $140 billion to its iShares business and the latter gathered in $93 billion.[31] Notably, the ETF market is rather concentrated, as more than 70 percent of the market is dominated by the top three powerhouses.

Equally important is that the overall trading volume of ETFs exceeded that of stock in 2016. More specifically, according to Bloomberg, only 3 of the 15 most heavily traded securities in 2016 were individual stocks, citing data compiled by Credit Suisse Group AG.[32] Not only a challenge to traditional mutual funds and stocks, observers also see ETFs as an ideal vehicle to replace certain derivatives, as low-cost ETFs are used to substitute for fully funded futures or credit default swaps.[33]

In the meantime, the landscape inside the EFT industry is not static. As types of ETFs proliferate, variations other than the traditional index--tracking ETF have emerged and created new dynamics. This trend also poses tough questions for the future of ETFs.

3.2 GLOBALIZATION OF INVESTMENT AND MARKET CONNECTIVITY

Having more international investment opportunity, provided first by mutual funds and later by foreign ETFs and other derivative investments that connect to international trading venues, poses both opportunities

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[30] ETFGI. *ETFGI.com*. Available from: http://etfgi.com/index/cookie [Accessed 14 September 2017].

[31] Willmer, S. & Stein, C. (2017) BlackRock Sees Record Flows into Low-cost ETFs as Passive Rules. *Bloomberg*. Available from: https://www.bloomberg.com/news/articles/2017-01-13/blackrock-fourth-quarter-profit-rose-on-etf-inflows-lower-costs [Accessed 14 September 2017]. Basically, buying ETFs still incurs costs and other expenses. Because an ETF is traded through a stock exchange, placing a buy or sell order through a broker will generally incur a trading fee (mostly commission). Moreover, ETF providers have an expense ratio for their ETF, which is used to collect money from investors to cover an ETF's expenses. The industry average ETF expense ratio is 0.28 percent. See Vanguard Group (2016), ETF Fees and Minimums, Available from: https://investor.vanguard.com/etf/fees [Accessed 14 September 2017].

[32] Burger, D. (2017) Stocks Are No Longer the Most Actively Traded Securities in Stock Markets. *Bloomberg*. Available from: https://www.bloomberg.com/news/articles/2017-01-12/stock-exchanges-turn-into-etf-exchanges-as-passive-rules-all [Accessed 14 September 2017].

[33] Ernst & Young. (2016) *Global ETF Survey 2016 – Integrated Innovation: The Key to Sustainable Growth,* p. 9. Available from: http://www.ey.com/Publication/vwLUAssets/ey-integrated-innovation-the-key-to-sustainable-growth-global-etf-survey-2016/$File/ey-integrated-innovation-the-key-to-sustainable-growth-global-etf-survey-2016.pdf [Accessed 14 September 2017].

and threats to the traditional wisdom of both regulation and industry policy. Following are some of the often-mentioned ones:

1. Capital outflow and loss of domestic investment. For developing countries, more foreign stock ETFs, as they represent more access to foreign markets, may accelerate capital outflow and weaken capital accumulation when local capital seeks a safer place to invest. A similar but reverse concern relates to mature markets, too. In mature markets or developed countries, when facing lower or sluggish growth, easy access to other markets might mean more money outflow into a foreign market in search of a hoped-for higher return. Therefore, this concern may be exaggerated in its essence. In the abstract realm where theories work out as conceived, the outflow of capital should be to some extent offset by the inflow that seeks to diversify in the opposite direction, and thus reach a balance of inflow and outflow of capital that corresponds to each market's strength and weakness.
2. Regulatory challenges. At the product level, much product-level scrutiny and collaboration have been provided across different markets, especially in markets where regional integration has started.[34] The challenge is to apply a well-defined set of rules to a universe of products that may use similar names but function much differently from each other, or *vice versa*. Also, when ETF products evolve and increase in variety, the rules must be tailored to deal with the different types of risk they engender. To what extent the increased regulatory burden can be justified by the increased investment choices is a perpetual question of balancing that most regulatory agencies need to consider. However, in a financial world where global competition is common, and the speed of moving money to any part of the world is swift, how to achieve the proper level of regulation (or alternatively, delegation of regulatory duty

[34] A similar concept can be found in financial "passporting" in the European Economic Area. For a useful introduction on European passporting, see Bank of England (2017), Passporting. [online] Available from: http://www.bankofengland.co.uk/pra/Pages/authorisations/passporting/default.aspx [Accessed 14 September 2017]; BBA (2017), Brexit Quick Brief: What Is "Passporting" and Why Does It Matter? [online] Available from: https://www.bba.org.uk/wp-content/uploads/2016/12/webversion-BQB-3-1.pdf [Accessed 14 September 2017]. For product-level coordination in ASEAN countries, see e.g. PricewaterhouseCoopers (2015), Funds Passport Regimes in Asia Pacific: Taxing Issues, Available from: https://www.pwc.com/sg/en/asset-management/assets/funds-passport-regimes-in-asia-pacific.pdf [Accessed 14 September 2017].

to foreign regulators who oversee other major markets) may be a more difficult question to answer than ever, as no single regulator can answer that question alone.

3. International cooperation. A linked securities market as we see today is a fact that no regulator can deny. Contrary to the existing reality, however, the corresponding regulatory net falls far short of the anticipated extent. Currently, securities regulation is mostly a domestic matter, which is subject to each country or market's regulation. Although there is a striking similarity in the substance of these regulations, a coordinated or joint enforcement mechanism is dangerously absent when dealing with some global securities market issues such as a flash crash that might hit all markets in a matter of hours. This threat, in the form of systemic risk, rises as market connectedness becomes denser. In other words, when markets are more connected, as we see now, a systemic risk of global proportion looms ever larger, and the traditional national border can no longer serve as a firewall. In this regard, enhanced institutionalized international effort should be high on the agenda for the years to come.[35]

Indeed, a more efficient international capital flow is, in its essence, a democratization and liberalization of investment. This is a trend that can be traced back to the 1970s when it was first introduced by John Bogle, the founder of the largest mutual fund company in the United States: Vanguard.[36] The philosophy of index investment has proven successful in the last half century. This trend of success has become particularly spectacular since the 2008 financial crisis and is expected to continue for a certain period of time.[37] However, some critics raise questions about the essence of ETF investment and caution that past success does not guarantee worry-free future success. This concern will be addressed in more detail in subsection 4.1.

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[35] For example, the International Organization of Securities Commissions and Financial Stability Board.

[36] More generally, see Bogle, J. C. (1994) *Bogle on Mutual Funds: New Perspectives for the Intelligent Investor*. New York, McGraw-Hill.

[37] Citing the results of a survey it conducted, PricewaterhouseCoopers predicts ETF asset will at least double and reach $5 trillion or more by 2020. PricewaterhouseCoopers. (2015) ETF 2020: Preparing for a New Horizon, p. 8. Available from: https://www.pwc.com/jg/en/publications/etf-2020-exchange-traded-funds-pwc.pdf [Accessed 14 September 2017].

3.3 ACTIVELY MANAGED ETF

The array of ETF products, due to the pressure from competition and the desire for growth, has evolved into a more complex buffet of offerings beyond mere index tracking. Leveraged, inverse, commodity, fix-income, or hybrid ETFs are among the new entrants offering variations of their index-tracking predecessors. From a business viewpoint, it is natural and understandable that sponsors need to differentiate and expand their product lines to cater to different investor needs when a market reaches maturity. Outside the United States, a similar trend is seen in Europe as more innovative offerings are expected to come with a growing number of investors favoring a strategic deployment.[38]

Among them, actively managed ETFs capture much attention, especially from a regulatory perspective. Supporters, as well as critics, have debated the proper legal rules for regulating actively managed ETFs since their first appearance in the United States in 2008, seven years after the SEC issued a Concept Release in 2001.[39] The concerns related to the actively managed ETF, as discussed in the 2001 Concept Release, include (1) its relatively lower transparency (due to the fact that an actively managed ETF may need to change its portfolio more often compared to a traditional index-tracking ETF); (2) a disclosure rule that can balance investor confidence/information and an ETF's trading advantage; (3) whether an actively managed ETF can ensure that the portfolio securities are sufficiently liquid to permit effective arbitrage.[40]

In 2008 the SEC finally agreed to issue a first exemptive order permitting an ETF to pursue active investment strategies. In a series of similar exemptive orders, the SEC basically demanded an actively managed ETF to disclose a daily portfolio and make sales and marketing disclosures as premises for its exemptive order.[41] Similar to the earlier pattern

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[38] Morningstar Manager Research. (2014) *A Guided Tour of the European ETF Marketplace,* p. 2. Available from: http://media.morningstar.com/eu/Events/ETFEU/ETFEU14/ETF_Industry_Report_4Nov.pdf [Accessed 14 September 2017].

[39] Yoder, J. Howell, B. J. (2013) Actively Managed ETFs: The Past, Present, and Future. *Journal of Business & Securities Law.* 13 (2), p. 240; U.S. Securities and Exchange Commission. (2001) *Concept Release: Actively Managed Exchange-Traded Funds*, Investment Company Act Release No. 25258. Available from: https://www.sec.gov/rules/concept/ic-25258.htm [Accessed 14 September 2017].

[40] U.S. Securities and Exchange Commission. (2001) *Concept Release: Actively Managed Exchange-Traded Funds*, Investment Company Act Release No. 25258. Available from: https://www.sec.gov/rules/concept/ic-25258.htm [Accessed 14 September 2017].

[41] Ibid.

for ordinary ETFs, these exemptive orders' conditions set a precedent for other companies to follow when seeking an exemptive order for a new actively managed ETF. In other words, the SEC's response to the actively managed ETF is neutral, emphasizing the need for enhanced transparency and a demand for more public information for investors.[42]

The emergence of actively managed ETFs characterizes a trend of continuous product proliferation that makes perfect business logic, and it also reflects the ever-expanding appetite for investment even after the devastating financial crisis of 2007–2008.[43] However, if one looks at these innovations from a careful theoretical perspective, the advent of actively managed ETFs also represents a clear reversal of the traditional index--tracking feature common to most ETFs. This reversal thus poses a question about its very design concept as well as the regulatory approach that the SEC applied to other ETFs earlier. Further discussion on the future of actively managed ETFs and their possible impact is provided in subsection 4.2.

4. LOOMING CHALLENGES

As mentioned earlier, when tracking a foreign index, an ETF gains much of its popularity from two key features: its capability to diversify investment by putting money in a large group of targets, on the one hand, and the convenience of investing in a foreign market directly on the local exchange, on the other hand. These two features, to a large extent, contribute to its desirability. However, some consequences of these features present problems, especially as the ETF market expands and slowly changes the contours of securities trading.

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[42] A similar approach is followed in the new rule of October 2016. See U.S. Securities and Exchange Commission (2016), News Release: SEC Adopts Rules to Modernize Information Reported by Funds, Require Liquidity Risk Management Programs, and Permit Swing Pricing [online], p. 240, fn. 62. Available from: https://www.sec.gov/news/press release/2016-215.html. [Accessed 14 September 2017].

[43] Actively managed ETFs, despite the publicity they have received and the heated discussion they have sparked, currently represent only 1 percent of global ETF assets under management. Optimistic observers view the situation as an opportunity for growth. See Ernst & Young. (2016) *Global ETF Survey 2016 – Integrated Innovation: The Key to Sustainable Growth,* p. 9. Available from: http://www.ey.com/Publication/vwLUAssets/ey-integrated-innovation-the-key-to-sustainable-growth-global-etf-survey-2016/$File/ey-integrated-innovation-the-key-to-sustainable-growth-global-etf-survey-2016.pdf [Accessed 14 September 2017]

4.1 THE PROBLEM OF DERIVATIVE INVESTING

4.1.1 PASSIVITY

One primary challenge of ETFs is the problem of derivative investing. The threat posed by derivative investing is not to ETFs directly but the very concept of investment itself. Due to the feature of index tracking, ETFs, in reality, piggyback on certain larger criteria, namely the index compilation criteria, which are responsible for choosing an ETF's investment targets. In other words, as an investment vehicle, an ETF delegates the job of picking target companies to invest into the index compiler with the hope that the index is broad and well-selected enough to diversify default risk, avoid selection bias, and enjoy an average (or little above average) return. If so accomplished, it can reduce its investigation cost and attract more retail investors by lowering its fee. However, when more money is poured according to a broad preexisting criterion, be it a market or any industry, choosing a company to invest in without looking into the details of that company would become the norm. When this happens on a large enough scale, the capital market does not have a governance function and cannot discern good companies from bad ones.

When most of the funds are working in this abstracted fashion, fund managers then naturally have fewer incentives to scrutinize each company composing a bundle. Therefore, the corporate governance function of investors (especially of institutional investors) is weakened substantially. The loss of market discipline from financial investors, in the long run, will slowly deteriorate the monitoring role of large investors. This is especially true when all large investors, through all kinds of funds or ETFs, only hold a small stake in any one company, which is too small to justify any serious intervention, and when the number of targets receiving investment is several dozen or even hundreds.

The long-term impact may be complicated and profound. The expanding ETF market not only distorts the traditional price-finding function of investment; it also threatens the traditional corporate governance function and the hierarchy of shareholder vis-à-vis management, which are fundamental building blocks in modern corporate governance: capital providers, namely investors, monitor and discipline managers as the final line of defense in the corporate world. When the trend toward derivative investing such as index mutual funds and index-tracking ETFs continues

to spread and becomes a stable majority, the consequent threats for financial markets and corporate governance will grow even larger and become that much harder to reverse.

4.1.2 SELECTION BIAS AND MARKET VOLATILITY

Index selection has an overt preference for companies that are already large, without paying equal attention to emerging ones that are worth noticing. It can be argued that the job of fostering young emerging companies should be shouldered by other vehicles such as venture capital, angel investors, or even incubators. However, as a clear prevalence for collective investment tools such as ETFs takes root, the long-term effect of the selection bias led by ETFs becomes worrisome to many. It is not clear to what extent actively managed ETFs or new indexes might mitigate this problem, but surely companies at the burgeoning stage deserve close attention as the ETF market booms exponentially.

Another related problem brought on by preponderating ETF products is market volatility. As more and more money is poured into ETFs and other index-tracking products, the movement of certain indexes can trigger market panic more easily than previously expected. One example of precipitous, unforeseen sell-off was the market flash crash of August 24, 2015.

On August 24, 2015, Standard & Poor's 500 index opened at 1965.15 and within minutes fell to a low of 1867.01, a 5 percent decline. The Dow shed more than 1000 points that day in early trading, about 6.6 percent at its worst point.[44] Later the Standard & Poor 500 bounced back and closed at 1893.21. This sudden crash was triggered by a sell-off on August 20 (closing at 2035.73, a 43.88 point loss from the previous day) and August 21 (closing at 1970.89), leaving investors wary heading into the weekend. One thing that triggered the crash on Monday, August 24, 2015, was the decline of 8.5 percent that morning on the Shanghai stock exchange.[45] However, as all markets quickly stabilized, the actual reasons for this crash, as well its recovery, are still subject to debate.

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[44] Long, H. (2015) The Stock Market Drop... By The Numbers. *CNN Money,* August 24. Available from: http://money.cnn.com/2015/08/24/investing/stocks-market-crash-by-the-numbers/ [Accessed 14 September 2017].

[45] Mitchell, C. (2016) The Two Biggest Flash Crashes of 2015. *Investopedia,* January 11. Available from: http://www.investopedia.com/articles/investing/011116/two-biggest-flash-crashes-2015.asp [Accessed 14 September 2017].

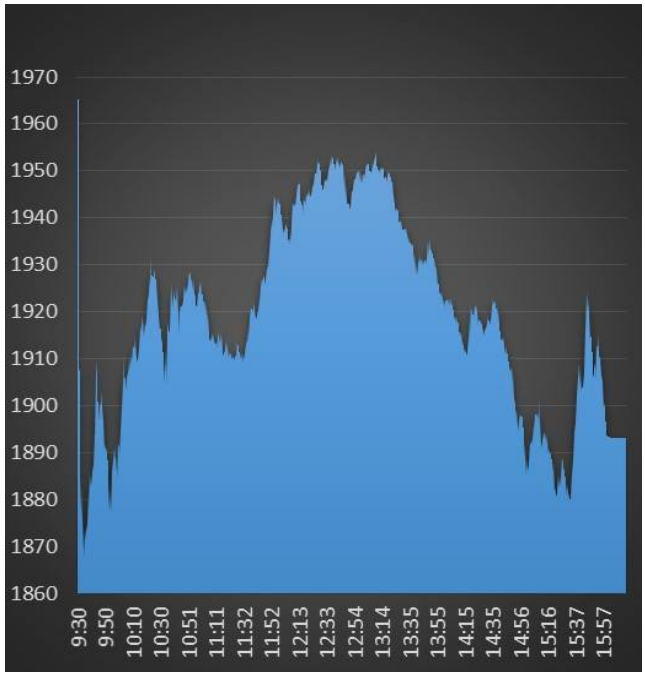

Figure 1: Standard & Poor's 500 price movement, August 24, 2015. The y-axis is scaled by stock market points, and the x-axis is scaled by (mostly) twenty-minute increments.[46]

This single event illustrates several crucial facts about market structure when dominated by ETFs and other index-tracking investment vehicles. As most observers felt confused about the exact reasons for the crash and its similarly odd recovery, it seems that (a) the interconnectivity of markets around the globe shows a clear domino effect: as one market falls, it leads to another falling, as was seen on August 24, 2015, in the UK and Germany markets.[47] This connectivity spreads unrest to other markets even when other markets face no similar threat or reason for decline. Furthermore, (b) ETFs, like other index-tracking investment tools, face a more severe challenge than do ordinary stocks in such a situation when some of the composing stocks have a problem. In the market crash of August 24, 2015, because of the lack of bids, many stocks in the index composition were delayed in opening.[48] It left many ETFs' prices unable to be determined

[46] Data Source: *Bloomberg*.

[47] Ro, S. & Udland, M. (2015) Market Mayhem. *Business Insider*, August 24. Available from: http://www.businessinsider.com/us-markets-sell-off-aug-24-2015-2015-8 [Accessed 14 September 2017].

and thus triggered further unrest. This unrest led to further decline in the ETFs' prices.[49]

4.1.3 MARKET SIZE

The sheer increase of market size by itself also constitutes a potential threat to overall market stability. From the case of Standard & Poor's 500 crash on August 24, 2015, it becomes obvious that ETF products are vulnerable to market volatility by their very nature. Namely, when one or more companies in the index or portfolio cannot get a quote for some reason, that delay will jeopardize timely quoting more widely and then disrupt the entire trading of the ETF, even if the companies that stop trading only constitute a tiny portion of the entire portfolio. Further, a chain reaction of markets, time differences, and the complexity in stock bundling make it more difficult to arrive at an informed and timely decision. In a financial trading world like this, a mistaken drop and recovery as was witnessed on August 24, 2015, surprised and disturbed many investors and market watchers and is likely to occur again at some point in the future.[50]

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[48] Pisani, B. (2015) What Happened During the Aug 24 "Flash Crash"? CNBC.com, September 25. Available from: http://www.cnbc.com/2015/09/25/what-happened-during-the-aug-24-flash-crash.html [Accessed 14 September 2017]. Pisani reports that *"[o]nly about half of S&P 500 stocks were opened on NYSE by 9:35 a.m."*; in addition, "there were 1,278 trading halts for 471 different ETFs and stocks. Because of this, it was not possible to calculate the value of many ETFs, or hedge or trade ETFs and stocks at a 'correct' price." This occurred because high-speed traders use models that shut down their systems when they detect extreme pricing anomalies. See also, Egan, M. (2015) Trading Was Halted 1,200 Times. CNN Money, August 24. Available from: http://money.cnn.com/2015/08/24/investing/stocks-markets-selloff-circuit-breakers-1200-times/ [Accessed 14 September 2017].

[49] Dieterich, C. (2015) The Great ETF Debacle Explained: The Stock Market Slide on August 24 Led to ETF Prices Falling More Sharply Than the Stocks They Owned. *Barron's Asia,* September 5. Available from: http://www.barrons.com/articles/the-great-etf-debacle-explained-1441434195.[Accessed 14 September 2017]. Dieterich explains that "*when the S&P 500 fell as much as 5.3 % in the opening minutes of trading, the $65 billion iShares Core S&P 500 ETF fell as much as 26 %, some 20 percentage points below its fair value. Disorderly trading affected big ETFs from every major provider: The $18 billion Vanguard Dividend Appreciation ETF and the $12 billion SPDR S&P Dividend plunged 38 % apiece, while the PowerShares S&P 500 Low Volatility ETF fell as much as 46 % before clawing back an hour after markets opened.*" See also, Nadig, D. (2016) Understanding ETF "Flash Crashes." *ETF.com,* August 24. Available from: http://www.etf.com/sections/blog/understanding-etf-flash-crashes?nopaging=1 [Accessed 14 September 2017]. For his explanation of the flash crash, Nadig uses the Guggenheim Equal Weight S&P 500 ETF to exemplify how ETFs suffered deeper drops than their underlying indexes; to illustrate the disparity, Nadig points out that the Guggenheim Equal Weight S&P 500 ETF was "*trading below $50 when 'fair value' for the underlying stocks never dropped below $71*."

[50] The word mistaken is aptly used to describe the drop because no one actually knows what caused the August 24 drop. As all major stocks are linked to some extent today, once the fall goes beyond some tipping point, a run can start. At this point, the ability of a market to self-correct may no longer function once panic spreads and the drop acts like an avalanche. The decline may only end once the markets cool off. As analysts later realized, the drop may be baseless, and the recovery can come on as quickly as the drop.

4.2 ACTIVELY MANAGED ETF: A WAY BACK TO THE OLD PROBLEM?

As the ETF market evolves, the desire for ETFs to compete against each emerges. For those index-tracking products, more indexes are created, and slowly they become a universe of their own. These newly created indexes, in most cases, are tailored to meet ETF companies' promotion needs. For alternative ETF products, actively managed ETFs have also come on the scene to attract investors who want to outperform the market and garner greater profits through better stock-picking skill. Two approaches, seemingly complementary to each other from the perspective of product diversification, are possibly contradictory in their essence. The divergence in direction poses a question about the validity of the philosophy under which the ETF industry traditionally presented itself.

The emergence of actively managed ETFs, though still proportionately small in terms of total value, thus begs a theoretical question.[51] Leaving concerns such as transparency, exemption, and performance of actively managed ETFs aside, on its face, an actively managed ETF and other synthetic products are in a clear opposite position to ordinary index--tracking products, which get their appeal from their simplicity. If this observation holds, the rise of actively managed ETFs and other synthetic products may bring about a fall in popularity for traditional index-tracking ETFs, by the operation of logic. However, the real-world situation is confusingly contradictory, as a rise in both products types is occurring. This oddity is still a debated phenomenon, and its possible future development is not settled by consensus. But as the growth speed of ETFs presents an undisputed trend, the proper governance of ETF products and the corresponding regulatory approach thus becomes an unavoidable challenge, in the short term and in the long run.

