Roundtable on Antitrust Developments in China Ten Years On
A panel of seasoned practitioners—Mark Cohen, Ninette Dodoo, Michael Han, Su Sun, and Guanbin Xie—share their views on trends observed over the past decade in China’s antitrust enforcement in the areas of merger review, investigation, and litigation; implications of the recent consolidation of the Chinese antitrust agencies; hot topics such as treatment of Standard Essential Patents; and the outlook for the future of antitrust in China.

Looking Ahead: The Integration of Chinese Anti-Monopoly Enforcement Authorities
Earlier this year, China combined its three anti-monopoly enforcement agencies into one new agency, the State Administration for Market Regulation (SAMR). Peter J. Wang, Yizhe Zhang, and Qiang Xue examine the background behind the reform and the major implications of this integration.

A Ten-Year Review of Merger Enforcement in China
Following up on their review of the first five years, Fei Deng and Cunzhen Huang extend their study to include the subsequent five years. The authors survey and examine the latest trends and discuss the characteristics of China’s past merger enforcement that remain.

A Decade in Review: Antitrust Enforcement by China’s NDRC and SAIC
Yong Huang, Elizabeth Xiao-Ru Wang, and Roger Xin Zhang provide an overview of the antitrust investigations conducted by the NDRC and the SAIC in the last decade, an in-depth discussion of two landmark cases, and a prediction of the potential effects of the recent regulatory restructuring on antitrust enforcement in China going forward.

Algorithmic Price Discrimination on Online Platforms and Antitrust Enforcement in China’s Digital Economy
Wei Han, Yajie Gao, and Ai Deng discuss the antitrust implications of “Shashu” practices—algorithmic price discrimination by online platforms where longer-term customers are charged less favorable prices—in China. They explore the potential challenges of applying China’s antitrust law to algorithmic price discrimination and offer some suggestions on how to structure the analysis.

The Role of Computing Infrastructure in Economic Consulting and Litigation
Continuing our series of articles explaining complex antitrust economics principles to lawyers, Allan Shampine, Loren Poulsen, and Michael Sabor offer a very practical look at how progress in computing infrastructure and developments in data availability and size have opened up exciting new possibilities for economic analysis. The authors illustrate the new challenges economic consultants are faced with, what equipment and software are being used to deal with these challenges, and how to avoid or mitigate potential issues.
Roundtable on Antitrust Developments in China
Ten Years On*

Editor’s Note: This roundtable gathers a panel of seasoned practitioners with extensive hands-on experience advising clients on antitrust matters in China. They share their views on trends observed over the past decade of China’s antitrust enforcement in merger, investigation, and litigation; implications of the recent consolidation of the Chinese antitrust agencies; hot topics, such as Standard Essential Patents, digital economy, discovery process, consideration of non-competition factors, and use of economic analyses and economic experts; and the outlook of future antitrust development in China. The Roundtable was conducted by Editor Fei Deng for The Antitrust Source. Fei, a partner at Edgeworth Economics, and Su Sun, a vice president at Economists Incorporated, were co-symposium organizers for the articles on China in this issue of The Antitrust Source.

THE ANTITRUST SOURCE: How has MOFCOM’s merger review practice evolved over the past decade of enforcement, in terms of the procedural process and also the level of sophistication in its analysis?

GUANBIN XIE: From the implementation of China’s Anti-Monopoly Law (AML) in 2008, until its recent replacement by a new agency, the State Administration of Market Regulation (SAMR), the Anti-monopoly Bureau of MOFCOM had been actively engaged in supervising concentrations of undertakings. Regarding the conduct of reviews, MOFCOM continuously optimized its review process and efficiency. It also made great strides in strengthening its evaluations of competition within industries and improved its data management and statistical analysis methods. MOFCOM

* This Roundtable was conducted in writing.
became increasingly specialized and professional in its work until its replacement. Also, MOFCOM attached great importance to international cooperation and carried out extensive cooperation with its counterparts in other parts of the world, such as the European Union and the United States. The experience that MOFCOM acquired, along with its mentality and attitude towards reviews and investigations, are all recorded in related guidelines and implementation rules that they produced, which provide detailed guidance on firms’ notification filings.

**NINETTE DODOO:** MOFCOM’s review practice has evolved significantly in the past ten years, as its decisions show. Three key hallmarks of the regime reflect developments in this period. First, China has established itself as one of the three major antitrust regimes in the world, alongside the European Union and the United States. MOFCOM’s decisions (and now SAMR’s) show that China will not hesitate to intervene in global deals—even if this means blocking a deal that its peers permit, imposing onerous remedies like its unique hold separate remedies, or delaying deal closure. Second, the number of notifications has continued to grow steadily on a year-to-year basis, likely due to the twin effects of increased scrutiny of failure to file cases and the introduction of the simplified case procedure in 2014 designed to accelerate review of no-issues deals. Finally, MOFCOM’s decisions reveal increased levels of sophistication with greater use of economic tools and models comparable to those used elsewhere in the world, such as in the European Union and the United States.

**SU SUN:** I think MOFCOM has become more sophisticated analytically. When difficult analytical issues arise, they sometimes seek external expertise. Based on a couple of cases where I consulted for MOFCOM as their external economic expert, I got the impression that the staff had accumulated a lot of experience in merger review, from analyzing horizontal mergers to evaluating vertical and conglomerate mergers, from defining relevant markets to calculating shares and HHIs, and from evaluating price effects to considering issues, such as entry barriers, efficiencies, and innovation. They were interested in learning about frontier models and new tools, but were also mindful of their limitations. They showed a strong interest to do their work professionally and on a par with international best practices.

**MICHAEL HAN:** Over the past decade, MOFCOM has issued rules to give more certainty and transparency to the merger review process. The agency has also improved in terms of the timing for the review process, including introduction of an expedited review procedure for “simple cases” and its overall sophistication, providing more detail in its decisions, especially in remedies cases, with a greater emphasis on economic analysis of the impact a transaction may have.

In terms of potential areas of improvement going forward, it would be useful if SAMR could continue to improve the transparency of the merger review process and continue to provide fuller explanations of the economic rationale for merger decisions. In addition, I hope that SAMR will consider the possibility of loosening its requirements regarding market definition and market shares for non-issue cases or purely overseas transactions that have no impact on the China market. This would help to reduce the parties’ market data gathering burden. I also hope that SAMR will consider whether in these situations it might be possible to leave the precise market definitions open.

**ANTITRUST SOURCE:** Now that the antitrust divisions within the NDRC and the SAIC, along with the Anti-Monopoly Bureau of MOFCOM, have merged into the new agency, SAMR, will there be more
consistency in the agency’s enforcement, for example, with respect to price-related vs. non-price related conduct?

**MICHAEL HAN:** I anticipate that the merger of the three previous antitrust enforcement authorities into SAMR will improve the consistency of the law enforcement. For example, the SAIC and the NDRC used to have different rules with regards to the sliding scale for the reduction of fines imposed on leniency applicants (i.e., the level of the reduction of fines for the first, second, and third and subsequent applicants). I hope this discrepancy will be eliminated by the merger. The creation of SAMR also means that the agency will be able to look at both price and non-price related conduct in the same investigation. The elimination of overlapping jurisdiction means that undertakings will no longer bear any potential risk of responding to multiple investigations from different agencies with respect to the same conduct.

**NINETTE DODOO:** Although each antitrust authority is ultimately subject to the AML, each authority developed its own unique approach to antitrust enforcement and its own set of implementing rules and regulations. This, in part, is due to differences in institutional design, jurisdiction, and practice among the three antitrust authorities. The merger of the antitrust authorities under SAMR can be expected to set a uniform tone and focus for antitrust enforcement in the future. I think it will enhance consistency of approach and streamline antitrust enforcement in China. The change may be gradual, however, as officials settle into new positions and roles at SAMR—and I anticipate that a new head of the Anti-Monopoly Bureau at SAMR will set the tone and the authority’s future direction.

**MARK COHEN:** It is still too early to see how SAMR will evolve. However, the potential for both improvements, such as greater efficiency and synergies among these former agencies, and adverse outcomes, such as inappropriate influences among these agencies, is enormous. In relation to the IP area, not only have the three antitrust agencies been combined, but the State Intellectual Property Office (SIPO) and the Standard of Administration of China (SAC) are now also part of the agency. One of the first changes I have heard of is that SIPO will reportedly no longer be involved in proposing standards policy, as it had attempted to do under the prior government structure where it was not co-located with an antitrust agency.

**ANTITRUST SOURCE:** How have China’s antitrust agencies prioritized various complaints and investigations, given their limited capacity?

**NINETTE DODOO:** Unlike most major jurisdictions, the majority of investigations in China are currently triggered by complaints. Leniency applications have steadily increased as the antitrust authorities clarify the leniency regime and the business community’s confidence in the regime has grown over time. As in many jurisdictions, the Chinese authorities have prioritized alleged anticompetitive conduct with a potentially significant impact on competition and consumer interests. The authorities initially focused on clear-cut infringements of the AML and, whether by design or coincidence, prioritized cases following the Chinese adage, “killing the chicken to scare the monkey,” as a review of significant investigations suggest. And, as the authorities’ experience with antitrust enforcement increased and investigative techniques matured, they increasingly pursued complex cases, including those with a cross-border element.

**MICHAEL HAN:** To date, the enforcement agencies appear to have taken an industry-focused
approach to investigation. Recently, their primary focus has been on industries with a direct impact on the welfare of individual Chinese citizens, such as the pharmaceuticals and automotive sectors. The agencies have also focused on a number of industries important to China’s economic policies, including ports and public utilities, etc. International cartels are also one of the enforcement agencies’ main areas of focus, the investigations into which are normally triggered by one or more leniency applications.

**SU SUN:** One other factor is how well parties can bring their arguments. Given the agency staff’s busy schedule, they won’t devote much time or resources to an investigation unless there is highly convincing evidence to support a complaint. Thus, those who bring a complaint need to present an analysis with both rigor and clarity, backed by sufficient and concrete evidence. Equally, those who respond to such complaints need to present their response with rigor and clarity as well, and fully address the core concerns. This is where economic analysis plays an important role by providing a useful framework under which parties can exchange arguments and analyses, so that the antitrust agency can be fully informed and evaluate opposing claims and analyses with confidence.

**ANTITRUST SOURCE:** We have seen that both the SAIC’s IP rules and the draft State Council Anti-Monopoly Commission IP guidelines include an essential facilities doctrine for “essential” IP. Have the agencies or the courts applied this doctrine in practice? Do you expect it to be a significant part of enforcement going forward?

**NINETTE DODOO:** The SAIC’s IP rules and the draft State Council Anti-Monopoly Commission IP guidelines both controversially refer to an essential facilities doctrine in relation to essential IP. It is worth noting that the Chinese authorities’ peers, such as those in the United States and the European Union, do not apply such a doctrine to IP. There is genuine concern amongst the business community that the inclusion of an essential facilities doctrine could open the floodgates to antitrust litigation or complaints involving IP rights and ultimately stifle innovation. Having said that, a careful assessment of the criteria under the SAIC IP rules and draft IP guidelines—as well as recent litigation—offers some hope that the strict refusal-to-supply standards set in the European Union will at a minimum inform the approach in China.

**GUANBIN XIE:** The refusal to grant licenses for essential IP has always been a point of contention because ownership of IP has traditionally been like most other forms of ownership: it has been exclusive in nature. Under the essential facilities doctrine, the owners of essential IP may be required to grant licenses to others on a compulsory basis, which in turn, would result in the IP owners losing their exclusive rights. The State Council Anti-Monopoly Commission’s draft IP guidelines mention the essential facilities doctrine but do not discuss it in detail. The draft views the unjustified refusal to grant a license to essential IP as a major factor in deciding whether it constitutes refusal to deal. However, it is still to be seen in future practice how it will be applied by China’s antitrust authorities.

**MICHAEL HAN:** Generally, the essential facilities doctrine is considered to be somewhat controversial when applied to IPRs. For example, during the drafting of the SAIC’s IP rules and with respect to the State Council Anti-Monopoly Commission’s draft IP guidelines, some commentators held the view that applying the essential facilities doctrine to IPRs would substantially impinge upon IPR
holders’ core right to exclude, create disincentives for competitors to develop their own competing IPR, and discourage innovation in general in the long run.

I am not aware of any IP cases in China where the essential facilities doctrine has been applied by the antitrust agencies to date. Given that this doctrine has not yet been used in China and it is highly controversial, I anticipate that SAMR will take a cautious approach to its adoption in practice in the future.

**ANTITRUST SOURCE:** We’ve seen more and more Standard Essential Patent (SEP) cases litigated in China. Why is this happening? Is it easier to get injunctions in Chinese courts on SEPs?

**MICHAEL HAN:** The increase in SEP litigation in China is not surprising considering the fact that China is one of the largest jurisdictions for SEP licensees. China is now host to a number of large OEMs (e.g., in the mobile phones market) which need to obtain licenses from SEP holders. When a dispute arises, this often leads to litigation before the Chinese courts. However, I don’t believe it is generally easier to obtain injunctions pertaining to SEPs in China as opposed to other jurisdictions. In 2016, the Supreme People’s Court issued its Interpretations (II) on Several Issues Regarding Law of Application During Trial of Cases Related to Patent Right Infringement Disputes, in which Article 24 imposes certain restrictions on a patent holder to obtain injunctions pertaining to SEPs in China. That is, if a patent holder violates its FRAND obligations in the negotiation of an SEP license agreement, the courts are unlikely to support the injunctions request by such patent holder. Nevertheless, there are two SEP cases after the 2016 Interpretations, namely, Iwncomm v. Sony and Huawei v. Samsung, in which both plaintiffs’ requests for injunctions were upheld by the court as they did not violate FRAND obligations.

**GUANBIN XIE:** There may be several reasons. First, China is a manufacturing behemoth. Because of this fact alone, the likelihood of SEP cases occurring in China is high. Second, the time scales involved in SEP infringement cases are the same as in normal patent cases in China. Additionally, these time scales are shorter than in the United States. Lastly, for patent infringement cases, the Chinese courts tend to grant injunctions as a tradition, which is limited by the recently adopted Supreme Court’s rules that SEP holders have to comply with FRAND obligations in order to secure an injunction.

**SU SUN:** After China’s (and perhaps the world’s) first judicial decision on FRAND rate was made in Huawei v. InterDigital almost five years ago, I co-authored an article postulating three reasons for increasing SEP and FRAND cases in China: First, China’s continuing integration into the world economy has led to an increasing need for Chinese companies to license patents from multinational companies, particularly in the Information and Communications Technology (ICT) industry. Second, China has been promoting the development of an innovation-based economy and has been promulgating new IPR rules and guidelines, including those related to SEPs. Third, both antitrust enforcement agencies and courts in China have become more confident in pursuing difficult issues, such as FRAND. I’d like to add now an additional observation—that some Chinese firms have emerged in recent years as SEP owners as opposed to merely implementers, for example, IWNCOMM in Iwncomm v. Sony, and Huawei in Huawei v. Samsung. Thus, Chinese firms, in addition to foreign SEP owners, may well initiate SEP litigation. It is likely that the fast-developing ICT industry and the changing licensor-licensee landscape in China will continue to prompt more SEP litigations.
NINETTE DODOO: There is increased focus on the interface between antitrust and SEPs—particularly those related to 3G/4G mobile communications standards—in China, as in other major antitrust regimes. This intensified interest occurs at a time when China has emerged as one of the largest producers of mobile handsets and some Chinese implementers remain concerned that foreign SEP holders may set unreasonable or discriminatory licensing terms or delay negotiations on licensing terms. The uptick in SEP litigation does not necessarily mean that seeking injunctive relief in China is easier. Recent guidance, such as the Guangdong High People’s Court’s guidance, notes factors that courts will consider when determining whether to grant an injunction. The guidance focuses on “subjective fault,” where injunctive relief is available when an infringing party has obvious fault, that is, the infringing party has not acted in good faith. This is broadly consistent with the “willing licensee” test articulated in the European Court of Justice’s [ Huawei v. ZTE ]^

MARK COHEN: China is increasingly seen as a good jurisdiction to litigate patents. There are several reasons for this apart from the importance of the Chinese market and different approaches to SEPs. Some of the reasons include increased transparency of the courts, increased professionalism of the courts, the success of China’s IP courts and a proposed national appellate IP court, the introduction of technical assessors, increasing judicial attention on the issue of SEPs, and an increasingly professional and experienced Bar.

Regarding injunctions, China lacks an eBay doctrine. Chinese courts generally follow continental practice in making injunctions available absent compelling contrary public interests. However, it would be wrong to say that injunctions are always granted in IP cases, and increasingly it is wrong to say that injunctions are always denied in SEP cases. Preliminary injunctions have been especially rare in IP (patent) cases, but this also appears to be changing. Finally, it would be wrong to say that the high rate of injunctive relief means that there is high degree of injunction enforcement. Let’s begin with the last statement.

Once an injunction is issued, the injunction may be stayed pending appeal. In addition, the injunction may be subject to a separate judicial enforcement action. Thus far, the various reports of high injunctive relief have not looked at the judicial enforcement database to determine if the courts had to physically enforce the grant of the injunction. We do not, therefore, know if in fact there is a high rate of actually implementing injunctions.

Historically, preliminary injunctions were quite rare even if they were necessary for certain types of IP infringement (e.g., trademark counterfeiting and copyright piracy). The need for preliminary injunctions may also have been reduced because Chinese courts typically take seven months to adjudicate a patent case. Thus, if a company is financially solvent, there would be no need to pursue a preliminary injunction and instead avoid the risk of having to indemnify the defendant if one lost a case on the merits. There have, however, been two notable cases brought against U.S. companies where Chinese companies obtained preliminary injunctions (the [ Veeco ] and [ Micron ] cases), so circumstances may be changing. Thus far there have been no preliminary injunctions that I am aware of involving a SEP in China, although there have been grants of permanent injunctions ( [ Huawei v. Samsung, Iwncomm v. Sony ]). However, the speed with which the courts have handled the preliminary injunction cases suggests that this is not an impossibility.

I believe it is likely that over the long run a blanket denial of injunctive relief in SEP cases will not continue to hold as the mainstream Chinese judicial practice. The high-water mark in that approach was the [ Huawei v. InterDigital ] case in Shenzhen, where InterDigital’s pursuit of an exclusion order at the ITC was in essence deemed a per se violation of Chinese antitrust law.
There was also a prior Supreme People’s Court opinion on standards and patents, which is rarely cited, that addressed the same issue. Recent cases and policy guidance, such as the *Iwncomm v. Sony* case, appear to be taking an approach based on good faith in negotiations to determine whether judicial intervention is warranted. As China becomes a bigger stakeholder in international standards, such as 5G-related standards, and, in light of China’s efforts to become a technology licensor, I expect that China will no longer be viewing itself as a standards-consuming nation. It is my hope that the precedent however will increasingly “balance” itself so that the pathbreaking cases do not appear to principally involve foreign defendants brought before a Chinese court.

Finally, I caution against uncritically using injunction and win rate data, now available from the courts, to come to conclusions about China as a hospitable forum for foreign non-practicing entities (NPEs). The reality is that we have very few NPE-related cases reported as final decisions by the courts. As settled or mediated cases may not be reported, and since 30 to 50 percent of the cases overall may not be reported, it is difficult to estimate how many NPE cases there really are in the court dockets. We also need to recognize that a Chinese NPE may manifest itself quite differently from a foreign NPE. For example, the Chinese Academy of Sciences has a holding company (CASH) that asserts patents. Also, in the Beijing IP court, nearly one third of the patent assertions were brought by non-service inventors. Anecdotally, some attorneys are saying that China is now a good place for NPEs to litigate because of the availability of injunctive relief. We need to see how the system fully evolves.

**ANTITRUST SOURCE:** Do Chinese courts have jurisdiction over the royalty rates applied in China? In other words, can a Chinese court decide on a global FRAND rate? How enforceable is it?

**GUANBIN XIE:** In principle, Chinese courts can make decisions on royalty rates but will not, in practice, make decisions that are out of their jurisdiction. However, as is stated in Article 16 of the Guidelines for the Trial of SEP Disputes promulgated by the Guangdong High People’s Court, when a SEP holder or an implementer requests a court to determine a FRAND royalty rate, but the licensing territory of the subject SEPs goes beyond the jurisdiction of the court, if the other party raises no objection in the course of litigation or such objection is deemed improper by the court, the court may adjudicate and set a royalty rate for said licensing territory.

