Chapter 1
Making the Most of Big Data for Financial Stability Purposes

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ABSTRACT

Big data has become a key topic in data creation, storage, retrieval, methodology, and analysis in the financial stability area. The flexibility and real-time availability of big data have opened up the possibility of extracting more timely economic signals, applying new statistical methodologies, enhancing economic forecasts and financial stability assessments, and obtaining rapid feedback on policy impacts. But, while public financial authorities appear increasingly interested in big data, their actual use has remained limited, reflecting a number of operational challenges. Moreover, using big data for policy purposes is not without risks, such as that of generating a false sense of certainty and precision. Exploring big data is thus a complex, multifaceted task, and a general and regular production of big data-based information would take time. Looking ahead, it is key to focus on concrete pilot projects and share these experiences. International cooperation would certainly add value in this endeavor.

INTRODUCTION

There is general policy interest for “big data”, which is fundamentally changing the character of the information available to public authorities. To put it simply, this term usually describes extremely large data-sets that are often a by-product of commercial or social activities and provide a huge amount of granular information, typically at the level of individual transactions. This form of data is available in, or close to, real time and can be used to identify behavioral patterns or economic trends. Its impact in terms of information creation, storage, retrieval, methodology and analysis has gained increasing importance, and the private sector is already using to a significant extent data patterns from such data-sets to produce new and timely indicators.

The flexibility and immediacy of big data also provide new opportunities for public authorities involved in financial stability policies. In particular, central banks, macro-prudential authorities and financial supervisors are showing an increasing interest, especially at senior policy level. They can have access

DOI: 10.4018/978-1-5225-7077-6.ch001
to a broader and timelier (often on a real-time basis) range of indicators, opening up the possibility of extracting more timely economic signals, applying new statistical methodologies, supporting economic forecasts and financial stability analyses, and obtaining rapid feedback on policy impacts.

Yet there are important peculiarities as regards the role of big data for financial stability issues. Financial stability needs are quite specific, and not all big data fields are equally promising from this perspective. For instance, central banks’ focus is more on those big data sources that can effectively support micro- and macro-economic as well as monetary and financial stability analyses. In contrast, other types of big data sources – such as geospatial information, an increasingly important source for national statistical offices – is often of lower interest to central banks.

Not only is the focus specific, the challenges faced in handling and using big data for financial stability purposes are also particular. For instance, a key input in financial stability assessments relates to the identification of pockets of micro fragilities that can have a system-wide impact – but basing such an identification on large granular data-sets can be difficult because of, for instance, confidentiality protection rules or commercial copyrights. Another example is the feedback loop that is inherent to policy-making authorities: big data sources can affect central bank policy-making, and in turn the policies implemented can generate new data-sets. This relates to the more general Lucas critique, and is a clear distinctive mark compared to other public statistical bodies in the field of big data. One obvious example is the growing number of qualitative statements that can be used to decipher central banks’ communication, by applying big data-related text mining techniques, and which in turn can modify other agents’ actions. Another example relates to the large number of big data pools generated by various financial regulations, since public authorities in charge of supervising financial institutions and monitoring specific market segments can request a lot of (complex and highly rich) information. In turn, big data can strengthen supervisors’ capacity by providing insights into large amounts of unstructured data (Basel Committee on Banking Supervision (BCBS), 2018).

Another key specificity relates to the public nature of financial authorities and the degree of trust they benefit in the pursuing of their mission of promoting monetary and financial stability. They put a great emphasis on the degree of confidence they enjoy in the society and are usually the first to be concerned about possible ethical or reputational consequences of using big data. Moreover, the risk of misusing big data has to be carefully considered, since policy decisions based on wrong data could have incommensurable consequences. Indeed, the public and private sectors may have different areas of concerns from this data quality perspective: for instance, online retailers targeting potential customers based on past web searches might find it acceptable to be “right” once out of five times, but official statisticians would usually consider such an accuracy level of 20% as completely inadequate…

The same applies to security issues. Recent news have highlighted the risk that large private records of personal information collected by social medias could be accessed and potentially misused by unauthorized third-parties. For public authorities, especially those tasked to collect official statistics, such risks are of utmost importance. Among financial supervisors, attention has focused on cyber threat intelligence and cyber threat modelling techniques that should be mobilized, with a focus on firms’ capability to gather and interpret related information (which is increasingly big data-type information, such as the number of computing logs, payments et cetera). More generally, a growing area of focus has been how to ensure the resilience of financial market infrastructures (Committee on Payments and Market Infrastructures (CPMI) & International Organization of Securities Commissions (IOSCO), 2016).