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[51] PricewaterhouseCoopers. (2015) ETF 2020: Preparing for a New Horizon, p. 19. Available from: https://www.pwc.com/jg/en/publications/etf-2020-exchange-traded-funds-pwc.pdf [Accessed 14 September 2017]. The report's authors write, *"The vast majority of U.S. ETF assets, approximately 99 % of them, are currently in passively managed index products. Active ETFs accumulated approximately $16 billion of assets under management (AMU) between 2008 and mid-2014."* A similar estimation says that as of 2015, out of the asset tied to ETFs in the U.S. market, which was more than USD$2 trillion, less than 1 percent of it was tied to actively managed ETFs. More up-to-date data can be found in ETF.com. ETF.com. (2017) Active Management ETF Overview. [online] Available from: http://www.etf.com/channels/active-management-etfs [Accessed 14 September 2017].

5. CONCLUSION

The growing ETF market around the world brings about much greater interconnectivity across multiple trading platforms and markets. Notably, the proliferation of ETF products allows smaller investors to reach out to the global market more easily in a safer, or more hedged, way. From the perspective of product design, ETFs successfully bypass, at least supplement to, the traditional approach of dual listing, and consequently its high transactional costs. ETFs allow investing in a foreign market directly, which used to be the privilege of larger or institutional investors, and create a third route of access to other products and trading platforms. This newly created route, more importantly, by reaching out to smaller investors and linking global markets, also increases the depth of the market and thus makes the overall market more efficient and stable, if all trading activities follow an ordinary course or we consider its effects only at the micro level. With its help, the current financial market becomes a more connected and less partitioned one.

In addition to offering easier access to foreign investment opportunities and investment targets, the index-tracking feature of most ETF products also possesses advantages over traditional stocks. The ability to link multiple stocks in an index also contributes to a lower volatility, which attracts investors. Moreover, it provides better liquidity and more price efficiency. In short, it revolutionizes the landscape of investment. The ever--growing volume of assets under management confirms this trend.

However, despite their distinct advantage and proven commercial success, the development or proliferation of ETF products across the board also faces severe challenges. One key problem arises from the fact that ETF investment is, in its essence, a derivative one. Derivative investment with its passive nature, in the long run, endangers the functional dynamics of a securities market and companies that receive investment. This change in dynamics will gradually but steadily reshape the structure of traditional investment concepts and, more fundamentally, the ways that companies respond to capital market demands. In addition, connectivity also poses a threat to the stability of linked markets, as a baseless drop may happen suddenly, followed by a quick and similarly unaccountable recovery.

The bottom line is that ETFs are a powerful instrument, one that has transformed the landscape of financial investment. It liberalizes the job

of stock picking and enables global investment, which traditionally had been the preserve of sophisticated professionals or large institutional investors. Although challenges and uncertainties lie ahead, the immense power of financial innovation still opens up a lot of possibilities to all involved, be they regulatory agencies, the investment community, or curious individuals.

LIST OF REFERENCES

[1] Ashworth, W. (2017) 6 Popular ETF Types for Your Portfolio. *Investopedia*. Available from: http://www.investopedia.com/articles/exchangetradedfunds/11/ten-popular-etf-types.asp [Accessed 14 September 2017].

[2] Bank of England. (2017) *Passporting*. [online] Available from: http://www.bankofengland.co.uk/pra/Pages/authorisations/passporting/default.aspx [Accessed 14 September 2017].

[3] BBA. (2017) *Brexit Quick Brief: What Is "Passporting" and Why Does It Matter?* [online] Available from: https://www.bba.org.uk/wp-content/uploads/2016/12/webversion-BQB-3-1.pdf [Accessed 14 September 2017].

[4] Board of the International Organization of Securities Commissions. (2013) *Principles for the Regulation of Exchange Traded Funds: Final Report*. Available from: http://www.iosco.org/library/pubdocs/pdf/IOSCOPD414.pdf [Accessed 14 September 2017].

[5] Bogle, J. C. (1994) *Bogle on Mutual Funds: New Perspectives for the Intelligent Investor*. New York, McGraw-Hill.

[6] Bogle, J. C. (2006) The First Index Mutual Fund: A History of Vanguard Index Trust and the Vanguard Index Strategy. *Vanguard*. Available from: https://www.vanguard.com/bogle_site/lib/sp19970401.html [Accessed 14 September 2017].

[7] Burger, D. (2017) Stocks Are No Longer the Most Actively Traded Securities in Stock Markets. *Bloomberg*. Available from: https://www.bloomberg.com/news/articles/2017-01-12/stock-exchanges-turn-into-etf-exchanges-as-passive-rules-all [Accessed 14 September 2017].

[8] Council Directive 2009/65/EC. *Official Journal of European Union* (2009/L 302) 13 July. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32009L0065 [Accessed 14 September 2017].

[9] Council Directive 2014/91/EU of the European Parliament and of the Council of July 23, 2014, Amending Directive 2009/65/EC On the Coordination of Laws, Regulations, and Administrative Provisions Relating to UCITS as Regards Depositary Functions, Remuneration Policies, and Sanctions, *Official Journal of European Union* (2014/L 257) 23 July. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex: 32014L0091 [Accessed 14 September 2017].

[10] Dieterich, C. (2015) The Great ETF Debacle Explained: The Stock Market Slide on Aug. 24 Led to ETF Prices Falling More Sharply Than the Stocks They Owned. *Barron's Asia*, September 5. Available from: http://www.barrons.com/articles/the-great-etf-debacle- explained-1441434195 [Accessed 14 September 2017]

[11] *E*gan, M. (2015) Trading Was Halted 1,200 Times. *CNN Money,* August 24. Available from: http://money.cnn.com/2015/08/24/investing/stocks-markets-selloff-circuit-breakers-1200-times/ [Accessed 14 September 2017].

[12] ETF.com. ETF.com. (2017) Active Management ETF Overview. [online] Available from: http://www.etf.com/channels/active-management-etfs
[Accessed 14 September 2017].

[13] ETFGI.com. Available from: http://etfgi.com/index/cookie
[Accessed 14 September 2017].

[14] Ernst & Young. (2016) *Global ETF Survey 2016 – Integrated Innovation: The Key to Sustainable Growth*. Available from: http://www.ey.com/Publication/vwLUAssets/ey-integrated-innovation-the-key-to-sustainable-growth-global-etf-survey- 2016/$File/ey-integrated-innovation-the-key-to-sustainable-growth-global-etf-survey-2016.pdf
[Accessed 14 September 2017]

[15] European Commission, Strengthening Global Competitiveness of EU Investment Funds. (2016) *EUR-Lex*. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=URISERV:mi0037 [Accessed 14 September 2017].

[16] European Securities and Market Authority (2012), *Guidelines for Competent Authorities and UCITS Management Companies*. ESMA/2012/832EN. Available from: https://www.esma.europa.eu/sites/default/files/library/2015/11/2012-832en_guidelines_on_etfs_and_other_ucits_issues.pdf [Accessed 14 September 2017].

[17] European Securities and Market Authority (2014), *Guidelines for Competent Authorities and UCITS Management Companies*. ESMA/2014/937. Available from: https://www.esma.europa.eu/sites/default/files/library/2015/11/esma-2014-0011-01-00_en_0.pdf [Accessed 14 September 2017].

[18] Hassine, M. (2016) European ETF Market Outlook for 2016. *Lyxor Asset Management*. Available from: http://www.lyxor.com/uploads/tx_bilyxornews/European_ETF_Market_Outlook_for_2016.pdf [Accessed 14 September 2017].

[19] Long, H. (2015) The Stock Market Drop... By The Numbers. *CNN Money,* August 24. Available from: http://money.cnn.com/2015/08/24/investing/stocks-market-crash-by-the-numbers/ [Accessed 14 September 2017].

[20] Mitchell, C. (2016) The Two Biggest Flash Crashes of 2015. *Investopedia,* January 11. Available from: http://www.investopedia.com/articles/investing/011116/two-biggest-flash-crashes-2015.asp [Accessed 14 September 2017].

[21] Morningstar Manager Research. (2014) *A Guided Tour of the European ETF Marketplace*. Available from: http://media.morningstar.com/eu/Events/ETFEU/ETFEU14/ETF_Industry_Report_4Nov.pdf [Accessed 14 September 2017].

[22] Nadig, D. (2016) Understanding ETF "Flash Crashes." *ETF.com,* August 24. Available from: http://www.etf.com/sections/blog/understanding-etf-flash-crashes?nopaging=1 [Accessed 14 September 2017].

[23] Pisani, B. (2015) What Happened During the Aug 24 "Flash Crash"? *CNBC.com,* September 25. Available from: http://www.cnbc.com/2015/09/25/what-happened-during-the-aug-24-flash-crash.html [Accessed 14 September 2017]

[24] PricewaterhouseCoopers. (2015) ETF 2020: Preparing for a New Horizon. Available from: https://www.pwc.com/jg/en/publications/etf-2020-exchange-traded-funds-pwc.pdf [Accessed 14 September 2017].

[25] PricewaterhouseCoopers. (2015) Funds Passport Regimes in Asia Pacific: Taxing Issues, Available from: https://www.pwc.com/sg/en/asset-management/assets/funds-passport-regimes-in-asia-pacific.pdf [Accessed 14 September 2017].

[26] Ro, S. & Udland, M. (2015) Market Mayhem. *Business Insider,* August 24. Available from: http://www.businessinsider.com/us-markets-sell-off-aug-24-2015-2015-8 [Accessed 14 September 2017].

[27] Ross, S. (2016) How Big Is the Global ETF Market? *Investopedia*. Available from: http://www.investopedia.com/articles/etfs/071216/how-big-global-etf-market-blk-stt.asp [Accessed 14 September 2017].

[28] Statista. (2017) *ETFs –Statistics & Facts.* [online] Available from: https://www.statista.com/topics/2365/exchange-traded-funds/ [Accessed 14 September 2017].

[29] U.S. Securities and Exchange Commission. (2001) *Concept Release: Actively Managed Exchange-Traded Funds*, Investment Company Act Release No. 25258. Available from: https://www.sec.gov/rules/concept/ic-25258.htm [Accessed 14 September 2017].

[30] U.S. Securities and Exchange Commission. (2013) *Exchange-Traded Funds (ETFs)*. [online] Available from: https://www.sec.gov/answers/etf.htm [Accessed 14 September 2017].

[31] U.S. Securities and Exchange Commission. (2013) *Unit Investment Trusts (UITS)*. [online] Available from: https://www.sec.gov/answers/uit.htm [Accessed 14 September 2017].

[32] U.S. Securities and Exchange Commission. (2016) News Release: SEC Adopts Rules to Modernize Information Reported By Funds, Require Liquidity Risk Management Programs, and Permit Swing Pricing. [online] Available from: https://www.sec.gov/news/pressrelease/2016-215.html [Accessed 14 September 2017].

[33] Vanguard Group. (2016) *ETF Fees and Minimums*, Available from: https://investor.vanguard.com/etf/fees [Accessed 14 September 2017].

[34] Willmer, S. & Stein, C. (2017) BlackRock Sees Record Flows into Low-cost ETFs as Passive Rules. *Bloomberg*. Available from: https://www.bloomberg.com/news/articles/2017-01-13/blackrock-fourth-quarter-profit-rose-on-etf-inflows-lower-costs [Accessed 14 September 2017].

[35] Yoder, J. & Howell, B. J. (2013) Actively Managed ETFs: The Past, Present, and Future. *Journal of Business & Securities Law*. 13 (2), pp. 231–257.

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SYNERGIES, RISKS AND THE REGULATION OF STOCK EXCHANGE INTERCONNECTION

by

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In this article, the author discusses the phenomenon of stock exchange interconnection and the synergies that it can bring. He investigates the methods and rationales behind various models currently employed such as the Euronext virtual model, the integration between the London Stock Exchange and the Milan Stock Exchange, and the ASEAN model in Asia. Despite the fact that there are many models of interconnection, none of them are truly interconnected in that they share a common trading platform, a single clearing house, and a single central securities depository. Divergence in national law remains a major obstacle to interconnection. This is because, notwithstanding a certain degree of harmonisation achieved in jurisdictions such as the EU, national laws continue to play an important role in regulating financial market infrastructure such as stock exchanges. Therefore, without a clear regime governing jurisdiction and applicable law, true interconnection is unlikely to be achieved.

KEY WORDS

Stock Exchanges, Interconnection, Trading Venue, Clearing and Settlement, Risk, Regulation

1. INTRODUCTION

As global financial markets have become increasingly interconnected, stock exchanges have followed suit by connecting their operations at the cross--border level to benefit from increased demand for cross-border securities services. To provide some examples, Euronext, a pan-European exchange,

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connects five Eurozone markets: Paris, Amsterdam, Brussels, Lisbon, and London.[1] The London Stock Exchange and Borsa Italiana (the Milan Stock Exchange) have come together under the umbrella of the London Stock Exchange Group (LSEG), which has been the fifth-largest exchange in the world by market capitalisation since 2008. In the derivatives market, Eurex, Deutsche Börse's derivatives exchange, has launched a common trading platform with the Korean Stock Exchange (KRX) to trade derivatives on both markets.[2] In the Far East, the Shanghai Stock Exchange (SSE) is now connected to the Hong Kong Stock Exchange (HKEX) for certain equities, allowing investors in the two jurisdictions to purchase shares directly across borders.[3] Singapore is leading the ASEAN countries in integrating their markets.[4] Taiwan has established a trade link with Singapore, allowing investors to place orders through the Taiwan Stock Exchange (TWSE) to trade securities listed on the Singapore Stock Exchange.[5] The EU Commission has long advocated single clearing and settlement to connect exchange-trading platforms. The Target2Securities (T2S) project of the European Central Bank (ECB) has also linked European central securities depositaries (CSDs) to facilitate cross-border securities services.

As market interconnection promotes the free flow of capital, goods, services, and human capital across national borders, exchange interconnection also increases the flow of securities and financial services and reduces market fragmentation. These exchange interconnections (as is

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1 Euronext London, a UK licenced exchange operator, is also a member of Euronext and performs listing services in London. See Euronext. (2017) *Euronext London.* [online] Euronext. Available from: https://www.euronext.com/nl/listings/euronext-london [Accessed 20 September 2017].

2 The London Stock Exchange is connected to the Oslo Exchange. See London Stock Exchange Group. (2017) *Norwegian Equity Derivatives.* [online] London Stock Exchange Group plc. Available from: http://www.lseg.com/derivatives/lsedm/products/equity-derivatives/norwegian-equity-derivatives [Accessed 20 September 2017].

3 HKEX–SSX Stock Connect. (2017). [online] Hong Kong Exchanges and Clearing Limited. Available from: http://www.hkex.com.hk/eng/csm/index.htm# [Accessed 20 September 2017].

4 Grant, J. (2015) Singapore urges closer ASEAN markets integration. *Financial Times.* Available from: https://www.ft.com/content/50d42aa6-10d1-11e5-9bf8-00144feabdc0 [Accessed 20 September 2017]; See also Wan, W. (2017) Cross-Border Public Offering of Securities in Fostering an Integrated ASEAN Securities Market: The Experiences of Singapore, Malaysia and Thailand. *Capital Markets Law Journal,* 12 (3), pp. 381–411.

5 Regarding the TWSE–SGX stock connection, See Singapure Exchange. (2016) *Taiwan Stock Exchange and Singapore Exchange Sign Strategic Partnership Agreement, TWSE Subsidiary to Join SGX as Remote Trading Member.* [online] Singapore Exchange Ltd. Available from: http://www.sgx.com/wps/wcm/connect/sgx_en/home/higlights/news_releases/Taiwan-Stock-Exchange-and-Singapore-Exchange-sign-Strategic-Partnership-Agreement [Accessed 23 September 2017].

the case for market interconnection) combine the different systems in which they operate into an interactive mode. In turn, this interactive mode can change not only market practices and structures but also legal and regulatory systems[6] – hence achieving market convergence.

This article considers the rationale, methods, risks and current legal and regulatory framework for stock exchange interconnections. Firstly, it outlines the methods of interconnection. Secondly, it discusses the models of interconnection and identifies the rationale behind some interconnected models and obstacles to cross-border interconnection. Thirdly, it examines the synergies that interconnection can bring. Fourthly, it considers some of the risks of interconnection in terms of market stability and market safety. Fifthly, it discusses how law and regulation, using EU law as an example, can facilitate interconnection. Finally, it provides an outlook on the future of stock exchange interconnection.

2. WHAT IS AN INTERCONNECTION?

Interconnection is a generic term that covers mergers, common trading platform sharing,[7] common clearinghouse sharing (such as the Central Counter Party, CCP)[8], and the use of a common settlement facility. Some of these interconnection methods have been used to connect different markets, thus facilitating cross-border transactions (e.g. Euronext's Universal Trading Platform, UTP).[9] In the derivatives market, index derivatives products can be traded across different time zones through common trading platforms. For instance, Eurex and the KRX have pioneered the trading of certain derivative products on a shared trading platform.[10] In addition to these exchange-led interconnections, dual-listing methods,[11] which enable shares listed on one stock exchange to be simultaneously traded on another, have long been used to forge

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6 Legal and regulatory systems also need to change in order to enable interconnections.

7 In the existing practices, many are still operating separately, but with some arrangements, they achieve the function of interconnections.

8 For instance, Shanghai Stock Exchange (SSE) and Shenzhen Stock Exchange share the same clearing house – China Securities Depository and Clearing Co. (CSDC).

9 Euronext's Universal Trading Platform See Euronext. *Universal Trading Platform – New Trading Safeguards.* [online] Euronext. Available from: https://www.euronext.com/en/node/11277 [Accessed 23 September 2017].

10 Eurex/KRX Link See Eurex Exchange. *Eurex/KRX Link.* [online] Available from: http://www.eurexchange.com/exchange-en/products/eurex-krx-link [Accessed 22 September 2017].

11 Dual-listings are not as prevalent as they were.

interconnections.[12] The dual-listing concept and method have also been developed further for the listing and trading of foreign securities through Exchange Traded Funds (ETFs). ETFs allow securities traded on an 'A' stock exchange to be packaged according to indices provided by that a stock exchange into a managed fund (normally a company) and then traded on a 'B' exchange, hence achieving interconnections.[13] Furthermore, with distributed ledger technologies (DLTs) such as blockchain, the underlying technology of bitcoin, it is assumed that applications of DLTs can create a blockchain network to facilitate securities transfers.[14] In this type of common blockchain network, securities issued in different markets can be traded by participants in a more secure and transparent way. Using the same blockchain network by different stock exchanges can also facilitate interconnections.[15]

Each model of interconnection has its own rationale and complex legal arrangements. Indeed, not all these models have achieved trading synergies or truly integrated their markets. A detailed examination shows that certain models of interconnection achieve only organisational synergy. Therefore, I question *whether law matters as an obstacle to or facilitator of market interconnections led by exchange operators*.

It is therefore necessary to first identify various types of interconnections (models and activities) and their contexts (i.e. their rationales). Second, I outline their endogenous synergies and exogenous benefits (i.e. efficiency to markets) and risks. Third, I examine the law and regulatory environments and identify legal factors that constrain interconnection. Fourth, I present my conclusions on the need for a common method of addressing risks posed by interconnected markets.

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[12] Ackerly, D. T. and Pan, E. J. (2002) Dual-listing Securities in Europe and the United States. In: Sarah Bolton (ed.) *The Complete Guide to Listing on London Stock Exchange.* Royal Tunbridge Wells: ISI Publications Ltd.

[13] The cross-listing of ETFs is also taking place in the Asia Pacific region. See Jing, L. (2015) Taiwan–Japan ETF Cross-listing Scheme Under Way. *Financial Times*. Available from: http://www.ft.com/cms/s/0/8f265346-36ac-11e5-b05b-b01debd57852.html?ft_site=falcon& desktop=true#axzz4tQzFpt1I [Accessed 22 September 2017]. Although ETF may not be considered as the same product as interconnection, it can also achieve the same effect of interconnections.

[14] Euroclear and Oliver Wyman. (2016) *Blockchain in Capital Markets: the Price and the Journey.* Available from: http://www.dltmarket.com/docs/BlockchainInCapitalMarkets-ThePrizeAndTheJourney.pdf [Accessed 22 September 2017].

[15] DLT is largely focused on post trade issues rather than trading – questionable if this is possible in the med term given divergent laws.

3. INTEGRATED MODELS: INTEGRATION OR NOT?

3.1 MERGER (LSE–BORSA ITALIANA)

The LSEG is a multi-local exchange in which the London Stock Exchange (LSE) and Milan Stock Exchange (*Borsa Italiana*) form part of the LSEG. The group was created through the 2008 takeover of the Milan Stock Exchange by the LSE in the immediate aftermath of the financial crisis.[16] After the financial crisis, Italian banks were struggling with cash flows and, as the shareholders of the non-listed Borsa Italiana, were keen to sell their shares to the LSE at a large premium.[17] Presumed synergies arose out of these trading interconnections via the same information technology infrastructure. The Millennium Exchange, a trading platform tool acquired by the LSE from a Sri Lankan developer in 2009, was sold to Borsa Italiana and used for its trading platform.[18] Almost a decade later, the Borsa Italiana and the LSE remain two separate markets without any linkages in terms of trading, clearing or settlement concerns.[19] The main synergy achieved is at the organisational level and is based on corporate restructuring.[20] The two markets maintain their trading cycles of listing, trading, clearing, and settlement.[21]

This begs the question of why the LSE acquired Borsa Italiana. The answer lies in Borsa Italiana's MTS (the wholesale market for the government bonds) and clearinghouse.[22] When the LSE acquired Borsa Italiana, it did not have its own clearinghouse to clear trades on its markets. Hence, it was thought that acquiring Borsa Italiana and its clearinghouse (CC&G) would help the LSE Group develop a closed-silo system that could compete with its main rival, Deutsche Börse.[23] Furthermore, the acquisition of Borsa Italiana prevented Deutsche Börse, its

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[16] MacDonald, A. (2007) LSE Snags Borsa Italiana, Beating Out NYSE Euronext. *The Wall Street Journal*, Eastern Edition, 249 (146).

[17] Banker (2007) LSE/Borsa Italiana talks, 157 (997), pp. 14–16.

[18] The IT system of the Milan Stock Exchange is the same as the LSE, as it has been developed by the LSE. This forced Milan to be acquired by the LSE, as Borsa Italiana must upgrade its IT infrastructure as required by European law.

[19] Banker (2007) LSE/Borsa Italiana talks, 157 (977), pp. 14–16.

[20] Strategic groups of the two exchanges were combined and the combined strategy group sits in the group headquarters office in London. This has caused the Milan Stock Exchange to introduce restructuring programmes that render every one in four employees redundant.

[21] It should be noted that the Milan Stock Exchange is the listing authority in Italy, whereas the Financial Conduct Authority, rather than the London Stock Exchange, is the listing authority in the UK.