**MICHAEL HAN:** The Chinese courts have jurisdiction to set FRAND royalty rates applicable in China, and have previously done so (e.g., in the *Huawei v. InterDigital* case, where the Guangdong High Court upheld a lower court decision to determine the FRAND rate applied to InterDigital’s SEPs). In terms of global FRAND royalty rates, due to comity and uncertainty about enforcement, I expect that the courts will take a conservative approach to setting global FRAND rates. To date, there have not been any IP cases in China where a global FRAND royalty rate has been adjudicated. Nevertheless, the Guangdong Higher People’s Court recently issued guidelines on SEP cases, in which Article 16 suggests that courts in China do have the right to determine FRAND rates for other jurisdictions unless the respondent clearly objects and the objection is found to be reasonable by the court. It is to be seen in future practice whether there is any breakthrough in Guangdong Province where a global FRAND rate can be set in an IP case in China.

In terms of enforceability, Chinese courts’ decisions can be enforced in China, but it is less clear how enforceable these decisions might be outside of China. This is especially true given the lack of anti-suit injunctions typically used by courts in the United States to deter challenges to the enforcement of a global FRAND rate, for example.
MARK COHEN: Chinese courts are increasingly inclined to determine global FRAND rates, particularly, as I understand, in Guangdong. However, Chinese courts rarely enter into any type of comity analysis in determining whether their cases should proceed forward or if a case will interfere with the adjudication in process in another jurisdiction. A good example of this was the Huawei v. Interdigital case mentioned before. An unduly aggressive approach towards asserting global jurisdiction could be highly disruptive. Clearly, Chinese courts currently do have a “chokehold” role in litigating patents, as the Chinese market has become very important and China is the largest manufacturer of high-tech products. Chinese courts also tend to ignore anti-suit injunctions. Although it is rare, one Chinese court in a non-IP case, Huatai P&C Insurance Shenzhen Branch v. Clipper Chartering SA, actually issued an anti-anti suit injunction.

ANTITRUST SOURCE: Other than those related to IP, what other types of antitrust litigation have been active in China?

GUANBIN XIE: Up to April 2018, there are 454 public judgments of antitrust cases available online, among which there are 20 on monopoly agreements and 82 on abuse of market dominance. There are also a small number of administrative monopoly cases. It is noteworthy that abuse of market dominance cases significantly outnumber other types of cases. Regarding the types of industries involved in antitrust litigation, traditional industries, such as automobile, medical, and building materials, play a more active role than others. Emerging industries, such as computers and telecommunications, have also started to witness quite a lot of antitrust disputes.

NINETTE DODOO: Landmark cases outside the IP context include Qihoo 360 v. Tencent, involving an abuse of dominance claim, and Rainbow v. Johnson & Johnson, involving RPM. Although private actions have steadily increased, including following adoption of the Supreme People’s Court’s Judicial Interpretation on the trial of antitrust-related disputes, antitrust litigation has yet to take off significantly in China. For example, we have yet to see significant follow-on damage claims come before the courts (although some cases may settle before trial). This is expected to change as antitrust enforcement intensifies in China and third parties rely on administrative decisions to seek damages in the courts. We have also yet to see substantive attempts to challenge administrative decisions in China. This may be due, in large part, to the negotiated settlement and/or decision that an investigated company will often broker with the antitrust authority.

MICHAEL HAN: There have been a number of cases related to vertical agreements, including RPM and suppliers’ allocation of customers between their distributors, in addition to abuse of dominance cases involving conduct, such as exclusive dealing. An example of these RPM cases is the Rainbow v. Johnson & Johnson case in 2013, where the court took a rule of reason approach, as opposed to the per se illegal approach taken by the NDRC (now SAMR), and ruled that the illegality of an RPM practice must be established on the basis of the harm caused to competition in the relevant market. This approach was also followed in the GREE case before the Guangzhou Intellectual Property Court in 2016, where the plaintiff was held to have failed to convince the court that the RPM agreement in question restricted or eliminated inter-brand competition in the Dongguan city air conditioning market.

An example of the customer allocation cases is one brought against Panasonic Electronics in 2014 by Rijn Electric Co., one of Panasonic’s distributors, after it was penalized for violating a customer-allocation agreement used by Panasonic to prevent competition among its distributors. The claim brought by Rijn was based on there being a horizontal agreement for customer allocation
but the court took the view that the agreement in question was actually a vertical agreement and therefore dismissed the claim.

In respect of exclusive dealing, a recent case of note is the coffee startup Luckin Coffee’s litigation against Starbucks, accusing Starbucks of unfair competition arising out of exclusivity provisions in its rental and supply agreements.

**ANTITRUST SOURCE:** How does the discovery process in China work for litigation matters? Have you encountered any difficulty trying to get the evidence you’d like to obtain?

**MICHAEL HAN:** There is no formal discovery process in China that would be analogous to discovery in common law jurisdictions. In legal proceedings in China, the plaintiff is generally responsible for providing the court with all the supporting evidence necessary to support their arguments and the defendant will not be compelled to produce any documents except those they seek to rely on in the course of a case. Given the lack of discovery process in China, it can often be hard for a plaintiff to obtain sufficient evidence in a case to meet the requisite burden of proof. This often acts as a deterrent to plaintiffs considering whether to bring an antitrust action as they are required to produce most of the required evidence themselves.

**GUANBIN XIE:** In the United States, the discovery process gives litigating parties access to their opponent’s information, documents, and testimony. However, there is no discovery process in China. The nearest legal concept to discovery is evidence exchange, which is mainly organized by the courts. Evidence exchange and methods for dealing with spoliation of evidence are dealt with by the judiciary in accordance with laws, regulations, judicial opinions, and guidelines.

In IP infringement actions, the plaintiff has a preliminary burden of proof to show some form of infringement and the extent of such infringement. If such preliminary evidence is not rebutted, then a court may adopt that evidence and draw adverse inferences from the lack of rebutting evidence. As antitrust cases are also heard by IP judges, the same set of evidentiary rules is applicable in antitrust cases as well. Because IP owners often have great difficulties in producing evidence of infringement, the Beijing Intellectual Property Court has started to create an evidence discovery system for IP actions. This system can be regarded as a consolidation of laws and judicial interpretations. However, it still requires further adjustment and testing to make the system more suitable for Chinese judicial application.

**ANTITRUST SOURCE:** Are there other aspects of China’s antitrust litigation process that U.S. companies or U.S. lawyers might find surprising when preparing for antitrust litigation in China, as compared to what they are used to in the United States?

**MICHAEL HAN:** There are a number of key differences in Chinese litigation that American companies or lawyers might find surprising. Some of the most prominent differences are: (1) there is a lack of discovery (as previously noted); (2) there is no class action procedure; (3) damages awards are quite low—plaintiffs can only claim actual losses, leading to lower overall awards of damages; and (4) there are no jury trials.

I would also like to note that antitrust cases in China are rarely settled—most cases proceed to trial, and cases generally proceed much more quickly than they would in the United States. Unlike the United States, there also have not been any criminal prosecutions for antitrust violations. In China, there is no criminal liability for antitrust infringement itself, unless there is an obstruction of an investigation.
**ANTITRUST SOURCE:** China has a very dynamic digital economy, led by long-time domestic champions, such as Tencent, Alibaba, Baidu, and newer ones, such as Didi and Mobike. What is the Chinese antitrust agencies’ and Chinese courts’ position when dealing with potential antitrust issues encountered in the digital economy?

**GUANBIN XIE:** In the digital economy, big data is transforming business, and increasingly, it is becoming a subject of concern for antitrust authorities. The Chinese authorities have begun to consider the role of big data in mergers and market competition more broadly. The situation is complicated because the anticompetitive acts of internet companies are often hidden and difficult to prosecute. This is a challenge for antitrust authorities, which generally encourage innovation and are trying to create an inclusive environment for the development of prescribed models and structures for internet businesses. They have also paid special attention to the behaviors exhibited by market entities battling for an increase in market share. Such behaviors include data mining and promoting tacit collusion by data sharing. Chinese antitrust authorities are now looking closely at the substitutability of different types of data for different purposes and the role of related but distinct factors, such as the availability of algorithms or other software used to process such data. Antitrust measures have begun to be applied to internet companies to promote economic development and protect consumers.

**MICHAEL HAN:** Due to the dynamic nature of the digital economy, the Chinese enforcement authorities used to take a more relaxed laissez-faire approach to issues in this sector. For example, the Supreme Court held the opinion in 2014 in the *Qihoo 360 v. Tencent* case that the digital economy market is a dynamic market with active market entrants, and therefore a company’s high market share did not necessarily translate to market power. Accordingly, Tencent was held not to have a dominant position even though its market share in the PC and mobile instant messaging market exceeded 80 percent.

However, given the rapid growth in the digital economy in the past decade, the formation of several internet giants, and the active mergers and acquisitions in this market, competition issues are increasingly on the radar of not only antitrust enforcement but also industrial regulatory authorities. In the past year the authorities have been monitoring and investigating big M&A transactions in the industry, conducting market surveys on the competition issues, and promulgating industrial regulations to prohibit “anticompetitive behavior.” On the other side, increasing disputes between internet companies may also lead to potential antitrust investigations and litigation in the future.

**ANTITRUST SOURCE:** Do economic experts play any role in antitrust investigations and litigation in China? How do the antitrust government officials and judges in China view economic analyses presented in antitrust matters?

**SU SUN:** I think there is a clear trend of bringing in economic experts in antitrust investigations and litigation. Enforcement officials and judges are becoming more receptive to reviewing economic expert reports as part of the parties’ submissions and hearing economic experts’ testimony. In the *Tetra Pak* decision, the State Administration of Industry and Commerce (SAIC) spent many pages describing the economics behind the loyalty rebate schemes Tetra Pak employed and their anticompetitive effects. In the *Huawei v. Samsung* decision, the Shenzhen Intermediate People’s Court described and compared the two sides’ economic experts’ opinions in its decision. I think we will see more of such reliance on economic analysis in the years to come.
NINETTE DODOO: Economic experts can play an important role in mergers, investigations, and litigation. The antitrust authorities are increasingly open to economic arguments, and the courts have shown that they will consider economic evidence in appropriate cases. With antitrust still evolving in China, reliance on economists and economic evidence can likewise be expected to evolve with time. For now, reliance on economists and economic evidence is driven by several considerations, including the type of case before the antitrust authority or the courts. Complex mergers (typically those involving remedies), dominance cases (e.g., Qihoo 360 v. Tencent), and SEP disputes (e.g., Huawei v. Samsung) have recently proved to be fertile ground for economic expert evidence in China. As follow-on private actions take off, this area could also lend itself to use of economic evidence and economists.

MICHAEL HAN: Economic experts do play a role in advising on the economic impacts of conduct subject to antitrust investigations and litigation in China. The courts and agency officials in China generally find economists to be useful in antitrust cases. Examples of high profile cases involving economists include the SAIC’s Tetra Pak investigation (2016), the NDRC’s Qualcomm investigation (2015), MOFCOM’s review of Thermo Fisher/Life Technologies merger (2014), and the Supreme Court's Qihoo 360 v. Tencent decision (2014).

GUANBIN XIE: In China, economic analyses have been considered to be of great importance by relevant authorities for both antitrust investigations and litigation. There is a desire among government officials and judges to improve their professionalism in examining or hearing relevant cases by using economic tools. In addition, they may also resort to external experts in major cases to obtain more professional perspectives and support in handling such cases. One well-known example is the second instance of the dispute between Qihoo 360 and Tencent before the Supreme People’s Court. Economic experts presented their analyses at the trial and played an important role in the case. This case is noteworthy because it is a guiding example set by the Supreme People’s Court on the appropriate procedures to adopt when handling expert testimony in antitrust litigation, which is a subject not specifically addressed in China’s Civil Procedural Law.

ANTITRUST SOURCE: This is a perpetual question from outside observers, but do non-competition factors, such as public interest and industrial policy, play a role when Chinese antitrust government officials or judges make decisions? Can you give us some concrete examples?

NINETTE DODOO: Non-competition factors can play a role. In the merger control context, the AML requires the antitrust authority to consider a transaction’s impact on national economic development which implies that non-competition factors need to be taken into account. In the case of investigations, complaints, particularly from Chinese stakeholders, have generally been the source of most investigations in China. With the antitrust authority needing to prioritize cases, the focus has inevitably been on conduct and issues that are likely to affect a wide cross-section of Chinese industry and Chinese consumer interests—and which cases are pursued can be influenced by the prevailing priorities of the day.

ANTITRUST SOURCE: Has there been any appeal of government decisions? Why don’t we see more like what we see in the United States or the European Union? Will this change in the future?

MICHAEL HAN: There have been a number of appeals of government decisions in China, most
recently in *Hainan Yutai Scientific Feed v. Hainan Price Bureau* (an appeal related to an RPM investigation) and a 2015 appeal before the courts in Shaanxi of a penalty decision made against a vehicle inspection fee cartel.

The United States relies on judicial enforcement of antitrust rules (as opposed to unilateral action by enforcement authorities), which has a clearer appeals process, and a much longer history of appeals. The European Union also has a longer history of enforcement actions and a greater body of case law to draw on in lodging appeals of enforcement decisions.

In China, the courts are still deferential to enforcement authorities, so it can be harder to challenge government decisions. There is also a shorter history of antitrust law, so cases are normally only appealed where there are procedural irregularities or legal errors in the government decision. Overall, this means that potential appellants are generally more reticent when it comes to lodging a possible appeal.

**ANTITRUST SOURCE:** What are the key things to watch for in China’s antitrust enforcement in the next ten years?

**SU SUN:** We should watch for any indication that the new enforcement agency, SAMR, will build up its economic analysis capacity, and for any tendency that the courts will raise the bar for economic analysis and testimony so that there will be more rigor and clarity. Then, eventually, they will be more useful to the courts to adjudicate complex antitrust disputes.

**MICHAEL HAN:** In the next ten years, I anticipate that the creation of SAMR will lead to more active and aggressive enforcement of antitrust rules in China. Over time, I hope that we will also see more appeals of enforcement actions. I also anticipate that private enforcement actions (especially follow-on claims) will become increasingly common as case law in this area is built up. Accordingly, I anticipate that antitrust compliance for both domestic and international companies will become increasingly important and that the standard of antitrust compliance in China will continue to rise.

**NINETTE DODOO:** The merger of the three antitrust authorities into SAMR is part of broader institutional reforms in China and underscores the increasing importance of antitrust and its centrality to China’s future development. The merger will shape the future course of antitrust enforcement in the next decade. And recent developments, such as dawn raids, and decisions suggest that the Anti-Monopoly Bureau at SAMR is set for robust enforcement of the AML. As part of an agency with a broad policy portfolio including to drive market reforms, public and national interest considerations could play a larger role in future antitrust enforcement. I think for companies doing business in China, an understanding of, and compliance with, China’s AML is more important than ever before.

**GUANBIN XIE:** First, with the improving awareness of the AML in China, we may see more private civil actions for damages in the future. Investigation decisions made by antitrust authorities may be of relevance in private civil actions. However, the evidentiary value of such investigation decisions remains unclear. It is normal for Chinese courts to defer to the findings of fact made by antitrust authorities during investigations. Nevertheless, the courts have the authority to make a final review of relevant facts. The deference of the courts may lessen a plaintiff’s burden of proof because they would only need to prove that they suffered harm from monopolistic behavior and quantify damages. During antitrust investigations, there are powerful procedural rules which can
help private entities to obtain evidence. Therefore, it remains unclear how the judicial practice would interpret the rules in this regard.

Second, with the development of "big data," new antitrust disputes may arise in the future, such as price discrimination through identifying the highest price a consumer is willing to pay for a product. China's AML prohibits price discrimination exercised by dominant companies, but it remains unclear how the judicial system would define the relevant market and a company's dominance in that market.
Looking Ahead: The Integration of Chinese Anti-Monopoly Enforcement Authorities

Peter J. Wang, Yizhe Zhang, and Qiang Xue

China recently combined its three anti-monopoly enforcement agencies into one new agency known as the State Administration for Market Regulation (SAMR). SAMR was established under the Institutional Reform Plan of the State Council approved in March 2018 that consolidated the antitrust enforcement responsibilities of the Price Supervision and Anti-Monopoly Bureau of the National Development and Reform Commission (NDRC), the Anti-Monopoly Bureau of the Ministry of Commerce (MOFCOM), and the Anti-Monopoly and Anti-Unfair Competition Bureau of the State Administration of Industry and Commerce (SAIC). After a short transition period in April and May, the new agency has begun to carry out its antitrust mission even though its internal organization and leadership has not been finalized.

This long-awaited antitrust institutional reform is one of the significant changes in the recent sweeping restructuring of the Chinese central government. In this article, we will examine and explore the background of the reform and major implications of this integration—such as greater independence and efficiency, reducing overlapping jurisdictional responsibilities, resolving inconsistent rules and practices, and facilitating easier issuance of new legislation and industry guidance.

Background of the Reform

The Chinese government has undertaken institutional reforms approximately every 10 to 15 years to reflect its economic reforms. For example, the Chinese government established the State Economic and Trade Commission and retooled a number of industrial regulatory agencies into economic entities as part of an effort to separate governmental and enterprise related functions in a 1993 institutional reform. After China joined the WTO in 2001, it took further steps to move from a planned economy to a more market-oriented economy. As a result, in the 2003 institutional reform, the National Development and Reform Commission was formed to replace the State Planning and Development Commission, the State-owned Assets Supervision and Administration Commission (SASAC) was formed to supervise state-owned enterprises and manage state owned assets, and the Ministry of Commerce was established to integrate the separate agencies regulating domestic and foreign trade.

The current round of government restructuring appears to be focused primarily on consolidation, in which 24 agencies under the State Council were consolidated into 15 newly established agencies.

1 In addition to the antitrust enforcement authorities, SAMR also assumed the non-antitrust responsibilities of the former SAIC as well as the responsibilities of the former State Food and Drug Administration and General Administration of Quality Supervision, Inspection and Quarantine.
agencies. The previously noted creation of SAMR was only one piece of the puzzle of much larger reforms.³

While consolidation of the antitrust enforcement agencies was contemplated during the drafting of the Chinese Anti-Monopoly Law (AML), it was not clear when such consolidation would take place. Before the enactment of the AML, MOFCOM was responsible for the competition review of foreign merger and acquisition (M&A) transactions; SAIC was responsible for enforcement against unfair competition practices and for consumer protection; and NDRC was responsible for price cartels and price supervision over regulated industries.

The previous three-agency concurrent enforcement structure itself was understood to be a compromise that maintained the pre-AML allocation of responsibilities among the three existing ministries while also establishing in the AML a unifying body (i.e., the Anti-Monopoly Commission of the State Council, or AMC) to coordinate enforcement activities and set overall policy.⁴ While the compromise might have facilitated faster enactment of the AML, criticisms have been focused on the sometimes inconsistent application of the law, as well as imperfect coordination issues arising from the structure. Therefore, when Article 10 of the AML established and set out the basic power and responsibilities of the antitrust enforcement agency of China, the agency is referred to as the “Anti-monopoly Enforcement Authority,” instead of MOFCOM, SAIC, and NDRC separately. The use of this generic name left room for potential further consolidation after the AML was enacted.

**Status of the Reform**

Although it will still take time to complete the reorganization, the integration process is well underway. Former SAIC Minister Zhang Mao has been appointed to head SAMR, but the head of SAMR’s Antitrust Bureau has yet to be announced. It has also been reported that personnel from the antitrust divisions of NDRC and MOFCOM have started moving to their new offices at SAMR, formerly the location of SAIC. MOFCOM has issued an official notice that, as of May 14, 2018, all merger filing documents must be submitted to or picked up from SAMR, rather than from MOFCOM.⁵ Other internal organizational and staffing announcements at the level of Antitrust Bureau within SAMR are expected soon. After a short transition period, the agency seems to be fully operational. Merger clearances under the simple case procedure continue as usual and one even sees a trend of faster clearances, although some high profile transactions may be held up due to lingering uncertainty and other reasons. SAMR also started several new conduct investigations.

