ADVICE TO JC

High-level response to JC Discussion Paper 2016 86 on the Use of Big Data by Financial Institutions

The SMSG's overall view of the Big Data phenomenon is consistent with the analysis of its potential benefits and risks identified in the JC Discussion Paper. The use of Big Data by financial institutions has the undisputed potential to improve the variety and quality of service provision; at the same time, the increasing use of Big Data entails a set of investor protection risks which calls for a close monitoring by supervisors.

Nevertheless, the SMGS would like to suggest additional items that account to a few subtle moving parts of a complex phenomenon. *Firstly*, there is a tension between two types of concern: at one end lies the concern of mitigating the effects of asymmetric information between consumers and producers or distributors; at another end lies the risk of creating adverse selection outcomes that would compromise the viability of efficient business models relying on new Big Data technology (see paragraphs 11 and 12 below). *Secondly,* the SMSG points to the need that, to the extent possible, supervisors focus on evaluating the risks identified in the JC Discussion Paper through existing investor and data protection laws, rather than on regulating the data-analysis process. For example, MIFID II requires an investment firm to act honestly, fairly and professionally in accordance with the best interests of its clients, and the risks identified in some parts of this document (see paragraph 3) belong to an area that is already within the scope of existing regulation. *Thirdly,* the SMSG would like to recommend that supervisors be also able to monitor and evaluate risks related to exploitation of Big Data by financial institutions through technology adequate to this scope.

The SMSG has remarks pertaining to three potentially overlapping spaces that illustrate these points:

  (i)   Discriminatory advisory practice and related risks
 (ii)   Data protection and transparency of proprietary modeling
(iii)   The stability of financial market microstructure

(i)   Discriminatory advisory practice and related risks

1. The SMSG agrees that the availability of technology that exploits Big Data may lead to increased risks related to investor protection. Discriminatory advisory practice is a potential area of concern. For example, Big Data analytics may exploit behavioral biases and lead to advisory practice that would not be justified if only based on standard parameters

regarding consumers' risk-return trade-off profiles, as in the hypothetical examples developed in paragraphs 2 and 3 below. Furthermore, Big Data analytics may inadvertently rely on misspecified models and/or unrealistic data input assumptions. These modeling imperfections may well lead to inaccurate predictions and, in some cases, to practices that may result to be detrimental to consumers. Some members of the SMSG also suggest that the lower costs of financial institutions due to the use of Big Data does not automatically mean these will be passed on to consumers. The efficiency gain for consumers can for example be offset by costs of new intermediaries that provide services such as product comparisons and guidance.

2. The following examples aim to illustrate a hypothetical instance of discriminatory advisory practice. Discriminatory advisory practice resembles the classical Pigouvian Third Degree Price Discrimination albeit it is distinct from it. In fact, price discrimination is not illegal in many instances (e.g., in the travel industry) but financial markets do not operate as in the standard instances that lead to price discrimination. Third Degree Price Discrimination in the travel industry (e.g., weekday flight tickets much more expensive than weekend tickets) does not really harm those who pay a higher price, as the latter simply lose some of their (consumer's) surplus otherwise available in a situation with homogenous pricing.

3. By contrast, an automated advice algorithm may be trained to detect consumers' behavioral biases that lead to identify those who are prone to more frequent portfolio rebalancing (there might be additional sources of revenues accruing to the service provider for that). The algorithm may, then, suggest different product solutions to individuals that would otherwise be quite similar regarding, say, their wealth or risk-aversion (i.e., what has been defined as "standard parameters" in paragraph 1 above). A natural question is: Is more frequent rebalancing really needed by investors who simply seek for efficient inter-temporal allocations of their consumption needs? Probably not, because the algorithm was trained to search for behavioral biases with the purpose of identifying consumers who are more likely to trade more often, regardless of the very same consumers' objective of an optimal resource allocation consistent with their wealth or risk-aversion. Naturally, different would have been the situation in which the algorithm contained a well-defined sophisticated dynamic stochastic asset allocation scheme that only focused on achieving an efficient inter-temporal portfolio-consumption allocation from the consumer's perspective.

4. The SMSG notes that the JC Discussion Paper lacks concrete examples (such as those in paragraphs 2 and 3 above) that lead to clarify how Big Data can affect securities markets. In this respect, some member of the SMSG would label the previous discriminatory practices as "distortionary practices," identifying in these distortions any departure from the behavior that the investor would have had in absence of Big Data analytics.

5. More generally, the SMSG notes that while Big Data analytics have the undisputed potential to help financial institutions deliver more homogenous advice to clients, there is also a thin line between targeted sales and the provision of real advice compliant with the necessary regulatory protections. In the context of increasing on-line distribution of financial services, assisted by Big Data analytics, supervisors should be mindful that this line should not be over-stepped.

6. The SMSG proposes that emphasis should be given to the role supervisors should play while evaluating and trying to mitigate such risks. Supervisors should be able to detect

the emergence of these risks, which consumers might likely not. To prevent information asymmetries to be used to consumers' detriment, supervisors should be enabled to monitor and evaluate whether providers of financial services are acting in violation of investor protection rules or through discriminatory behavior. Furthermore, supervisors should intervene once it is ascertained that a risk has materialized that Big Data analytics are being used in violation of investor and data protection laws. Moreover, the SMSG recommends that financial institutions that exploit Big Data own human capital that is appropriately skilled compared to their size or have recourse to relevant expert support so that supervision within firms keeps pace with the enterprise's innovation, thereby mitigating these risks in line with existing regulation.