[22] Flinders, K. (2008) London Stock Exchange Gains Clearing Technology. *Computer Weekly*, p. 6.

rival operating under a closed-silo model,[24] from acquiring this important continental European exchange. Despite this merger within the European common market, no common trading platform has been established, such as the Euronext model's UTP.[25] Those opposed to such an interconnected platform primarily include Italian-based traders, who fear that an interconnected trading platform based in London could put them at a disadvantage relative to their London counterparts.[26] Orders placed through Borsa Italiana would be delayed due to distance. Although the LSE proposed delaying orders placed by London-based traders to level the playing field, Milan traders did not consider this a sufficient means of addressing the latency issue.

The LSE acquired LCH. Clearnet, a merged clearinghouse. Clearnet SA was created by Euronext, the Paris Stock Exchange.[27] To date, there has been no consolidation between the LSE-owned CCP, LCH. Clearnet and the Borsa Italiana-owned CC&G. CC&G is not even a CCP that offers clearing services for trading on the LSE London market for its own clearing members. Indeed, there is no interoperability between LCH. Clearnet and CC&G. Moreover, no access has been granted for LCH. Clearnet to clear trade on Borsa Italiana. The clearing members of the two markets could have benefited from either more consolidated or interoperable clearing services. Furthermore, the settlement of trade in the Italian markets was carried out by Monte Titoli, Borsa Italiana's own CSD. In London, settlement facilities were provided through Euroclear London & Ireland, a subsidiary of Euroclear SA. In Milan, Monte Titoli, a subsidiary

[23] Deutsche Börse operates a closed-silo model, which through subsidiaries executes the entire trading cycle of listing, trading, clearing and settlement; See also a description of the background market prior to the 2008 LSE–BI merger in Zwick, S. (2006) *Futures: News, Analysis & Strategies for Futures, Options & Derivatives Traders*, 35 (4), p. 14.

[24] Köppl, T. V. and Monnet, C. (2007) Guess What: It's the Settlements! Vertical Integration as a Barrier to Efficient Exchange Consolidation. *Journal of Banking & Finance*, 31 (10), pp. 3013–3033.

[25] Euronext. *Universal Trading Platform – New Trading Safeguards.* [online] Euronext. Available from: https://www.euronext.com/en/node/11277 [Accessed 23 September 2017]; See also Pownall, G., Vulcheva, M. and Wang, X. (2014) The Ability of Global Stock Exchange Mechanisms to Mitigate Home Bias: Evidence from Euronext. *Management Science*, 60 (7), pp. 1655–1676.

[26] Murray, H., Pham, T. P. and Singh, H. (2016) Latency Reduction and Market Quality: The Case of the Australian Stock Exchange. *International Review of Financial Analysis,* 46, pp. 257–265.

[27] See History of LCH.Clearnet. Clearing houses have been subject to M&A activities in the exchange industry. When LCH was acquired by Clearnet, the LSE also challenged its independence, as Clearnet was a Euronext subsidiary. See (2003) Entente peu cordiale. *Economist*. [online] Available from: http://www.economist.com/node/1883659 [Accessed 23 September 2017]

of the Milan Stock Exchange, provides settlement functions. Such vertical operations (the so-called vertical silo) for servicing the entire lifecycle of the securities trade act as an obstacle to horizontal integration,[28] as Monti Titoli is unlikely to be consolidated with other CSD such as Euroclear.

3.2 VIRTUAL EURONEXT INTERCONNECTIONS

Euronext is the first pan-European exchange network to link five equity markets: Paris, Amsterdam, Brussels, Lisbon, and London.[29] In 2014, Euronext London received approval from the UK regulator to tap into London's international financial market by providing an entry point for international investors to access its deep liquidity pool obtained through interconnected markets.

Under this model, the five markets remain as different listing venues with a common trading platform.[30] That said, each market retains its home trading platform. For instance, a Belgian company does not need to go to Paris for its shares to be admitted to trade (listing) and to be traded on the Euronext UTP. Permission to trade is granted by Euronext Brussels, and shares are traded on the same platform, which is achieved through the harmonised single order book. A Belgian investor can purchase French securities by placing an order on the Euronext Brussels that will be routed to UTP. Similarly, a seller based in Lisbon can place an order through Euronext Lisbon to sell Dutch securities that can be matched via a buy order placed through Euronext Paris.

The clearing function is performed by Clearnet SA, a subsidiary of LCH. Clearnet. The settlement of securities is performed by the Euroclear for each of these markets. There is no common settlement facility for this interconnected market because issuing companies and investors prefer national securities to be deposited in their own countries, and currently, no law exists that can safely manage legal risks posed by depositing securities outside of the jurisdiction in which securities are issued.

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[28] Köppl, T. V. and Monnet, C. (2007) Guess What: It's the Settlements! Vertical Integration as a Barrier to Efficient Exchange Consolidation. *Journal of Banking & Finance*, 31 (10), pp. 3013–3033.

[29] Because our scale and single order book model is constructed on a Pan-European basis, Euronext represents the deepest source of liquidity in Europe. Higher liquidity levels lead to higher trading levels or stock velocity, tighter spreads on the buying and selling of shares and lower share price volatility. These key factors are crucial in terms of attracting global investors.

[30] However, the local rules of each market still apply.

In this manner, the governing law on trade will depend on the nationality of the securities involved. An order placed through the Paris market to purchase a Belgian security will be governed by Belgian law. Members of the five exchanges are mutually recognised: a member of one of the five markets can place orders in the others. Because there is a common trading platform operating in parallel with domestic trading platforms, market conduct issues can be regulated by national regulators who permit securities access to trading. However, a college of regulators establishes policy criteria. A market surveillance team based at Euronext Paris identifies market misconduct such as market abuse and breaches of market rules. This model serves as the best example of interconnections that allow for exchanges within the network to continue to operate within their own market.

In practice, however, such a model can reduce the functions of smaller exchanges in the interconnected network. The Lisbon exchange had roughly 70 personnel and had roughly 10 remained in 2016. If regional development is a factor to consider in an interconnection model, some revisions may be needed to improve it.

3.3 ASEAN EXCHANGE INTERCONNECTIONS

In Asia, stock exchange interconnections are not common. The domestic laws and capital market rules among the largest stock exchanges — the Tokyo Stock Exchange (TSE), Shanghai Stock Exchange (SSE), Hong Kong Stock Exchange (HKEX), Korea Stock Exchange (KRX), and Taiwan Stock Exchange (TWSE) — remain very different. There is no regional consensus on standards in terms of listing prospectuses, disclosure obligations, or cross-border enforcement. As a result, Asian capital markets remain fragmented, and there have been no significant developments in terms of creating a common legal framework for financial market infrastructures. Cross-border securities transactions rely heavily on intermediaries, increasing transaction costs.

Singapore has taken the lead in terms of forging the ASEAN Exchange interconnections that connect Singapore, Thailand, and Malaysia.[31] The three countries have signed an agreement to create a Trans-Tasman Mutual Recognition of Securities Offerings (MRSO) regime, whereby companies complying with the agreed-upon prospectus regime can have their shares traded on a common trading platform.[32] Shares placed on the Thai order book are routed to this trading platform and can be matched by orders placed on the Singaporean order book. However, because of a lack of EU-style legal regimes such as the Prospectus Directive[33] — giving rise to passporting rights[34] — and a lack of an effective college of regulators, as is the case for Euronext,[35] the ASEAN interconnection model has not been successful. In addition to a lack of regulatory frameworks that facilitate interconnections, Thailand and Malaysia fear that such interconnections may cause liquidity fragmentation, limiting the depth capital pool needed to support their domestic markets and raising the question of whether stock exchange interconnections reduce the liquidity of less developed exchanges.

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[31] Implementation plan to promote the development of an integrated capital market to achieve the objectives of the AEC Blueprint, See ASEAN Capital Markets Forum (ACMF). (2016) *The Implementation Plan.* [online] Available from: http://www.theacmf.org/ACMF/report/ImplementationPlan.pdf [Accessed 23 September 2017]; See Park, C.-Y. (2013) Asian Capital Market Integration: Theory and Evidence. [online] *Asia Development Bank Economics Working Paper*. Available from: http://www.adb.org/sites/default/files/publication/30284/ewp-351.pdf [Accessed 23 September 2017]; See also Stiglitz, J. E. (2010) Risk and Global Economic Architecture: Why Full Financial Integration May Be Undesirable. *The American Economic Review*, 100 (2), pp. 388–390 (pointing out the risks of full integration).

[32] The Association of Southeast Asian Nations (ASEAN). (2015) *ASEAN 2025: Forging Ahead Together*. [online] The ASEAN Secretariat: Jakarta. Available from: http://asean.org/storage/2015/11/67.-December-2015-ASEAN-2025-Forging-Ahead-Together-2nd-Reprint.pdf [Accessed 23 September 2017]; See also ASEAN Capital Markets Forum (ACMF). (2016) *ACMF Action Plan 2016–2020.* [online] Available from: http://www.theacmf.org/ACMF/upload/acmfactionplan2016-2020.pdf [Accessed 23 September 2017].

[33] Directive 2003/71/EC of the European Parliament and of the Council of 4 November 2003 on the Prospectus to be Published when Securities are Offered to the Public or Admitted to Trading and Amending Directive 2001/34/EC. *Official Journal of the European Union* 31 December. Available from: http://data.europa.eu/eli/dir/2003/71/oj [Accessed 23 September 2017]; International Organization of Securities Commissions. (1998) *International Disclosure Standards for Cross-Border Offerings and Initial Listings by Foreign Issuers*. [online] Available from: http://www.iosco.org/library/pubdocs/pdf/IOSCOPD81.pdf [Accessed 23 September 2017] (non-financial reporting).

[34] There is no automatic mutual recognition of prospectus. Approval is still given by national regulators, and standards may be applied differently by national regulators.

[35] There is no supra-national securities agency.

3.4 TAIWAN–SINGAPORE CONNECTION

Taiwan is not an ASEAN country. It has the fifth-largest stock exchange in Asia and the 18th largest stock exchange in the world, measured by the market capitalisation value of the shares traded[36] as part of its internationalisation strategy to increase Taiwan investors' exposure to international markets, in 2016, Taiwan established a Singapore–Taiwan Stock Connect regime to allow investors in the two countries to trade in securities listed on the Singapore Stock Exchange (SGX) and the Taiwan Stock Exchange (TWSE).[37] The TWSE created a subsidiary, Global Link Securities Co.,[38] which then became a remote trading member of the SGX. Within this model, investors in Taiwan can place orders through the TWSE to trade in securities on the SGX. The original plan was for the SGX to implement the same model, creating a subsidiary that then becomes a remote member of the TWSE. In essence, this is similar to using a third party broker obtaining access in another jurisdiction. However, this can substantially reduce the costs of Taiwan intermediaries for connecting directly with SGX. To date, however, the connection is oriented only southward (the TWSE to the SGX) in that investors in Taiwan can place orders to trade on the SGX but not *vice versa*. Listings are controlled by their respective authorities, and clearings and settlements are performed by their respective institutions.

This model benefits not only investors in Taiwan in terms of providing more investment targets but also broker-dealers in Taiwan because international investors can use the TWSE as a gateway to access the SGX. However, this model can pose risks in terms of retail investor protection and market stability levels. Retail investors in Taiwan may not have access to direct legal services and enforcement agencies in cases in which there have been securities violations by parties based in Singapore. On the issue of market stability, because the TWSE's subsidiary is a remote member and because the TWSE acts as a guarantee for its subsidiary's default, the TWSE has greater exposure to liability.

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[36] See the estimation by StockMarket.com. (2017). *Taiwan Stock Exchange* [online] StockMarketClock. Available from: https://www.stockmarketclock.com/exchanges/twse [Accessed 23 September 2017].

[37] Loh, J. (2016) Taiwan and Singapore Ink Trading Link. *Global Capital* (1442).

[38] See TWSE. (2016) *Taiwan Stock Exchange and Singapore Exchange sign Strategic Partnership Agreement, TWSE subsidiary to join SGX as remote trading member*. [press release] 27 January. Available from: http://www.twse.com.tw/en/about/press_room/tsec_news_detail.php?id=18183

3.5 EUREX–KRX DERIVATIVES INTERCONNECTIONS

Derivatives should be treated differently than equities. Derivatives traded on exchanges are products devised from exchanges such as Eurex based on the trading information of equities and other products listed on an exchange such as Deutsche Börse or KRX. For investors to be able to engage in the trade of derivatives outside market time, Eurex and KRX have created a common platform for certain derivatives to be traded without market opening time restrictions.[39]

3.6 EUROPEAN CENTRAL BANK (ECB) TARGET2SECURITIES (T2S)

T2S, launched by the ECB, is a platform linking European Central Securities Depositories for settling securities traded on European platforms. T2S serves as a single platform for settling securities trades[40] and aims to harmonise European post-trade practices based on barriers identified in the Giovannini reports.[41] A single settlement platform has been proposed by the European Commission as a means of reducing settlement costs since the settlement of securities has been performed by a monopoly of national CSDs and, in some cases, by the same exchange operator of a closed-silo model. The rationale for consolidating CSDs is to enable companies' securities to be traded on different venues outside of national jurisdictions and to be settled at a lower cost outside of the jurisdiction in which securities are issued.[42]

T2S is a platform for linking CSDs operations. In effect, national CSDs outsource their settlement processes to T2S and focus on custody and issuance services. In addition, CSDs offer other services such as asset servicing, securities lending, and collateral management data management (big data) services,[43] thus moving up the value chain. With the introduction

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[39] Eurex/KRX Link See Eurex Exchange. *Eurex/KRX Link.* [online] Available from: http://www.eurexchange.com/exchange-en/products/eurex-krx-link [Accessed 22 September 2017].

[40] Mortensen, S. (2015) Reviewing the Implementation of T+2, the Impact on the Industry and What Comes Next (T2S). *Journal of Securities Operations & Custody*, 7 (4), pp. 312–318.

[41] The Giovannini Group. (2003) *Second Report on EU Clearing and Settlement Arrangements.* [online] Directorate-General for Economic and Financial Affairs, European Commission. Available from: http://ec.europa.eu/internal_market/financial markets/docs/clearing/second _giovannini_report_en.pdf [Accessed 23 September 2017].

[42] The securities are still deposited in their national CSDs.

[43] (2017) The Custodian-bank Business: A Big Deal Roils the Industry's Usually Placid Waters. *The Economist.* [online] Available from: http://www.economist.com/news/finance-and-economics/21716051-big-deal-roils-industrys-usually-placid-waters-custodian-bank-business [Accessed 23 September 2017].

of the European Central Securities Depository Regulation (CSDR), CSDs will have access to clearinghouses (CCPs) and trading venues,[44] meaning that clients will be presented with more options when choosing a CSD to settle securities trades.[45] In domestic trade, a link between the exchange and CSD helps investors. However, in cases of cross-border trade, horizontal integration between CSDs brings the best synergies: full technical integration followed by legal integration.[46] This is the rationale behind the ECB's T2S project.

4. AIMS AND OBJECTIVES OF AN INTERCONNECTION

4.1 TRADING SYNERGIES

Interconnections enable two or more capital markets operated by stock exchanges to connect.[47] The combination of two markets generates a deep capital pool, increasing liquidity. Liquidity is a critical ingredient of price discovery that is a function performed by the stock exchange. Therefore, interconnections can augment the efficiency of the price discovery function of exchanges. This is a matter of important social utility in terms of investor protection. When markets are fragmented, there is a disparity in prices, and investors may not secure the best price available for the securities in question, hence failing the best execution obligations. The original aim of the EU *Best Execution Rule* under MiFID I[48] was to remediate the problem of market fragmentation resulting from competition between different trading venues generated through market competition.

For issuing companies, interconnections increase their exposure to international markets.[49] As discussed above, dual-listing methods can be used to indirectly connect capital markets and to increase companies' exposure to individuals other than domestic investors. Interconnections with a common trading platform such as the Euronext UTP grant securities

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[44] It is not clear whether there will be any meaningful changes to the current market arrangements.

[45] This is at least in theory. However, it will need to be investigated further after the CSDR has been implemented for a period of time.

[46] Tapking, J. and Yang, J. (2006) Horizontal and Vertical Integration in Securities Trading and Settlement. *Journal of Money, Credit & Banking*, 38 (7), pp. 1765–1795.

[47] See the Euronext UTP for equities and the KRX–Eurex for derivatives.

[48] Ferrarini, G. and Moloney, N. (2012) Reshaping Order Execution in the EU and the Role of Interest Groups: from MiFID I to MiFID II. *European Business Organization Law Review*, 13 (4), pp. 557–597.

[49] Companies listed on the SGX can benefit from Taiwan's larger capital pool through the SGX–TWSE connection.

listed on the five markets access to investors in different geographic markets. In the TWSE–SGX southward connection, Singaporean companies now have access to investors in Taiwan. As is the case with the ASEAN model, Thai and Malaysian securities can access international investors based in Singapore. In the failed merger between the LSE and Deutsche Börse, were these two markets permitted to interconnect to create one of the largest equity markets in the world, securities arbitrage caused by market fragmentation could be limited, while investors' investment targets were increased.

The LSE–Borsa Italiana merger did not bring about such trading synergies, as no common trading platform and order routing methods have been implemented.

4.2 CLEARING SYNERGIES

Transaction costs can be reduced by sharing a common clearing platform.[50] For instance, traders of numerous trading venues can use a single CCP to clear their trade. For instance, Traders from both SIX Swiss and LSE or from BATS Chi–X, and NSDAQ OMC can choose a single CCP such as LCH, SIX x-clear or EMCF to clear trades. In Euronext Paris, clearing is performed by Clearnet SA as the sole CCP. The proposed merger between LSE and Deutsche Börse, though failed to obtain approval, would have resulted in clearing synergies in which a single clearinghouse can act as a CCP to clear the trade of securities listed on the two markets. Such synergies would substantially reduce transaction costs since clearing represents 40 % of the total trading cost.

A common CCP for different trading venues can reduce margins and collaterals needed by traders operating in two markets. However, a single CCP within the same trading platform can increase costs due to a lack of competition. This problem can be remedied by creating open access, as required under EMIR and MIFIR, to more clearinghouses. To create competition, clearinghouses need to create interoperating linkages so that traders can choose their own preferred CCP to clear trades. However, there are concerns that such inter-linkages can increase risks

[50] For information on the equities market, see (2011) EMCF Says Yes to CCP Interoperability. *Global Investor*. 245, p. 43. For information on the derivative market, see Himaras, E. (2010) Super–CCP Model Could Spur Interoperability: ISDA. *Derivatives Week*, p. 15; for a general analysis, see de Meijer, C. (2010) Are We Facing European CCP Interoperability Regulation?. *Journal of Securities Operations & Custody*, 3 (1), pp. 55–65.

of contagion while spurring over-collateralisation.[51] These links could spread systemic risk with the bankruptcy of an interconnected CCP, which could very quickly infect every interconnected entity.[52] ECB acts as a liquidity provider in time of crisis and its location policy on the CCP will affect the ways in which CCPs operate and their interconnections.

5. RISK OF INTERCONNECTIONS

5.1 MARKET STABILITY AND DEFAULT RISK

When two markets are interconnected by a common trading platform, default risk can spread across the two markets. Default can occur when one party fails to fulfil its obligations, creating a blockage in the trading system. At worst, such a failure to fulfil trade obligations can cause a run because another party's trade depends on its completion. As is the case in a securities market, having an entity acting as a CCP in all transactions can mitigate default risks. When two exchange-trading platforms interconnect, their CCPs must be interoperable to reduce transaction costs, enabling their clearing members to trade on an interconnected common trading platform. To manage the default risk spread across the two markets, CCPs of the interconnected market must have 1) rules dealing with trade defaults as an important risk management tool; 2) a robust recovery and resolution regime to address the insolvency of their clearing members; and 3) strong lines of defence against trading defaults resulting from the insolvency of clearing members. Normally, losses are covered by defaulting the member's own collateral, the CCP's own money and the clearing members' collective fund.

An interconnected trading platform would require the formation of an interconnected clearing platform by creating an inter-linkage between CCPs. This type of interoperable linkage is created when a CCP becomes a clearing member of another CCP. Each interoperable CCP provides collateral deposited with a third party, i.e. Clearstream Luxembourg. Because the insolvency of a CCP will cause a systemic run, the CCP's solvency requirements, governance, and risk management with clearing

[51] However, in preventing the risk of contagion, an overcollateralization problem may arise. Mägerle, J. and Nellen, T. (2011) Interoperability Between Central Counterparties. *Swiss National Bank Working Papers.* 12, pp. 1–28.

[52] Farrell, S. (2014) Too Important to Fail: Legal Complexity in Planning for the Failure of Financial Market Infrastructure. *Journal of International Banking Law and Regulation,* 29 (8), pp. 461–470.

members through collateral provisions and margin calls are critical in preventing the CCP's failure.

Although competition between CCPs can reduce transaction costs and thus benefit consumers, such competition can increase insolvency risks because as smaller CCPs enter the clearing market, dispersed liquidity can increase the chances of a CCP's insolvency. A CCP's insolvency will affect other interoperable CCPs. Therefore, a balance must be struck between 1) risks of non-competition between CCPs and 2) risks of contagion resulting from the insolvency of an interoperable CCP. Another issue concerns whether CCP monopolies or oligopolies may create too-big-to-fail risks and moral hazards through which clearing members or trading venues fail to do their due diligence in vetting the solvency of a CCP. Therefore, financial regulators and supervisors should give special attention to a CCP that is of substantial systemic importance.

5.2 MARKET CONFIDENCE

5.2.1 TRADE TRANSPARENCY

Trading transparency facilitates price discovery, a function of exchanges. When pre-sale disclosures are not made, such an important function can be distorted, rendering investors unable to obtain the best price available. However, pre-sale disclosure can disturb the market and spread panic. For instance, institutional investors engage in block trades and the disclosure of trades — often at a discount — to the market before execution can influence the market price. However, each country employs its own rules and positions in dealing with such issues. The UK is in favour of non-disclosure, whereas Germany and France are more in favour of transparency. In the US, it is based on a competitive model rather than the EU style of bulletin board. There are also policy concerns. For instance, in the fixed-income market, it is said that pre-trade transparency can reduce liquidity. Therefore, in an interconnected trading platform, a set of common rules must be in place to guide investors.[53] In cases of post-trade transparency, a common trade repository[54] for an interconnected trading

[53] However, one should also consider the specificity of different product markets, i.e.. equities and bonds; liquid and illiquid markets.

[54] For instance, there is the consolidated tape in the EU. See European Securities and Markets Authority (ESMA). (2017) *MiFID II: ESMA Issues Final Specifications for Non-equity Tape Test.* [online] Available from: https://www.esma.europa.eu/press-news/esma-news/mifid-ii-esma-issues-final-specifications-non-equity-tape [Accessed 23 September 2017].

platform must be in place to ensure the final price agreed upon to inform the market.