In addition, the State Council has recently announced the member agencies of the AMC.⁶ According to the State Council notice, representatives from five additional agencies will be added to the members of the AMC for the first time: SAMR, National Bureau of Statistics, Department of Justice, National Energy Administration, and the People’s Bank of China. These are in addition to the previously existing members, such as NDRC, MOFCOM, SAIC, SASAC, and the Ministry of

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⁶ For the full version of the State Council’s Notice on Adjustment to Members of the AMC (July 19, 2018), see http://www.gov.cn/zhengce/content/2018-07/19/content_5307747 (in Chinese).

Industry and Information Technology. Although the AMC is not responsible for enforcement of the AML in individual and specific cases, the additional members may be expected to exert some high-level influence on the enforcement of AML in general. For example, the National Bureau of Statistics may be expected to contribute to the definition of relevant market and market data by virtue of its access to comprehensive and extensive industrial statistics. The National Energy Administration and the People’s Bank of China will add another layer of industrial policy consideration with respect to high-level competition policy setting.7

As illustrated in the chart below, MOFCOM and NDRC will continue to perform other non-antitrust functions, such as supervision of foreign trade policy and foreign investment policy. Similarly, in addition to its antitrust functions, SAMR will also have other responsibilities, e.g., functioning as a food and drug regulator.

Potential Implications of the Reform

The consolidation of enforcement from three separate agencies into one is likely to have a profound impact on Chinese anti-monopoly enforcement.

Combining Enforcement Resources for Solid Enforcement. Lack of enforcement personnel and resources has been one of the major hurdles faced by the three previous enforcement agencies. There has long been a substantial imbalance between the high number of cases handled by each of the previous AML enforcement agencies and their limited staffing. The total headcount of the previous three antitrust bureaus was probably over 100. However, less than half of those officials were actually handling specific antitrust cases. The total number of personnel is unlikely to expand significantly in the near future and, thus, SAMR still will be understaffed as compared to U.S. and EU antitrust agencies. The consolidation will, however, allow SAMR to combine existing enforcement resources, streamline the enforcement process, and optimize the use of resources for its enforcement priorities.

SAMR may also be able to combine the respective experience and skills of the three agencies with respect to various types of data and industries in an attempt to improve overall enforcement efficiency. For example, MOFCOM’s extensive experience and knowledge in market definition and
assessments of market power may prove helpful with enforcement efforts targeted toward abuse of dominance. In particular, MOFCOM—after reviewing over two thousand mergers—has accumulated perhaps the most data among the three agencies, which can now be better used as a resource for non-merger investigations previously carried out by NDRC and SAIC.

**Reducing Jurisdictional Uncertainty.** The lack of clear allocation of authority among the three agencies was the target of criticism from the very beginning. For example, although NDRC was responsible for price-related AML violations and SAIC for non-price-related AML violations, in practice, violations often included elements of both, giving rise to jurisdictional overlap between agencies. For example, in NDRC’s 2017 penalty decision against two pharmaceutical companies for abuse of dominance by unfair pricing in the market for isoniazid Active Pharmaceutical Ingredients, the agency also found an illegal refusal to deal, a non-price-related violation. Similarly, in SAIC’s penalty decision against Tetra Pak for bundling, it also found anticompetitive loyalty rebates, a price-related violation that would fall under the jurisdiction of NDRC.

In an effort to avoid such conflicts, the agencies are understood to have followed an internal rule of “first to initiate, first to investigate,” according to which the first agency to formally initiate a case would carry out the investigation. However, private parties seeking leniency or reporting AML violations still were required to report to both agencies since they could not know which agency would first initiate the case.

The combination of the three antitrust authorities will resolve the tension created by overlapping jurisdictions.

**Harmonizing Inconsistent Rules and Practices Among Agencies.** The establishment of the new agency is expected to facilitate the harmonization of inconsistent rules and/or practices under the old regime.

For example, the leniency provisions in the SAIC and NDRC rules differ in significant and important ways, including whether leniency applies to the organizer of the anticompetitive agreement, the definition of “important evidence,” and the specific implementation of the leniency program. The table below illustrates some of the inconsistencies and uncertainties that, pre-reorganization, appear to have hampered the effective implementation of the leniency rules.

<table>
<thead>
<tr>
<th>Agency</th>
<th>Whether Applicable to Organizer</th>
<th>Definition of “Important Evidence”</th>
<th>Implementation of Leniency</th>
<th>Level of Reduction of Fines</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAIC</td>
<td>No</td>
<td>Evidence that plays a key role in the decision to initiate an investigation or in a finding of monopoly agreement.</td>
<td>The first to voluntarily self-report and provide Important Evidence, and comprehensively and voluntarily cooperate with the investigation.</td>
<td>Should be exempted from penalties.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Others that voluntarily self-report and provide Important Evidence.</td>
<td>Reduction of penalties at SAIC’s discretion.</td>
</tr>
<tr>
<td>NDRC</td>
<td>No clear prohibition</td>
<td>Evidence that will play a critical role in finding a price monopoly agreement.</td>
<td>The first to voluntarily self-report and provide Important Evidence.</td>
<td>May be exempted from penalties.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>The second to voluntarily self-report and provide Important Evidence.</td>
<td>May be granted a 50% or more reduction of penalties.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Others that voluntarily self-report and provide Important Evidence.</td>
<td>May be granted a 50% or less reduction of penalties.</td>
</tr>
</tbody>
</table>
more than 20 percent of the affected relevant markets (or in markets with at least four other independently controlled substitutable technologies available at reasonable cost); or (2) companies in vertical relationships, with none having more than a 30 percent market share (or where at least two other independently controlled substitutable technologies are available at reasonable cost). However, the draft antitrust guidelines that NDRC issued on behalf of the AMC for public comment contain slightly lower market share thresholds (15 percent for horizontal relationships and 25 percent for vertical relationships) for the safe harbors, leaving uncertainty as to how parties with in-between market shares would be treated.

These inconsistencies have caused confusion and uncertainty in AML enforcement. With the integration of antitrust authorities, it can be hoped that the new agency will be able to harmonize prior inconsistent rules and practices. However, it is likely that, at least for some initial period, regulations promulgated by the respective legacy enforcement agencies will remain in effect until new rules are available to replace them.

**More Efficient and Independent Enforcement.** The institutional reform of the Chinese antitrust agencies also reflects the government’s increasing focus on antitrust and competition issues. There has been a steady trend of increasing antitrust enforcement since the birth of the AML in 2008. The three legacy agencies had become more and more active in their enforcement actions, however measured: the level of fines; the number of companies under investigation or transactions under review; the range of industries under scrutiny; and their willingness to look into more complicated competition issues. With broader and unified authority, the new agency will only be more active and aggressive in its enforcement of China’s AML. Zhang Mao, the head of SAMR, recently stated that the new agency will “strengthen antitrust and anti-unfair competition enforcement.”8 Moreover, as noted above, SAMR should be able to combine the respective experience and skills of the three agencies in an attempt to improve the overall quality of enforcement.

Under the old structure, both NDRC and MOFCOM maintained—as they continue to do now—other arguably more important responsibilities beyond antitrust enforcement, particularly for industrial policy (NDRC) and trade policy (MOFCOM). Thus, there always were concerns about industrial and trade policy considerations influencing merger reviews, conduct investigations, and competition analysis. Specifically, one of NDRC’s main functions is to “put forward targets and policies concerning the development of the national economy, the regulation of the overall price level and the optimization of major economic structures.”9 Similarly, one of MOFCOM’s functions is to “formulate the strategies, guidelines and policies of developing domestic and foreign trade and international economic cooperation.”10 Such policy-driven functions motivated by national economic interest raised concerns as to whether the anti-monopoly conduct investigations and merger review procedures of the same agencies would remain independent in cases or transactions that may have a potential impact on the industrial or trade policy that the agencies were also charged with promoting.

After the integration, it may be hoped that the new antitrust enforcement agency will be able to maintain greater distance from MOFCOM and NDRC, and presumably thus also from industrial and trade policies. If so, then the antitrust enforcement of SAMR may be able to become more

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After the integration, it may be hoped that the new antitrust enforcement agency will be able to maintain greater distance... from industrial and trade policies.

**Accelerating the Legislative Process.** Last but not least, the consolidation may also influence ongoing antitrust legislative efforts. In September 2017, a number of seminars and workshops were held by the legacy antitrust enforcement agencies to discuss potential amendments to the AML. In addition, in 2015 and 2016 NDRC also issued for public comment, on behalf of AMC, several draft guidelines on various antitrust issues. These guidelines included: Guidelines on Abuse of Intellectual Property Rights, Guidelines on Anti-Monopoly in Automobile Industry, Guidelines on Leniency, Guidelines on Commitments of Undertakings, Guidelines on Calculation of Illegal Gains and Penalties, and Guidelines on Exemption from Monopoly Agreement.11 These guidelines reflect China’s ongoing efforts to increase the transparency and predictability of AML enforcement. However, none of the above efforts resulted in the issuance of new amendments or final guidance. Part of the reason for the delay is believed to be unresolved conflicts and competition among the legacy enforcement agencies. The consolidation of the agencies into SAMR likely will smooth in due time the legislative process.

China has become one of the important jurisdictions for global merger clearances and competition law compliance by putting its own stamps on global transactions and aggressively enforcing against conduct, such as resale price maintenance, bundling, and abusive licensing practices involving intellectual property rights. Some continuity in enforcement can be expected for at least the short term given that the AML will be enforced by essentially the same group of enforcement personnel, albeit with some restuffing. In addition, the consolidation will provide new momentum for antitrust enforcement in China.

A Ten-Year Review of Merger Enforcement in China

Fei Deng and Cunzhen Huang

Another five years have passed since we last reviewed the first five years of merger enforcement in China.1 Earlier this year, at the dawn of the tenth anniversary of the enforcement of China’s anti-monopoly law (AML), the three Chinese antitrust agencies merged into a new agency—the State Administration for Market Regulation (SAMR)—and the Anti-Monopoly Bureau (AMB) within the Ministry of Commerce (MOFCOM), which was responsible for merger reviews in China, is now history. While uncertainty remains, the new agency has kept pretty much all of MOFCOM AMB’s original staff, and there has not been any report of significant change with respect to how they handle merger filings. Therefore, it is still worthwhile to summarize the past characteristics of MOFCOM’s merger review, which may provide some insights on the future trends in merger enforcement in China.

General Overview

Similar to the trend we observed before, the vast majority of filings that MOFCOM reviewed were cleared unconditionally.2 Through the first quarter of 2018, MOFCOM completed the review of 2,151 filings in total, of which 2,052 were cleared unconditionally, 36 were cleared with conditions, and 2 were blocked.

As observed in Chart 1, the number of filings and the number of reviews completed each year have been steadily rising.3 In fact, MOFCOM’s work load increased about five times since it started, undertaken by roughly the same number of staff members—around 30—and compounded by a high staff turnover rate.4

In an effort to quickly screen out filings that are less likely to have anticompetitive concern, in February 2014 MOFCOM adopted a simplified procedure implementing a much shorter review

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2 When MOFCOM blocked a transaction or gave conditional clearance, it published a detailed decision immediately. On unconditional clearance, through 2012, MOFCOM periodically published the names of the merging parties involved and the total number of clearances within a certain period. These reports were published on a regular quarterly basis starting at the end of 2012. See http://fldj.mofcom.gov.cn/article/zcfb/ (where MOFCOM publishes the unconditional clearance data) and http://fldj.mofcom.gov.cn/article/zbx/ (where MOFCOM publishes its intervention decisions). SAMR has been publishing intervention decisions on its website since July 25, 2018.
3 There is sometimes a gap between the number of cases filed and the number of cases accepted, and between the number of cases accepted and the number of cases reviewed each year (see Chart 1). As for the first gap, possible explanations are: (1) a natural time lag, i.e., cases were filed at the very end of the year and accepted early the next year, or (2) the deal cratered and the filing was withdrawn after the initial submission but before acceptance. As for the second gap, again, other than a time lag (i.e., cases were accepted and under review toward the end of one calendar year but the review was not finished until the next calendar year), it may reflect filings withdrawn by the merging parties.
4 It was reported that as of July 2017, there were fewer than 40 staff, of which fewer than 20 oversaw case review (as opposed to administrative responsibilities). See http://www.sohu.com/a/160721099_260616. For a list of MOFCOM officials who left the agency in 2016 and in 2017, see http://www.mofcom.gov.cn/article/jhguihua/redianzhuizong/201701/20170102499680.shtml, and http://www.mofcom.gov.cn/article/jhguihua/redianzhuizong/201804/20180402737872.shtml.
timeline for “simple cases” that satisfy certain criteria, such as (in the case of horizontal mergers) where the combined market share of all parties is below 15 percent. By our count, 750 cases have been filed through the simplified procedure up to May 23, 2018. Although the simplified procedure has successfully reduced the clearance time for many transactions to within a month after acceptance, MOFCOM may have been increasingly stringent in applying the criteria.

Chart 2 shows a significant change in the industry distribution of filings compared to what we observed in our five-year review. The service industry encompasses a much higher percentage in recent years, changing from 6 percent over the first five years to 12 percent over the ten years, reflecting the fast development of the service industry both globally and in China, while some of the more traditional industries, such as gas, oil, and energy, are trending down, representing 10 percent over the first five years while only 6 percent over the ten years.

In terms of the nationality of the filing parties (based on the location of their corporate headquarters), as shown in Chart 3, among the acquisitions, 46 percent involve a foreign firm acquiring another foreign firm, followed by 29 percent where a Chinese firm acquired another Chinese firm, 15 percent where a foreign firm acquired a Chinese firm, and 11 percent where a Chinese firm acquired a Chinese firm, and 11 percent where a Chinese firm acquired a Chinese firm.

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6 MOFCOM publishes basic information about filed simple cases on its website: http://fldj.mofcom.gov.cn/article/jyzjyajgs/. Each case has a 10-day window for the public to file a complaint. We have counted the total number of simple cases posted here up to May 23, 2018.

A few non-acquisition mergers involved reorganization of the company’s assets, expansion of the company’s business divisions, or increase in capital share.
icantly. Specifically, while the domestic to domestic acquisitions accounted for only 18 percent of all acquisition filings MOFCOM reviewed during the first five years, they account for 29 percent when looking at the past ten years. Filings involving a domestic firm acquiring a foreign firm accounted for 7 percent of all acquisitions during the first five years, while representing 11 percent over the ten-year period. This shows that, while there may have been an underfiling by domestic firms during the first few years of China’s merger enforcement, it has significantly improved, probably due to MOFCOM’s stricter enforcement against violators in recent years. In particular, MOFCOM adopted a public “name and shame” measure for non-filers starting in 2014. By our account, up to April 18, 2018, 46 firms have been publicly named, shamed, and fined, among which 28 are domestic, including 13 State Owned Enterprises (SOEs).

An In-depth Study of Decisions Where MOFCOM Intervened

Next we delve into those decisions where MOFCOM either imposed remedies or blocked the deal, i.e., intervened. MOFCOM releases a public notice for every case in which it intervenes, but does not do so for unconditionally cleared cases. We have collected relevant information from these public notices to analyze whether there is any observable trend in MOFCOM’s written decisions. Again, there have been a total of 38 such decisions so far—36 conditional clearance and 2 blocked decisions. Among these, 17 (16 conditional clearances and 1 blocked decision) happened during the most recent five years, after our five-year review. In some of the analyses that follow, we compare all of these decisions across the whole ten years to summarize the overall trend, while in others we focus on those that happened during the most recent five years to avoid repeating what has already been stated in our five-year review.

Length of Written Decisions. Overall, the level of detail in a MOFCOM decision has increased, as can be observed in Chart 4. This may reflect that MOFCOM has increased the transparency and sophistication of its analyses over time.

Two decisions—Thermo Fisher/Life Tech and Microsoft/Nokia—are particularly lengthy. The Thermo Fisher/Life Tech decision contains the results of various economic analysis and a detailed remedy proposal submitted by the parties and approved by MOFCOM. The Microsoft/Nokia decision contains a detailed list of Microsoft’s patents. Other lengthy decisions, such as Bayer/Monsanto, Advanced Semiconductor Engineering (ASE)/Siliconware Precision Industries (SPI), and Dow/Du Pont are mostly due to the inclusion of a detailed remedy proposal in the decision.

Duration of Review. We observed in our five-year review that MOFCOM’s review periods tend to be long. The long review time is perhaps an expected norm by now. Even though MOFCOM has adopted an expedited review procedure for cases deemed to be “simple,” normal cases cannot take advantage of this process. Also, we have not observed any trend that would indicate that this procedure has alleviated MOFCOM staff’s burden and thus indirectly benefited other cases by devoting more resources to them and consequently speeding up the review process.

In fact, the recent ASE/SPIL case that closed in November 2017 broke MOFCOM’s own record in total duration of review. It took MOFCOM 111 days to accept the case and another 345 days to complete the review. The merging parties withdrew and refiled by the end of phase III in the first round and went through a second round of review, making the total review time 456 days from the

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10 These notices are posted on MOFCOM’s website, http://fldj.mofcom.gov.cn/article/ztxx/.
Antitrust agencies in other jurisdictions, such as the DOJ and the European Commission, also took a long time to review this merger. The DOJ issued a conditional clearance two months after MOFCOM. See Press Release, U.S. Dep’t of Justice, Justice Department Secures Largest Negotiated Merger Divestiture Ever to Preserve Competition Threatened by Bayer’s Acquisition of Monsanto, https://www.justice.gov/opa/pr/justice-department-secures-largest-merger-divestiture-ever-preserve-competition-threatened.

Market Definition, Market Share, and Concentration. MOFCOM delineates the relevant product market and geographic market in every case. In addition, MOFCOM always starts the analysis by laying out the market shares of the merging parties, which is then sometimes followed by a calculation of the HHI if the merger contains a horizontal overlap.

Similar to what we did in our five-year review, in Chart 6 we list the market shares of each of the individual merging parties, along with their combined market share, where indicated by MOFCOM, for cases with a horizontal overlap. We will not repeat the cases we have already covered in our five-year review here—the transactions we list start from October 1, 2013. Similar to what we observed before, the combined share of the merging parties covers a wide range—from more than 90 percent in transactions, such as Abbott/St. Jude Medical and some markets in Bayer/Monsanto, to 25–30 percent in transactions, such as ASE/SPIL.

11 Antitrust agencies in other jurisdictions, such as the DOJ and the European Commission, also took a long time to review this merger. The DOJ issued a conditional clearance two months after MOFCOM. See Press Release, U.S. Dep’t of Justice, Justice Department Secures Largest Negotiated Merger Divestiture Ever to Preserve Competition Threatened by Bayer’s Acquisition of Monsanto, https://www.justice.gov/opa/pr/justice-department-secures-largest-merger-divestiture-ever-preserve-competition-threatened.
Competitive Effects Analyses. It can be observed from Chart 7 that MOFCOM may have lessened its concern about purely vertical and conglomerate mergers, but not totally. Over the past five years (since October 1, 2013), among the 17 cases where MOFCOM intervened, 10 cases were horizontal, one case was vertical, two cases were a mixture of horizontal and vertical, two were a mixture of horizontal and conglomerate, one was a mixture of vertical and conglomerate, and one was conglomerate. While in our previous five-year review, we counted that among the 21 cases where MOFCOM intervened before October 1, 2013, 12 cases were horizontal, five cases were vertical, two were a mixture of horizontal and vertical, and two were conglomerate. Consistent with what we observed in our five-year review, MOFCOM’s decisions almost always contain assessments of the significance of barriers to entry but have yet to mention consideration of any “hot” documents, customer complaints, or efficiencies.