7. The SMSG would like to emphasize the importance to rely on existing regulatory mechanisms (or new measures that regulators and supervisors should adopt in response of new and unforeseen risks) and ensure that these risks are properly monitored and evaluated. The SMSG considers that, to the extent possible by investor and data protection laws, Big Data analytics should not be the direct focus of regulation. Rather, the SMSG emphasizes that the ultimate scope of supervisors is still to assess whether a breach in investor and data protection laws is likely to have occurred, regardless of whether this instance might have arisen as a result of the use of Big Data analytics.

8. However, the SMSG expects supervisors to have the ability to be intrusive with respect to reviewing Big Data analytics, especially those regarding automated investment advice. Furthermore, while acknowledging the complexity of these tasks, the SMSG also recommends that supervisors deal with the complexities arising from efficient monitoring of Big Data outcomes by relying on the use of surveillance analytics adequate to the scope (e.g., Big Data analytics).

(ii) Data protection and transparency of proprietary modeling

9. The SMSG endorses the concerns expressed in the JC Discussion Paper regarding data protection issues raised by the use of Big Data by financial institutions.

10. The SMSG recommends that data protection in the context of Big Data analytics operate through the channels of existing regulatory frameworks, and that supervisors exert the effort to monitor and evaluate instances of regulation breaches by market participants and data-providers. Examples cover standard areas related to collection, use and storage of data, such as rights to opt-out of collection and dataset resale, rights to be informed about, and opt-out of, automated decisions based on collected data, responsibility of data-holders to protect and encrypt data and identifiers, or responsibility of data-holders in events of data-breach.

11. Consistent with its position expressed above that Big Data regulatory concerns should be predominantly addressed through the existing framework for investor and data protection, rather than an ad-hoc framework specifically designed for Big Data analytics, the SMSG considers that GDPR requirements should be the prism through which any data and privacy concerns should be addressed and enforced. However, the SMSG notes that appropriate consideration should be given to intellectual property considerations inherent in the collection, processing and analysis of data. Two instances in the JC Discussion Paper that illustrate the nature of the SMSG concern for appropriate balance are:

a. "**Consumers also have the right to know the logic involved in the automatic processing of data concerning them, at least in the case of the automated decisions**" (see paragraph 19 of the JC Discussion Paper)

b. "**Overall, in order to ensure compliance with the above requirements but also to preserve consumers' trust, it appears essential for any financial institution looking to use Big Data to be transparent about data processing**" (see paragraph 24 of the JC Discussion Paper)

The SMSG considers that excess transparency may have the potential to lead to unintended adverse selection outcomes. Efficient Big Data technology necessitates vast resources devoted to investments in human and physical capital as well as intellectual property rights. Model transparency could lead only those methods and systems that have relatively lower value to survive, increasing the average risks of model misspecifications that are carried by surviving technologies. In addition, the SMSG notes that disclosure of the type of inputs utilized by Big Data analytics may expose financial institutions to reveal proprietary model biases, thereby transmitting private information to the marketplace, and that accordingly care should be exercised in mandating disclosures which are not otherwise required by GDPR.

12. The SMSG therefore recommends extreme caution regarding a call for disclosure of proprietary models by financial institutions in cases not explicitly considered by the GDPR. (Automated decisions are, obviously, explicitly considered by the GDPR.) In these cases, the SMSG considers that the appropriate supervisory approach should only regard disclosure of proprietary models or model inputs to supervisors, not to the marketplace: while data is private and protected, so is the intellectual property inherent in data analysis methodologies, and transparency requirements should be respectful of this dividing line. Moreover, full public disclosure of proprietary models could lead to opportunistic trading behavior of other market participants that could jeopardise client returns and potentially affect market stability in extreme situations such as those hypothesized in paragraph 14 below. Some members of the SMSG do not share the concerns addressed above and, instead, call for further guidance to guarantee that fundamental privacy principles coined by the GDPR (such as the right to know the logic involved in the automatic processing of data concerning them, at least in the case of the automated decisions), are effectively enforced.

(iii) The stability of financial market microstructure

13. Exploiting Big Data technology may, in some cases, lead to creation of endogenous risk and amplification. Endogenous risk and amplification describe situations in which an initial disturbance to the asset price formation process may trigger actions from market participants that reinforce the initial shock, over a perverse spiral, creating a trend. To illustrate, two trading firms may rely on trading signals based on similar Big Data technologies. Under conditions, their trades may lead to a positive feedback loop: a large market order from one entity has a price impact that becomes a trading signal for the second entity, whereby the ensuing second entity trade has an additional price impact that becomes a trading signal for the first in turn. The resulting and delicate interaction may lead asset prices to spiral over a very small span of time, contributing to a disorderly market and hindering price discovery. This situation would not be conceivable were the trading inputs only based on human generated inputs or previously standard algorithms.

14. The SMSG points at the need that trading venues aim at pro-actively detecting such episodes of market behavior. Trading venues should aim to adopt appropriate market surveillance analytics that lead to efficient trading halts in face of signals pointing to the likely occurrence of such episodes of acute volatility. Moreover, the SMSG strongly expects that national competent authorities have the ability to periodically review the soundness of these surveillance analytics and, more generally, to audit trading algorithms in the context of their supervisory duties. It may be, of course, an open issue as to how to best implement this surveillance while disentangling volatility spirals caused by episodes such as those in the hypothetical examples of paragraph 13 above from volatility spirals caused by sources unrelated to exploitation of Big Data analytics.

This advice will be published on the Securities and Markets Stakeholder Group section of ESMA's website.

Adopted on 7 april 2017]

[signed]

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