5.2.2 CORPORATE TRANSPARENCY

Unlike trade transparency, corporate transparency requires companies to disclose corporate information according to accounting standards and reporting rules. When standards differ, investors can lose confidence in not only the securities in question but also the overall quality of securities on the market. When two markets have diverse corporate reporting rules and different enforcement regimes, investors can have reduced confidence to trade these securities on an interconnected platform. Moreover, to protect retail investors, regulators of a market with higher standards may prevent the market from creating a common trading platform, such as the Euronext UTP, to trade the securities of another market that maintains less stringent corporate reporting standards. This problem is also seen in cross-listing cases in which company's shares are listed and traded on several markets. The company may make a disclosure to its competent authority, however, fail to make the similar disclosure to that of another. This can happen when disclosure rules differ in the two markets or the authorities take different approaches to corporate transparency. In extreme cases, a company shares can be suspended from trading by the decision of the competent authority due to lack of transparency, while shares continue to be traded on another. This shows that a lack of regulatory convergence and regulatory collaboration can lead to damages to investors. Such a risk will reduce the willingness to engage in cross-border trade.

Furthermore, investors need to receive notices to be able to exercise corporate actions in a timely manner. How should the investor receive information at the cross-border level? Who are the actual investors entitled to hold the issuing companies to accountable for the loss of entitlements? How are the language and tax barriers to be overcome? There are different ways as to how the intermediaries such as custodian banks operate to facilitate corporate actions. Without a harmonised approach, there is a risk that the investor will not be protected in relation to their legal and economic entitlements.

5.2.3 BEST EXECUTION RULE AND CONSUMER PROTECTION

Investment banks and brokers may hold securities themselves. When they act on behalf of their investor clients to purchase securities, they may obtain securities not in an open market, and therefore, they may not obtain the best price available on the market. Because retail investors are consumers in the securities markets, it is important to secure their willingness to participate in the securities market. A lack of consumer protection in the securities market will affect overall liquidity levels. To address this liquidity risk, Best Execution Rules require brokers to search for the best price available on different trading venues, clearing houses, settlement facilities, and custodians all in the interest of customers.[55] This rule is important when the two exchanges' trading platforms are interconnected. If one market does not employ such a rule, an intermediary such as an investment bank (through systematic internalization, SI) may offer securities to investors through securities it has held instead of seeking a quote from alternative trading platforms.[56] In some markets, such as Taiwan, there is still a concentration rule which prohibits securities to be traded outside the exchange i.e. an alternative trading platform. An interconnection between the markets will need to adopt similar approaches to competition and consumer protection to achieve the intended synergies.

5.2.4 CONFLICT OF LAWS

Conflict of laws risks can arise when transactions are made by parties in different jurisdictions. In an interconnected trading platform, parties must determine which law applies and which regulatory agencies will have the power to supervise, investigate and impose sanctions. A buy order can be placed through an exchange based in country a and matched by a sell order through an exchange based in country B. The trading platform can be located in country C. Conflict of laws rules must address 1) which law governs contracts and 2) which regulator addresses issues of misconduct such as cases of market manipulation. Without this legal certainty, investors will not be willing to trade on an interconnected platform. Without rules

[55] If a product is tradable in multiple trading platforms which have different post trade arrangements the executable price may seem good but is eroded by the post trade costs.

[56] However, this duty may be overridden when parties introduce their traders to orders placed in a particular trading venue.

detailing each regulator's powers, investors may not know what redress they may pursue.

This is the area where a harmonized private law can increase the effectiveness of market interconnections. That is if contract law, tort law, regulatory regimes are the same in these three countries, investors can obtain the same redress no matter which law of the country applies.[57] Hence, common approaches in this area can reduce risks. On the enforcement side, a model of a college of regulators [i.e. similar to the structures of the European Securities and Markets Authority (ESMA), the European Banking Authority (EBA), and the European Insurance and Occupational Pensions Authority (EIOPA)] can be introduced to facilitate bilateral or multilateral interconnections. However, the harmonisation of private law can be a slow process, and the determination of an agreeable regulatory structure also requires a long period of political negotiation.

6. CURRENT REGULATION

The harmonisation of rules can facilitate system convergence to create market infrastructure connectivity. I will use some of the measures aimed at forging market interconnections introduced by the European Union.

6.1 FREE MOVEMENT OF CAPITAL AND PASSPORTING RIGHTS FOR ISSUERS

National regulators focus less on competition among exchanges within the national market and more on making regulatory regimes competitive so as to attract foreign capital beyond borders [e.g. motivating foreign companies to list their securities on their national primary or secondary boards for primary or secondary listings (dual-listing)]. To break through national regimes aimed at protecting national exchange operators, EU law has facilitated the free movement of capital and competition among different market operators across the EU through the Prospectus Directive[58]

[57] See the case of the Common European Sales Law.

[58] Directive 2003/71/EC of the European Parliament and of the Council of 4 November 2003 on the Prospectus to be Published when Securities are Offered to the Public or Admitted to Trading and Amending Directive 2001/34/EC. *Official Journal of the European Union* 31 December. Available from: http://data.europa.eu/eli/dir/2003/71/oj [Accessed 23 September 2017].

and Transparency Directive[59]. The combination of the Prospectus Directive and Transparency Directive establishes a uniform capital market across the EU to grant European issuers access to European capital markets with relative ease. The Prospectus Directive[60] and the Transparency Directive[61] allow securities approved for listing in one jurisdiction to be offered and traded in another jurisdiction's market without the need for further regulatory approval. The Transparency Directive and Transparency Directive Regulations[62] require issuers of securities admitted to regulated markets in the EU to ensure appropriate transparency levels for investors through the regular flow of information by disclosing periodic and on-going regulated information and by disseminating such information to the public throughout the EU. The creation of the European Electronic Access Point (EEAP) by the European Securities and Markets Authority will provide access to all published regulatory information via each Member State's storage service.[63] This enables companies to disseminate information in a timely fashion through their home member states and across the EU.

However, because there is only a minimum harmonisation rule on continuing disclosure obligations under the Transparency Directive, companies with securities traded on multiple regulated markets must

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[59] Directive 2013/50/EU of the European Parliament and of the Council of 22 October 2013 amending Directive 2004/109/EC of the European Parliament and of the Council on the harmonisation of transparency requirements in relation to information about issuers whose securities are admitted to trading on a regulated market, Directive 2003/71/EC of the European Parliament and of the Council on the prospectus to be published when securities are offered to the public or admitted to trading and Commission Directive 2007/14/EC laying down detailed rules for the implementation of certain provisions of Directive 2004/109/EC. *Official Journal of the European Union.* 6 November. Available from: http://data.europa.eu/eli/dir/2013/50/oj [Accessed 23 September 2017].

[60] For an example of how passporting rights operate in cross-border securities, see Ferran, E. (2007) Cross-border Offers of Securities in the EU: the Standard Life Flotation. *European Company and Financial Law Review,* 4 (4), pp. 461–490; for the legislative history of the European markets regulation, see Ferrarini, G. (2002) Pan-European Securities Markets: Policy Issues and Regulatory Responses. *European Business Organization Law Review,* 3 (2), pp. 249–292.

[61] Fleischer, H. and Schmolke, K. U. (2011) The Reform of the Transparency Directive: Minimum or Full Harmonisation of Ownership Disclosure?. *European Business Organization Law Review*, 12 (1), pp. 121–145.

[62] *The Transparency Regulations 2015,* SI 2015/1755. United Kingdom of Great Britain and Northern Ireland. London: The Stationery Office. In English. Available from: http://www.legislation.gov.uk/uksi/2015/1755/pdfs/uksi_20151755_en.pdf [Accessed 23 September 2017].

[63] European Securities and Markets Authority (ESMA). (2015) *Final Report: Draft Regulatory Technical Standards on European Electronic Access Point (EEAP).* [online] Available from: https://www.esma.europa.eu/sites/default/files/library/2015/11/2015-1460_-_esma_final_report_on_draft_rts_on_eeap.pdf [Accessed 23 September 2017].

comply with more than one continuing disclosure regime, generating higher costs than those when securities are traded in a single venue.

6.2 PROMOTING COMPETITION IN TRADING, CLEARING AND SETTLEMENT

Regulation can facilitate interconnections while creating obstacles to the formation of interconnection. Because many countries' stock exchanges are still considered national infrastructure and operate as monopolies, national government's views on the role of and on its interest — both regulatory and revenue-wise — in the stock exchange influence the models of linkages that their stock exchanges can have with others.

However, transnational regulators such as EU agencies and the International Organization of Securities Commissions (IOSCO) employ different regulatory policies from those of national regulators, which may focus on national competitiveness (how their market operators can win) rather than on competition at the cross-border level. Even between transnational regulators, regulatory objectives vary: IOSCO focuses on risk,[64] whereas EU regulators, in addition to risk, monitor competition in securities markets. The EU has the objective of rendering EU securities markets more integrated so that they can compete with markets in countries such as the USA. This objective has led to the formation of measures aimed at the gradual liberalisation of the financial market infrastructure sector. MiFID I, by dispensing with the 'concentration rule', allows alternative trading venues such as Multilateral Trading Platform (MTF) to compete with traditional exchanges' trading platforms. In turn, alternative trading venues have significantly reduced trading fees,[65] causing exchanges to focus on other areas of the value chain (e.g. clearing and data management services). In the clearing sector, MiFID I and MiFID II open up competition in the clearing sector through 'open access' and 'interoperability'. Open access enables clearing houses to have access to the exchange-controlled trading venues. Interoperable linkages between clearinghouses enable clearinghouses to net trade by parties that use different trading venues.

[64] Karmel, R. S. (2012) IOSCO's Response to the Financial Crisis. *Journal of Corporation Law*, 37 (4), pp. 849–902.

[65] Geranio, M. (2016) *Evolution of the Exchange Industry: from Dealers' Clubs to Multinational Companies*. Switzerland: Springer International Publishing.

To maintain the sustainability of alterative trading venues, open access also grants alternative trading venues access to clearing facilities.

6.3 TRADING TRANSPARENCY

Trading transparency facilitates exchange price discovery. MiFID imposes such requirements on both the sell side and the buy side,[66] which is particularly important when the same types of securities can be traded on different venues because trading transparency can mitigate the risks of arbitrage and enable traders to fulfil their obligations of optimal execution for customers.[67]

However, there is no agreement on the impact of trading transparency on market stability. It is argued that although pre-trade disclosure can increase price transparency, the disclosure of large block trades can create instability in the market. Because of such uncertainties, a compromise has been made pursuant to which pre-trade disclosure applies only to certain trading venues such as equities traded on the regulated market.[68]

MiFID II also requires post-trade transparency and trade reporting to ARMs (approved reporting mechanisms) such as UniVista[69] can operate throughout Europe. Reporting entities under MiFIR are both 'legal' and 'natural' persons. Legal persons must use a Legal Entity Identifier (LEI).[70] Natural persons must use a unique number.[71] Firms can no longer select their own identifiers. In the UK markets, the National Insurance Number has been chosen for the UK as a LEI, and the user passport number for those outside of the European Economic Area.

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[66] Position limits in MiFID II will affect fund managers who trade in commodities derivatives. Of course, firms trading these instruments will also have to report their positions.

[67] Art. 21 MiFID I; However, over-reporting is being clamped down on now. If data are over-reported, the will must re-review and report them.

[68] European Securities and Markets Authority (ESMA). (2015) *Regulatory Technical and Implementing Standards – Annex I: MiFID II/MiFIR.* [online] Available from: https://www.esma.europa.eu/sites/default/files/library/2015/11/2015-esma-1464_annex_i_-_draft_rts_and_its_on_mifid_ii_and_mifir.pdf [Accessed 23 September 2017].

[69] See London Stock Exchange Group. (2015) *MIFID II: An Update on its Status and Impact.* [online] London Stock Exchange Group plc. Available from: http://www.lseg.com/markets-products-and-services/post-trade-services/unavista/resources/mifid-ii-update-its-status-and-impact [Accessed 23 September 2017].

[70] Changes in the MiFID I and MiFIR: a massive increase in the number of reportable financial instruments, a significant increase in types of transactions to be reported, a large increase in the number of fields in a transaction report (24 data fields increases to 81), significant impacts on entities with reporting obligations, and (including those of the buy-side), safe betting at the moment of over reporting. Certain regulators do not prefer this, but it is not a breach, whereas under-reporting is.

[71] MiFIR encourages LEI use.

EMIR also requires trade reporting, and yet, the objectives are different from those of MiFIR. EMIR focuses on the visibility of systemic risk and position exposure, whereas MiFIR is more focused on the detection of market abuse. There has always been a wish for the two to be converged, and thus, a person can report once to one ARM.

These regulations allow interconnected markets to operate using the same approach to transparency. This can reduce arbitrage and render the function of exchange price discovery more efficient.

6.4 MARKET STABILITY, RISK OF CONTAGION, AND ENTITY GOVERNANCE

6.4.1 REGULATED MARKETS

Market connectivity occurs when financial market infrastructure providers make linkages to spur cross-border trade flows. These providers must be resilient to cope with market eventualities. The UK regulatory regime, under the Financial Services and Markets Act 2000, can offer some guidance. Currently, 'fit and proper' rules; organisational rules addressing conflicts of interest, management risks, the adoption of trading rules, and fiscal resources; and market monitoring rules are imposed through regulated market management and in regulated markets. Regulated markets are traditionally known exchanges.[72] These rules also apply to alternative trading systems, clearinghouses, securities depositories, and other settlement systems. When a regulated market wishes to make a connection with a third-country market, the third country will need to have equivalent regimes for the markets to operate such an interconnection.

6.4.2 CCP

On the trading side, default risk can cause a run on the system. Hence, on-exchange and alternative venue trades must be cleared by a clearinghouse.[73] The CCP acts as an important entity that manages default risks of trade. Accordingly, the CCP will assume a concentration

[72] Investment exchanges – The FSA (29 S; s 285A (1) of FSMA 2000) has the power to make additional rules. See *The Financial Services Act 2012 (c. 21)*. United Kingdom of Great Britain and Northern Ireland. London: The Stationery Office. In English. Available from: http://www.legislation.gov.uk/uksi/2015/1755/pdfs/uksi_20151755_en.pdf [Accessed 23 September 2017].

[73] Currently, there is no legal obligation to do so for trades on alternative trading venues.

of risks that can affect market stability levels. Because CCPs provide a trade guarantee, they are subject to more rigorous governance scrutiny under MiFIR.[74] Whereas CCPs forge interoperable linkages to ease cross-border securities trade, the insolvency of their members and their own risks of insolvency should not affect 1) smooth trading and 2) the entitlements of end investors. Hence, the internal governance of CCPs, margins, collateral levels required for clearing members, clearing member default and close-out rules, and the enforceability of contracts involving clearing members within and outside of the jurisdiction of a trading venue become pertinent for market stability. Unlike the case for regulated exchanges, there are no passporting rights for CCPs. However, EMIR effectively gives a passporting right when a clearinghouse obtains a QCCP status.[75] In other words, a CCP will need to obtain approval from a competent authority of the market in which it operates. This approval can increase the cost of operations while limiting competition.

However, the regulatory objective of market stability can be translated into different types of provisions. Market stability, such as market confidence, is a broad term that can capture different themes from solvency measures to investor protection regimes.

6.4.3 CSD

The CSD processes the settlement of securities trade and provides for settlement finality. It records information on the ownership of securities and may own securities. CSDR regulates how CSD should protect assets and functions of ownership registration. Because European central securities depositories operate on different models, legal relationships between a CSD and its members and between a CSD and end investors vary. Furthermore, CSDs have no passporting rights. Therefore, these differences affect standards for their services, their liabilities towards stakeholders, and enforcements against them. For cross-border securities transfers, International Central Securities Depositories (ICSDs) serve as important intermediaries that link domestic CSDs. In structures in which CCPs begin to interoperate, ICSDs protect the assets of collateral provided

[74] CCP – The PRA (s 285A (2) of FSMA 2000) has the power to make additional rules.

[75] For QCCP status under EMIR see LCH The Markets' Partner. (2016) *Regulatory Framework and QCCP Status of LCH.* [online] Available from: http://www.lch.com/documents/731485/762558/regulatory-framework-and-qccp-status-of-lch-final.pdf/5d274c8f-03bb-4647-a69e-ecf0000ad365 [Accessed 23 September 2017].

by interoperable CCPs. The CSDR regulates the governance, conduct, and management of CSDs. Clawback risks for cases involving the insolvency of a member of an CSD are addressed through the Financial Markets and Insolvency (Settlement Finality) Regulations of 1999, which do not allow a trade to be revoked once it has been settled. In terms of the applicable law, the EU member states currently follow the Place of Relevant Intermediary Approach (PRIMA) method under EU law, whereby applicable laws for securities settlement are governed under the laws of the country in which the accounts are maintained.[76] As a result, parties cannot freely dispose of the applicable law through an agreement. Under the PRIMA approach, insolvency issues are governed by laws of the country in which the accounts are maintained.

That said, private law continues to affect standards of regulation in this area. When a private law model recognises pledges of digital securities, the risk regulation of the CSD will be less robust, as pledges will not increase prudential CSD risks. When a private law model does not recognise pledges of digital securities, the CSD will hold assets as its own, which will increase the prudential risks of the entity, therefore placing considerable CSD collateral requirements on Central Banks. There is no harmonised means of assessing CSD risks. The European financial market infrastructure group is currently studying laws and regulations in this area.

6.5 CONDUCT REGULATION

Conduct regulation is designed to maintain market integrity against irregular behaviours such as insider dealing, market manipulation, and other fraudulent and unfair dealings. Market integrity therefore supports participant confidence in financial market operations. These regulations carry sanctions against entities and individuals. In terms of accounting standards, the IFRS facilitates the cross-border movement of capital through the passporting rights regime, and enforcement against accounting fraud and irregularity aim at maintaining participant confidence. Insider dealing regulations aim at creating a level playing field, and market manipulation levels the playing field while addressing market stability issues. Therefore, stock exchange interconnections reveal which laws regulate and which agencies enforce the law. This area creates public

[76] Directive 2009/44/EC amends the Settlement Finality Directive and the Financial Collateral Arrangements Directive.

power. The more interconnected markets become, the higher the degrees of shared regulatory and enforcement power become. Even though regulations are imposed at the EU level to crack down on forms of market misconduct, such as market abuse, insider dealing and accounting fraud, market abuse and insider dealing still require further convergence among member states. Therefore, supervisory convergence will be necessary to facilitate market interconnection.

6.6 LEGAL REGIME GOVERNING JURISDICTION AND APPLICABLE LAW

No model law addresses conflicts in the laws that govern interconnections. Each country retains jurisdiction over activities occurring in their territory. Home regulators assert enforcement power over market activities. Even though passporting rights allow securities admitted for trading to be traded on a market outside the home country, the host country exerts power over how sales are conducted. The home country retains control over solvency requirements. However, in regard to clearing, the issue becomes more contentious. Who has the power to regulate off-shore clearing? This issue relates clearing houses regulation when the United Kingdom, which clears most of the Euro-denominated derivatives, leaves the European Union. Currently, the UK can clear those securities despite the European Central Bank holds a contrary view over off-shore clearing issues. It is envisaged that the European Central Bank will insist on the clearing venues, i.e. CCPs being located within the Euro-zone or a direct oversight into the UK CCPs when the UK leaves the European Union. It will not be sufficient for the UK to rely on the 'equivalence regime' so as to allow CCPs located in the UK to clear Euro-denominated securities. The rationale behind such a location policy of the European Central Bank is that, in time of crisis, the Bank will act as the lender of last resort to provide liquidity. Hence, those CCPs of substantial systemic importance will need to be come under the supervision of ECB.

Furthermore, the differences in the market abuse regime can lead to further regulatory divergence. It is not clear whether the reliance on the equivalence regime will be an adequate solution to ensure market stability in an interconnected market.

7. OUTLOOK FOR EXCHANGE INTERCONNECTION

This article identifies the models of interconnection currently used and the legal obstacles to creating more integrated capital markets led by exchange operators. It shows that interconnection, as far as the equity market is concerned, remains a challenge technically and legally, as well as for broader policy issues. For most markets, an integrated common trading platform that connects two or more markets to realise synergies has not been achieved – the exception is the Euronext UVP model. Whether the non-silo model drives or complicates interconnection at both the domestic and cross-border levels remains a question.

Exchange operators form part of the critical financial infrastructure and are highly regulated. However, different exchange operators engage in different financial activities and have different risk profiles. Regulators may not allow home market participants to participate in activities without approval or regulation. For instance, home traders may not trade on a platform outside the local jurisdiction. This defeats the goal of interconnection where traders should be allowed to engage in direct trade on a foreign platform outside their own country. On the clearing side, few jurisdictions have implemented rules on interoperability or open access, and this increases the cost of cross-border trade. Some jurisdictions also consider participation in a foreign CCP risky when the foreign CCP is not subject to the home CCP requirements.

On the policy argument side, there are also questions about the impact of interconnection on the local economy. Would interconnection result in a concentration of capital and financial services, contributing to an unbalanced global economic development? And, if so, what new models of stock exchange interconnection can bring about a distributed and shared economy?

LIST OF REFERENCES

[1] (2003) Entente peu cordiale. *Economist*. [online] Available from: http://www.economist.com/node/1883659 [Accessed 23 September 2017].

[2] (2017) The Custodian-bank Business: A Big Deal Roils the Industry's Usually Placid Waters. *The Economist.* [online] Available from: http://www.economist.com/news/finance-and-economics/21716051-big-deal-roils-industrys-usually-placid-waters-custodian-bank-business [Accessed 23 September 2017].

[3] (2011) EMCF Says Yes to CCP Interoperability. *Global Investor.* 245, p. 43.

[4] Ackerly, D. T. and Pan, E. J. (2002) Dual-listing Securities in Europe and the United States. In: Sarah Bolton (ed.) *The Complete Guide to Listing on London Stock Exchange.* Royal Tunbridge Wells: ISI Publications Ltd.

[5] ASEAN Capital Markets Forum (ACMF). (2016) *ACMF Action Plan 2016–2020.* [online] Available from: http://www.theacmf.org/ACMF/upload/acmfactionplan2016-2020.pdf [Accessed 23 September 2017].

[6] ASEAN Capital Markets Forum (ACMF). (2016) *The Implementation Plan.* [online] Available from: http://www.theacmf.org/ACMF/report/ImplementationPlan.pdf [Accessed 23 September 2017].

[7] Banker (2007) LSE/Borsa Italiana talks, 157 (997), pp. 14–16.

[8] De Meijer, C. (2010) Are We Facing European CCP Interoperability Regulation?. *Journal of Securities Operations & Custody*, 3 (1), pp. 55–65.

[9] Directive 2003/71/EC of the European Parliament and of the Council of 4 November 2003 on the Prospectus to be Published when Securities are Offered to the Public or Admitted to Trading and Amending Directive 2001/34/EC. *Official Journal of the European Union* 31 December. Available from: http://data.europa.eu/eli/dir/2003/71/oj [Accessed 23 September 2017].