There is one specific type of competitive harm that we notice MOFCOM has started alleging in some of the more recent cases—concern about bundling or tying certain products of the merging parties. In Merck/AZ Electronic Materials (2014), MOFCOM focused on two products that are raw materials for the manufacture of flat panel displays—liquid crystal and photoresist, each defined to be a separate market. Merck produces only liquid crystal, and AZ Electronic Materials produces only photoresist. Thus, there is no horizontal overlap between the merging parties, but it could be deemed to be a conglomerate merger. MOFCOM was concerned that the merged firm would become the largest supplier of both liquid crystal and photoresist, while other competitors were able to supply only one product alone. Competitors’ shares were relatively small and MOFCOM was concerned that the merged firm would be able to engage in tied or bundled sales of these two products and thus harm competition. Similar concerns related to possible bundling or tying were also raised in Broadcom/Brocade (2017), HP/Samsung Electronics (2017), and Bayer/Monsanto (2018).
Chart 6
Market Shares of Merging Parties in Relevant Markets for Mergers with Horizontal Overlap
Where MOFCOM Intervened
October 2013 - March 2018

<table>
<thead>
<tr>
<th>Company 1</th>
<th>Company 2</th>
<th>Company 3</th>
<th>Combined Share</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cell Culture Global</strong></td>
<td>50.0</td>
<td>40%-60%</td>
<td>40%-60%</td>
</tr>
<tr>
<td><strong>SSP Kits China</strong></td>
<td>22.5</td>
<td>45.0%</td>
<td>45.0%</td>
</tr>
<tr>
<td><strong>SDS-PAGE Protein Standards China</strong></td>
<td>55.0</td>
<td>56.0%</td>
<td>56.0%</td>
</tr>
<tr>
<td><strong>siRNA Global</strong></td>
<td>85.0</td>
<td>80%-90%</td>
<td>80%-90%</td>
</tr>
<tr>
<td><strong>Thermo Fisher /Life Tech</strong></td>
<td>Asia - Europ Trade Lane</td>
<td>20.0</td>
<td>46.7%</td>
</tr>
<tr>
<td><strong>2G and 3G Standard SEPs</strong></td>
<td>40.0</td>
<td>35%-45%</td>
<td>35%-45%</td>
</tr>
<tr>
<td><strong>RF Power Transistor 2013 Global</strong></td>
<td>30.3</td>
<td>51.1%</td>
<td>51.1%</td>
</tr>
<tr>
<td><strong>RF Power Transistor 2014 Global</strong></td>
<td>22.0</td>
<td>54.0%</td>
<td>54.0%</td>
</tr>
<tr>
<td><strong>AB InBev/SAB Miller</strong></td>
<td>Beer China</td>
<td>43.0%</td>
<td>43.0%</td>
</tr>
<tr>
<td><strong>Abbott/St. Jude Medical</strong></td>
<td>Small Vessel Occluders China</td>
<td>72.0</td>
<td>95.2%</td>
</tr>
<tr>
<td><strong>Dow/Du Pont</strong></td>
<td>Rice Herbicides China</td>
<td>40.0</td>
<td>Almost 40%</td>
</tr>
<tr>
<td></td>
<td>Acid Copolymer China</td>
<td>33.0</td>
<td>48.0%</td>
</tr>
<tr>
<td><strong>Acid Copolymer Global</strong></td>
<td>48.0</td>
<td>75.0%</td>
<td>75.0%</td>
</tr>
<tr>
<td><strong>Lonomers China</strong></td>
<td>100.0</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td><strong>Lonomers Global</strong></td>
<td>90.0</td>
<td>91.0%</td>
<td>91.0%</td>
</tr>
<tr>
<td><strong>Broadcom/Brocade</strong></td>
<td>Fibre Channel SAN Switches Global</td>
<td>50.0</td>
<td>70%-80%</td>
</tr>
<tr>
<td></td>
<td>Fibre Channel SAN Switches China</td>
<td>60.0</td>
<td>40%-50%</td>
</tr>
<tr>
<td></td>
<td>Fibre Channel Hot Bus Adapters Global</td>
<td>60.0</td>
<td>40%-50%</td>
</tr>
<tr>
<td></td>
<td>Fibre Channel Hot Bus Adapter China</td>
<td>50.0</td>
<td>40%-50%</td>
</tr>
<tr>
<td><strong>HP/Samsung</strong></td>
<td>A4 Laser Printer and Printing Supplies China</td>
<td>47.5</td>
<td>50%-55%</td>
</tr>
<tr>
<td><strong>Agrium/PotashCorp</strong></td>
<td>Potassium Chloride Fertilizer Global</td>
<td>50.0</td>
<td>50.0%</td>
</tr>
<tr>
<td><strong>Maersk/MSC/CMA-CGM</strong></td>
<td>Reefer Container Shipping Far East - SAWC Route by Volume</td>
<td>72.5</td>
<td>70%-75%</td>
</tr>
<tr>
<td></td>
<td>Reefer Container Shipping Far East - SAWC Route by Capacity</td>
<td>72.5</td>
<td>70%-75%</td>
</tr>
<tr>
<td><strong>Maersk/Hamburg Süd</strong></td>
<td>Reefer Container Shipping Far East - SAEC Route by Volume</td>
<td>77.5</td>
<td>75%-80%</td>
</tr>
<tr>
<td></td>
<td>Reefer Container Shipping Far East - SAEC Route by Capacity</td>
<td>77.5</td>
<td>75%-80%</td>
</tr>
<tr>
<td><strong>Nokia/Alcatel</strong></td>
<td>2G and 3G Standard SEPs</td>
<td>40.0</td>
<td>35%-45%</td>
</tr>
<tr>
<td><strong>NXP/Freescale</strong></td>
<td>RF Power Transistor 2013 Global</td>
<td>20.8</td>
<td>51.1%</td>
</tr>
<tr>
<td></td>
<td>RF Power Transistor 2014 Global</td>
<td>32.0</td>
<td>54.0%</td>
</tr>
<tr>
<td><strong>ASE/SPIL</strong></td>
<td>Semiconductor Packaging and Testing Services Global</td>
<td>27.5</td>
<td>25%-30%</td>
</tr>
<tr>
<td><strong>Becton Dickinson/C. R. Bard</strong></td>
<td>Core Needle Biopsy Devices China</td>
<td>50.0</td>
<td>50.0%</td>
</tr>
<tr>
<td><strong>Bayer/Monsanto</strong></td>
<td>Long-day Onion Seeds China</td>
<td>47.5</td>
<td>Over 60%</td>
</tr>
<tr>
<td></td>
<td>Carrot Seeds under Cutting Process for Sale China</td>
<td>47.5</td>
<td>Over 60%</td>
</tr>
<tr>
<td></td>
<td>Large-fruit Tomato Seeds China</td>
<td>50.0</td>
<td>15.0%</td>
</tr>
<tr>
<td></td>
<td>Cotton Traits Global</td>
<td>57.5</td>
<td>55%-65%</td>
</tr>
<tr>
<td></td>
<td>Soybean Traits Global</td>
<td>57.5</td>
<td>55%-65%</td>
</tr>
<tr>
<td></td>
<td>Oilseed Rape Traits Global</td>
<td>37.5</td>
<td>90%-95%</td>
</tr>
</tbody>
</table>

Notes:
1 Company 1 is the first company shown in the case name (e.g., for Microsoft/Nokia, Company 1 is Microsoft and Company 2 is Nokia).
2 Only the combined market shares, but not the individual ones, are available in the published decision.
3 Decisions in these mergers provide only an estimate or a range of market shares, but not the exact numbers. When the share is stated in the decision as a range, the number on the bar in this graph is taken from the midpoint of the range, while the range itself is indicated on the right side of the bar.
4 In the Maersk/Hamburg Süd case, Company 2 refers to parties to ASPA Agreements for Far East-SAEC route and parties to Asia 2 Agreement, of which Hamburg Süd had joined. The combined market share of Reefer Container Shipping Far East-SAEC South Route by volume was 75–80%.

Source: http://fldj.mofcom.gov.cn/article/ztxx
As shown in Chart 8, consistent with what we observed in our five-year review, MOFCOM continues to routinely seek opinions and information from third parties, including other relevant government agencies, trade associations, upstream and/or downstream firms, and competitors. MOFCOM also continues to utilize outside experts in law, economics, the relevant industry, and the relevant technical areas. The process of MOFCOM’s consultation with other agencies and entities remains opaque, especially with respect to the type of information and opinions obtained from other Chinese government agencies and trade associations and how MOFCOM views and utilizes such information.

**Chart 8**

Third-Party Information and Opinions Sought Out By MOFCOM for Cases Where MOFCOM Intervened

<table>
<thead>
<tr>
<th>Case</th>
<th>Other Relevant Government Agencies</th>
<th>Trade Association</th>
<th>Downstream Firms</th>
<th>Competitors</th>
<th>Outside Experts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermo Fisher/Life Tech (2014)</td>
<td>Y</td>
<td>Y</td>
<td>Maybe³</td>
<td>Maybe¹</td>
<td>Economic Expert</td>
</tr>
<tr>
<td>Microsoft/Nokia (2014)</td>
<td>Y</td>
<td>Y</td>
<td>Maybe¹</td>
<td>Maybe¹</td>
<td></td>
</tr>
<tr>
<td>Merck/AZ Electronic (2014)</td>
<td>Y</td>
<td>Y</td>
<td>Maybe¹</td>
<td>Maybe¹</td>
<td>Economic Expert</td>
</tr>
<tr>
<td>Maersk/MSC/CMA-CGM (2014)</td>
<td>Y</td>
<td>Y</td>
<td>Maybe¹</td>
<td>Maybe¹</td>
<td>Legal Expert and Economic Expert</td>
</tr>
<tr>
<td>Corun/Toyota China/PEVE/ ZhongYuan/</td>
<td>Y</td>
<td>Y</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Nokia/Alcatel (2015)</td>
<td>Y</td>
<td>Y</td>
<td>Maybe¹</td>
<td>Maybe¹</td>
<td>—</td>
</tr>
<tr>
<td>NXP/Freescale (2015)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>—</td>
<td>Industry Expert</td>
</tr>
<tr>
<td>AB InBev/SAB Miller (2016)</td>
<td>Y</td>
<td>Y</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Abbott/St. Jude Medical (2016)</td>
<td>Y</td>
<td>Y</td>
<td>—</td>
<td>—</td>
<td>Industry Expert</td>
</tr>
</tbody>
</table>

*continued*
Chart 8 continued
Third-Party Information and Opinions Sought Out By MOFCOM for Cases Where MOFCOM Intervened
October 2013 - March 2018

<table>
<thead>
<tr>
<th>Case</th>
<th>Other Relevant Government Agencies</th>
<th>Trade Association</th>
<th>Downstream Firms</th>
<th>Competitors</th>
<th>Outside Experts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dow/Du Pont (2017)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>---</td>
<td>Industry Expert</td>
</tr>
<tr>
<td>Broadcom/Brocade (2017)</td>
<td>Y</td>
<td>Y</td>
<td>Maybe¹</td>
<td>Maybe¹</td>
<td>---</td>
</tr>
<tr>
<td>HP/Samsung (2017)</td>
<td>Y</td>
<td>Y</td>
<td>Maybe¹</td>
<td>Maybe¹</td>
<td>---</td>
</tr>
<tr>
<td>Agrium/PotashCorp (2017)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>---</td>
<td>Industry Expert</td>
</tr>
<tr>
<td>Maersk/Hamburg Süd (2017)</td>
<td>Y</td>
<td>Y</td>
<td>Maybe¹</td>
<td>Maybe¹</td>
<td>---</td>
</tr>
<tr>
<td>ASE/SPIL (2017)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Economic Expert</td>
</tr>
<tr>
<td>Bayer/Monsanto (2018)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>---</td>
<td>Industry Expert</td>
</tr>
</tbody>
</table>

Notes:
1 “Relevant enterprises” were contacted by MOFCOM according to the decisions. These could be downstream firms, upstream firms, or competitors.
2 In the decision, there is no indication as to whether MOFCOM has consulted with such third parties, which we interpret as meaning that MOFCOM may not have consulted with such third parties.

Source: http://fldj.mofcom.gov.cn/article/ztxx

Remedies. Since our five-year overview, there have been 16 conditional approvals (plus one blocked decision) issued by MOFCOM. There continues to be divergence between the remedies imposed by MOFCOM and those by its counterparts in the EU and the United States. MOFCOM continues to show a preference for behavioral remedies and uniquely considers industrial policy issues as part of the merger control process, which is reflected in some of the unconventional remedies imposed.

Chart 9
Timing of Remedy Proposal and Behavioral Remedy Obligations for Conditional Approval Cases
October 2013 - March 2018

<table>
<thead>
<tr>
<th>Case</th>
<th>Merger Type</th>
<th>Overlapping Industry</th>
<th>Remedy Type China</th>
<th>Final Remedy Proposal Submission</th>
<th>Clearance</th>
<th>Duration of Behavioral Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermo Fisher/Life Tech (2014)</td>
<td>Horizontal</td>
<td>Life Sciences</td>
<td>Hybrid</td>
<td>Phase III</td>
<td>Phase III</td>
<td>10 years</td>
</tr>
<tr>
<td>Microsoft/Nokia (2014)</td>
<td>Vertical</td>
<td>Electronics</td>
<td>Behavioral</td>
<td>Phase III</td>
<td>Phase III</td>
<td>5 years for Nokia; 8 years for Microsoft</td>
</tr>
<tr>
<td>Merck/AZ Electronic (2014)</td>
<td>Conglomerate</td>
<td>Electronics</td>
<td>Behavioral</td>
<td>Phase II</td>
<td>Phase II</td>
<td>3 years</td>
</tr>
<tr>
<td>Corun/Toyota China/PEVE/ ZhongYuan/Toyota Tsusho (2014)</td>
<td>Horizontal and Vertical</td>
<td>Automotive</td>
<td>Behavioral</td>
<td>Phase II</td>
<td>Phase II</td>
<td>indefinite</td>
</tr>
<tr>
<td>Nokia/Alcatel (2015)</td>
<td>Horizontal</td>
<td>Consumer Technology</td>
<td>Behavioral</td>
<td>Phase III</td>
<td>Phase II</td>
<td>5 years</td>
</tr>
<tr>
<td>NXP/Freescale (2015)</td>
<td>Horizontal</td>
<td>Semi-conductor</td>
<td>Structural</td>
<td>Phase I after refiling</td>
<td>Phase I</td>
<td>after refiling</td>
</tr>
</tbody>
</table>

continued
### Chart 9 continued

Timing of Remedy Proposal and Behavioral Remedy Obligations for Conditional Approval Cases

October 2013 - March 2018

<table>
<thead>
<tr>
<th>Case</th>
<th>Merger Type</th>
<th>Overlapping Industry</th>
<th>Remedy Type China</th>
<th>Final Remedy Proposal Submission</th>
<th>Clearance</th>
<th>Duration of Behavioral Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>AB InBev/SAB Miller (2016)</td>
<td>Horizontal</td>
<td>Brewing</td>
<td>Structural</td>
<td>Phase II</td>
<td>Phase II</td>
<td></td>
</tr>
<tr>
<td>Abbott/St. Jude Medical (2016)</td>
<td>Horizontal</td>
<td>Healthcare</td>
<td>Structural</td>
<td>Phase II</td>
<td>Phase II</td>
<td></td>
</tr>
<tr>
<td>Dow/Dupont (2017)</td>
<td>Horizontal</td>
<td>Agriculture</td>
<td>Hybrid</td>
<td>Phase III after refiling</td>
<td>Phase III</td>
<td>5 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and Chemicals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broadcom/Brocade (2017)</td>
<td>Vertical and</td>
<td>Semiconductor</td>
<td>Behavioral</td>
<td>Phase III</td>
<td>Phase III</td>
<td>10 years</td>
</tr>
<tr>
<td></td>
<td>Conglomerate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HP/Samsung (2017)</td>
<td>Horizontal and</td>
<td>Printer</td>
<td>Behavioral</td>
<td>Phase II after refiling</td>
<td>Phase II</td>
<td>5 years</td>
</tr>
<tr>
<td></td>
<td>Conglomerate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agrium/PotashCorp (2017)</td>
<td>Horizontal</td>
<td>Fertilizer</td>
<td>Hybrid</td>
<td>Phase III after refiling</td>
<td>Phase III</td>
<td>5 years/ indefinite</td>
</tr>
<tr>
<td>Maersk/Hamburg Süd (2017)</td>
<td>Horizontal and</td>
<td>Shipping</td>
<td>Behavioral</td>
<td>Phase I after refiling</td>
<td>Phase I</td>
<td>5 years/ indefinite</td>
</tr>
<tr>
<td></td>
<td>Vertical</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASE/SPIL (2017)</td>
<td>Horizontal</td>
<td>Semiconductor</td>
<td>Behavioral</td>
<td>Phase III after refiling</td>
<td>Phase III</td>
<td>24 months</td>
</tr>
<tr>
<td>Becton Dickinson/C. R. Bard</td>
<td>Horizontal</td>
<td>Healthcare</td>
<td>Structural</td>
<td>Phase III</td>
<td>Phase III</td>
<td></td>
</tr>
<tr>
<td>(2017)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bayer/Monsanto (2018)</td>
<td>Horizontal and</td>
<td>Agricultural</td>
<td>Hybrid</td>
<td>Phase III after refiling</td>
<td>Phase III</td>
<td>5 years</td>
</tr>
<tr>
<td></td>
<td>Conglomerate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: In certain cases, merging parties withdraw and refile their application. For example, MOFCOM may take a longer time than the maximum statutory review period of 180 days to finish its review due to remedy negotiations. In such instance, parties will withdraw and refile. Here, we use the new date of acceptance after parties refiled their applications when calculating the “Clearance” column and the “Final Remedy Proposal Submission” column.

Source: [http://fldj.mofcom.gov.cn/article/zbxx](http://fldj.mofcom.gov.cn/article/zbxx)

### Types of Remedies

In Chart 10, we categorize the remedies imposed by MOFCOM in each of the 16 conditional approvals and the corresponding remedies imposed in the United States and the EU, where applicable.

Since 2014, MOFCOM continues to show more willingness than its western counterparts to require or accept behavioral remedies. MOFCOM imposed behavioral remedies in 12 out of the 16 conditional approval cases since October 2013, four cases of the 12 cases required a combination of both types of remedies (hybrid), and only four transactions were cleared with structural remedies only. The duration of behavioral remedies ranged from 24 months to indefinite, with five years and ten years being the most common. Over the ten-year period, the majority of the behavioral remedies MOFCOM imposed (17 out of 24) were set to last for five years or more.

