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Working Party No. 3 on Co-operation and Enforcement

Data Screening Tools for Competition Investigations – Note by Singapore

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This document reproduces a written contribution from Singapore submitted for Item 3 of the 136th OECD Working Party 3 meeting on 28 November 2022.

More documents related to this discussion can be found at
www.oecd.org/daf/competition/data-screening-tools-for-competition-investigations.htm

Ms Despina PACHNOU
[Email: Despina.PACHNOU@oecd.org]

JT03506714

Singapore

1. Introduction

1. Competition law in Singapore is administered and enforced by the Competition and Consumer Commission of Singapore (“CCCS”), a statutory body established under the Competition Act 2004 (“**Competition Act**”). Section 34 of the Competition Act prohibits agreements between undertakings, decisions by associations of undertakings or concerted practices which have as their object or effect the prevention, restriction or distortion of competition within Singapore.

2. An example of a hardcore conduct that falls within the Section 34 prohibition is bid-rigging. Tender procedures are designed to provide competition in areas where it may otherwise be absent. An essential feature of the system is that tenderers prepare and submit bids independently. Any tenders submitted as a result of collusion between tenderers will, by their very nature, be regarded as restricting competition appreciably. Forms of bid rigging include cover bidding, bid suppression, bid rotation or market allocation among tenders.

3. Singapore takes a serious view on bid-rigging, particularly in government procurement. Government procurement is governed by the principles of transparency, open and fair competition and value-for-money. However, bid rigging in government procurement undermines these principles and results in harm to the wider society. Competition helps to achieve lower prices, better quality and greater innovation, but this is not possible if bidders agree not to compete. Prices paid by the Government, which is ultimately borne by taxpayers, will not be value-for-money as they are not determined by competition on the merits among independent bidders. This drains precious and limited public funds and undermines public confidence in the Government.

4. To improve efficiency and reduce human error in an area of work that is typically manpower intensive, CCCS has developed a bid-rigging detection tool to flag suspicious tenders for government projects which may be subjected to bid rigging; and a document similarity tool which can be applied to the suspicious tenders to identify similar tender documents between competitors which suggest bid rigging. The two tools are complementary and can be used in combination to identify suspicious tenders and facilitate early intervention by CCCS. This submission provides further information on the tools and the learning points in developing and applying such tools.

2. Bid-rigging detection tool (“BRDT”)

5. In Singapore, public procurement is conducted through the Singapore Government’s one-stop procurement portal (e.g. GeBiz¹) where the public sector’s invitation for quotations and tenders are found. To participate in the invitation for quotations and tenders, interested tenderers are required to submit their proposals via the procurement portal. In addition, they enter their prices, including the total bid price, in specified fields. This implies that structured data on each tender, including winning and losing bids eventually, is available in the central procurement portal. Hence, the BRDT was

¹ www.Gebiz.gov.sg

developed in-house to take advantage of the availability of the structured data in the procurement portal.

6. The BRDT uses a number of quantitative indicators based on common signs of bid rigging and their corresponding expected patterns in bidding data. Broadly speaking, these indicators measure the central tendency and dispersion of the bidding data.

7. The BRDT improves efficiency by automating the bid rigging detection process. In a recent investigation into potential bid-rigging in government procurement, CCCS officers initially manually scanned for suspicious tenders covering a two-year period which identified 12 suspicious tenders. This was a time-intensive exercise, as the officers had to review each tender individually and manually extract the prices from the tender documents submitted by tenderers. Subsequently, the BRDT was applied on tenders over a five-year period which identified 323 suspicious tenders. This was possible because the BRDT utilises data from the procurement portal, allows easy cleaning of the data and automates the price analysis. As a rough indication, each run of the BRDT takes about 5 minutes. Hence, the BRDT has allowed CCCS to expand our coverage and increase sensitivity to suspicious tenders, while saving manhours.

8. In addition, the BRDT was developed on R (programming language) and has been shared with other government agencies in Singapore who may be interested to use the tool via an intra-governmental data analytics platform. As the BRDT is useful even when there is no prior evidence of bid-rigging, random checks can be conducted in the future on government tenders to identify potential tenders that may be subjected to bid rigging.

3. Document similarity tool (“DST”)

9. More recently, CCCS developed the DST in collaboration with Singapore’s Government Technology Agency. Essentially, the DST uses text analytics to compare similarity of documents at sentence and document levels. This allows CCCS to more efficiently detect similarities in tender proposals of competitors which may be indicative of bid rigging and replaces the manual scanning process by CCCS officers which is time consuming and potentially prone to human error.

10. Broadly speaking, the DST uses natural language processing algorithms to assess the degree of similarity between a matrix of documents, such as tender documents.

11. The DST can be a complementary tool to the BRDT. As the BRDT is used to scan procurement data based on price information only, it is useful as an initial screening tool to shortlist suspicious tenders from a wide coverage. In contrast, the DST dives deeper into the text of the tender documents to identify similarities between them, but it is too resource intensive, notwithstanding an automated process, to be applied to all public procurement tenders. Therefore, it would be ideal to feed the bidding documents of the suspicious tenders shortlisted by the BRDT to the DST. This two-step process allows CCCS to identify suspicious tenders and generate documentary evidence, so as to intervene early in bid-rigging cases.

4. Learning points from the development of BRDT and DST

12. In developing the BRDT and DST, it is important to consider these tools as investments that require sacrifices in the short term in order to reap the benefits in the longer term. As a small agency with limited manpower, the development of the tools may stretch internal resources when there are many other cases (perhaps lower hanging fruits which

may reap benefits earlier) to work on. However, it is important to press on steadily, and have the end goal in mind.

13. As the development of sophisticated tools does not fall traditionally within the expertise of a competition authority, it is useful to consider tapping into expertise outside of CCCS. While the BRDT was developed in-house by economists, the DST was developed in collaboration with the professional developers at Singapore’s Government Technology Agency, which provided the technical skills to complement CCCS’s domain knowledge in bid-rigging. The collaboration also helped CCCS officers gain a better understanding of the programming required for to develop such tools.

14. The deployment of the tools is also an important aspect to consider. In absence of proper deployment, such as effective staff training and wider adoption, the tools may remain white elephants. While a small team in CCCS has been trained as “expert” users of the tools to enable continuous improvements, other CCCS case officers have been briefed and trained to use the tools. In addition, CCCS will continue its outreach efforts to other government agencies to encourage them to adopt the tools, including sharing the codes to enable the government agencies to use the tool on their own. Where there is a suitable opportunity and mutual interest, CCCS is also eager to contribute to the international community of competition authorities through code sharing or other means.

15. This has been a learning journey for CCCS for several years, and we will continue to test, apply and improve the BRDT and DST to enhance our enforcement in bid rigging in Singapore.