[10] Directive 2013/50/EU of the European Parliament and of the Council of 22 October 2013 amending Directive 2004/109/EC of the European Parliament and of the Council on the harmonisation of transparency requirements in relation to information about issuers whose securities are admitted to trading on a regulated market, Directive 2003/71/EC of the European Parliament and of the Council on the prospectus to be published when securities are offered to the public or admitted to trading and Commission Directive 2007/14/EC laying down detailed rules for the implementation of certain provisions of Directive 2004/109/EC. *Official Journal of the European Union* 6 November. Available from: http://data.europa.eu/eli/dir/2013/50/oj [Accessed 23 September 2017].

[11] Eurex Exchange. *Eurex/KRX Link.* [online] Available from: http://www.eurexchange.com/exchange-en/products/eurex-krx-link [Accessed 22 September 2017].

[12] Euroclear and Oliver Wyman (2016) *Blockchain in Capital Markets: the Price and the Journey.* Available from: http://www.dltmarket.com/docs/BlockchainInCapitalMarkets-ThePrizeAndTheJourney.pdf [Accessed 22 September 2017].

[13] European Securities and Markets Authority (ESMA). (2015) *Final Report: Draft Regulatory Technical Standards on European Electronic Access Point (EEAP).* [online] Available from: https://www.esma.europa.eu/sites/default/files/library/2015/11/2015-1460_-_esma_final_report_on_draft_rts_on_eeap.pdf [Accessed 23 September 2017].

[14] European Securities and Markets Authority (ESMA). (2015) *Regulatory Technical and Implementing Standards – Annex I: MiFID II/MiFIR.* [online] Available from: https://www.esma.europa.eu/sites/default/files/library/2015/11/2015-esma1464_annex_i_-_draft_rts_and_its_on_mifid_ii_and_mifir.pdf [Accessed 23 September 2017].

[15] European Securities and Markets Authority (ESMA). (2017) *MiFID II: ESMA Issues Final Specifications for Non-equity Tape Test.* [online] Available from: https://www.esma.europa.eu/press-news/esma-news/mifid-ii-esma-issues-final-specifications-non-equity-tape [Accessed 23 September 2017].

[16] Euronext. (2017) *Euronext London.* [online] Euronext. Available from: https://www.euronext.com/nl/listings/euronext-london [Accessed 20 September 2017].

[17] Euronext. *Universal Trading Platform – New Trading Safeguards.* [online] Euronext. Available from: https://www.euronext.com/en/node/11277 [Accessed 23 September 2017].

[18] Farrell, S. (2014) Too Important to Fail: Legal Complexity in Planning for the Failure of Financial Market Infrastructure. *Journal of International Banking Law and Regulation,* 29 (8), pp. 461–470.

[19] Ferran, E. (2007) Cross-border Offers of Securities in the EU: the Standard Life Flotation. *European Company and Financial Law Review,* 4 (4), pp. 461–490.

[20] Ferrarini, G. (2002) Pan-European Securities Markets: Policy Issues and Regulatory Responses. *European Business Organization Law Review,* 3 (2), pp. 249–292.

[21] Ferrarini, G. and Moloney, N. (2012) Reshaping Order Execution in the EU and the Role of Interest Groups: from MiFID I to MiFID II. *European Business Organization Law Review,* 13 (4), pp. 557–597.

[22] Fleischer, H. and Schmolke, K. U. (2011) The Reform of the Transparency Directive: Minimum or Full Harmonisation of Ownership Disclosure?. *European Business Organization Law Review*, 12 (1), pp. 121–145.

[23] Flinders, K. (2008) London Stock Exchange Gains Clearing Technology. *Computer Weekly*, p. 6.

[24] Geranio, M. (2016) *Evolution of the Exchange Industry: from Dealers' Clubs to Multinational Companies.* Switzerland: Springer International Publishing.

[25] Grant, J. (2015) Singapore urges closer ASEAN markets integration. *Financial Times.* Available from: https://www.ft.com/content/50d42aa6-10d1-11e5-9bf8-00144feabdc0 [Accessed 20 September 2017].

[26] Himaras, E. (2010) Super-CCP Model Could Spur Interoperability: ISDA. *Derivatives Week*, p. 15.

[27] HKEX–SSX Stock Connect (2017). [online] Hong Kong Exchanges and Clearing Limited. Available from: http://www.hkex.com.hk/eng/csm/index.htm# [Accessed 20 September 2017].

[28] International Organization of Securities Commissions. (1998) *International Disclosure Standards for Cross-Border Offerings and Initial Listings by Foreign Issuers*. [online] Available from: http://www.iosco.org/library/pubdocs/pdf/IOSCOPD81.pdf [Accessed 23 September 2017].

[29] Jing, L (2015) Taiwan–Japan ETF Cross-listing Scheme Under Way. *Financial Times*. Available from: http://www.ft.com/cms/s/0/8f265346-36ac-11e5-b05b-b01debd57852.html?ft_site=falcon&desktop=true#axzz4tQzFpt1I [Accessed 22 September 2017].

[30] Karmel, R. S. (2012) IOSCO's Response to the Financial Crisis. *Journal of Corporation Law*, 37 (4), pp. 849–902.

[31] Köppl, T. V. and Monnet, C. (2007) Guess What: It's the Settlements! Vertical Integration as a Barrier to Efficient Exchange Consolidation. *Journal of Banking & Finance*, 31 (10), pp. 3013–3033.

[32] LCH The Markets' Partner. (2016) *Regulatory Framework and QCCP Status of LCH.* [online] Available from: http://www.lch.com/documents/731485/762558/regulatory-framework-and-qccp-status-of-lch-final.pdf/5d274c8f-03bb-4647-a69e-ecf0000ad365 [Accessed 23 September 2017].

[33] Loh, J. (2016) Taiwan and Singapore Ink Trading Link. *Global Capital* (1442).

[34] London Stock Exchange Group. (2015) *MIFID II: An Update on its Status and Impact.* [online] London Stock Exchange Group plc. Available from: http://www.lseg.com/markets-products-and-services/post-trade-services/unavista/resources/mifid-ii-update-its-status-and-impact [Accessed 23 September 2017].

[35] London Stock Exchange Group. (2017) *Norwegian Equity Derivatives.* [online] London Stock Exchange Group plc. Available from: http://www.lseg.com/derivatives/lsedm/products/equity-derivatives/norwegian-equity-derivatives [Accessed 20 September 2017].

[36] MacDonald, A. (2007) LSE Snags Borsa Italiana, Beating Out NYSE Euronext. *The Wall Street Journal*, Eastern Edition, 249 (146).

[37] Mägerle, J. and Nellen, T. (2011) Interoperability Between Central Counterparties. *Swiss National Bank Working Papers.* 12, pp. 1–28.

[38] Mortensen, S. (2015) Reviewing the Implementation of T+2, the Impact on the Industry and What Comes Next (T2S). *Journal of Securities Operations & Custody*, 7 (4), pp. 312–318.

[39] Murray, H., Pham, T. P. and Singh, H. (2016) Latency Reduction and Market Quality: The Case of the Australian Stock Exchange. *International Review of Financial Analysis,* 46, pp. 257–265.

[40] Park, C.-Y. (2013) Asian Capital Market Integration: Theory and Evidence. [online] *Asia Development Bank Economics Working Paper*. Available from: http://www.adb.org/sites/default/files/publication/30284/ewp-351.pdf [Accessed 23 September 2017].

[41] Pownall, G., Vulcheva, M. and Wang, X. (2014) The Ability of Global Stock Exchange Mechanisms to Mitigate Home Bias: Evidence from Euronext. *Management Science*, 60 (7), pp. 1655–1676.

[42] Singapure Exchange. (2016) *Taiwan Stock Exchange and Singapore Exchange Sign Strategic Partnership Agreement, TWSE Subsidiary to Join SGX as Remote Trading Member.* [online] Singapore Exchange Ltd. Available from: http://www.sgx.com/wps/wcm/connect/sgx_en/home/higlights/news_releases/Taiwan-Stock-Exchange-and-Singapore-Exchange-sign-Strategic-Partnership-Agreement [Accessed 23 September 2017].

[43] Stiglitz, J. E. (2010) Risk and Global Economic Architecture: Why Full Financial Integration May Be Undesirable. *The American Economic Review*, 100 (2), pp. 388–390.

[44] StockMarket.com. (2017). *Taiwan Stock Exchange* [online] StockMarketClock. Available from: https://www.stockmarketclock.com/exchanges/twse [Accessed 23 September 2017].

[45] Tapking, J. and Yang, J. (2006) Horizontal and Vertical Integration in Securities Trading and Settlement. *Journal of Money, Credit & Banking*, 38 (7), pp. 1765–1795.

[45] The Association of Southeast Asian Nations (ASEAN). (2015) *ASEAN 2025: Forging Ahead Together*. [online] The ASEAN Secretariat: Jakarta. Available from: http://asean.org/storage/2015/11/67.-December-2015-ASEAN-2025-Forging-Ahead-Together-2nd-Reprint.pdf [Accessed 23 September 2017].

[46] The Giovannini Group. (2003) *Second Report on EU Clearing and Settlement Arrangements.* [online] Directorate-General for Economic and Financial Affairs,

European Commission. Available from: http://ec.europa.eu/internal_market/financial markets/docs/clearing/
second_giovannini_report_en.pdf [Accessed 23 September 2017].

[47] *The Financial Services Act 2012 (c. 21)*. United Kingdom of Great Britain and Northern Ireland. London: The Stationery Office. In English. Available from: http://www.legislation.gov.uk/uksi/2015/1755/pdfs/uksi_20151755_en.pdf [Accessed 23 September 2017].

[48] *The Transparency Regulations 2015,* SI 2015/1755. United Kingdom of Great Britain and Northern Ireland. London: The Stationery Office. In English. Available from: http://www.legislation.gov.uk/uksi/2015/1755/pdfs/uksi_20151755_en.pdf [Accessed 23 September 2017].

[49] TWSE. (2016) *Taiwan Stock Exchange and Singapore Exchange sign Strategic Partnership Agreement, TWSE subsidiary to join SGX as remote trading member*. [press release] 27 January. Available from: http://www.twse.com.tw/en/about/press_room/tsec_news_detail.php?id=18183

[50] Wan, W. (2017) Cross-Border Public Offering of Securities in Fostering an Integrated ASEAN Securities Market: The Experiences of Singapore, Malaysia and Thailand. *Capital Markets Law Journal,* 12 (3), pp. 381–411.

[51] Zwick, S. (2006) *Futures: News, Analysis & Strategies for Futures, Options & Derivatives Traders*, 35 (4), p. 14.

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EXTRATERRITORIALITY OF THE REGULATIONS AND INTERCONNECTIONS OF THE DERIVATIVES MARKET: LEGAL IMPLICATIONS FOR EAST AND SOUTHEAST ASIA[*]

by

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This article examines the legal implications of the interconnections of the global derivatives market, such as the exchange and over-the-counter (OTC) markets, in East and Southeast Asia. First, we introduce the interconnectedness of the global derivatives market. We then examine some legal implications of such interconnectedness from several angles, such as the extraterritoriality of relevant regulations (notably the reporting, clearing and trading mandates prescribed by the G20 and the new initial margin rule), standard product documentation, the effect of substituted compliance, the potential competition effect due to shifting OTC trades to exchange trading and the effect of consolidating exchanges and/or clearing services. We approach these issues from the perspective of Asian countries in relation to development in core markets, such as those in the US, the UK and Europe.

KEY WORDS

Derivative, Interconnection, Exchange, ISDA, Extraterritoriality, Territorial Extension, Financial Regulation

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1. INTRODUCTION

There is probably no other market in the world that is as globally interconnected as the derivatives market. Such interconnectedness may influence laws and regulations regarding the derivatives involved. As the derivatives market, which has existed since the 1980s, is reasonably new, the high degree of interconnection also affects how norms are created or implemented in different countries. We focus on the interconnections of the global derivatives market. We also examine how the market conditions of the derivatives market affect the development of local and global regulations and consider the strategies of some Asian markets to address the potential cross-border effects of American and European regulations.

In general, a derivative is a financial instrument whose value refers to another financial instrument or underlying variable.[1] Depending on the trading venue, the derivatives market can be broadly divided into two main categories: exchange-traded products and over-the-counter (OTC) transactions. Derivatives also appear in several different forms. The most fundamental instruments are options (i.e. the right to buy or sell a certain asset or variable in the future with the striking fixed at present) and forward contracts (under which one party agrees to buy and the other agrees to sell a certain asset or variable in the future with the price fixed at present).[2] Standardised and exchange-traded forward contracts are generally called *"futures"*. A *"swap"* is a transaction under which parties agree to exchange future flows based on benchmarks, such as the relationship between a fixed interest rate and a floating market rate (e.g. an interest rate swap[3]), a certain event (e.g. a credit default swap[4]) and the total return of an underlying instrument (e.g. an equity swap[5]). A derivative may also be incorporated into another financial instrument (e.g. a debenture or deposit) to create a hybrid or structured product (e.g. the minibonds or structured notes that were issued to many Asian investors before the global financial crisis[6]).

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1 Hudson, A. (2012) *Law on Financial Derivatives* 5th Ed., London: Sweet & Maxwell, p. 24.
2 Ibid, pp. 28–31.
3 Ibid, pp. 62–63.
4 Ibid, pp. 82–85.
5 Ibid, pp. 71–72.
6 Chen, C. (2011) Product Due Diligence and the Suitability of Minibonds: Taking the Benefit of Hindsight. *Singapore Journal of Legal Studies*, pp. 311–314.

Parties often choose to settle trades in cash, although occasionally underlying assets (e.g. gold or crude oil) may be physically delivered.

A wide range of underlying variables may be involved in a derivative transaction. Underlying assets may include securities, such as shares or debentures. They may also be the prices of commodities, such as agricultural products (e.g. soybean), precious metals (e.g. iron ore) or energy (e.g. natural gas). An underlying variable may also be an index (e.g. FTSE100), a certain event (e.g. the insolvency of a bond issuer) or even the weather (e.g. a designated region's average seasonal rainfall[7]). Virtually anything that is uncertain and that fluctuates may become an underlying variable of a derivative instrument as long as there is a market for it (e.g. forward freight rate swaps for shipping rates or property derivatives for the rental of commercial buildings).

The variety of forms, trading venues and underlying variables makes derivatives and the market quite complex. As Part II below will elaborate, the derivatives market, whether exchange-traded or OTC, is very interconnected. Such interconnectedness and complexity is eventually reflected in contract and regulatory issues. We analyse the legal issues flowing from highly interconnected derivatives markets, how market interconnections affect the creation and implementation of derivative laws and regulations and the strategies adopted by Asian markets to deal with the norms implemented in the core markets.

In Part II, we examine different aspects of market interconnection in the global derivatives market. In Part III, we analyse some legal implications of the derivatives market interconnections. We then examine current legal regimes governing derivatives. Furthermore, we consider the extraterritoriality and territorial extension of US and EU regulations (i.e. regulations from core markets) and their effects on Asian markets before examining different options and the strategies Asian regulators may use in light of the current market conditions. In Part IV, we conclude this article.

2. INTERCONNECTIONS IN THE DERIVATIVES MARKET

The global derivatives market is highly interconnected, which is reflected in several ways. The OTC market is connected through major dealers

[7] Henderson, S.K. (2010) *Henderson on Derivatives* 2nd Ed., London: LexisNexis, pp. 91–98.

and standard documentation. However, the few powerful global futures exchanges, each with its own niche products and specialty, further connect traders from all over the world to participate in setting the prices of major benchmark products, thereby expanding the effects of those futures exchanges beyond their geographical locations. There may also be a connection between the OTC and exchange-traded markets.

First, the global OTC derivatives market is dominated by a few major dealers in the US, the UK and Europe (together, the *"core markets"*). Those dealers (e.g. Goldman Sachs, UBS or Deutsche Bank) have branches or offices in major financial centres (e.g. London, New York City, Singapore or Hong Kong) and are usually acting as counterparties to other traders. The OTC market also has clear power centres in the US and UK. Pursuant to the Bank of International Settlement's triennial central bank survey in 2016, the US led with a US$1,241 billion daily average of all interest rate derivatives, followed by the UK (US$1,180 billion) and France (US$141 billion).[8] The same survey in 2013 showed the UK leading with US $1,347.75 billion, followed by the US (US$628.15 billion), France (US$202.21 billion) and Germany (US$101.34 billion), which ranked second, third and fourth, respectively.[9] These data show that the OTC market is dominated by the US and UK, the largest trading centres, which together share more than half of the global trading volume.

That the OTC derivatives market has two dominant power centres means that major derivatives dealers in the OTC market are located in either country. As a result, traders from outside the core markets probably have to trade with dealers from the US, the UK or continental Europe (or through their offices in the local market). This further connects the OTC derivatives market, as reflected by the financial statements of large derivatives dealers. For example, the total notional amount of derivatives traded in 2014 was US$6,366.2 billion for JP Morgan Chase, US$2,909.7 billion for HSBC and €5,200.3 billion for Deutsche Bank.[10] In contrast, the total notional amount for the ICBC, the biggest Chinese bank, in 2014 was RMB2,529.6 billion, whereas DBS Group Holdings, which controls

[8] Bank of International Settlement. (2016) *Triennial Central Bank Survey of Foreign Exchange and OTC Derivatives Markets in 2016.* [online] Basel: BIS. Available from: http://www.bis.org/publ/rpfx16.htm [Accessed 6 September 2017].

[9] Bank of International Settlement. (2013) *Triennial Central Bank Survey – Interest Rate Derivatives Market Turnover in 2013: Preliminary Global Results*. Basel: BIS, p. 1, Available from: http://www.bis.org/publ/rpfx13ir.pdf [Accessed 6 September 2017].

[10] See the annual reports of JP Morgan Chase, HSBC and Deutsche Bank for the year of 2014.

the biggest bank in Southeast Asia, had only approximately US$1,877 billion in 2014.[11] Although this is not a complete comparison, there are significant gaps between large banks in different regions.

Second, the interconnections in the OTC market are reinforced by the widespread use of the standard documentation issued by the International Swaps and Derivatives Association (ISDA) – that is, the ISDA master agreement and associated forms. Although with no official statistics, one estimates that approximately 90 % of OTC trades are processed using the ISDA form.[12] Another estimates that 85 % of the collateral agreements reached in the OTC derivatives market in 2011 were based on ISDA documentation.[13] Considering the overall market volume, such a high degree of standardisation in terms of contractual documentation is probably unseen in other markets.

The widespread use of the ISDA master agreement has its own historical background. In the early 1980s, when the market was growing quickly, there was strong demand for standard documentation. This provided a backdrop of the establishment of the ISDA by major derivatives dealers.[14] Through these dealers, the ISDA form quickly spread to other markets.[15] With market trading commonly conducted on the same contractual platform, the trading process could be more standardised to further strengthen the interconnections of the OTC derivatives market around the world.

Third, futures exchanges offer a way to examine the interconnections in the derivatives market. Although each futures exchange must be situated in a given market (e.g. Chicago Mercantile Exchange [CME] in the US), it may have a global effect, especially large futures exchanges in the US and Europe. For example, setting the price of petroleum on the wholesale or even retail level may to a certain extent depend on the prices of the West Texas Intermediate (WTI) crude oil futures traded in the CME. The prices of some precious metals (e.g. copper and palladium) may partly depend

[11] See the annual report of ICBC and DBS for the year of 2014.

[12] Henderson, above note 7, p. 803.

[13] Rauterberg, G.V. & Verstein, A. (2013) Assessing Transnational Private Regulation of the OTC Derivatives Market: ISDA, the BBA, and the Future of Financial Reform. *Virginia Journal of International Law*, 54, pp. 13–14.

[14] Flanagan, S.M. (2001) The Rise of a Trade Association: Group Interactions within the International Swaps and Derivatives Association. *Harvard Negotiation Law Review*, 6, p. 234.

[15] See Gao, S. and Chen, C. (2017) Financial Transnationalism and Financial Regulation Change: a Case Study for Derivatives Markets, *European Business Organisation Law Review*.

on the prices traded in the London Metal Exchange. The same also applies for many agricultural products, such as wheat and soybean.

This partly reflects the price discovery function of the futures market.[16] If the price of a product in the future (e.g. the market price expected in 6 months) is known, one can determine the product's current price using the market interest rate. Through the international trade of commodities and raw materials, the price setting function of a futures exchange warrants the price of a particular futures product to affect not only local traders, but also a wide range of traders or end-users in foreign markets. For example, the movement of WTI crude oil futures would affect not only oil traders or buyers/sellers in the US, but also those outside the US who adopt the WTI crude oil futures prices as their pricing benchmark.

Sometimes, a futures exchange in one country may offer a product whose underlying variable is something in another country. For example, the Singapore Exchange (SGX) offers futures products linked to stock market performance in China and Taiwan, such as the FTSE China A50 Index Futures and the MSCI Taiwan Index Futures.[17] This may further bind two or more markets together.

Cross-trading and/or cross-margining may provide a further point of interconnection between exchanges to facilitate cross-exchange trading and reduce the limitations of geography and time zones. Cross-trading may help a trader to trade the same products in different markets, often in different time zones. For example, the CME and SGX have collaborated to create an offset system for some futures or options products (e.g. Eurodollar futures) to allow market participants to continue trading at any time of day, even when one market is closed for a day.[18] Some exchange operators have collaborated to create a link between two exchanges so that market participants on different continents can continue to trade in their time zones when trading sessions in the original market are

[16] Chen, C. (2010) *Trading Risk: the Contractual Nature of Derivative Instruments and Certain Regulatory Issues*, VDM Verlag Dr. Müller, p. 101.

[17] Singapore Exchange. (2017) *Products*. [online] Singapore: SGX. Available from: http://www.sgx.com/wps/portal/sgxweb/home/products/derivatives/financials [Accessed 6 September 2017].

[18] CME. (2017) *CME Group Strategic Partnership with Singapore Exchange*. [online] Chicago: CME. Available from: http://www.cmegroup.com/international/partnership-resources/sgx-resources.html [Accessed 6 September 2017].

closed (e.g. the Eurex/TAIFEX link[19] or Eurex/KRX link[20]). For example, a member of Eurex may continue to trade certain products after the Eurex market has closed but while the KRX market is still open, with margin and settlement transferred back to Eurex at the end of the KRX trading session. This provides traders with a seamless trading window, rather than forcing them to wait for the Eurex market to reopen the next day. Through a cross-trading link with a foreign futures exchange, an exchange in a home country (e.g. Eurex) may not have to open another exchange in a host country (e.g. South Korea), thereby reducing legal and operational costs. Its users may still enjoy extended trading hours without the need to open another trading and clearing account in the host country. Such a cross--trading link does not involve clearing services, as all trades would move back to the home exchange for clearing. Thus, there would be fewer regulatory concerns from the host state.