Among the 16 conditional approvals since October 2013, one was not notified in either the United States or the EU. In three transactions—Thermo Fisher/Life Tech (2014), Dow/DuPont (2017), and Agrium/PotashCorp (2017)—MOFCOM required behavioral remedies in addition to divestitures when the United States and/or the EU required only structural remedies. Interestingly, MOFCOM required only divestiture in AB InBev/SAB Miller while additional behavioral remedies were required in the United States. In five transactions—Microsoft/Nokia (2014), Merck/AZ Electronic (2014), Nokia/Alcatel (2015), HP/Samsung (2017), ASE/SPIL (2017)—MOFCOM imposed behavioral remedies, when they were unconditionally cleared in the United States and the EU, if notifiable. This continues the trend since our five-year review that MOFCOM may impose
## Chart 10
Comparison of Remedies Imposed in China, the U.S., and the EU
for MOFCOM Conditional Approval Cases
October 2013 - March 2018

<table>
<thead>
<tr>
<th>Case</th>
<th>Merger Type</th>
<th>Overlapping Industry</th>
<th>Remedy Type China</th>
<th>Remedy Type U.S.</th>
<th>Remedy Type EU</th>
<th>Remedy Type Cross-Jurisdictional Comparison of Remedies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermo Fisher/Life Tech (2014)</td>
<td>Horizontal</td>
<td>Life Sciences</td>
<td>Hybrid</td>
<td>Structural</td>
<td>Structural</td>
<td>Structural12</td>
</tr>
<tr>
<td>Microsoft/Nokia (2014)</td>
<td>Vertical</td>
<td>Electronics</td>
<td>Behavioral</td>
<td>Cleared</td>
<td>Cleared</td>
<td>Stricter</td>
</tr>
<tr>
<td>Nokia/Alcatel (2015)</td>
<td>Horizontal</td>
<td>Consumer Technology</td>
<td>Behavioral</td>
<td>Cleared</td>
<td>Cleared</td>
<td>Stricter</td>
</tr>
<tr>
<td>NXP/Freescale (2015)</td>
<td>Horizontal</td>
<td>Semi-conductor</td>
<td>Structural</td>
<td>Structural</td>
<td>Structural</td>
<td>Same</td>
</tr>
<tr>
<td>AB InBev/SAB Miller (2016)</td>
<td>Horizontal</td>
<td>Brewing</td>
<td>Structural</td>
<td>Hybrid</td>
<td>Structural</td>
<td>Same</td>
</tr>
<tr>
<td>Dow/DuPont (2017)</td>
<td>Horizontal</td>
<td>Agriculture and Chemicals</td>
<td>Hybrid</td>
<td>Structural</td>
<td>Structural</td>
<td>Different</td>
</tr>
<tr>
<td>Broadcom/Brocade (2017)</td>
<td>Vertical</td>
<td>Semi-conductor</td>
<td>Behavioral</td>
<td>Behavioral</td>
<td>Behavioral</td>
<td>Stricter</td>
</tr>
<tr>
<td>HP/Samsung (2017)</td>
<td>Horizontal and Conglomerate</td>
<td>Printer</td>
<td>Behavioral</td>
<td>Cleared</td>
<td>Cleared</td>
<td>Stricter</td>
</tr>
<tr>
<td>Agrium/PotashCorp (2017)</td>
<td>Horizontal</td>
<td>Fertilizer</td>
<td>Hybrid</td>
<td>Structural</td>
<td>—</td>
<td>Stricter and Different</td>
</tr>
<tr>
<td>Maersk/Hamburg Süd (2017)</td>
<td>Horizontal and Vertical</td>
<td>Shipping</td>
<td>Behavioral</td>
<td>Cleared</td>
<td>Behavioral</td>
<td>Stricter</td>
</tr>
<tr>
<td>ASE/SPIL (2017)</td>
<td>Horizontal</td>
<td>Semi-conductor</td>
<td>Behavioral</td>
<td>Cleared</td>
<td>—</td>
<td>Stricter</td>
</tr>
<tr>
<td>Becton Dickinson/ C.R. Bard (2017)</td>
<td>Horizontal</td>
<td>Healthcare</td>
<td>Structural</td>
<td>Structural</td>
<td>Structural</td>
<td>Different</td>
</tr>
<tr>
<td>Bayer/Monsanto (2018)</td>
<td>Horizontal and Conglomerate</td>
<td>Agricultural</td>
<td>Hybrid</td>
<td>Structural</td>
<td>Hybrid</td>
<td>Less strict</td>
</tr>
</tbody>
</table>

**Sources:** MOFCOM Press Releases; United States FTC Merger Case Decisions and Orders, Department of Justice Final Judgements, Statements, Press Releases; European Commission Merger Case Decisions

12 The comparisons in this column involve an actual assessment of the conditions imposed in each jurisdiction, as opposed to a mere comparison of remedy types. For example, in Thermo Fisher/Life Tech, Thermo Fisher was required to divest its cell culture and gene modulation business in all three jurisdictions. MOFCOM, however, additionally required Thermo Fisher to divest its 51% stake in a Chinese joint venture and behavioral remedies, such as price commitments. In some cases, differences in the scope of remedies may reflect different market conditions in the different jurisdictions.
behavioral remedies when the United States and/or the EU required no remedy and continues to utilize behavioral remedies to address horizontal concerns.

**Unconventional Remedies.** Over the last five years, MOFCOM has continued to require remedies that are generally uncommon in other jurisdictions. In Chart 11, we categorize unconventional remedies MOFCOM imposed in the 16 conditional approvals since 2014. Five conditional approvals specified supply terms with Chinese customers, three involved restrictions on future transactions, three prohibited practices of bundling or tie-in sales, three mandated access to technology know-how, IP rights and digital platforms on fair, reasonable, and non-discriminatory (FRAND) terms, and two involved price commitments. Last year in ASE/SPIL, MOFCOM imposed a long-term hold-separate for the first time since 2013 although the long-term hold-separate remedy remains widely criticized, and three out of four previous long-term hold-separate remedies were at least partially lifted. The last five years have also seen other uncommon behavioral remedies, such as a cap on capacity in Maersk/Hamburg Süd (2017), and a conversion of shareholding into passive investment in a Chinese subsidiary. Each will be discussed in more detail below.

**Long-term Hold-Separate.** Long-term hold-separate orders have probably been the most unique and controversial remedy imposed by MOFCOM in the context of horizontal mergers. Unlike temporary hold-separate orders intended to preserve the competitiveness and marketability of the divestiture assets, long-term hold-separate orders have been used by MOFCOM to tackle alleged horizontal concerns in MediaTek/MStar, Marubeni/Gavilon, Seagate/Samsung, and ASE/SPIL, each of which was either not notifiable, or unconditionally cleared, in the United States and the EU. MOFCOM also required global long-term hold-separates in Western Digital's

### Chart 11

<table>
<thead>
<tr>
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<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermo Fisher/ Life Tech (2014)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microsoft/Nokia (2014)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>Merck/AZ Electronic (2014)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>Nokia/Alcatel (2015)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>Dow/DuPont (2017)</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broadcom/Brocade (2017)</td>
<td>Y</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HP/Samsung (2017)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agrium/PotashCorp (2017)</td>
<td>Y</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maersk/Hamburg Süd (2017)</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASE/SPIL (2017)</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bayer/Monsanto (2018)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

*Source: [http://fldj.mofcom.gov.cn/article/ztxx](http://fldj.mofcom.gov.cn/article/ztxx)*
2012 acquisition of Hitachi’s HDD subsidiary, where a global divestiture of the 3.5 inch HDD business was required by all three jurisdictions.

These long-term hold-separate orders have been heavily criticized for creating adverse consequences for businesses, including disruption, without achieving procompetitive goals. MOFCOM publicly defended its imposition of a hold-separate for 24 months in ASE/SPIL last year, which shows that it continues to view long-term hold-separates as a viable remedy in horizontal mergers. It appears, however, MOFCOM no longer resorted to this option as readily in recent years, as ASE/SPIL was the first case since 2013 in which a long-term hold-separate was required, whereas the prior four long-term hold-separates were issued in relatively quick succession within a span of three years. In addition, the hold-separate in ASE/SPIL will terminate automatically after 24 months, whereas MOFCOM retained the right in prior cases to review the hold-separate when the initial time period ended.

**Guaranteed Access to Technology, IP Rights, and Digital Platforms.** MOFCOM frequently imposes conditions to ensure Chinese customers or competitors’ access to technology know-how, IP rights, and digital platforms. This is achieved primarily through restrictions on licensing terms for patents, but also other behavioral remedies. The Google/Motorola Mobility transaction was the first one in which MOFCOM imposed FRAND-related conditions. MOFCOM required Google to honor Motorola Mobility’s FRAND commitments for its standard essential patents (SEPs) in existence at the time of the decision, without identifying a merger-specific theory of harm that would be addressed by that remedy. Similar conditions were imposed in Nokia/Alcatel, Merck/AZ Electronics, and Microsoft/Nokia. Common restrictions include limits on the transfer of SEPs only to entities that would honor existing FRAND commitments, and seeking injunctions against infringers only after failure of good faith negotiation. MOFCOM has also imposed a behavioral remedy to guarantee access to a platform. In the recently approved Bayer/Monsanto transaction, the merged entity was required by MOFCOM to allow all Chinese agricultural application developers to connect their software with the merged entity’s digital agricultural platform within five years of such platform’s entry into the Chinese market based on FRAND terms. The merged entity was also required to allow all local users to register and employ its digital agricultural products.

**Restrictions on Future Transactions.** Another noteworthy remedy in MOFCOM’s toolbox is a restriction on the merged entity’s ability to engage in future transactions, which may take the form of a ban on acquisitions of further interests in competitors in the relevant product market for a certain period of time. MOFCOM first imposed such a condition in the InBev/Anheuser Busch transaction cleared in 2008, shortly after China’s AML entered into force. As a condition to the clearance, InBev was banned from increasing its existing 27 percent stake in Tsingtao Brewery Co., Ltd. or its existing 28.56 percent stake in Zhujiang Brewery Co., Ltd., and could not seek to hold any stake in certain Chinese brewery companies unless MOFCOM agreed. So far, MOFCOM has required such limitations in six conditional approvals. MOFCOM has required that parties obtain MOFCOM approval before making further acquisitions in competitors in the identified product market, which is not uncommon in other jurisdictions. Furthermore, in HP/Samsung, the parties are banned from acquiring any stake in the Chinese business of any A4 laser printer manufacturers, and in Maersk/Hamburg Süd,

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13 This sunset provision is provided in the remedy package attached to the decision.

14 In addition to InBev/Anheuser Busch, they are, Mitsubishi Rayon/Lucite, Media Tek/MStar, and Agrium/PotashCorp., MOFCOM required that parties obtain MOFCOM approval before making further acquisitions in competitors in the identified product market, which is not uncommon in other jurisdictions. Furthermore, in HP/Samsung, the parties are banned from acquiring any stake in the Chinese business of any A4 laser printer manufacturers, and in Maersk/Hamburg Süd,
the parties were banned from entering into any sharing agreements on particular routes between the Far East and South America.

**Specific Supply Terms with Chinese Customers.** It is now commonplace to see MOFCOM requiring a commitment to specific supply terms with Chinese customers when it identifies “disadvantaged negotiation position of Chinese customers” as a potential harm of the merger. As early as GM/Delphi in 2009, which was granted early termination by the U.S. Federal Trade Commission and unconditionally cleared by the European Commission, MOFCOM required the merged entity to maintain non-discriminatory, timely, and reliable supply to Chinese customers on pre-transaction terms and market terms. Similar terms were imposed in Uralkali/Silvinit, Glencore/Xstrata, MediaTek/MStar, Dow/DuPont, HP/Samsung, Broadcom/Brocade, ASE/SPIL, and Agrium/PotashCorp. Remedies regarding supply terms with Chinese customers have also grown more detailed and specific over time. In MediaTek/MStar, the parties were required by MOFCOM to maintain the pre-transaction cycle and scope of price cuts in China, and the minimal quarterly price cut must be of a certain agreed-to amount without price rebound.

**Price Commitments.** A related unique remedy is a commitment to certain price levels post-transaction, which MOFCOM is authorized under the AML to impose taking into account the socialist market economy and industrial policy considerations. As discussed above, MOFCOM imposed detailed pricing commitments in MediaTek/MStar. MOFCOM continued to impose such conditions after 2014. In Thermo Fisher/Life Tech, the merged entity was required to commit to lowering catalog prices in China for two products by one percent per year without reducing any other discounts offered to Chinese distributors. In Dow/DuPont, the merged entity was required to continue supply of certain active ingredients and related formulations to Chinese customers at prices no higher than the 12-month average level before the approval. In both cases, price commitments were required in addition to global divestitures.

**No Bundling or Tie-in Sales.** Another behavioral remedy related to specified supply terms with Chinese customers is the requirement to refrain from bundling or tie-in sales post-transaction. MOFCOM has required merged entities to refrain from bundling or tie-in sales in four conditional approvals so far,15 two of which were conglomerate and/or vertical transactions.

**Other Uncommon Conditions.** Two other uncommon remedies MOFCOM has recently attached as a condition to clearance are (1) a capacity cap at a certain level for three years required in Maersk/Hamburg Süd, and (2) the required conversion of shareholding in a Chinese subsidiary into passive investment in Agrium/PotashCorp. In particular, the required cap on capacity in Maersk /Hamburg Süd departs from typical antitrust enforcement norms, as a capacity-limiting behavioral remedy would tend to benefit competitors at the expense of customers. These remedies reflect MOFCOM’s consideration of industrial policies in its merger enforcement regime.

**Remedy Modification.** It remains difficult to petition MOFCOM to lift or modify behavioral remedies. The relevant rules on remedies modification provide MOFCOM with substantial discretion in determining whether and when to lift remedies, and it is difficult to comprehensively establish the factors relevant to the determination. Under the applicable rules, MOFCOM may assess applications for remedy modifications based on, but not limited to, considerations of (1) whether there have been significant changes to the parties to the concentration, (2) whether there have been material changes to the competition structure in the relevant markets, and (3) whether the implementation of the remedies has become unnecessary or impossible. There is no guidance as to

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15 HP/Samsung, Broadcom/Brocade, and Merck/AZ.
when such factors are sufficiently established. The applicable rules also do not impose a time limit for the review of such application, making it a prolonged and uncertain process. Since 2015, MOFCOM has issued six remedies-modification decisions, including the lifting of three long-term hold-separate orders. In five out of the six cases, MOFCOM took seven to 29 months to reach its decision, after conducting a full competitive re-assessment. In the exceptional case of Google/Motorola Mobility, it took a little over a month after the sale of Motorola Mobility to Lenovo was notified and cleared by MOFCOM in a separate merger filing. It was also explicitly provided for in the original decision that the relevant condition would become inapplicable if Google no longer controlled Motorola Mobility. In two cases, Western Digital/Hitachi and Seagate/Samsung, MOFCOM decided to modify instead of lift the original behavioral remedies after a full-fledged competitive assessment lasting more than a year. Parties agreeing to behavioral remedies should not expect MOFCOM to modify remedies quickly, even when such modifications are justified by external factors such as material changes to market conditions.

Sunset Clause. While a remedy modification remains difficult to obtain, MOFCOM has started using sunset clauses in its remedy designs, which may allow the parties to avoid the lengthy process of a remedy modification review. MOFCOM first incorporated a quasi-sunset clause in the condition-modification decisions of Western Digital/Hitachi and Seagate/Samsung in 2015. The relevant language in these two decisions provided that the conditions terminate after two years, after which the parties may request the relevant conditions to be lifted.

<table>
<thead>
<tr>
<th>Case</th>
<th>Time of Conditional Approval</th>
<th>Duration of Behavioral Remedies</th>
<th>Remedies Lifted or Modified</th>
<th>Time of Application</th>
<th>Time of Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media Tek/MStar Cayman</td>
<td>Aug. 26, 2013</td>
<td>3 years (termination upon review)</td>
<td>Lifting behavioral remedies due to the significant decrease of the parties’ market shares, and other material changes in the relevant markets</td>
<td>Sep. 2016</td>
<td>Feb. 9, 2018</td>
</tr>
<tr>
<td>Henkel Hong Kong/Tiande (JV)</td>
<td>Feb. 9, 2012</td>
<td>Indefinite</td>
<td>Lifting behavioral remedies due to Henkel Hong Kong’s transfer of its shares in the joint venture to Tiande and significantly increased competition in the relevant market</td>
<td>Jul. 2017</td>
<td>Feb. 1, 2018</td>
</tr>
<tr>
<td>Seagate/Samsung</td>
<td>Dec. 12, 2011</td>
<td>1 year (termination upon review)</td>
<td>Modifying behavioral remedies (MOFCOM held several meetings with Seagate, consulted opinions from stakeholders, and conducted economic analysis)</td>
<td>May 2013</td>
<td>Oct. 10, 2015</td>
</tr>
<tr>
<td>Google/Motorola Mobility</td>
<td>May 19, 2012</td>
<td>5 years (early termination possible upon application)</td>
<td>Lifting one of the behavioral remedies due to the sale of Motorola Mobility business to Lenovo</td>
<td>Dec. 1, 2014</td>
<td>Jan. 6, 2015</td>
</tr>
</tbody>
</table>

without specifying whether the parties ought to apply for MOFCOM review for the conditions to be formally lifted, but indicating that an “application” may only be needed before the two-year period lapses. MOFCOM has since improved the clarity of its sunset clauses by specifying that conditions “terminate automatically upon expiration of the time limit” in decisions approving Broadcom/Brocade, HP/Samsung, and ASE/SPIL.

**Chart 13**

Sunset Clauses in MOFCOM Decisions for Conditional Approval Cases
August 1, 2008 - March 31, 2018

<table>
<thead>
<tr>
<th>Case</th>
<th>Sunset Clause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Digital/ Hitachi (Modification Decision 2015)</td>
<td>“The above conditions terminate after 2 years of this notice. If Western Digital could sufficiently establish that there have been material changes to the competition structure in the relevant markets, then an application to lift the condition may be submitted before the expiration of the 2 year time limit.”</td>
</tr>
<tr>
<td>Seagate/Samsung (Modification Decision 2015)</td>
<td>“The above conditions terminate after 2 years of this notice. If Seagate could sufficiently establish that there have been material changes to the competition structure in the relevant markets, then an application to lift the condition may be submitted before the expiration of the 2 year time limit.”</td>
</tr>
<tr>
<td>Broadcom/Brocade (2017)</td>
<td>“The above conditions are effective for 10 years after this notice, and terminate automatically upon expiration of the time limit.”</td>
</tr>
<tr>
<td>Samsung/HP (2017)</td>
<td>“The above conditions are effective for 5 years after this notice, and terminate automatically upon expiration of the time limit.”</td>
</tr>
<tr>
<td>ASE/SPIL (2017)</td>
<td>“The above conditions terminate automatically upon expiration of the time limit.”</td>
</tr>
</tbody>
</table>

Source: [http://fldj.mofcom.gov.cn/article/ztxx](http://fldj.mofcom.gov.cn/article/ztxx)

**Structural Remedies.** While structural remedies are generally regarded as the more effective type of remedy, MOFCOM has required structural remedies in only 16 out of 36 conditional approvals so far and required additional behavioral remedies in 9 of those 16 transactions. Overall, MOFCOM tends not to require an “upfront buyer”16 or fix-it-first17 in cases of divestiture. So far, MOFCOM has on only three occasions (i.e., Abbott/St. Jude Medical, AB InBev/SAB Miller, and NXP/Freescale) requested that the agreement for the sale of the assets-to-be-divested be executed and approved before the approval of the main transaction. In only one other case, namely Dow/DuPont in 2017, MOFCOM required that the main transaction may not close until MOFCOM approved a divestiture buyer and the sale agreement for the divestiture (i.e., an upfront buyer divestiture). In the most recent structural remedy cases, MOFCOM did not request a fix-it-first or an upfront buyer.

In the three fix-it-first transactions, the closing of the divestiture transactions were allowed to take place after the closing of the main transaction. In NXP/Freescale, MOFCOM requested that the divestiture take place before the closing of the main transaction. AB InBev/SAB Miller , MOFCOM required that the divestiture take place within 24 hours after the closing of the main transaction. In Abbott/St. Jude Medical, MOFCOM allowed Abbott to close the divestiture 20 days after the closing of the main transaction.

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16 MOFCOM’s upfront buyer divestiture requirement is that a divestment agreement be executed before the closing of the main transaction, but after MOFCOM’s approval of the main transaction, which is the same as the EU’s upfront buyer divestiture requirement.

17 MOFCOM’s fix-it-first divestiture requirement is that the divestment agreement be executed before MOFCOM’s approval of the main transaction, which is the same as the EU fix-it-first divestiture requirement and similar to upfront buyer divestitures in the United States.
MOFCOM has not typically required a Chinese buyer for the divestitures. Based on publicly available information, parties divested the assets as required by MOFCOM to Chinese buyers in only three transactions so far. In NXP/Freescale, the Chinese buyer, Beijing Jianguang, an SOE, was also proposed as the divestiture buyer in the United States and the EU. In AB InBev/SAB Miller, the Chinese divestiture package was purchased by SAB Miller’s Chinese JV partner, while the U.S. divestiture package was similarly purchased by SAB Miller’s U.S. JV Partner.

Notably, MOFCOM included a “crown jewel” provision in its structural remedy in Glencore/Xstrata. If the divestiture was not completed within a certain period of time, the “crown jewel” provision required the divestiture of an alternative package of assets to what the party was originally required to divest, and the alternative assets are typically to be divested by a trustee. In Glencore/Xstrata, Xstrata was ordered to divest its Las Bambas copper mine in Peru. However, if Xstrata could not execute the divestiture agreement with a MOFCOM-approved buyer or close the divestiture transaction within the time limit set by MOFCOM, Xstrata would have had to allow a divestiture trustee to divest one of four projects (Tampakan, Frieda River, El Pachón, and Alumbrera) selected by MOFCOM.