Some exchanges and/or clearinghouses may also allow cross-margining, which refers to an arrangement under which a trader may use the excess in his or her margin account with a broker to secure another account. Cross--margining may reduce a trader's overall need to post collateral when he or she trades in two or more different products and/or in two or more different markets. However, cross-border cross-margining is considerably more challenging than cross-trading. Instruments eligible for margining (e.g. some debentures or securities) may not be able to move seamlessly from one country to another. However, enforcing margins and collateral may also be subject to local property law, which may not be harmonised if the home and host markets have considerably different security interest laws. In addition, whether it is in the form of cash or other liquid assets, enforcement issues occur when one or more clearing service providers need to tap into the margin pool. These issues may explain why cross-margining is not very common in futures exchanges, although they may be easier to handle when cross-margining occurs between two exchanges within the same country.

[19] CME. (2017) *Eurex/TAIFEX Link*. [online] Chicago: CME. Available from: http://www.eurexchange.com/exchange-en/products/eurex-taifex-link [Accessed 6 September 2017].

[20] Ibid.

3. LEGAL IMPLICATIONS: EXTRATERRITORIALITY AND THE GLOBAL FLOW OF NORMS

The interconnectedness of the global derivatives market may affect the creation and implementation of derivative laws and regulations. We focus on the potential extraterritorial effects of core market regulations on Asian markets due to strong market interconnections, and on the solutions and strategies adopted to address these effects. First, we analyse the current status of laws governing derivatives and how they fare in light of market interconnections. Then, we address the extraterritoriality of national regulations and the need to harmonise regulatory rules, and discuss some concerns over global competition in exchanges and clearing service providers.

3.1 CURRENT STATUS OF LAWS GOVERNING DERIVATIVES: INTERNATIONAL AND DOMESTIC DIMENSIONS

The development of derivative laws reflects the interconnectedness of the global derivatives market. On the private law side, a distinct feature of the global OTC derivatives market is the adoption of the ISDA master agreement as the standard form regulating a super-majority of global trades. In addition, English law or New York law is the default governing law of the agreement. As English law and New York law are largely within the common law family, the governing contractual norms of OTC derivatives are quite uniform. The same business model (i.e. standardised contracts traded on exchanges before moving to clearinghouses for clearing and settlement, supported by margin requirements and membership agreements)[21] is used in almost every futures exchange in the world.[22]

On the regulatory side, there were interrelated regulatory regimes at the international level after the global financial crisis. Regarding OTC derivatives, radical reforms have been implemented in the past few years. Before the global financial crisis, OTC derivatives were commonly seen as falling into the *"no man's land"* of the overall regulatory system,[23] with no dedicated regulations. Regulators could indirectly regulate derivatives

[21] Braithwaite, J. P. (2016) The Dilemma of Client Clearing in the OTC Derivatives Markets. *European Business Organisation Law Review*, 17, p. 356.

[22] For the life cycle of a typical futures contract, see Chen, above note 16, pp. 79–99.

[23] Cohen, S. S. (1995) Financial Services Regulation: a Mid-Decade Review: Colloquium: the Challenge of Derivatives. *Fordham Law Review*, 63, p. 2013.

trading through existing banking or insurance regulations.[24] The situation changed radically after the collapse of Lehman Brothers. During the Pittsburgh Summit in 2009, the G20 declared a commitment to strengthening the international financial regulatory system, such as by pushing standardised OTC derivatives to be traded on exchanges or electronic trading platforms and to be cleared through central counterparties, and to improving transparency by prescribing the reporting of OTC trades to trade repositories.[25] In short, there are three main regulatory mandates on OTC derivatives: trade reporting, clearing and exchange trading. These mandates are meant to control counterparty risk, to improve transparency and to prevent systemic risk via the derivatives market.

With international regulators aiming to divert at least some OTC trades to organised exchanges or trading platforms and to be cleared by central counterparties, global regulatory reforms provide further interconnections between the OTC and exchange markets. More trades must be accommodated to improve the regulatory system for central counterparties (CCPs) and trading platforms. For example, CCPs must have solid solvency requirements to prevent them from becoming mammoth financial institutions that are too big to fail.[26] With more trades expected to enter trading and clearing systems, associated issues will arise, such as the fairness of market access, pricing and competition or the protection of customer information and client money.[27]

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[24] For example, under Singapore law, an insurer can only trade derivatives *"for the purposes of hedging or efficient portfolio management"*. *Investment of Insurers*, Notice 125. Republic of Singapore. Singapore: MAS. In English.

[25] G 20. (2009) *Leaders' Statement – the Pittsburgh Summit*. [online] Available from: http://ec.europa.eu/archives/commission_2010-2014/president/pdf/statement_20090826_en_2.pdf [Accessed 6 September 2017].

[26] See generally Roe, MJ (2013) Clearinghouse Overconfidence. *California Law Review*, 101, pp. 1641–1703; Yadav, Y. (2013) The Problematic Case of Clearinghouses in Complex Markets. *Georgetown Law Journal*, 101, pp. 387–444; Chamorro-Courtland, C. (2012) The Trillion Dollar Question: Can a Central Bank Bail Out a Central Counterparty Clearing House Which Is "*Too Big to Fail*"? *Brook Journal of Corporate, Financial & Commercial Law*, 6, p. 433; Kress, JC. (2011) Credit Default Swaps, Clearinghouses, and Systemic Risk: What Centralised Counterparties Must Have Access to Central Bank Liquidity? *Harvard Journal on Legislation*, 48, pp. 49–93; Nichol, A. (2013) Hedging against the Next Financial Crisis: Proposals for Managing Systemic Risk in Centrally Cleared Derivatives Transactions. *Banking and Finance Law Review*, 29, pp. 169–184; Wendt, F. (2015) *Central Counterparties: Addressing their Too Important to Fail Nature*. [online] IMF. Available from: https://www.imf.org/external/pubs/ft/wp/2015/wp1521.pdf [Accessed 6 September 2017].

[27] See generally Greenberger, M. (2013) Diversifying Clearinghouse Ownership in Order to Safeguard Free and Open Access to the Derivatives Clearing Market. *Fordham Journal of Corporate & Financial Law*, 18, pp. 245–268.

However, the power imbalance in OTC derivatives has remained unchanged since the global financial crisis. The market for exchange-traded derivatives and derivatives clearing is still dominated by a few of the largest Western exchange operators and CCPs. For example, in 2017, CCPs clearing in multiple popular currencies (i.e. US dollars, pounds, euros and Japanese yen) can only be found in three financial centres (i.e. London, Chicago and New York).[28] Thus, new regulatory reforms may create further issues if trades from all over the world are cleared in a handful of CCPs situated in a few countries.

A competition effect may also exist. The cross-border merger and acquisition of futures exchanges and CCPs (especially across the Atlantic) amidst EU reforms to break up the *"vertical silo"* model[29] may further affect how the market evolves. In other words, current regulatory reforms seem to favour incumbent exchange operators and CCPs in the West by prescribing trade reporting, clearing and trading mandates. As we argue in the following, this may further strengthen the market power of Western traders, making it more difficult for other markets to catch up.

Next, we consider the extraterritoriality of laws coming from the interconnections of the global derivatives market. We then address some competition effects and the effect of harmonising regulatory rules at the international stage on Asian regulators when designing regulatory rules in light of the market dominance and interconnections in the global derivatives market.

3.2 EXTRATERRITORIALITY OF REGULATIONS AND SUBSTITUTED COMPLIANCE

As discussed previously, one prominent feature of the global derivatives market is that there are two clear power centres: the US and UK. The major dealers from these centres dominate the markets. The US market is regulated by US federal and state regulations and the UK market is governed by UK regulations (and henceforth influenced by EU regulations at least until the conclusion of Brexit), which creates two tiers of legal interactions. One question concerns the coherence of US and EU

[28] Stafford P. (2016) US Eyes Prize in Brexit Battle Over Derivatives. *Financial Times*, 20 October. Available from: https://www.ft.com/content/8ae3e610-908b-11e6-a72e-b428cb934b78 [Accessed 6 September 2017].

[29] See *Financial Times*. (2008) Clearing the Way. 17 April. Available from: https://next.ft.com/content/135b1744-0be2-11dd-9840-0000779fd2ac [Accessed 6 September 2017].

regulations. As both sides of the Atlantic have large derivatives dealers, a conflict of regulations between EU and the US may affect the operation of the market. This is much less an issue on the private law side, as the ISDA master agreement generally adopts either New York law or English law, which both share common law heritage, as the governing law. However, there may be conflicts regarding the regulations or relevant rules. For example, whether the level of the initial margin or variation margin for non-cleared derivatives differs significantly in the US and the EU may create room for regulatory arbitrage and impose considerable compliance costs on firms trading on both sides of the Atlantic.[30]

Another question concerns how US and/or EU/UK law affect other countries (e.g. Asian financial markets) when dealers trade in the main markets or with dealers from the US or Europe. This raises concerns over the extraterritoriality of US and/or EU law. As the laws governing major markets may affect traders and trading activities in other markets, the problem of the extraterritorial application of domestic regulations arises. This further prompts calls for the harmonisation of regulatory rules, at least between the two giants, through international law, soft law or other mechanisms. This is further discussed in Section C.

As a result, regulators from non-US and non-EU markets may have to look to the two giants to determine how regulations develop and evolve. For example, regulators in Hong Kong and Singapore, the largest financial centres in Asia Pacific, have to look to regulations in not only the US, but also the EU for clues, as traders in the two markets are either branches of American, European or British financial institutions or have to trade with major market dealers in the West.[31] Thus, regulatory developments

[30] The US and the EU eventually reached an agreement in 2016 regarding the margin rule for non-cleared derivatives. See Brunsden, J. and Stafford, P. (2016) EU and US Strike Derivatives Regulation Deal. *Financial Times*, 11 February. Available from: https://www.ft.com/content/b7f72eda-cfef-11e5-92a1-c5e23ef99c77 [Accessed 6 September 2017].

[31] For example, in both Hong Kong and Singapore, early consultation papers on derivatives regulations all compare the developments in the US and EU and in Japan and Australia. See Hong Kong Securities and Futures Commission. (2011) *Consultation Paper on the Proposed Regulatory Regime for the Over-the-Counter Derivatives Market in Hong Kong*. Hong Kong: SFC. Available from: http://www.sfc.hk/edistributionWeb/gateway/EN/consultation/doc?refNo=11CP6 [Accessed 6 September 2017]; Monetary Authority of Singapore. (2012) *Proposed Regulation of OTC Derivatives*. P003–2012. Singapore: MAS. Available from: http://www.mas.gov.sg/News-and-Publications/Consultation-Paper/2012/Consultation-Paper-on-Proposed-Regulation-of-OTC-Derivatives.aspx [Accessed 6 September 2017].

in the two major markets have immense effects on other markets, indirectly affecting regulatory design, a point we elaborate as follows.

Before advancing further, we must consider the meaning of extraterritoriality. There has been some debate on the boundary between extraterritoriality and mere territorial extension.[32] Professor Joanne Scott defines extraterritoriality as

> *"the application of a measure triggered by something other than a territorial connection with the regulating state".*[33]

In contrast, territorial extension occurs when

> *"the application of a measure is triggered by a territorial connection but in applying the measure the regulator is required, as a matter of law, to take into account conduct or circumstances abroad".*[34]

In the derivatives market, both effects have occurred.

3.2.1 TERRITORIAL EXTENSION OF US AND EU REGULATIONS

Both US law and EU law try to define the territorial extension of derivatives regulations by assuming jurisdiction over transactions conducted by home institutions. Essentially, a foreigner is regulated by American and/or European regulations he or she conducts a regulated activity in either market. For example, in the UK, dealing in investments, which includes securities and other contract-based investments (e.g. derivatives), as a principal party or an agent is a regulated activity that requires authorisation from the UK's financial regulator.[35]

However, the scope of OTC derivatives regulations may be considerably wider. The clearing mandate demonstrates the differences in the jurisdictional scope of US and EU regulations.

In the US, the Dodd–Frank Wall Street Reform and Consumer Protection Act (DFA)[36] regulates activities that

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[32] Scott, J. (2014) Extraterritoriality and Territorial Extension of EU Law. *American Journal of Comparative Law*, 62, pp. 89–90.

[33] Ibid, p. 90.

[34] Ibid.

[35] See *Financial Services and Markets Act 2000 (c. 8)* ss. 19 and Schedule 2, para. 2. United Kingdom of Great Britain and Northern Ireland. London: HMSO. In English.

[36] Dodd–Frank Wall Street Reform and Consumer Protection Act (Pub. L. 111–203) s 723(h)(1), 12 USC 2(h)(1). United States of America. Washington: Government Publishing Office. In English.

> *"… have a **direct and significant connection** with activities in, or effect on, commerce of the United States* (emphasis added)*".*[37]

In its subsidiary rule, the Commodity Futures Trading Commission focuses on the term "US person". One's activities are governed by the DFA if he or she is a US person, which is widely defined to include any natural person who is a resident of the US, any legal entity (e.g. companies and partnerships) organised in or having its principal place of business in the US, any trust governed by US law, any collective investment vehicle organised under US law (except for those offered only to non-US persons) and any legal entity that is majority-owned by the aforementioned persons.[38]

In contrast, in Europe, the European Market Infrastructure Regulation (EMIR)[39] requires a trade to be cleared by a CCP subject to EU law if it is concluded between two European parties who are financial counterparties or non-financial counterparties that meet the clearing threshold.[40] When both parties are from outside the EU, a trade is subject to European regulation if the contract has a *"direct, substantial and foreseeable effect"* in the EU or when it is necessary and appropriate.[41] A further delegated regulation clarifies that such a direct, substantial and foreseeable effect means that a trade is guaranteed by an institution within the EU if the guarantee is above a certain amount.[42] This means that a totally foreign transaction would trigger European regulation if there were some financial effect in the EU.

In short, the US extends its reach to certain foreign financial institutions through their connections with the US. In contrast, EU law emphasises

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[37] 7 USC 2(i).

[38] *Interpretative Guidance and Policy Statement Regarding Compliance with Certain Swap Regulations*, 78 FR 45292, 45316–45317. United States of America. Commodities Futures Trading Commission. Washington: CFTC. In English.

[39] Regulation (EU) No. 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC Derivatives, Central Counterparties and Trade Repositories. *Office Journal of the European Union* (OJ. L. 201). 27 July. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32012R0648 [Accessed 6 September 2017]. ("EMIR")

[40] Ibid, Recital 13 and arts. 4(1)(a)(i) to (iii).

[41] Ibid, art. 4(1)(a)(v).

[42] Commission Delegated Regulation (EU) No. 285/2014 of 13 February 2012 supplementing Regulation (EU) No. 648/2012 of the European Parliament and of the Council with regard to regulatory technical standards on direct, substantial and foreseeable effect of contracts within the Union and to prevent the evasion of rules and obligations. Recital 5. *Office Journal of the European Union* (L85/1) 12 March. Available from: http://eur-lex.europa.eu/Lex UriServ/LexUriServ.do?uri=OJ:L:2014:085:0001:0003:EN:PDF [Accessed 6 September 2017].

financial effects on the market. Although there are some common features in extending regulations' territorial jurisdictions to financial institutions in the home market, the focuses of the two markets differ in certain ways. US regulations focus more on a trader's identity. In other words, the territorial extension of the DFA is built upon the person. Thus, if a trade is purely between two foreign parties and has no effect on the US market, it may still fall under US regulation if one party is considered a US person, whose definition is wide enough to capture some foreigners. In contrast, EU regulations seem to be more reserved, as they extend the application of the EMIR only to overseas transactions that have significant financial effects on the EU market if conducted purely between two non-EU persons.

This poses a challenge for financial regulators in Asia. Asian regulators are unlikely to have the luxury of imposing stringent regulations and wide territorial extensions of OTC derivatives regulations. A wide jurisdictional scope may push many transactions offshore. Systemic risk may increase if there is insufficient liquidity to reduce the credit risk facing local CCPs. As one essential tool to protect a CCP from a large insolvency or default is to offset contrary trades committed by the same trader, the market needs to have sufficient liquidity for people to conduct trading and to have a sufficient number of opposing trades. This explains why Hong Kong and Singapore require trades to have some degrees of local connection to trigger the mandatory reporting obligation for OTC derivatives, through either physical connections (e.g. the residence of the person who makes the trade) or effects (e.g. a trade booked in the account of a Hong Kong subsidiary).[43] On the one hand, the rule ensures that regulators can still govern trades that have some local impact. On the other, by limiting the jurisdiction scope of regulation, it would not have the consequence of driving foreign traders away as long as the local market can run an equivalent regulatory system to that in the EU and/or US.

There is no doubt that the major financial centres in Asia want a share of OTC derivatives trading and clearing. A certain degree of regulatory competition may therefore take place. As both markets thrive as international financial centres, there are a lot of foreign traders trading

[43] *Securities and Futures (Reporting of Derivatives Contracts) Regulations 2013* (No. S 668), regulation 2(1). Republic of Singapore. Singapore: MAS. In English. ("Singapore Reporting Rules"); *Securities and Futures (OTC Derivative Transactions – Reporting and Record Keeping Obligations) Rules* (Cap 571AL), rule 4(1). Hong Kong Special Administrative Region of the People's Republic of China. Hong Kong: SFC. In English. ("HK Reporting Rules")

in either market. From this light, Singapore and Hong Kong's positions should be sensible to not scare away foreign traders while maintaining control of the trades that have local connections and effects.

3.2.2 EXTRATERRITORIAL EFFECT OF REGULATION

US and EU regulations may have considerable extraterritorial effects in other parts of the world. The underlying problem is that at least two parties are required to make a trade. Therefore, even if a party has no connection to a country (e.g. the US), it may be subject to the national law of that country through the nature of the counterparty or through another indirect connection to that country. Implementing reporting and clearing mandates for OTC derivatives may exacerbate the problem of extraterritoriality through a wide jurisdictional scope, as described in the previous section.

Such extraterritoriality may affect non-US and non-EU market countries or market participants (e.g. Singapore or Hong Kong). First, a transaction conducted completely overseas may still be subject to US and/or EU regulations. For example, a Japanese trader may be forced to submit a trade to a US-based trade repository for reporting and/or a US-based CCP for clearing if the trader deals with a US bank. In this case, the transaction falls within the jurisdictional scope of US regulations due to the nature of the counterparty. Although the Japanese trader is not a US person, they may be forced to report and clear the trade in the US unless the US bank allows for reporting and clearing of the trade to or by a foreign repository or CCP, raising the issue of foreign system recognition and substituted compliance (discussed below). This also means that the Japanese trader may incur additional compliance costs if the same trade has to be reported twice (once to the US and another time subject to Japanese law). In short, the extraterritorial effects of US and EU law may enhance the legal risks and compliance costs of foreign financial institutions. The effects may worsen if the US and EU continue to clash over CCP regulatory issues.[44]

Second, regarding the trade reporting of OTC derivatives, such extraterritoriality may affect information flow. Regulators outside of the US

[44] Chon G. (2014) Massad See End to US–EU Clearing Disputes. *Financial Times*, 31 July. Available from: http://www.ft.com/cms/s/0/c0a04f92-18c3-11e4-a51a-00144feabdc0. Html# axzz3PQyKFc50 [Accessed 6 September 2017]; Stafford P. (2014) Quick View: Clearing up Differences. *Financial Times*, 16 June. Available from: http://www.ft.com/cms/s/0/ 3ccba18a-f52d-11e3-91a8-00144feabdc0.html#axzz3PQyKFc50 [Accessed 6 September 2017].

or EU markets may not have complete control of information and information flow if some trades conducted in its place are reported to a US or European trade repository, whereas the US and EU have access to a large volume of information. How such an information advantage affects regulators and international competition outside of the core markets remains to be seen.

Third, regarding the clearing mandate, if a party chooses to clear a trade in a foreign CCP, the risk associated with the trade may also shift to the location of that CCP. This has two implications. First, it may increase the total risk exposure in the CCP venue, further burdening the CCP regulator. Second, the regulator of the trading venue may have to accept that the risk associated with the trade is governed by a foreign institution and hence the law of the clearing venue. This means that transactions conducted in the trading venue may be regulated by the laws of the clearing venue.

For example, an Australian bank conducts a trade with a US bank in Melbourne. If the bank decides to clear the trade in a US-based CCP because the US bank wants to ensure its compliance with US regulations, the US CCP absorbs the risk associated with the trade. There is little problem if the CCP stays safe and sound. However, if the CCP runs into financial problems, the primary regulators are US regulators. For Australian regulators, the failure of the US CCP may mean that the Australian bank faces counterparty risk, which should be resolved by the CCP. However, it is beyond the Australian regulators' jurisdiction to handle a US CCP, which is thus left to the US regulators. In this sense, US regulations have significant effects on a foreign market.

The same might also happen if there is more connection between futures exchanges (e.g. via cross-trading such as the Eurex/KRX link). The Eurex/KRX link manages potential solvency risk of foreign CCPs by having trades cleared in the home market. For example, a trade conducted by an Eurex member during the trading hours of KRX would be cleared by the clearing arm of Eurex in Europe. In this way, the arrangement is more like an extension of trading hours hosted by another futures exchange. With no local clearing in the host country, regulators in the host country (e.g. South Korea) would have less issue as risks do not stay and home market regulators (e.g. Europe) can still control risk from trading committed in the foreign market. Nonetheless, this would become an issue if any

trading link between two futures exchanges involve clearing in the host or a third market.

There may also be global competition problems. For the clearing model to work well, there must be sufficient liquidity. Therefore, a large exchange operator or clearing service provider may only get larger with more liquidity and probably a better pool of collateral to draw upon. Moreover, a large trade repository may have more expertise in collecting and packaging data and have a larger volume of data available for analysis.[45] In fact, some large data repositories have significant operations even outside of their home markets. For example, Singapore's sole trade repository is a subsidiary of the DTCC,[46] the US giant. Although a trade repository is still locally incorporated and licensed, data may be aggregated across countries and US regulators may still have a say in how to regulate the parent institution in the US. Thus, the extraterritorial effects of US and/or EU regulations can hardly be avoided.

3.3 POTENTIAL SOLUTIONS FOR NON-US AND NON-EU MARKETS

How can the territorial extension and extraterritorial application of major market regulations, coming from a highly interconnected market with dominant dealers, be addressed? From the angle of Asian regulators, there may be several strategies for negotiating the extraterritoriality of US or EU regulations.

One solution is to require firms to comply with local regulations only if they or a transaction fall within the jurisdiction of local regulators. For example, for mandatory reporting of OTC derivatives, Hong Kong requires traders to report to the Hong Kong Trade Repository.[47] This approach may ensure local regulators of data completeness.[48] Nevertheless, some US or European dealers may simply choose to trade in other markets

[45] For example, it has been reported that the DTCC, a large trade repository, uses blockchain technology to process over trade information worth over trillions of dollars a year. Murphy H. (2017) Database Move Gives Blockchain its First Big Test Case. *Financial Times*, 9 January. Available from: https://www.ft.com/content/aeb63b96-d64b-11e6-944b-e7eb37a6aa8e [Accessed 6 September 2017].

[46] The company is registered as DTCC Data Repository (Singapore) Pte. Ltd.

[47] HK Reporting Rules, footnote 43, rule 20.

[48] Hong Kong Securities and Futures Commission. (2013) *Consultation Conclusions and Further Consultation on the Securities and Futures (OTC Derivative Transactions – Reporting and Record Keeping Obligations) Rules*, p. 59. Hong Kong: SFC. Available from: http://www.sfc.hk/edistributionWeb/gateway/EN/consultation/doc?refNo=14CP8 [Accessed 6 September2017].

to reduce compliance costs and legal risks. If so, this may not be good news for a local regulator aiming to grow its market.

Another solution is to allow substituted compliance in an equivalent jurisdiction with a similar regulatory requirement. In general, substituted compliance means allowing a person to comply with local law by way of complying with the law of a foreign country. In other words, the compliance with foreign law is a substitute for the compliance with local law. The allowance of substituted compliance is built upon equivalent and mutual recognition, so that a local regulator may ensure that the quality of compliance is upheld. This also means that a person cannot substitute his or her local compliance obligation simply by complying with the law of any country of choice. The country must be recognised by the local regulator.

For example, according to Singapore's regulations on trade reporting of OTC derivatives, a person is deemed to have complied with the reporting obligation if any other party (or the principal party, if the specified person is an agent) is incorporated under a foreign law and if that party is required to comply with the reporting law of the foreign country.[49] Thus, Singapore allows for substituted compliance if the other party to a trade is a foreign person who is obliged to report a trade pursuant to the laws in his or her home country.

Although allowing substituted compliance may help to address market participants' concerns over double compliance, it has its own shortcomings. By allowing substituted compliance, a local regulator may lose a certain degree of control, as it may not be easy to supervise the compliance process. In addition, substituted compliance may mean that the local regulator does not have control of all of the information under its nose. For example, if reporting to a foreign trade repository were allowed, the local regulator would no longer have direct access to information on some trades. Cross--border regulatory cooperation may resolve this problem. For instance, the Monetary Authority of Singapore signed a memorandum of understanding for information sharing with the Australia Securities and Investments Commission in 2014.[50] However, unless there is a global

[49] *Securities and Futures Act* s 128(1) and (2). Republic of Singapore. Singapore. In English.

[50] See the MAS. (2014) *ASIC* and *MAS sign World-First Memorandum of Understanding on Authorities' Access to OTC Derivatives Trade Repository Data*. [online] Singapore: MAS. Available from: http://www.mas.gov.sg/News-and-Publications/Media-Releases/2014/ASIC-and-MAS-sign-World-First-Memorandum-of-Understanding.aspx [Accessed 6 September 2017].

agreement on mutual (or even multilateral) information sharing, the regulator must sign multiple agreements with foreign regulators to achieve the effect.

Substituted compliance may even have a dire implication for non-US and non-EU regulators. With the US and UK dominating the OTC derivatives market, it is perhaps reasonable to some major Western dealers to choose not to trade in a market if the regulator of that market does not allow substituted compliance of the clearing mandate. However, allowing substituted compliance of the clearing mandate also means that some local trades may be cleared in a foreign CCP. This may affect the volume of OTC derivatives cleared in that market. If the market's regulator has the ambition to grow the clearing business of OTC derivatives, it may be negatively affected.

In addition, that some local trades involving local market participants may be cleared in a foreign CCP implies that the local regulator must depend on the regulations and enforcement of the regulator of the foreign CCP to ensure its solvency and integrity. As a result, substituted compliance of the clearing mandate is often allowed only if the alternative clearing venue is in a country recognised by the local regulator based on equivalence and mutual recognition. For example, in Singapore, the law generally allows for substituted compliance of the clearing obligation if the foreign country in question is a *"relevant clearing jurisdiction"*.[51] In Hong Kong, substituted compliance of the clearing mandate is allowed if a trade is cleared by a CCP in that jurisdiction designated by the regulator, with the CCP being a designated CCP.[52] At the moment, Hong Kong's regulators seem to prefer to recognise member states of the OTC Derivatives Regulators Group[53] as *"comparable overseas jurisdictions"*.[54] Nevertheless, substituted compliance does not negate that the clearing system and related risk are not fully under the supervision

[51] *Securities and Futures Act* s 129F(1). Republic of Singapore. Singapore. In English.

[52] *Securities and Futures (OTC Derivative Transactions – clearing and Record Keeping Obligations and Designation of Central Counterparties) Rules* (Cap 571AN), rule 11(1). Hong Kong Special Administrative Region of the People's Republic of China. Hong Kong: SFC. In English. ("HK Clearing Rules")

[53] OTC Derivatives Regulators Forum. (2017) *Authorities Currently Involved in the OTC Derivatives Regulators' Forum*. Available from: http://www.otcdrf.org/about/members.htm [Accessed 6 September 2017].

[54] Hong Kong Securities and Futures Commission. (2016) *Consultation Conclusions and Further Consultation on Introducing Mandatory Clearing and Expanding Mandatory Reporting*, paras. [117]–[120]. Hong Kong: SFC. Available from: https://www.sfc.hk/edistributionWeb/gateway/EN/consultation/conclusion?refNo=15CP4 [Accessed 6 September 2017].

of the local regulator. How substituted compliance affects global competition remains to be seen. Whether such mutual information sharing would work also remains to be seen. Only time will reveal the real effects.

A final solution may be to harmonise global financial regulations to reduce differences and extraterritorial effects. Regarding the derivatives market, much like many other international financial regulatory standards (e.g. the Basel Accord), there is no international hard law (i.e. treaties) signed by states to implement a set of rules. Instead, the current method is to implement the regulations through the so-called *"soft law approach"*. In the soft law approach, regulators around the world set international regulatory standards not by negotiating a formal treaty, but through *"informal committees of ministry officials, regulators, or private experts"*.[55] The most obvious example is the Basel Accord for capital adequacy standards of banks, issued by the Basel Committee on Banking Supervision, which is a kind of transnational regulatory network (TRN) attended by regulators of major world markets. Other examples of TRNs include the Financial Stability Board (FSB), the International Organisation of Securities Commissioners and the International Association of Insurance Supervisors. Together they are responsible for setting standards for many regulatory issues across the three main pillars of the financial market. For example, in addition to OTC derivatives regulation, the FSB is in charge of designating globally and systemically important financial institutions.

Adopting the soft law approach reflects that more cross-border regulatory cooperation is necessary to ensure the solvency and stability of the globalised and well-connected financial market.[56] Although negotiating a treaty may be time-consuming and ill fitted for the fast--moving financial market, the soft law approach provides speed, flexibility and expertise through the collaboration of specialised regulators.[57] Nevertheless, whether this approach is sustainable and legitimate is a broad question that is beyond the scope of this article.[58]

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[55] Gadinis, S. (2015) Three Pathways to Global Standards: Private, Regulator, and Ministry Network. *American Journal of International Law*, 109, p. 1.

[56] Brummer, C. (2012) *Soft Law and the Global Financial System: Rule Making in the 21st Century*, Cambridge: Cambridge University Press, p. 16.

[57] Verdier, P.-H. (2013) The Political Economy of International Financial Regulation. *Indiana Law Journal*, 88, pp. 1456–1459.

[58] See generally Brummer, above note 55; Gadinis, above note 58; Shaffer, G. & Pollack, M.A. (2010) Hard vs. Soft Law: Alternatives, Complements, and Antagonists in International Governance. *Minnesota Law Review*, 94, pp. 706–799.

Regarding OTC derivatives, the three mandates arose through the same approach. They were prescribed by the G20 before the FSB issued a guideline[59] for each member country to follow. However, not every country has implemented the three mandates at the same pace. From the FSB's periodical progress report, it is clear that several member countries have not fully implemented the three mandates.[60] After examining the regulatory developments in Hong Kong, Singapore, China and Taiwan, Gao and Chen find significant gaps in the implementation of the three mandates in East Asia outside of Japan.[61] For example, Hong Kong and Singapore both implemented the reporting mandate first. However, Hong Kong issued its final clearing regulations for OTC derivatives only in September 2016, and Singapore had not even published its final clearing rules by the end of 2016.[62] China and Taiwan are not even close to implementing any mandate. Even in major markets, there may be some lag. For example, the EU put the trading mandate into regulation only in 2014 through the Markets in Financial Instruments Regulation.[63]

As Gao and Chen argue, the time gap in implementing the three mandates reflects that other concerns and interests underlie the economic functions of the three mandates. For example, the reporting mandate is least controversial, as it tries to enhance market transparency. Furthermore, information sharing is the biggest hurdle to overcome even if a country allows substituted compliance, considering the wide US territorial extension of the DFA.[64] However, for clearing and trading mandates, other national interests (e.g. competition to become a larger international financial centre) and domestic concerns (e.g. solvency of local financial markets) must be

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[59] Financial Stability Board. (2010) *Implementing OTC Derivatives Market Reforms*. Basel: FSB. Available from: http://www.fsb.org/2010/10/fsb-report-on-implementing-otc-derivatives-market-reforms/ [Accessed 6 September 2017].

[60] See Financial Stability Board. (2016) *Implementation and Effects of the G20 Financial Regulatory Reforms – Dashboard*. Basel: FSB. Available from: http://www.fsb.org/wp-content/uploads/Report-on-implementation-and-effects-of-reforms-dashboard.pdf [Accessed 6 September 2017].

[61] See Gao and Chen, above note 15.

[62] Ibid.

[63] Regulation (EU) No. 600/2014 of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Regulation (EU) No. 648/2014, art. 28. *Official Journal of the European Union* (L 173/84) 12 June. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32014R0600 [Accessed 6 September 2017].

[64] See Gao and Chen, above note 15.

considered. This complicates the design and implementation of the two mandates for Asian regulators.[65]

Last, would more harmonisation facilitate more interconnection? It is hard to predict the market and how regulations may evolve in the fast--moving financial market. This article believes that a higher degree of harmonisation of rules governing the derivatives market (no matter they are about exchange trading, clearing or OTC market regulation) should help more interconnection and competition. With rules in different countries more akin to each other, it would facilitate traders to conduct trading in different markets and reduce legal uncertainties and potential extraterritorial effect of national regulations.

4. CONCLUSION

There is probably no other corner of the global financial market that is more interconnected and polarised than the derivatives market. The high degree of interconnection also poses problems for regulators, especially in countries that are not major markets. The US, UK and EU dominate the derivatives market. Although Asian markets may have niche products or expertise in specialised products, they fall behind in the OTC markets.

The sheer dominance of Western markets and dealers twists the market and the development of global regulations, granting US and EU regulations significant extraterritorial effects for activities in non-US and non-EU countries. On the private law side, it is through the total dominance of the ISDA master agreement. On the regulatory side, Asian markets are almost forced to accept the regulatory reforms on OTC derivatives, although studies have shown different degrees of implementation due to various national interests and market conditions. Harmonising global regulations at least in major markets may be the solution to reducing the extraterritoriality and territorial extension of the effects of the regulations of major derivatives markets, such as the US, the UK and Europe. Although some international organisations may lead the efforts, there are still some technical differences and uncertainties ahead for regulators in Asia and other developing countries.

[65] Ibid.

LIST OF REFERENCES

[1] Bank of International Settlement. (2016) *Triennial Central Bank Survey of Foreign Exchange and OTC Derivatives Markets in 2016*. [online] Basel: BIS. Available from: http://www.bis.org/publ/rpfx16.htm [Accessed 6 September 2017].

[2] Bank of International Settlement. (2013) *Triennial Central Bank Survey – Interest Rate Derivatives Market Turnover in 2013: Preliminary Global Results*. Basel: BIS, Available from: http://www.bis.org/publ/rpfx13ir.pdf [Accessed 6 September 2017].

[3] Braithwaite, J.P. (2016). The Dilemma of Client Clearing in the OTC Derivatives Markets. *European Business Organisation Law Review*, 17, p. 355–378.

[4] Brunsden, J. and Stafford, P. (2016) EU and US Strike Derivatives Regulation Deal. *Financial Times*, 11 February. Available from: https://www.ft.com/content/b7f72eda-cfef-11e5-92a1-c5e23ef99c77 [Accessed 6 September 2017].

[5] Brummer, C. (2012). *Soft Law and the Global Financial System: Rule Making in the 21st Century*, Cambridge: Cambridge University Press.

[6] Chamorro-Courtland, C. (2012). The Trillion Dollar Question: Can a Central Bank Bail Out a Central Counterparty Clearing House Which Is "Too Big to Fail"? *Brooklyn Journal of Corporate, Financial & Commercial Law*, 6, p. 433.

[7] Chen, C. (2011) Product Due Diligence and the Suitability of Minibonds: Taking the Benefit of Hindsight. *Singapore Journal of Legal Studies*, 2011, pp. 309–329.

[8] Chen, C. (2010). *Trading Risk: the Contractual Nature of Derivative Instruments and Certain Regulatory Issues*, VDM Verlag Dr. Müller.

[9] Chon G. (2014) Massad See End to US–EU Clearing Disputes. *Financial Times*, 31 July. Available from: http://www.ft.com/cms/s/0/c0a04f92-18c3-11e4-a51a-00144feabdc0.html#axzz3PQyKFc50 [Accessed 6 September 2017].

[10] CME. (2017) *CME Group Strategic Partnership with Singapore Exchange*. [online] Chicago: CME. Available from: http://www.cmegroup.com/international/partnership-resources/sgx-re-sources.html [Accessed 6 September 2017].

[11] CME. (2017) *Eurex/TAIFEX Link*. [online] Chicago: CME. Available from: http://www.eurexchange.com/exchange-en/products/eurex-taifex-link [Accessed 6 September 2017].

[12] Cohen, S.S. (1995) Financial Services Regulation: a Mid-Decade Review: Colloquium: The Challenge of Derivatives. *Fordham Law Review*, 63, p. 1993.

[13] Commission Delegated Regulation (EU) No. 285/2014 of 13 February 2012 supplementing Regulation (EU) No. 648/2012 of the European Parliament

and of the Council with regard to regulatory technical standards on direct, substantial and foreseeable effect of contracts within the Union and to prevent the evasion of rules and obligations. *Office Journal of the European Union* (L85/1) 12 March. Available from: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do? uri=OJ:L:2014:085:0001:0003:EN: PDF [Accessed 6 September 2017].

[14] *Dodd–Frank Wall Street Reform and Consumer Protection Act* (Pub. L. 111-203). United States of America. Washington: Government Publishing Office. In English.

[15] *Financial Services and Markets Act 2000* (c. 8). United Kingdom of Great Britain and Northern Ireland. London: HMSO. In English.

[16] Flanagan, S.M., 2001. The Rise of a Trade Association: Group Interactions within the International Swaps and Derivatives Association. *Harvard Negotiation Law Review*, 6, pp. 211–263.

[17] Financial Stability Board. (2016) *Implementation and Effects of the G20 Financial Regulatory Reforms – Dashboard.* Basel: FSB. Available from: http://www.fsb.org/wp-content/uploads/Report-on-implementation-and-effects-of-reforms-dashboard.pdf [Accessed 6 September 2017].

[18] Financial Stability Board. (2010) *Implementing OTC Derivatives Market Reforms*. Basel: FSB. Available from: http://www.fsb.org/2010/10/fsb-report-on-implementing-otc-derivatives- market-reforms/ [Accessed 6 September 2017].

[19] G 20. (2009) *Leaders' Statement – the Pittsburgh Summit.* [online] Available from: http://ec.europa.eu/archives/commission_2010-2014/president/pdf/statement_20090826 _en_2.pdf [Accessed 6 September 2017].

[20] Gadinis, S., 2015. Three Pathways to Global Standards: Private, Regulator, and Ministry Network. *American Journal of International Law*, 109, pp. 1–57.

[21] Gao, S. & Chen, C., 2017. Financial Transnationalism and Financial Regulation Change: A Case Study for Derivatives Markets. *European Business Organisation Law Review*, 19, p. 193–223.

[22] Greenberger, M., 2013. Diversifying Clearinghouse Ownership in Order to Safeguard Free and Open Access to the Derivatives Clearing Market. *Fordham Journal of Corporate and Financial Law*, 18, pp 245–268.

[23] Henderson, S.K. (2010) *Henderson on Derivatives*, 2nd Ed., LexisNexis.

[24] *Investment ofInsurers*, Notice 125. Republic of Singapore. Singapore: MAS. In English.

[25] Hong Kong Securities and Futures Commission. (2016) *Consultation Conclusions and Further Consultation on Introducing Mandatory Clearing and Expanding Mandatory*

Reporting. Hong Kong: SFC. Available from: https://www.sfc.hk/edistributionWeb/gateway/EN/consultation/conclusion?refNo=15CP4 [Accessed 6 September 2017].

[26] Hong Kong Securities and Futures Commission. (2013) *Consultation Conclusions and Further Consultation on the Securities and Futures (OTC Derivative Transactions – Reporting and Record Keeping Obligations) Rules*. Hong Kong: SFC. Available from: http://www.sfc.hk/edistributionWeb/gateway/EN/consultation/doc?refNo=14CP8 [Accessed 6 September 2017].

[27] Hong Kong Securities and Futures Commission. (2011) *Consultation Paper on the Proposed Regulatory Regime for the Over-the-Counter Derivatives Market in Hong Kong*. Hong Kong: SFC. Available from: http://www.sfc.hk/edistributionWeb/gateway/EN/consultation/doc?refNo=11CP6 [Accessed 6 September 2017].

[28] Hudson, A.(2012) *The Law on Financial Derivatives* 5th Ed., London: Sweet & Maxwell.

[29] *Interpretative Guidance and Policy Statement Regarding Compliance with Certain Swap Regulations*, 78 FR 45292, 45316–45317. United States of America. Commodities Futures Trading Commission. Washington: CFTC. In English.

[30] Kress, J.C. (2011) Credit Default Swaps, Clearinghouses, and Systemic Risk: What Centralised Counterparties Must Have Access to Central Bank Liquidity? *Harvard Journal on Legislation*, 48, pp. 49–93.

[31] Monetary Authority of Singapore. (2012) *Proposed Regulation of OTC Derivatives*. P003–2012. Singapore: MAS. Available from: http://www.mas.gov.sg/News-and-Publications/Consultation-Paper/2012/Consultation-Paper-on-Proposed-Regulation-of-OTC-Derivatives.aspx [Accessed 6 September 2017].

[32] Monetary Authority of Singapore. (2014) *ASIC and MAS sign World-First Memorandum of Understanding on Authorities' Access to OTC Derivatives Trade Repository Data.* [online] Singapore: MAS. Available from: http://www.mas.gov.sg/News-and-Publications/Media-Releases/2014/ASIC-and-MAS-sign-World-First-Memorandum-of-Understanding.aspx [Accessed 6 September 2017].

[33] Murphy H. (2017) Database Move Gives Blockchain its First Big Test Case. *Financial Times*, 9 January. Available from: https://www.ft.com/content/aeb63b96-d64b-11e6-944b-e7eb37a6aa8e [Accessed 6 September 2017].

[34] Nichol, A. (2013) Hedging against the Next Financial Crisis: Proposals for Managing Systemic Risk in Centrally Cleared Derivatives Transactions. *Banking and Finance Law Review*, 29, pp. 169–184.

[35] OTC Derivatives Regulators Forum. (2017) *Authorities Currently Involved in the OTC Derivatives Regulators' Forum*. Available from: http://www.otcdrf.org/about/members.htm [Accessed 6 September 2017].

[36] Rauterberg, G.V. & Verstein, A. (2013) Assessing Transnational Private Regulation of the OTC Derivatives Market: ISDA, the BBA, and the Future of Financial Reform. *Virginia Journal of International Law*, 54, pp. 9–50.

[37] Regulation (EU) No. 600/2014 of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Regulation (EU) No. 648/2014. *Official Journal of the European Union* (L 173/84) 12 June. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32014R0600
[Accessed 6 September 2017].

[38] Regulation (EU) No. 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC Derivatives, Central Counterparties and Trade Repositories. *Official Journal of the European Union* (OJ. L. 201) 27 July. Available from: http://eur-lex.europa.eu/legal- content/EN/TXT/?uri=celex%3A32012R0648
[Accessed 6 September 2017].

[39] Roe, M.J. (2013) Clearinghouse Overconfidence. *California Law Review*, 101, pp. 1641–1703.

[40] Scott, J. (2014) Extraterritoriality and Territorial Extension of EU Law. *The American Journal of Comparative Law*, 62, p. 87.

[41] *Securities and Futures Act*. Republic of Singapore. Singapore. In English.

[42] *Securities and Futures (OTC Derivative Transactions — Clearing and Record Keeping Obligations and Designation of Central Counterparties) Rules* (Cap 571AN). Hong Kong Special Administrative Region of the People's Republic of China. Hong Kong: SFC. In English.

[43] *Securities and Futures (OTC Derivative Transactions — Reporting and Record Keeping Obligations) Rules* (Cap 571AL), rule 4(1). Hong Kong Special Administrative Region of the People's Republic of China. Hong Kong: SFC. In English.

[44] *Securities and Futures (Reporting of Derivatives Contracts) Regulations 2013* (No. S 668), regulation 2(1). Republic of Singapore. Singapore: MAS. In English.

[45] Shaffer, G. & Pollack, M.A. (2010) Hard vs. Soft Law: Alternatives, Complements, and Antagonists in International Governance. *Minnesota Law Review*, 94, pp. 706–799.

[46] Stafford P. (2016) US Eyes Prize in Brexit Battle Over Derivatives. *Financial Times,* 20 October. Available from: https://www.ft.com/content/8ae3e610-908b-11e6-a72e-b428cb934 b78 [Accessed 6 September 2017].

[47] Stafford P. (2014) Quick View: Clearing up Differences. *Financial Times*, 16 June. Available from: http://www.ft.com/cms/s/0/3ccba18a-f52d-11e3-91a8-00144feabdc0. html#axzz3PQyKFc50 [Accessed 6 September 2017].

[48] Verdier, P.-H. (2013) The Political Economy of International Financial Regulation. *Indiana Law Journal*, 88, pp. 1405–1474.

[49] Wendt, F. (2015) Central Counterparties: *Addressing Their Too Important to Fail Nature*. [online] IMF. Available from: https://www.imf.org/external/pubs/ft/wp/2015/ wp1521.pdf [Accessed 6 September 2017].

[50] Yadav, Y. (2013) The Problematic Case of Clearinghouses in Complex Markets. *Georgetown Law Journal*, 101, pp. 387–444.

[51] *Financial Times*. (2008) Clearing the Way. 17 April. Available from: https://next.ft.com/ content/135b1744-0be2-11dd-9840-0000779fd2ac [Accessed 6 September 2017].