### Chart 14
**Structural Remedies for Conditional Approval Cases**
**August 1, 2008 - March 31, 2018**

<table>
<thead>
<tr>
<th>Case</th>
<th>Merger Type</th>
<th>Remedy Type</th>
<th>Upfront Buyer/ Fix-it-First</th>
<th>Chinese Buyer?</th>
<th>Upfront Buyer/ Fix-it-First</th>
<th>Upfront Buyer/ Fix-it-First</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mitsubishi Rayon/ Lucite (2009)</td>
<td>Horizontal &amp; Vertical</td>
<td>Hybrid</td>
<td>N</td>
<td>N</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Pfizer/Wyeth (2009)</td>
<td>Horizontal</td>
<td>Structural</td>
<td>N</td>
<td>N</td>
<td>Upfront buyer (Boehringer Ingelheim)</td>
<td>N</td>
</tr>
<tr>
<td>Panasonic/Sanyo (2009)</td>
<td>Horizontal</td>
<td>Hybrid</td>
<td>N</td>
<td>N</td>
<td>Upfront buyer</td>
<td>N</td>
</tr>
<tr>
<td>Alpha V/Savio (2011)</td>
<td>Horizontal</td>
<td>Structural</td>
<td>N</td>
<td>N</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Western Digital/ Hitachi (2012)</td>
<td>Horizontal</td>
<td>Hybrid</td>
<td>N</td>
<td>N</td>
<td>Upfront buyer (Toshiba)</td>
<td>Upfront buyer (Toshiba)</td>
</tr>
<tr>
<td>UTC/Goodrich (2012)</td>
<td>Horizontal</td>
<td>Structural</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Glencore/Xstrata (2013)</td>
<td>Horizontal &amp; Vertical</td>
<td>Hybrid</td>
<td>N</td>
<td>Y (a group of Chinese companies)</td>
<td>N/A</td>
<td>N</td>
</tr>
<tr>
<td>Baxter/Gambro (2013)</td>
<td>Horizontal</td>
<td>Hybrid</td>
<td>N</td>
<td>N</td>
<td>N/A</td>
<td>Upfront buyer (Nikkiso Co. Ltd.)</td>
</tr>
<tr>
<td>Thermo Fisher/ Life Tech (2014)</td>
<td>Horizontal</td>
<td>Hybrid</td>
<td>N</td>
<td>N</td>
<td>Upfront buyer (GE Healthcare)</td>
<td>N</td>
</tr>
<tr>
<td>NXP/Freescale (2015)</td>
<td>Horizontal</td>
<td>Structural</td>
<td>Fix-it-first</td>
<td>Y (Beijing Jianguang, a state-controlled Chinese investment company)</td>
<td>Upfront buyer (Beijing Jianguang)</td>
<td>Proposed as a fix-it-first remedy but ended up with an upfront buyer remedy</td>
</tr>
</tbody>
</table>

*continued*
### Chart 14 continued
Structural Remedies for Conditional Approval Cases
August 1, 2008–March 31, 2018

<table>
<thead>
<tr>
<th>Case</th>
<th>Merger Type</th>
<th>Remedy Type—China</th>
<th>Upfront Buyer/ Fix-it-First—China</th>
<th>Chinese Buyer?</th>
<th>Upfront Buyer/ Fix-it-First—U.S.</th>
<th>Upfront Buyer/ Fix-it-First—EU</th>
</tr>
</thead>
<tbody>
<tr>
<td>AB InBev/ SAB Miller</td>
<td>Horizontal</td>
<td>Structural</td>
<td>Fix-it-first</td>
<td>Y (SAB Miller’s Chinese JV Partner Huarun)</td>
<td>Upfront buyer (Molson Coors, SAB Miller’s U.S. JV partner)</td>
<td>Upfront buyer (Japanese brewer Ashi to purchase SAB Miller’s business in France, Italy, the Netherlands, and the UK)</td>
</tr>
<tr>
<td>Abbott/St. Jude Medical</td>
<td>Horizontal</td>
<td>Structural</td>
<td>Fix-it-first</td>
<td>N (Terumo)</td>
<td>Upfront buyer (Terumo)</td>
<td>N</td>
</tr>
<tr>
<td>Dow/Dupont (2017)</td>
<td>Horizontal</td>
<td>Hybrid</td>
<td>Upfront buyer</td>
<td>N (FMC)</td>
<td>N</td>
<td>Upfront Buyer (FMC)</td>
</tr>
<tr>
<td>Agrium/PotashCorp (2017)</td>
<td>Horizontal</td>
<td>Hybrid</td>
<td>N</td>
<td>N/A (A group of large Israeli investment institutions purchased minority stakes in ICL, divestment of stakes in APC and SQM still pending)</td>
<td>Upfront buyer (Itafos, Trammo Inc.)</td>
<td>—</td>
</tr>
<tr>
<td>Becton Dickinson/ C.R. Bard (2017)</td>
<td>Horizontal</td>
<td>Structural</td>
<td>N</td>
<td>N (Merit Medical Systems, Inc.)</td>
<td>Upfront buyer (Merit Medical Systems, Inc.)</td>
<td>Upfront buyer (Merit Medical Systems, Inc.)</td>
</tr>
<tr>
<td>Bayer/Monsanto (2018)</td>
<td>Horizontal</td>
<td>Hybrid</td>
<td>N</td>
<td>N (BASF)</td>
<td>Upfront buyer (BASF)</td>
<td>Upfront buyer (BASF)</td>
</tr>
</tbody>
</table>

Source: [http://fldj.mofcom.gov.cn/article/ztzx](http://fldj.mofcom.gov.cn/article/ztzx)

**What Can We Observe over the Past Ten Years?**

Consistent with what we observed in our five-year review, it is reassuring that intervention remains rare for MOFCOM: among more than 2000 transactions MOFCOM has reviewed so far, it has only blocked two (less than 0.1 percent) and imposed remedies on 38 (about 2 percent). It is also laudable that MOFCOM has increased the transparency and sophistication of its analyses over time.

During the most recent five years, MOFCOM’s enforcement is highlighted by well-accepted new measures such as a simplified and expedited procedure for “simple cases” and public “name and shame” for non-filers, while retaining some of the accustomed albeit unpopular practices such as remedies required for industry policy reasons, challenges based on conglomerate effects, and a preference for behavioral remedies. We expect that China's new antitrust agency, SAMR, which incorporates much of the original staff from MOFCOM, will have a great foundation to build up upon.

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A Decade in Review: Antitrust Enforcement by China’s NDRC and SAIC

Yong Huang, Elizabeth Xiao-Ru Wang, and Roger Xin Zhang

The year 2018 marks a decade of antitrust enforcement in China since the Anti-Monopoly Law (AML) was enacted. China recently announced the creation of the State Administration for Market Regulation (SAMR), which consolidates the enforcement responsibilities of existing antitrust bureaus that were previously hosted within the Ministry of Commerce (MOFCOM), the National Development and Reform Commission (NDRC), and the State Administration for Industry and Commerce (SAIC). This is a significant regulatory development that will have profound implications for future antitrust enforcement in China.

Against that backdrop, this article provides an overview of past antitrust investigations conducted by the NDRC and the SAIC and discusses the potential effects of the recent regulatory restructuring on antitrust enforcement in China going forward. We first discuss the roles of the NDRC and the SAIC in China’s antitrust enforcement. We then provide an analysis of the past rulings published by the NDRC and the SAIC. We highlight two landmark cases and discuss the economic framework embodied in the agencies’ rulings in these cases. Finally, we identify both potential uncertainties and synergies resulting from the consolidation of antitrust enforcement under the SAMR.

Roles of the NDRC and the SAIC in China’s Antitrust Enforcement

When the AML was enacted in 2008, agencies within three different ministries were given responsibilities for enforcing different aspects of the law.1 In particular, merger review is the responsibility of a bureau under MOFCOM. The NDRC’s duty of AML enforcement is to investigate price-related conduct, such as price-fixing agreements and abuse of market dominance through monopolistic pricing behaviors. The SAIC is primarily responsible for investigating non-price related monopolistic conduct such as market division, exclusive dealing, and tying/bundling arrangements. Under the existing regime, conduct that involves both price and non-price violations can be subject to investigations by both the NDRC and the SAIC. In addition, the NDRC and the SAIC also have the authority to investigate conduct involving abuse of administrative power to eliminate or restrict competition, a unique aspect of China’s AML that aims to curtail the misuse of government power.

Furthermore, both the NDRC and the SAIC have significant enforcement resources at the local level, e.g., at the provincial and municipal level. The agencies’ local branches have been actively engaged in antitrust enforcement activities. For example, in 2017 the Zhejiang Provincial Price

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1 Specifically, Chapter 2 of the AML identifies various monopolistic agreements (including both horizontal agreements in Article 13 and non-horizontal agreements in Article 14), Chapter 3 of the AML lists various types of conduct that can constitute an abuse of market dominance, and Chapter 5 of the AML lists various types of conduct that can constitute an abuse of administrative power that eliminates or restricts competition.
Bureau under the NDRC investigated and penalized 17 paper manufacturers and an associated trade association for horizontally fixing the prices of paper products. In another 2017 investigation conducted by Zhengzhou Provincial Price Bureau under the NDRC, 23 electricity supply companies and their associated trade association were penalized for horizontal price fixing.

Similarly, in 2016, the SAIC delegated its Shandong branch to investigate a natural gas provider that was found to have abused its market dominance by forcing its customers to pre-pay for services.

According to existing provisions, any individual or any company can file an anti-monopoly complaint to these authorities. A substantial portion of the agencies’ investigations to date have been triggered by complaints made to the agencies by competitors or consumers. For example, several NDRC’s investigations were initiated based on complaints from the public, including the 2013 automobile insurance price-fixing investigations and the 2017 Zhengzhou electricity supplier horizontal price-fixing investigation. Similarly, a few SAIC investigations were initiated due to complaints from the public and the media, including investigations into abuse of dominance conduct by telecommunication services and utilities companies.

Aside from conducting antitrust investigations under the AML, the NDRC and the SAIC engage in significant legislative efforts, particularly with respect to drafting guidelines for certain industries and key enforcement areas. For example, in March 2016, the NDRC published a draft of anti-monopoly guidelines for the automobile industry, the first of its kind authorized by the Anti-Monopoly Commission under the State Council. More recently, the NDRC published trade association price behavior guidelines in July 2017, and price behavior guidelines for operators of active pharmaceutical ingredients and drugs prone to shortages in November 2017. In 2016, the NDRC also issued four other draft guidelines on leniency, commitment, exemption procedures, and illegal gains and fines. In 2010, the SAIC published a set of three substantive regulations to

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implement the AML. \(^\text{12}\) Recently, the SAIC, along with the NDRC, MOFCOM, and the State Intellectual Property Office (SIPO), also drafted intellectual property guidelines. \(^\text{13}\)

On March 17, 2018, China passed new legislation to create a new authority—the SAMR—that will take over antitrust and regulation related responsibilities from the NDRC, the SAIC, and MOFCOM.

**Key Patterns of the Enforcement Activities by the NDRC and the SAIC**

**Number of Investigations Released.** Since the AML was enacted in 2008, both the NDRC and the SAIC have increased their enforcement activities. It was reported that the NDRC and its local branches have conducted more than 210 AML investigations over the last decade. \(^\text{14}\) Between 2008 and 2012, when AML enforcement was in its early stage, the NDRC conducted a total of approximately 20 investigations. \(^\text{15}\) Its enforcement activities have increased significantly since 2013, and reached a record high of over 70 concluded investigations in 2017. \(^\text{16}\) Among those closed investigations in 2017, 16 involved conduct related to monopolistic agreements and/or abuse of dominance and over 60 involved abuse of administrative power. \(^\text{17}\)

Between 2008 and 2017, it was reported that the SAIC and its local branches conducted more than 130 investigations, including 41 related to abuse of administrative power and 91 related to monopolistic agreements and/or abuse of market dominance. \(^\text{18}\) To the best of our knowledge, approximately half of the SAIC's investigations have been concluded to date.

Not all of the agencies' official decisions are publicly available. The NDRC started publishing its official decisions in September 2014 (including some cases closed in 2013). \(^\text{19}\) Similarly, in 2013, the SAIC published all of its historical decisions and began publishing current decisions for closed investigations involving monopolistic agreements and/or abuse of market dominance. \(^\text{20}\) While the

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\(^\text{16}\) China Fair Competition Net, supra note 14.

\(^\text{17}\) Id.

\(^\text{18}\) Id.


NDRC has released some of its decisions related to abuse of administrative power, it appears that the SAIC’s website has not.\textsuperscript{21}

The NDRC and the SAIC conduct enforcement activities at both the national and the local level (e.g., at the provincial or municipal level). However, it is our understanding that although the NDRC’s website has posted its decisions in all national-level investigations since 2014, only a handful of the NDRC’s local branches have released a subset of their official decisions. In contrast, it appears that the SAIC has published decisions issued at both the national and local levels.

Our review in the rest of this section focuses on decisions that have been officially released on the agencies' websites. Pre-2013 decisions and rulings issued by the local NDRC branches are typically not posted on the national NDRC’s website. Such decisions are not included in our analysis. The SAIC has published all decisions on closed investigations against monopolist agreement and abuse of market dominance on its website, including those conducted by its local branches. Our analysis thus includes all these SAIC’s AML investigations with official rulings. To the extent that the NDRC and the SAIC closed investigations without finding violations and thus did not publish any official decisions, these matters are not included in our study.

Figure 1 below summarizes, by publishing year, the number of parties that have received an official ruling from the NDRC and the SAIC.\textsuperscript{22} To date, the NDRC has published official decisions issued to 118 parties, including 73 for abuse of market dominance and/or monopolistic agreement and 45 for abuse of administrative power. The SAIC has published official decisions issued to 214 parties for abuse of market dominance and/or monopolistic agreement.

\textsuperscript{21} In February 2018, one such abuse of administrative power decision was published on a local SAIC’s website instead of the national SAIC’s website. See Jiangsu Administration for Industry and Commerce, \textit{Re Correcting the Abuse of Administrative Power of Suzhou Road and Transportation Management Agency} (Feb. 26, 2018), http://www.zggpjz.com/m/view.php?aid=3333 (in Chinese). See also Pengpai News, supra note 19.

\textsuperscript{22} We have noticed that there is usually a delay between the date the official decision was made and the date the decision was publicly released. This is especially the case for the SAIC investigations ruled on before 2013 because all these decisions were publicly published in 2013. In addition, 24 of the decisions the NDRC published in 2014 are titled “NDRC Administrative Penalty Decision of 2013.” Therefore, we count these as 2013 decisions in this figure.
**Types of Conduct.** The NDRC’s and the SAIC’s enforcement activities focus on three categories of anticompetitive conduct: monopolistic agreement, abuse of market dominance, and abuse of administrative power. In this section, we provide a breakdown of the agencies’ decisions by the type of conduct within the categories of monopolistic agreements and abuse of market dominance. Because the agencies’ websites (particularly the SAIC’s website) do not contain sufficiently comprehensive information on abuse of administrative power, we focus our analysis on the agencies’ non-administrative investigation decisions.

With respect to monopolistic agreements, Article 13 of the AML prohibits competitors from reaching horizontal agreements on fixing prices, restricting production or capacity, dividing markets, restricting technology advancement or innovation, group boycotting, and other monopolistic conduct. In addition, Article 14 prohibits vertical agreements involving fixing resale prices, restricting minimum resale prices and other conduct deemed as monopolistic agreements by the agencies.

For abuse of market dominance, Article 17 of the AML prohibits behaviors involving excessively high or unfairly low pricing, predatory pricing, refusal to deal, exclusive dealing, tying, price discrimination or unfair trade conditions, and other types of conduct deemed by the agencies as abuse of market dominance.

Table 1 below summarizes the types of anticompetitive conduct that have been identified in the agencies’ released decisions and reports the number of parties involved in each.  

<table>
<thead>
<tr>
<th>Category</th>
<th>Types of Conduct</th>
<th># of Parties Investigated by the NDRC</th>
<th># of Parties Investigated by the SAIC</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monopolistic Agreements</td>
<td>Market Division</td>
<td>12</td>
<td>139</td>
<td>151</td>
</tr>
<tr>
<td></td>
<td>Horizontal Price Fixing</td>
<td>68</td>
<td>0</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>Production or Capacity Restrictions</td>
<td>0</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Monopolistic Conduct Involving Trade Associations</td>
<td>1</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Group Boycotts</td>
<td>3</td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Resale Price Maintenance</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Abuse of Market Dominance</td>
<td>Tying</td>
<td>1</td>
<td>21</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Refusal to Deal</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Exclusive Dealing</td>
<td>0</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Price Discrimination</td>
<td>0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Excessive Pricing</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Other Acts of Abuse or Dominance</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

A large portion of the agencies’ enforcement activities involve investigating horizontal agreements (e.g., horizontal market division, price fixing, production or capacity restrictions, monopolistic conduct involving trade associations, and group boycotts).

The NDRC’s top enforcement focus has been price-related horizontal arrangements. Another important area of the NDRC’s enforcement, though not shown in Table 1 due to the limited num-

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23 Investigations involving more than one anticompetitive conduct are counted multiples times in this table.
Our analysis shows that for the horizontal arrangements discussed in the agencies’ decisions, it is not uncommon for more than 10 parties to be involved. For example, in an investigation the NDRC closed in 2017, 18 domestic polyvinyl chloride (PVC) manufacturers, including 11 state-owned entities (SOEs), were found to have reached an agreement to increase PVC prices through meetings and WeChat (a popular Chinese social media app) communications. In the largest SAIC investigation by number of parties involved, 23 accounting firms in Shandong Province, led by the Tianyuan Tongtai Certified Public Accountant Firm, were found in violation of the AML by dividing the local public accounting service market.

The SAIC also issued six decisions in which only a trade association was investigated (the investigations involving just one entity in Figure 2). For example, in one investigation, the Huainan City Freight Association was found to have violated the AML by restricting its members to exclusively dealing with five designated property insurance companies. According to the SAIC’s decision, the freight association called a meeting with representatives from its 26 members. During this meeting, the members were asked to elect five property insurance companies that they wanted to conduct business with most, and the association asked its members to deal only with these companies.

companies. The investigation concluded that the freight association violated the AML for organizing anticompetitive conduct (i.e., group boycott). However, the individual members were not separately investigated or penalized.27

Industry Focus. Our analysis shows that the NDRC’s and the SAIC’s investigations have covered a wide range of industries, particularly those closely related to the welfare of the Chinese people. Table 2 below summarizes the agencies’ investigations by industry.

Table 2: The Agencies’ Investigations by Industry
Based on Official Releases Between 2013 and May 2018
Monopolistic Agreement and Abuse of Market Dominance

<table>
<thead>
<tr>
<th>Industry</th>
<th># of Parties Investigated by the NDRC</th>
<th># of Parties Investigated by the SAIC</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insurance</td>
<td>24</td>
<td>55</td>
<td>79</td>
</tr>
<tr>
<td>Industrial Materials</td>
<td>18</td>
<td>60</td>
<td>78</td>
</tr>
<tr>
<td>Consumer Products and Services</td>
<td>12</td>
<td>38</td>
<td>50</td>
</tr>
<tr>
<td>Professional Services</td>
<td>0</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>Health Care</td>
<td>10</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>Utilities</td>
<td>0</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Transportation</td>
<td>8</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Information Technology</td>
<td>1</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Telecommunication Services</td>
<td>0</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Construction &amp; Engineering</td>
<td>0</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Energy</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>73</strong></td>
<td><strong>214</strong></td>
<td><strong>287</strong></td>
</tr>
</tbody>
</table>

According to our analysis of the agencies’ decisions, the insurance, industrial materials, and consumer products and services industries received top attention from both agencies. The insurance industry has had the largest number of entities investigated, where the NDRC mainly reviewed conduct involving horizontal price fixing. For example, in 2013, Zhejiang Insurance Trade Association as well as a number of individual insurance companies were found to have violated the AML by fixing automobile insurance prices in the local market.28

The SAIC has investigated the industrial materials, insurance, and consumer products and services industries most frequently. Among the most heavily investigated conduct are market division, production and capacity restrictions, and monopolistic conduct by trade associations. For example, in 2015, 10 shale brick manufacturers in Hunan Province were investigated by the SAIC and found to have restricted the production volume of shale brick and divided the local shale brick market.29 In a 2017 Motorcycle Insurance investigation, the SAIC found that the Hechi Insurance Trade Association and nine local insurance companies violated the AML by dividing the local motorcycle insurance market, by organizing meetings among competitors and engaging in market dividing activities.30

**Types of Entities Under Investigation.** The NDRC’s and the SAIC’s enforcement activities relating to monopolistic arrangements and abuse of market dominance have targeted a range of different entities, among which foreign or foreign-controlled companies account for only a small share. It is reported that between August 2008 and the summer of 2014, only 10 percent of the entities the NDRC and its provincial branches investigated under the AML were foreign or foreign-controlled companies.31

Table 3 below reports the number of entities investigated by the NDRC or the SAIC by type (i.e., foreign entities, SOEs, trade associations, and other domestic companies), as revealed in their published decisions.

<table>
<thead>
<tr>
<th>Types of Entities</th>
<th># of Parties Investigated by the NDRC</th>
<th># of Parties Investigated by the SAIC</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign Entities</td>
<td>22</td>
<td>2</td>
<td>24</td>
</tr>
<tr>
<td>SOEs</td>
<td>26</td>
<td>35</td>
<td>61</td>
</tr>
<tr>
<td>Trade Associations</td>
<td>1</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>Others</td>
<td>24</td>
<td>162</td>
<td>186</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>73</strong></td>
<td><strong>214</strong></td>
<td><strong>287</strong></td>
</tr>
</tbody>
</table>

The table shows that according to decisions published between 2013 and May 2018, the NDRC investigated 73 entities, of which 22 (or 30 percent) were foreign or foreign-controlled companies. Importantly, because the decisions made by the NDRC’s local branches are not published on the NDRC’s website and therefore not included in our analysis, our result may overstate the extent to which foreign entities are investigated. The local NDRC branches are often focused more on domestic firms involved in AML violations. Very few foreign entities have been the target of the SAIC’s investigations. To date, of the 214 entities the SAIC has issued a ruling to, only two are foreign entities.

It is worth noting that there are instances where horizontal agreement investigations involved both foreign and domestic companies. For example, in 2013, the NDRC closed an investigation against nine baby formula manufacturers that were found in violation of the AML for resale price maintenance.32 Among the parties the NDRC investigated, seven were foreign brands and two were domestic brands.33

It is also evident that SOEs have not been exempted from NDRC and the SAIC scrutiny. As shown in Table 3 above, according to the decisions issued to date, the NDRC has investigated SOEs in 26 of 73 (or 36 percent) investigations, and the SAIC has investigated SOEs in 35 of 214


(or 16 percent) investigations. These SOEs are mostly in the financial, industrial material, utility, telecommunication services, or health care industries. They were found to have violated the AML for engaging in horizontal price fixing, market division, and tying.

**Fines and Remedies.** When a company’s anticompetitive conduct is established, the agencies can confiscate the company’s illegal gains and impose a monetary fine ranging from 1 to 10 percent of the company’s revenue in the previous year. The size of the fine is based on the nature, extent, and duration of anticompetitive conduct.

Figure 3 below shows the distribution of fines as a percent of prior year’s revenue, as revealed in the NDRC’s and the SAIC’s decisions.

In the decisions we reviewed, the vast majority of companies investigated by the NDRC were penalized for no more than 1 percent of their previous year’s revenue, and the vast majority of companies investigated by the SAIC were penalized with a fine of no more than 3 percent of their previous year’s revenue.

To date, the largest monetary fine by percent of revenue (i.e., 9 percent) was imposed by the NDRC in 2015 on Eukor Car Carriers, a specialized roll-on/roll-off shipping (RORO) company headquartered in South Korea. According to the NDRC decision, Eukor and seven other RORO companies violated the AML for horizontal price-fixing and market division activities. Eukor received a high percent fine not only because its violation lasted for a long period over a wide range of activities, but also because it played a leading role in some of the anticompetitive activities.

The largest fine percent imposed by the SAIC to date is 8 percent. Seven companies have been subject to this fine percent. For example, three domestic manufacturers of encrypted pay-

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34 See AML arts. 46 and 47.
35 See AML art. 49.
36 Different companies in the same case can be penalized using different fine percents. Trade associations and companies whose fine percent is not specified in the decisions are not included in this figure.
ment devices were found to have engaged in market division. These three companies met and agreed to only sell their products to their respectively designated bank clients. According to the decision, the fine was imposed because these companies violated the AML for five years, during which time they sold a large number of products at high prices and collected large sums of illegal gains.38

Table 4 below summarizes the top 10 monetary fines in terms of amount imposed on a single company by either the NDRC or SAIC.39 The largest monetary fine by amount was imposed by the NDRC on Qualcomm. The fine was RMB 6.09 billion (about USD $975 million, or 8 percent of its 2013 revenue in China).40 The SAIC has also imposed large fines. For example, in 2016 it fined Tetra Pak for illegal tying, exclusive dealing, and offering loyalty rebates in an amount of RMB 667.7 million (about USD $99 million, or 7 percent of its 2011 sales revenue in China)—to date the second largest in the history of China’s AML enforcement.

It is also worth noting that, though not shown here, investigations concluded by the NDRC’s local branches may impose big fines as well. For example, in an investigation conducted by the Shanghai Price Bureau under the NDRC in 2016, General Motors was found to have violated the AML for resale price maintenance and fined RMB 201 million (about USD $29 million, or 4 percent of its 2015 revenue in China).41

<table>
<thead>
<tr>
<th>Party</th>
<th>Agency</th>
<th>Year of Decision</th>
<th>Types of Conduct</th>
<th>Fine Percent</th>
<th>Fine Amount (RMB)</th>
<th>Fine Amount (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qualcomm</td>
<td>NDRC</td>
<td>2015</td>
<td>Excessive Pricing Bundling; Unfair Trade Conditions</td>
<td>8%</td>
<td>6,088,000,000</td>
<td>975,000,000</td>
</tr>
<tr>
<td>Tetra Pak</td>
<td>SAIC</td>
<td>2016</td>
<td>Exclusive Dealing; Tying; Loyalty Rebates</td>
<td>7%</td>
<td>667,724,177</td>
<td>99,000,000</td>
</tr>
<tr>
<td>Sumitomo Electric</td>
<td>NDRC</td>
<td>2014</td>
<td>Horizontal Price Fixing</td>
<td>6%</td>
<td>290,400,000</td>
<td>47,073,000</td>
</tr>
<tr>
<td>Eukor Car Carriers</td>
<td>NDRC</td>
<td>2015</td>
<td>Horizontal Price Fixing; Market Division</td>
<td>9%</td>
<td>284,731,338</td>
<td>43,971,000</td>
</tr>
<tr>
<td>Yazaki</td>
<td>NDRC</td>
<td>2014</td>
<td>Horizontal Price Fixing</td>
<td>6%</td>
<td>241,080,000</td>
<td>39,078,000</td>
</tr>
<tr>
<td>NSK</td>
<td>NDRC</td>
<td>2014</td>
<td>Horizontal Price Fixing</td>
<td>4%</td>
<td>174,920,000</td>
<td>28,354,000</td>
</tr>
<tr>
<td>Denso</td>
<td>NDRC</td>
<td>2014</td>
<td>Horizontal Price Fixing</td>
<td>4%</td>
<td>150,560,000</td>
<td>24,405,000</td>
</tr>
<tr>
<td>NTN</td>
<td>NDRC</td>
<td>2014</td>
<td>Horizontal Price Fixing</td>
<td>6%</td>
<td>119,160,000</td>
<td>19,315,000</td>
</tr>
<tr>
<td>Medtronic</td>
<td>NDRC</td>
<td>2016</td>
<td>Resale Price Maintenance</td>
<td>4%</td>
<td>118,520,000</td>
<td>17,200,000</td>
</tr>
<tr>
<td>JTEXT</td>
<td>NDRC</td>
<td>2014</td>
<td>Horizontal Price Fixing</td>
<td>8%</td>
<td>109,360,000</td>
<td>17,727,000</td>
</tr>
</tbody>
</table>

A company found in violation of the AML can be exempted from a monetary fine under certain conditions.42 For example, the NDRC investigated the horizontal price-fixing conduct of eight Japanese auto parts manufacturers. One of the manufacturers, Hitachi, was exempted from mon-

39 The fines discussed in this paragraph and in Table 4 do not include the confiscated income from illegal conduct.
42 See AML art. 46.
etary fines because it was the first to report anticompetitive conduct to the authorities and provided supporting evidence.43 The other manufacturers received a fine up to 8 percent of their prior year’s revenue.44

The agencies can also impose non-monetary remedies instead of or in addition to a monetary fine. For example, the SAIC’s Inner Mongolia Branch started to investigate China Mobile at the Inner Mongolia province for its abuse of market dominance in April 2014. China Mobile’s Inner Mongolia subsidiary was found to have taken away users’ remaining mobile data balance at the end of each month. The company subsequently introduced data rollover and other related services.45 In December 2017, the SAIC terminated the investigation because China Mobile’s Inner Mongolia branch had fulfilled its remedies in time.47 The company did not receive a monetary fine.

In contrast, Qualcomm was required to pay a large fine and cease bundling standard-essential patents (SEPs) with non-SEPs in its licensing practice, using the wholesale price of handsets as the royalty base in China, and selling its baseband chips with unreasonable trade conditions.

The Economic Framework of Investigations Against Abuse of Market Dominance

Although a substantial number of cases the agencies have investigated involve cartels and abuse of administrative power, economic analysis typically plays a relatively small role in those types of antitrust investigations. Abuse of market dominance cases, however, are often highly complex and are evaluated by the agencies on a rule-of-reason basis. These cases, though few in number, usually require fact-intensive antitrust analysis.

A review of publicly released rulings suggests that the agencies typically follow a four-step approach in analyzing such cases:

- **Step 1:** define the relevant market;
- **Step 2:** establish market dominance;
- **Step 3:** identify the abusive conduct; and
- **Step 4:** assess business justification and evaluate the competitive effects of the conduct.

In this section, we first summarize the types of abuse-of-dominance conduct that are subject to antitrust scrutiny under China’s AML. We then focus on two of the agencies’ landmark decisions—the NDRC’s investigation of Qualcomm, which concluded in 2015, and the SAIC’s investigation of Tetra Pak, which concluded in 2016—to assess the agencies’ analytical framework from an economic perspective. In these two landmark cases, the agencies generally followed the four-step framework to reach their conclusions.

**Types of Abuse of Dominance Conduct Prohibited by the AML.** Article 17 of the AML specifies that firms “holding dominant market positions are prohibited from doing the following by abusing their dominant market positions:”47

1. selling products at excessive prices or buying products at unfairly low prices;
2. selling products at prices below cost without justification;
3. refusal to deal without justification;

47 See AML art. 17.
(4) exclusive dealing without justification;
(5) bundling or imposing unreasonable conditions without justification;
(6) discriminatory treatments (in terms of prices or other transaction terms) without justification;
and
(7) other abusive conduct identified by the AML enforcement authorities.

All of the above identified abusive types of conduct are subject to business justifications, for which the burden of proof rests upon the dominant firm. Establishing market dominance and evaluating the appropriate business justifications for the alleged conduct are often at the center of the agencies’ investigations.

The AML specifies that a dominant market position should be determined on the basis of the following factors:\footnote{See AML art. 18.}
- market share and competitive conditions of the market;
- ability to control the sales market or the market for raw materials;
- financial strength and technical conditions;
- the extent to which other firms depend on the party under investigation;
- entry barriers to the relevant market; and
- other factors related to the determination of the dominant market position.

It is important to note that a firm with a market share of 50 percent or more is presumptively deemed to possess a dominant market position under the AML.\footnote{See AML art. 19.}

\textbf{Analytical Framework in the NDRC’s 2015 Qualcomm Ruling.} The NDRC launched an investigation into Qualcomm’s licensing and sales practices in November 2013 and concluded, in February 2015, that Qualcomm’s conduct had the effects of restricting competition. The agency issued a fine of RMB 6.09 billion (about USD $975 million, or 8 percent of its 2013 revenue in China), the highest amount in the AML enforcement history to date.\footnote{NDRC Administrative Penalty Decision 2015 No. 1, http://www.ndrc.gov.cn/zfwzxx/jct/201503/t20150302_754177.html (in Chinese). For another useful discussion of the Qualcomm ruling, see H. Stephen Harris, Jr., \textit{An Overview of the NDRC Decision in the Qualcomm Investigation}, CPI \textsc{Antitrust Chron.} (July 2015).}

Qualcomm owns a number of SEPs for CDMA, WCDMA, and LTE wireless communication. It also manufactures and sells baseband chips, a smartphone component that supports various wireless communication standards. The NDRC found that Qualcomm abused its market dominance in licensing its SEPs and sales of baseband chips.

In reaching this conclusion, for each of the telecommunication standards at issue, the NDRC first defined the following two relevant product markets: (1) a licensing market for the collection of Qualcomm’s SEPs (since Qualcomm offered portfolio licenses), where each SEP forms a separate relevant market; and (2) a market for baseband chip sales. The agency also found that the relevant geographic market for SEP licensing covers the jurisdictions where Qualcomm has SEPs, due to the territorial nature of patent application and protection. For baseband chips, the agency found that the relevant geographic market should be global because smartphone manufacturers buy chips worldwide and chipmakers compete for the sales of chips globally.

In each of these relevant markets, the NDRC concluded that Qualcomm held market dominance. In particular:
- For the SEP licensing markets, the agency stated that once a patent is adopted in a stan-
standard, it excludes other competing patents and thus has no substitute. The agency also found a lack of demand-side substitution because it is necessary for the device manufacturers to license Qualcomm’s SEPs, or otherwise the devices cannot conform to the corresponding standards.

- For the baseband chip markets, the agency examined both demand-side and supply-side substitutability of Qualcomm’s products. The NDRC found that device manufacturers had little choice but to use Qualcomm’s baseband chips that support a corresponding telecommunication standard. In addition, there is a high technical barrier that prevents other chip producers from quickly adjusting their production and reacting to changes in demand and prices for baseband chips.

The NDRC found that Qualcomm’s market share was 100 percent in the relevant markets of SEP licensing, and its market shares in the relevant baseband chip markets exceeded 50 percent, the threshold for presumptive market dominance under the AML. The NDRC concluded that Qualcomm presumptively possessed a dominant position in all relevant markets.

In addition to assessing market share, the agency also considered the following factors in determining that Qualcomm had a dominant market position:

- Qualcomm had a high ability to control both the SEP licensing and baseband chips markets;
- smartphone manufacturers highly depend on Qualcomm’s SEPs in order to produce devices that conform to a standard;
- Qualcomm’s baseband chip products are also crucial for the device manufacturers due to the limited number of chip suppliers and their relatively high preference for Qualcomm’s middle- and high-end baseband chips; and
- entry into the SEP and baseband chip markets is difficult due to high technical barriers.

The NDRC then identified the Qualcomm conduct that violated the AML, including:

- **Excessive Pricing.** The agency concluded that Qualcomm charged excessively high royalties for its SEPs, based on findings that (1) Qualcomm did not provide a list of its patents to licensees and charged royalties based on portfolios that included expired patents; (2) Qualcomm required licensees to grant their patents back to Qualcomm for free; and (3) Qualcomm calculated its royalty on the basis of the price of a smartphone—a price beyond the scope of its SEPs. Qualcomm, in response, argued that it added new SEPs to its licensed portfolio in larger numbers than those that expired. However, the agency found this explanation unconvincing, in part because Qualcomm had not evaluated the value of these new SEPs relative to those that had expired. Qualcomm also provided justifications for the royalty-free grant-back requirement it imposed on some licensees: e.g., obtaining the grant-back would protect itself and its customers from risks of patent infringement, and the free grant-back was part of the total value agreed to by the parties. In the end, the agency was unpersuaded and held that Qualcomm’s free grant-back request inhibited the licensees’ motivation to innovate, and thereby excluded competition with respect to communication technology.

- **Bundling.** The agency also found that Qualcomm abused its market dominance by bundling the licensing of non-SEPs with SEPs without justification. Qualcomm offered several justifications for its bundling practices during the investigation, but the agency eventually held that (1) Qualcomm did not always offer a licensee a choice to license only its SEPs; and (2) Qualcomm’s bundling practice had the effect of depriving a licensee from obtaining alternative technology from Qualcomm’s competitors. Thus, the agency found that Qualcomm’s bundling of SEPs and non-SEPs limited competition in the market for non-SEPs, hampered technical innovation, and ultimately harmed consumers.
Unreasonable Trade Conditions. The agency also found that Qualcomm abused its market dominance by making its sales of baseband chips conditional on the licensee not challenging the agreement. Should a licensee initiate litigation against Qualcomm, Qualcomm would cease the supply of chips to that licensee. The agency concluded that by imposing unreasonable conditions on its sales of baseband chips, Qualcomm restrained a licensee’s right to dispute its agreement with Qualcomm, and eliminated or restricted competition from licensees that do not accept such conditions.

In addition to the record-setting fine, the NDRC also ordered Qualcomm to cease the abusive conduct discussed above. Shortly after the NDRC ruling, Qualcomm agreed to implement a rectification plan, which included the following key terms:

- Qualcomm will offer licenses to its current 3G and 4G Chinese SEPs separately from licenses for its non-SEPs.
- Qualcomm will provide patent lists during the negotiation process.
- If Qualcomm seeks a cross license from a Chinese licensee, it will negotiate in good faith and provide fair consideration for its rights.
- For licenses of Qualcomm’s Chinese SEPs for devices sold for use in China, Qualcomm will charge royalties of 5 percent for 3G devices and 3.5 percent for 4G devices, in each case using a royalty base of 65 percent of the net selling price of the device.
- Qualcomm will give its existing licensees an opportunity to elect to take the new terms for sales of branded devices for use in China.
- Qualcomm will not condition the sale of baseband chips on the chip customer signing a license agreement with terms that the NDRC found to be unreasonable or on the chip customer not challenging unreasonable terms in its license agreement.

Analytical Framework in the SAIC’s 2016 Tetra Pak Ruling. In November 2016, the SAIC concluded its investigation into some of Tetra Pak’s business practices in China. After four years of investigation, it found Tetra Pak had abused its market dominance, and imposed a fine of RMB 667.7 million (about USD $97 million, or 7 percent of its 2011 sales revenue in China). This is the second largest fine in the history of enforcement under the AML to date.

Tetra Pak produces and distributes liquid food packaging equipment, packaging materials, and associated services for liquid foods, such as milk, fruit juices, and soups. The packaging containers Tetra Pak produces are mostly cartons made from paper. Among Tetra Pak’s portfolio are

51 In particular, for devices sold for use in China, Qualcomm was ordered (1) to provide licensees a list of patents, and not to charge on expired patents; (2) not to require any grant-back, or grant-back without any reasonable royalty, of non-SEPs possessed by licensees; (3) not to persist in calculating the royalty on the basis of net selling price of the entire terminal device; (4) not to bundle the license of non-SEPs with SEPs without good cause; and (5) not to set unreasonable conditions for potential licensees to purchase its baseband chips.


aseptic packaging solutions intended for products that have especially demanding hygiene requirements, in particular, milk products with long shelf-lives and juice. These aseptic packaging solutions are the focus of the SAIC’s decision.

The SAIC defined three relevant product markets: (1) packaging equipment for aseptic paper packaging (packaging equipment), (2) aseptic paper packaging materials (packaging materials) and (3) technical services related to packaging equipment (services). In defining product markets, the agency considered a number of potential demand-side substitutes. In particular, the SAIC considered whether customers could substitute aseptic cartons with containers made from other materials, including glass, aluminum, and plastic. However, the SAIC found substantial differences between aseptic cartons and other packaging materials in terms of their product characteristics (in particular, the superior aseptic properties of cartons) and associated costs for customers. The agency also found high customer loyalty and high switching costs for customers of aseptic paper-based packaging. Overall, the SAIC concluded that demand-side substitutability was insufficient to justify a market broader than aseptic paper-based packaging. Similarly, the SAIC found that there was no substitutability on the supply side due to the substantial barriers that producers of other packaging materials would have faced when attempting to enter paper-based aseptic packaging markets. As a result of its review of substitution possibilities, the SAIC defined a product market that included only aseptic paper-based packaging. The SAIC defined the relevant geographic market as the mainland of China.