<<< ARTICLES

COMMENTARIES >>>

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STOCK EXCHANGE INTERCONNECTIONS AND LEGAL ISSUES IN DATA EXCHANGE

by

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If philosophical cybernetics was interested in stock exchanges, it would probably treat them as relatively simple information structures. From that perspective, stock exchanges can be viewed as places where data on supply and demand of various negotiable instruments are processed. Besides that, stock exchanges, as institutions, provide respective transactions with additional informational (organisational) value that mostly consist of trust regarding the traders, clearing etc.

Consequently, a stock exchange interconnection can be seen as very natural process providing for bigger pool of useful data. One of key tasks in the establishment of exchange schemes is then not to hinder or diminish the added information value, i.e. to at least keep the existing level of trust. In that sense, one of the most important components of interconnection design is the legal compliance.

In the comment, we will examine some of the most emerging legal issues in data sharing between stock exchanges that were subject to examination under recently concluded project 'Creating a legal and regulatory framework for interconnections between stock exchanges: A comparative study of the UK and Taiwan' funded by the British Academy (UK) and the Ministry of Science and Technology, Taiwan. We will particularly focus in this comment on compliance issues in cross-border transfers of personal data and newly emerging regulatory phenomenon of cybersecurity.

KEY WORDS

Stock Exchange, Data Protection, Cybersecurity, Virtualisation

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1. VIRTUALISED STOCK EXCHANGE

One of must-sees of the Chicago Institute of Art is the original Chicago Stock Exchange Trading Room. The reconstructed creation of Dankmar Adler and Louis Sullivan nicely demonstrates the wealth and style of America's second city at the end of the nineteenth century. It also shows how architectural aesthetics was important for stock exchanges of that time. Good (rich) looking building and trading room was an asset that was for a stock exchange as inevitable as its listing program or trading services.

Times have changed and stock exchange is not defined any more with immovable assets. Today, the CHX does not even mention its building or trading room on its website. It is then reasonable to ask what defines today a stock exchange or more provocatively what defines today a financial market.[1] Subsequently, one might even ask what defines a stock exchange or a financial market not only today but as such.[2]

The reason we always tend to ask these questions in connection to technological developments was earlier described by Pierre Lévy as virtualisation.[3] Lévy demonstrated that technology from time to time allows or even makes us to reshape various societal phenomena. Technologies in that case do not affect the very nature, or core, of those phenomena, but might substantially change their forms. Virtualised money still act as a value-bearer, yet they have, compared to paper money, no tangible form.

It is a bit tricky to treat '*virtual*' as an opposite to '*real*'. Our feelings to '*virtual*' friends are as real as those to '*real*' ones similarly as a value represented by money is supposed to be '*real*' regardless of whether its bearer is tangible or electronic. Thus, virtuality is not the opposite of reality but its another form.[4]

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[1] Introduction of trust technologies even evokes a question whether financial institutions such as stock exchanges represent defining element of financial markets as such – see for example Reyes, C. L. (2016) Moving Beyond Bitcoin to an Endogenous Theory of Decentralized Ledger Technology Regulation: An Initial Proposal. *Villanova Law Review*, 61, p. 191.

[2] Carran asks a similar question regarding the nature and purpose of stock exchanges and cites the following passage from House of Lords decision in Weinberger v Inglis [1919] A.C. 606, HL 1: '*The London Stock Exchange is in reality a building vested in certain proprietors and used for the purpose of carrying on a market for stocks and shares*.' See Caran, P. C. (1975 –1978) Some Aspects of the Stock Exchange: Its Nature and Functions. *Victoria University Wellington Law Review,* 8, p. 71.

[3] See Lévy, P. (2002) *Becoming Virtual – Reality in the Digital Age.* New York: Plenum Trade.

[4] See Lévy, P. (1997) Welcome to virtuality. *Digital Creativity*, 8(1), p. 3.

Virtualisation causes some old problems to disappear, while new ones instantly pop up.[5] It is typical that namely problems associated with physical place (or placement) entirely vanish, because virtualisation is normally accompanied with loss of substance (or tangibility). On the contrary, new problems of virtualised phenomena are typically linked with various technology risks. A success of virtualisation can be called a situation when those problems that fell off had been worse than those that newly emerged – which means that not all societal phenomena are fit for virtualisation all the time.

It is also important to properly distinguish between mere substantive core and formal elements to master the virtualisation of some phenomenon, let it be friendship, money, justice or anything else. The identification of the core can provide for a protection of respective phenomenon from substantive erosion.[6] At the same time, properly knowing which elements of virtualised phenomenon are just formal enables us to maximise various positive effects of virtualisation, prevent unnecessary defects and prepare for necessary ones.[7]

The fact that we see today the original Chicago Stock Exchange Trading Room as a gallery object and that it was not replaced at the CHX by anything even architecturally or aesthetically fancier shows that stock exchanges simply got virtualised in past decades. It is then not only thanks to the use of ICT that trading rooms (i.e. physical locations where trade deals are made) do not represent core facilities of stock exchanges any more, but thanks to natural tendency of stock exchanges to develop further and to liberate trading from various obstacles. In this case, virtualisation was probably quite successful, because the problems lost (i.e. direct dependence of trading on physical presence of traders on the floor of the trading room) seem to be more serious than those that newly emerged (incl. the loss of aesthetic amusement of traders).[8]

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[5] For a detailed study regarding particular virtualisation of financial markets, see Chiu, I. H-Y. (2016) *Journal of Technology Law & Policy*, 21, p. 55.

[6] When Trautman and Harell discuss the use of bitcoin technology for financial transactions, they start with the question as '*what is money*'. See Trautmann, L. J., Harell, A. C. (2017) Bitcoin Versus Regulated Payment Systems: What Gives? *Cardozo Law Review*, 38, p. 1041.

[7] See for example Batog, C. Blockchain: A Proposal to Reform High Frequency Trading Regulation. *Cardozo Arts & Entertainment Law Journal*, 33, p. 739.

[8] See for example Engelen, P.-J. (2006) Changes in the Securities Trading Landscape in Europe and the U.S. *Competition and Regulation in Network Industries*, 1, p. 439.

The example of the CHX also demonstrates that neither architectural aesthetics nor physical presence of traders represent core elements of the phenomenon of a stock exchange. Both these features were already almost entirely lost with the introduction of ICT, but the stock exchange still exists and operates as a stock exchange.

2. INTERCONNECTIONS AS MEANS OF STOCK EXCHANGE VIRTUALISATION

Stock exchange interconnections[9] represent yet another way of virtualisation of stock exchanges. Interconnections are possible thanks to ICT and their purpose is to make further use of already present dematerialisation of stock trading. Similar with the shift from physical to virtual trading rooms, interconnections bring a shift from trading at multiple hubs to trading at one place. While virtualisation of a trading room introduced a possibility to trade between members who are not physically present at one place (in the trading room), interconnections make possible trading stock that is not available on local market.[10]

We noted above that virtualisation of any kind can be successful only if we get right the fundaments of respective phenomenon. Only then we can make proper use of its positive effects and successfully tackle in sufficient advance newly emerging problems.

Every stock exchange can be viewed from the perspective of information theory as a system that processes data. Stock exchange receives input data about offer and demand and turns them into information by adding an extra value to them and matching them together. Particularly, stock exchanges provide for concentrated and structured access to respective data (offer and demand incl. accompanying data) and they also increase informational value of that data by business trust related to offered stock and consequent clearance.[11] From that perspective, traders pay stock exchanges for extra value that consists primarily of efficient access to stock market (from both sides) and transactional credibility.

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[9] The phenomenon of stock Exchange interconnections was recently examined in a project funded by the British Academy (UK) and the Ministry of Science and Technology of Taiwan and titled: Creating a legal and regulatory framework for interconnections between stock exchanges: A comparative study of the UK and Taiwan. Further findings presented in this paper are primarily based on research undertaken within that project.

[10] Interconnections thus bring significantly different effects in comparison with mergers – see for example Kokkoris, I. and Olivares-Caminal, R. (2007–2008) Some Issues on Cross-Border Stock Exchange Mergers, *University of Pennsylvania Journal of International Law*, 29(2), p. 455.

Any virtualisation, if it is to do no harm to primary functions of stock exchanges, must preserve the aforesaid way in which stock exchanges turn data into information. Interconnections bring the opportunity for more data (on supply and demand side) to enter the stock exchange. One kind of risk then arises from different compliance standards of data that are being exchanged through the interconnection. Apart general stock regulatory issues (i.e. differences between stock market regulations in different jurisdictions), we must tackle issues related to data rights compliance (e.g. there are *sui generis* rights to databases in the EU, while no such rights exist anywhere else in the world).

The second type of legally relevant risks with regards to data that arise from stock exchange interconnections relate to security. Stock exchanges have always been extremely cautious about data security, because any breaches can seriously harm their reputation. Data security issues can also hugely affect one of aforesaid reasons for which traders use stock exchanges, i.e. transactional trust. Thus, substantive information systems of stock exchanges are highly secured which also means they are isolated from the rest of the internet to maximum possible extent.

Interconnection always means opening the information system and exposing it to external sources of data. Apart the aforesaid problem of differences in substantive standards between stock markets (incl. legal compliance), there is substantial increase of risk caused by distant communication. Stock exchanges can never be directly connected, so there is always a need for an information intermediary (e.g. a telecommunications provider).

While geographic distance is relevant as such (i.e. it represents a risk factor), there is no direct correlation between the distance and the possibility of stock exchange interconnections. Other sorts of trade relations between different nations often depend, for obvious reasons, on geographic proximity. As data can travel at any distance, there is no practical difference in establishment of stock exchange interconnections between any places in the world. In other words, once the above issues are

[11] This function of stock exchanges may partly vanish in near future with the introduction of technologies that will provide for trusted authentication and confidentiality – see for example Lee, L. (2017) New Kids on the Blockchain: How Bitcoin's Technology Could Reinvent the Stock Market, *Hastings Business Law Journal*, 12, p. 81, or Walch, A. (2015), *N.Y.U. Journal of Legislation and Public Policy*, 18, p. 837.

sorted, physical distance does not have to play any role in deciding about which stock exchanges are to be connected.

3. PERSONAL DATA

The scope of the definition of personal data is rather broad, namely thanks to the criterion of '*identifiability*'. It is under permanent discussion of legal academics across Europe whether the meaning of '*identifiability*' is in this case subjective or objective, i.e. whether a controller shall obey the rules upon the data being subjectively identifiable by that controller or objectively (theoretically).[12]

The Court of Justice of the EU recently ruled for the subjective interpretation that is slightly more restrictive (the court ruled that an internet service provider is considered a controller of personal data if it

> *"has the legal means which enable it to identify the data subject with additional data which the internet service provider has about that person"*[13]).

However, the court still upheld earlier rather extensive approach to the question as to which data are to be considered identifiable by stating that even a dynamic IP addresses can be identifiable in the sense of Art. 2(a) of the Directive 95/46/EC.

Although the subjective interpretation of the definition of personal data slightly limits the scope of application of data protection rules, that limitation hardly applies to stock exchanges. Despite some personal data that are regularly communicated through interconnections might be anonymised or pseudonymised, stock exchanges still hold means for reverse identification of particular individuals (incl. measures arising from AML obligations or KYC procedures).

In result, stock exchange interconnections inevitably include communications (exchange) of personal data within the meaning of Art. 2(a) of the Directive 95/46/EC. It implies that whenever an interconnection is made between a stock exchange within and outside the EU (or EEA), the data processing must comply with EU rules

[12] See for example Oostveen, M. (2016) Identifiability and the Applicability of Data Protection to Big Data, *International Data Privacy Law*, 6(4), p. 299.

[13] See Case-C-582/14 Patrick Breyer v. Bundesrepublik Deutschland.

for personal data transfers or even directly with extraterritorially applicable substantive rules for processing of personal data within the EU.[14]

Offshore data transfers recently represented quite turbulent agenda around the EU and it is still not entirely clear which instruments will provide desired essential equivalence under the GDPR.[15] Despite all contemporary problems and uncertainties in EU data protection laws, the prospect for stock exchange interconnections is relatively optimistic.

The reasons for our optimism were mostly institutional. Stock exchanges are equipped with state-of-the-art data security measures and compliance procedures. That allows them to relatively easily develop and maintain binding corporate rules as envisaged by Art. 47 of the GDPR or similar instruments that require approval by the respective data protection authority. If stock exchange interconnections become popular, it is even possible to think about adopting specific certification schemes or developing standard contractual clauses that would be adopted into interconnection agreements. In addition, the economic relevance of stock exchanges often allows them to actively influence domestic or foreign policing which might lead even e.g. to the conclusion of international agreements laid down in Art. 46(2)(a) or Art. 46(3)(b). In any case, it is advisable for interconnecting stock exchanges to invest into the development of proper personal data transfer compliance mechanisms rather than to argue that data protection or data transfer rules do not apply here.

4. CYBERSECURITY

Stock exchange interconnections obviously require establishment of proper means of communication and data storage. As data represent absolutely essential asset for stock exchanges, there is no space for half-way solutions or compromises. From security standpoint, it would be ideal if substantive information systems used by stock exchanges would be entirely independent on the Internet. That option, however, is not possible as it would prevent the availability of a number of popular trading services. Consequently, stock exchanges must tackle same security problems as those

[14] See for example De Hert, P., Czerniawski, M. Expanding the European Data Protection Scope Beyond Territory: Article 3 of the General Data Protection Regulation in its Wider Context, *International Data Privacy Law*, 6(3), p. 230.

[15] See for example Bender, D. (2016) Having Mishandled Safe Harbor, Will the CJEU do Better with Privacy Shield? A US perspective, *International Data Privacy Law*, 6(2), p. 117.

that arise in any systems connected to the Internet. Interconnections then only extend the scope and placement range of information assets that need to be secured.

Cybersecurity recently became also a regulatory issue in the EU. The NIS Directive[16] now brings entirely new compliance regime into the national laws of the member states. Stock exchanges fall within the scope of the NIS Directive which means that member states include them into the count of institutions whose systems are obliged to meet national security standards incl. an obligation to report security incidents to national response teams.

Compliance duties that are or shortly will be laid down in the laws of the member states upon the NIS Directive[17] do not obstruct stock exchange interconnections. They only require stock exchanges to build technical means for interconnections under same security standards and cover them with same operational duties as the rest of their information and communication infrastructures.[18]

At first, we do not expect any serious problems regarding technical compliance of stock exchanges with security standards that are or will be laid down in EU member states. Most financial institutions incl. banks, stock exchanges, insurance and reinsurance companies etc. already have in place strong cybersecurity measures that comfortably meet or often exceed new legal requirements. Thus, we might expect that only attention will mostly have to be paid to organisational adoption of existing cybersecurity measures to new security standards, documentation and establishment of incident reporting functionalities.

It might become problematic for establishing technically and legally functioning interconnection between stock exchanges namely if cybersecurity standards laid down in respective countries substantially differ. In that case, there will be a need for the development of technical and/or organisational security interface that would properly incorporate the interconnection into compliance structures on both sides.[19]

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[16] See Directive (EU) 2016/1148 of the European Parliament and of the Council of 6 July 2016 concerning measures for a high common level of security of network and information systems across the Union.

[17] The Directive shall be legislatively implemented by the member states by 9 May 2018.

[18] Interconnections infrastructures fall within class 4 (Financial market infrastructures) according to Annex II of the NIS Directive.

[19] NIS Directive does not provide for any equivalence regime, so compliance has to be tackled specifically within and outside the EU.

Not legally required but highly advisable for contractual framework of interconnections are measures for mutual sharing of data on cybersecurity incidents between interconnected stock exchanges.[20] If these security data are shared, it can provide for higher level of mutual credibility. In addition, it can also increase the probability of detecting serious incidents on both sides and improve consequent response capabilities.

Data on cybersecurity incidents are not important only for stock exchanges as such. Regulators of various capital markets also require listed companies to report significant cybersecurity incidents that occurred in their infrastructures. The reason is that cybersecurity incidents might directly affect operations of listed companies and influence the value of their shares.[21] It then hugely depends on particular details of such reporting obligations of listed companies, namely on types of compulsorily reported incidents, structure of reports or timeframes, but there is no doubt these data do not just have value for investors, but they might also give a very good picture about security situation in respective country.

If cybersecurity data of listed companies are subject to data exchange within stock exchange interconnection, they might become, one way or another, transparent to security institutions in respective foreign country. That can represent serious concern for national security. On the contrary, a stock exchange interconnection can be even utilised by security institutions on both sides, because it can provide them with a mutually secure channel through which they can get potentially valuable cybersecurity data from another country including sophisticated analytics.[22] Thus, the availability of cybersecurity data about listed companies through stock exchange interconnections can represent security risk or security asset, depending on how respective security institutions are able to cooperate with participating stock exchanges (it is needless to add here that we do not expect stock exchange interconnections to be established between countries with substantially diverse security interests).

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[20] These might include exchange of periodic security reports or even real-time exchange of incident reporting and/or incident management data between incident response teams on both sides. There already exist numerous technologies for such data sharing, e.g. the IODEF or IDMEF data formats.

[21] See for example Bledstein, N. (2013) Is Cyber Espionage a Form of Market Manipulation. *Journal of Law & Cyber Warfare*, 2(1), p. 104.

[22] For more detailed description of international cooperation schemes in cybersecurity, see for example Gross, O. (2015) Cyber Responsibility to Protect: Legal Obligations of States Directly Affected by Cyber-Incidents, *Cornell International Law Journal*, 48, p. 481.

5. CONCLUDING REMARKS

Cybersecurity and protection of personal data do not represent only data--related legal issues of stock exchange interconnections. Legal framework for interconnection of stock exchanges out of which at least one is in the EU has always to tackle other issues such as *sui generis* rights to databases, anti--money laundering reporting obligations etc. In addition, international interconnections are always burdened with general questions of contemporary cyberlaw such as delimitation of state jurisdictions, liability of information society service providers, competence conflicts of regulators (financial markets, telecommunications, competition)[23] etc. However, none of these issues is fatal for establishment or functioning of stock exchange interconnections as such.

Even the Brexit does not represent with regards to data-related laws any serious obstacle or source of fatal uncertainties for further development of interconnection projects between stock exchanges in the UK and those in other EU member states or elsewhere. It is now mostly clear that UK is about to keep the existing EU legal regulatory framework for data processing and cybersecurity, so interconnections can be further developed according to the existing EU regulatory standards.[24]

Consequently, the conclusions with regards to rights related to data are rather positive. Instead of general or fatal obstacles we found only particular regulatory issues that can be resolved mostly through diligent compliance mechanisms.

LIST OF REFERENCES

[1] Batog, C. Blockchain (2015) A Proposal to Reform High Frequency Trading Regulation. *Cardozo Arts & Entertainment Law Journal*, 33, p. 739.

[2] Bender, D. (2016) Having Mishandled Safe Harbor, Will the CJEU do Better with Privacy Shield? A US perspective. *International Data Privacy Law*, 6(2), p. 117.

[3] Bledstein, N. (2013) Is Cyber Espionage a Form of Market Manipulation. *Journal of Law & Cyber Warfare*, 2(1), p. 104.

[4] Case C-582/14 *Patrick Breyer v. Bundesrepublik Deutschland*, ECLI:EU:C:2016:779.

[23] See the debate between Tamar Frankel and Omri Yadlin in Chicago–Kent Law Review: Frankel, T. (1998) The Internet, Securities Regulation, and Theory of Law. *Chicago–Kent Law Review*, 73, p. 1319 and Yadlin, O. Should the Sec Regulate the Cybersecurities Market? *Chicago–Kent Law Review*, 73, p. 1355.

[24] See McCullagh, K. (2017) Brexit: Potential Trade and Data implications for Digital and 'fintech' Industries, *International Data Privacy Law*, 7(1), p. 3.

[5] Caran, P. C. (1975-1978) Some Aspects of the Stock Exchange: Its Nature and Functions. *Victoria University Wellington Law Review*, 8, p. 71.

[6] Chiu, I. H-Y. (2016) Fintech and Disruptive Business Models in Financial Products, Intermediation and Markets – Policy Implications for Financial Regulators. *Journal of Technology Law & Policy*, 21, p. 55.

[7] De Hert, P., Czerniawski, M. (2016) Expanding the European Data Protection Scope Beyond Territory: Article 3 of the General Data Protection Regulation in its Wider Context. *International Data Privacy Law*, 6(3), p. 230.

[8] Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data, 31995L0046, OJ L 281, 23. 11. 1995, p. 31–50 .

[9] Directive (EU) 2016/1148 of the European Parliament and of the Council of 6 July 2016 concerning measures for a high common level of security of network and information systems across the Union, 32016L1148, OJ L 194, 19.7.2016, p. 1–30.

[10] Engelen, P.-J. (2006) Changes in the Securities Trading Landscape in Europe and the U.S. *Competition and Regulation in Network Industries*, 1, p. 439.

[11] Frankel, T. (1998) The Internet, Securities Regulation, and Theory of Law. *Chicago–Kent Law Review*, 73, p. 1319.

[12] Gross, O. (2015) Cyber Responsibility to Protect: Legal Obligations of States Directly Affected by Cyber-Incidents. *Cornell International Law Journal*, 48, p. 481.

[13] Kokkoris, I. and Olivares-Caminal, R. (2007-2008) Some Issues on Cross-Border Stock Exchange Mergers. *University of Pennsylvania Journal of International Law*, 29(2), p. 455.

[14] Lee, L. (2017) New Kids on the Blockchain: How Bitcoin's Technology Could Reinvent the Stock Market. *Hastings Business Law Journal*, 12, p. 81.

[15] Lévy, P. (1997) Welcome to virtuality. *Digital Creativity*, 8(1), p. 3.

[16] Lévy, P. (2002) *Becoming Virtual – Reality in the Digital Age*. New York: Plenum Trade.

[17] McCullagh, K. (2017) Brexit: Potential Trade and Data implications for Digital and 'fintech' Industries. *International Data Privacy Law*, 7(1), p. 3.

[18] Oostveen, M. (2016) Identifiability and the Applicability of Data Protection to Big Data. *International Data Privacy Law*, 6(4), p. 299.

[19] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation), 32016R0679, OJ L 119, 4.5.2016, p. 1–88.

[20] Reyes, C. L. (2016) Moving Beyond Bitcoin to an Endogenous Theory of Decentralized Ledger Technology Regulation: An Initial Proposal. *Villanova Law Review*, 61, p. 191.

[21] Trautmann, L. J., Harell, A. C. (2017) Bitcoin Versus Regulated Payment Systems: What Gives? *Cardozo Law Review*, 38, p. 1041.

[22] Walch, A. (2015) The Bitcoin Blockchain as Financial Market Infrastructure: A Consideration of Operational Risk. *N.Y.U. Journal of Legislation and Public Policy*, 18, p. 837.

[23] Yadlin, O. Should the Sec Regulate the Cybersecurities Market? *Chicago–Kent Law Review*, 73, p. 1355.

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