The SAIC found that Tetra Pak possessed market dominance in all three relevant markets. Tetra Pak had market shares exceeding 50 percent in all three markets, and the SAIC also analyzed three additional factors relevant for assessing dominance:

- ability to control the market: the SAIC found that Tetra Pak could impose trading conditions on its customers, indicating a high level of control;
- downstream firms’ reliance on Tetra Pak: the SAIC investigation revealed that especially large dairies depended heavily on Tetra Pak to supply its aseptic packaging equipment, materials, and associated services; and
- barriers to entry: the SAIC concluded that there were substantial barriers to entry due to the high level of investment and technology required to enter the market.

The SAIC further noted that Tetra Pak’s prices and margins were higher than its competitors’, that it had advantages in acquiring raw materials, and that its offerings were much broader than its competitors’.

The SAIC concluded that Tetra Pak engaged in three different types of abusive conduct: tying, exclusive dealing, and loyalty rebates.

- **Tying:** The SAIC found that Tetra Pak tied its sales of packaging materials (or services) to the sales of packaging equipment. According to the SAIC, ensuring product quality (i.e., food safety) did not justify tying, mainly because other suppliers adhered to an industry standard that would safeguard product quality. Overall, the SAIC found that Tetra Pak’s tying practice limited its customers’ choice of packaging materials suppliers and, given Tetra Pak’s dominance in the equipment and services markets, restricted competition in the market.

- **Exclusive Dealing:** Tetra Pak signed an exclusive agreement with a subsidiary of Foshan Huaxin Packaging Co., Ltd. (Hongta), which stated that Hongta would supply the raw paper (a key input) used in the production of paper-based aseptic packaging materials exclusively to Tetra Pak. The SAIC found that this practice was not justified. According to the agency, Hongta relied on its own technology for producing paper and there was sufficient capacity to supply Tetra Pak and its competitors. Furthermore, the exclusive supply agreement put
Tetra Pak's competitors at a disadvantage because they had to resort to inferior alternatives. Overall, the SAIC found that the exclusive supply agreement created entry barriers and restricted competition in the aseptic packaging materials market.

- **Loyalty Rebates:** Tetra Pak offered a number of different rebates to its customers. In its analysis, the SAIC acknowledged that rebates can have procompetitive as well as anticompetitive effects. Focusing in particular on retroactive rebates—rebates that apply to all units a customer buys once a certain threshold has been met—the SAIC found that Tetra Pak's rebates hurt competition in this case.
  - According to the SAIC, a portion of Tetra Pak's customers' demand was non-contestable for competitors (due to Tetra Pak's product portfolio, production capacity and contractual terms) and Tetra Pak was able to leverage its dominant position in this non-contestable portion of demand to the contestable portion by using retroactive rebates.
  - Competitors found it hard to compete against Tetra Pak, because retroactive rebates applied to all purchases once the threshold had been met, including units that were non-contestable, and competitors could only compete on the contestable units. In order to win a customer's contestable demand, competitors would have to compensate the customer for forgone rebates on the non-contestable units. This meant competitors would have to offer very low prices.
  - According to the SAIC, such a situation would put competitors at a disadvantage and could have eventually led them to exit the market. The SAIC found that Tetra Pak's conduct negatively impacted its competitors in the market for packaging materials, as they supplied low volumes, were unable to enjoy economies of scale, and had low margins as a result.

In addition to imposing a large fine, the SAIC issued the following orders regarding Tetra Pak's illegal conduct:

- Tetra Pak will not tie its sales of packaging materials (or services) to the sales of packaging equipment.
- Tetra Pak will not restrict the trading party to deal exclusively with Tetra Pak without any justifiable reasons.
- Tetra Pak will not implement a loyalty-discount program that could potentially exclude or foreclose the competition in the packaging materials market.

**Formation of the SAMR and Its Implications for Future Antitrust Enforcement in China**

As discussed above, China's AML enforcement regime is going through a major restructuring, with SAMR taking over antitrust and regulation responsibilities from MOFCOM, the NDRC, and the SAIC. This change of structure will undoubtedly change anti-monopoly enforcement in China. The short-run effects include increased uncertainty in the process and substance of AML enforcement due to changes in organizational structure and leadership. It will take time for law enforcement staff to align their different work styles and enforcement focuses. In the long run, however, we believe these differences will be largely resolved and there will be synergies in enforcement.

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54 The SAMR will also combine the responsibilities previously held by the General Administration of Quality Supervision, Inspection and Quarantine (AQSIQ), the Certification and Accreditation Administration (CAC), the Standardization Administration of China (SAC), and the China Food and Drug Administration (CFDA).
practices by combining these authorities. We have considered these likely changes in detail below.

**Short-Term Uncertainties.** Consolidating several large institutions will be a highly challenging task. In the short run, there will be considerable uncertainties in both process and substance, mainly due to the lack of clarity regarding the newly formed SAMR’s organizational structure and leadership. First, it can take time for former officials to adapt to their newly assigned roles and responsibilities. Second, it can take time for officials and case handlers to familiarize themselves with new policy goals, new teams, and new data and tools that become available after consolidation.

In addition, the three authorities might have had separate agreements with other international competition authorities, which may take time to consolidate and renegotiate. Therefore, those complicated conduct investigations or M&A transactions that require more detailed analysis may take longer to be reviewed right after the consolidation.

Furthermore, each of the agencies has drafted and adopted different guidelines and industry regulations. Some of these documents offer different approaches in overlapping areas which may take time to reconcile.

**Long-Run Synergies.** Despite the potential prolonged review process for complicated matters in the short run, there will be synergies in AML enforcement in the long run. In particular, uncertainties will be eliminated due to the resolution of discrepancies in enforcement practices and ambiguities in certain areas of enforcement responsibilities among the three antitrust authorities.

First, bringing all the antitrust authorities under one roof will significantly reduce past regulatory uncertainties and administrative redundancies. For example, even though in the past the NDRC was in charge of investigating price-related conduct while the SAIC was in charge of investigating non-price-related conduct, it was not unusual for a case to involve both price and non-price related dimensions. As a result, abuse of dominance cases could be investigated by both the NDRC and the SAIC. For companies involved in potential enforcement activities, this created administrative uncertainty. Under the new SAMR, companies will be working with a single government agency, thus reducing this uncertainty.

Second, the consolidation will facilitate exchange of information and staff sharing by bringing conduct investigations and merger reviews under the same roof. It would be straightforward for the SAMR to draw on MOFCOM’s considerable experience, accumulated from merger reviews, in conducting and evaluating complex and data-intensive economic analysis in conducting investigations. In addition, the SAMR will also be able to assign resources more flexibly to increase enforcement efficiency.

**Conclusion**

The last ten years of AML enforcement has shined a spotlight on the role of competition in the Chinese economy, which is in a transition from a planned economy into a market economy. Indeed, China’s leadership has recognized that competition policy is one of the most important areas of regulation for the market economy. In particular, the Chinese government has envisioned that “in our economic reforms, we must concentrate on . . . ensuring the market-based allocation of production. . . . [W]e should ensure . . . fair and orderly competition,” and that “business survival is determined by competition.”

Furthermore, AML enforcement has cultivated and enhanced com-

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petition in Chinese society. Under the planned economic system of the past, government agencies, consumers, and companies (particularly SOEs) had little exposure to competition and antitrust principles. Following the introduction of AML enforcement, competition has gradually become a central theme in the economy, which has profoundly impacted stakeholders in a wide range of industries.

The establishment of the SAMR as the single antitrust authority in China is likely to create more opportunities to expand and deepen China’s opportunities for international collaboration. Antitrust enforcement often involves the same parties or the same issues across different jurisdictions around the globe. International collaboration has contributed significantly to the development of China’s antitrust enforcement, including the drafting of the AML and various guidelines and legislation, staff training at the Chinese antitrust agencies, as well as in-depth discussion about specific antitrust issues. In the last decade, there have been numerous collaborations on merger reviews between MOFCOM and other international antitrust agencies. However, collaboration in cases involving monopolistic agreements and abuse of market dominance remains rare. We believe that the creation of the SAMR will strengthen international collaboration in these areas and greatly improve the efficiency and transparency of China’s antitrust enforcement.

The past 10 years have witnessed the birth of China’s AML, an increasingly important role of antitrust enforcement, and the consolidation of antitrust power into a single entity. We expect that a unified, independent, and professional competition authority in China will bring more efficient antitrust enforcement and benefit Chinese economy for years to come.
Algorithmic Price Discrimination on Online Platforms and Antitrust Enforcement in China’s Digital Economy

Wei Han, Yajie Gao, and Ai Deng

Antitrust issues in the digital economy, especially those concerning big data and algorithms, have attracted the attention of both scholars and practitioners all around the world. Against the backdrop of rapid development of China’s digital economy, many online platforms now have a largely data- or algorithm-driven business model. Concurrently, the antitrust issues in relation to data and algorithms have also triggered social concerns. For example, in early 2018, the so-called Shashu phenomenon became a hot topic in Chinese society. “Shashu” refers to algorithmic price discrimination by online platforms where longer-term customers are charged less favorable prices. Some observers hold that this type of price discrimination is against the Anti-Monopoly Law of the People’s Republic of China (AML), and ought to be investigated accordingly.1

Similar calls for antitrust law intervention have taken place in other aspects of China’s digital economy. For example, in 2017, a Chinese lawyer brought a complaint against Apple, alleging abuse of dominance by Apple in running its App Store.2 From a regulatory perspective, it appears that the Chinese administrative agencies have taken a cautious position in intervening in the digital economy so far. The Government Work Report delivered during the “Two Sessions”3 in 2017 made it clear that the Chinese government intends to encourage innovation and promote the healthy development of emerging industries by formulating regulatory rules that are “tolerant and prudent.”4 Indeed, in the past two years, the Chinese authorities have closely followed the principle of “tolerance and prudence” in regulating the digital economy.

Against the backdrop of a principle emphasizing regulatory “tolerance and prudence,” algorithmic pricing has nevertheless garnered significant public interest and has recently caught the attention of regulators. In May 2018, Mao Zhang, the head of the State Administration for Market Regulation (SAMR), published an article in which Shashu is listed as one of the regulatory challenges.

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3 “Two Sessions” is the abbreviation of the “National People’s Congress of the People’s Republic of China” and the “Chinese People’s Political Consultative Conference,” which is the most important political event in China held every March since 1959. Representatives of the “Two Sessions” gather, summarize, and transmit information and requests from the Chinese people to the Communist Party of China.4
There is good reason to believe algorithmic price discrimination is top-of-mind for the Chinese regulators.

This article explores the potential challenges of applying the AML to algorithmic price discrimination and offers some suggestions on how to structure the analysis, taking into consideration the unique characteristics of China's digital economy and at the same time abiding by the "tolerant and prudent" principle. We note that although many of the discussions in this article apply to traditional off-line price discrimination as well, algorithmic price discrimination is unique in the sense that it is closely intertwined with online platforms and their ability to amass consumer information in a fashion unthinkable in traditional off-line marketplaces.

**Background of Algorithmic Price Discrimination in China:**

**Online Platforms’ Shashu Through Big Data**

In early 2018, Shashu through big data garnered widespread attention in China. As noted earlier, Shashu is a type of price discrimination where longer-term customers of an online platform are charged a higher price than shorter-term customers for the same product or service. Using data on customers’ purchasing behavior, online platforms attempt to assess the willingness to pay of each customer so that they can offer personalized pricing. For example, a Chinese user might find that he was charged CNY 380 when reserving a hotel room through his own account on a Chinese travel service website, while a friend would only be charged CNY300 for the same hotel. Similarly, it was discovered that someone who usually orders premium services (high-end rides) through an online car-hailing platform was charged a higher price than another individual who orders only express services (regular rides), for the same commute.

Price discrimination is not only limited to these examples but is also common and widespread in the marketplaces for airplane tickets, movie tickets, e-commerce, and travel services. A survey of 2,008 people conducted by the China Youth Daily reveals that 63.4 percent of the respondents believe Shashu through big data is a common practice among internet platforms; 51.3 percent have personally experienced Shashu; 59.2 percent believe that consumers are disadvantaged as a result of the information asymmetry; and 59.1 percent call on Chinese legislators to regulate internet companies’ discriminatory pricing.

Earlier this year, the idea that Shashu may potentially violate the AML was raised in the Chinese press. In March 2018, the People’s Daily, an authoritative newspaper in China, pointed out that Shashu through big data presents challenges to the authorities’ supervision and regulation, commenting that “the technological values are, in essence, also human values. The neutrality of technology does not mean that the application of technology is harmless. There is a risk of breaking the boundary of morality and law if there are no restrictions.”

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Shashu through big data by the internet companies bears the characteristics of the first-degree price discrimination. But this is not a positive development because it reflects the monopoly power of the merchants. These merchants, taking advantage of consumers’ faith in and even reliance on them, charge consumers discriminatorily. This effectively harms the consumers. Strictly speaking, the merchants’ conduct is against the AML. 9

Regulation of Price Discrimination Through the AML
The legal basis for regulating price discrimination in the AML is the prohibition of abuse of dominance, not price discrimination per se. Article 17 of the AML lists a series of prohibited conduct, including “without justifiable reasons, undertakings holding dominant market positions are prohibited from applying differential prices and other transaction terms among their trading counterparts who are on an equal footing.” Article 16 of the Provisions on Anti-Pricing Monopoly promulgated by the National Development and Reform Commission (NDRC) also stipulates that “[b]usiness operators with dominant market position shall not apply differential treatment to trading counterparties with the same conditions in terms of transaction price without justifiable reasons.”

On the issue of Shashu through big data, there has been no known investigation by Chinese antitrust agencies, despite the public call for intervention. Nevertheless, in the past decade, some abuse of dominance cases investigated by the agencies did involve certain discriminatory conduct, although none directly concerned price discrimination. The investigation of the Pizhou Branch of Xuzhou Tobacco Company by the Jiangsu Branch of the State Administration for Industry and Commerce (SAIC) in 201410 and the investigation of Inner Mongolia Chifeng Salt Company by the Inner Mongolia Branch of the SAIC in 201611 are two representative abuse of dominance cases that involve discriminatory conduct. The investigated companies in both cases are state-owned enterprises.

In addition, in 2018, the Hubei Branch of the SAIC investigated and disciplined a private enterprise, Hubei Yinxingtuo Gangbu Ltd., whose business includes vehicle roll-on-roll-off services; cargo (excluding explosive and dangerous goods) loading, transportation and storage; port support services; and shipping and transportation insurance.12 The competition agency found that, as the only provider of Yiyu Line roll-on-roll-off shipping services in the Sichuan River upstream route, the company gave preferential treatment to Yichang H Transportation Ltd. (H-company), a company with which it had a business relationship, over other transportation companies. Specifically, Hubei Yinxingtuo Gangbu Ltd. not only prioritized the loading of H-Company’s ships over others, but also assigned “more valuable” vehicles for the H-Company to ship, violating Article 17 of the AML that prohibits abuse of dominance through discriminatory conduct.

AML’s Regulation of Algorithmic Price Discrimination: Challenges and Potential Solutions

As discussed above, price discrimination has not been investigated in China, even though there is a relevant basis for antitrust challenges based on the abuse-of-dominance clause of the AML. With the rapid development of China’s digital economy, algorithmic discrimination, such as Shashu through big data, will only become more common. What, then, are the challenges when the Chinese antitrust agency tries to deal with algorithmic discrimination by online platforms in the future? In what follows, we explore these challenges in detail and offer our suggestions on some potential solutions.

The Role of “Fairness.” Discrimination is often associated with unfairness. Indeed, some in China question algorithmic discrimination such as Shashu through big data precisely from the perspective of fairness. But how should the question of fairness be addressed in competition enforcement? The Roundtable on Price Discrimination held by the Organization for Economic Cooperation and Development (OECD) in 2016 identified three different effects of price discrimination: “(1) it can exclude rivals and thereby lead to the exploitation of consumers; (2) it can exploit consumers directly; and (3) in upstream markets, it can exploit intermediate customers and create distortionary effects that harm consumers in downstream markets.” The Roundtable emphasized that “[i]n each case, it is the effect on consumers, and not the fairness of the discrimination, that determines the acceptability of the discrimination.” 13 In other words, competition law may not be the right tool to address the fairness standard. Therefore, what role, if any, fairness plays in competition enforcement is a question that the Chinese antitrust agency should be considering.

Article 1 of the AML makes clear that the policy goals of China’s competition law are multifaceted: “This Law is enacted for the purpose of preventing and restraining monopolistic conduct, protecting fair market competition, enhancing economic efficiency, safeguarding the interests of consumers and the interests of the society as a whole, and promoting the healthy development of socialist market economy.” Note that the AML protects “fair market competition,” but not explicitly “free market competition.” The academic community in China, however, has recognized that “the main goal of anti-monopoly law is to protect free competition.” 14 So exactly how the Chinese antitrust agency interprets Article 1 of the AML when approaching issues such as algorithmic discrimination that can be easily associated with the fairness standard is a key question.

Among the types of abuses listed in Article 17 of the AML, we find that only one explicitly references the “fairness” standard. 15 Even so, in the three abuse of dominance cases mentioned above, it appears that the Chinese antitrust agencies have, to some extent, taken fairness into account. In the case of Pizhou Branch of Xuzhou Tobacco Company, the complaint alleges that the discriminatory conduct was “against fairness.” The enforcement agency also emphasized in its ruling that “the discriminatory conduct of the undertaking concerned has impeded fair market

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15 The Anti-Monopoly Law of the People’s Republic of China (AML) (promulgated by the Standing Committee of the National People’s Congress, Aug. 30, 2007, effective Aug. 1, 2008), art. 17(1): “Undertakings holding dominant market positions are prohibited from selling commodities at unfairly high prices or buying commodities at unfairly low prices.”
competition” and has “disrupted the fair order of cigarette retail market competition.” In the case of Inner Mongolia Chifeng Salt Company, the enforcement agency stressed that the discrimination had “adversely affected the fair competition in the table salt market,” and “clearly infringed the right to choose and fairly trade of the residents in inland China, harming the rights and interests of consumers.” In the case of Hubei Yinxingtuo Gangbu Joint Stock Company, the competition agency similarly highlighted that the conduct had “impeded the fair participation of” other downstream companies in the market and “harmed the legitimate rights and interests of freight vehicle shippers.”

In our opinion, when analyzing discrimination cases, the Chinese antitrust agency should avoid interpreting Article 1 of the AML mechanically to regard fairness as a key standard. More specifically, we believe that the antitrust agency should combine Article 6 of the AML (general provision of abuse) and Article 17 of the AML (specific provision of abuse) to assess whether the algorithmic discrimination has eliminated or restricted competition. We would caution against arbitrarily expanding the interpretation of Article 1 of the AML to include fairness as a legislative goal: the emphasis should be on the freedom of competition.

Challenges for Antitrust Remedies

The Lack of a Legal Basis for Behavioral Remedies. Even if algorithmic discrimination by online platforms is determined to be anticompetitive, whether the AML could provide sufficient and effective remedies is still an open question for the Chinese antitrust agency. The AML provides a legal basis for structural and behavioral remedies only for antitrust review of mergers, but not for cartel agreements or abuse of dominance conduct. For abuse of dominance conduct, available remedies based on Article 47 of the AML are (1) discontinuance of the violation, (2) confiscation of unlawful gains, and (3) imposition of administrative fines.

It is worth noting that, in their review of abuse of dominance cases, competition agencies from the United States and the European Union have imposed behavioral remedies on high-tech companies, requiring these companies to abide by certain behavioral obligations for a certain period of time. For example, as recently as 2017, the European Commission imposed a series of behavioral obligations on Google. In the Microsoft operating system case, the U.S. District Court for the District of Columbia required Microsoft to disclose protocols used in server/client communications so as to promote and improve interoperability between Windows desktop PCs and non-Windows servers and other products.

Until now, the AML has only explicitly required companies found to be abusing their dominant market position to “discontinue (the) violation.” In some respects, this is a “non-action” obligation. This means that the Chinese antitrust agency might face certain obstacles when imposing proactive behavioral remedies. If we go back to one of the three remedies in the AML, “discontinuance...
of violation” only requires the companies to cease the illegal conduct under investigation, but not to proactively engage in other actions. As an example, in the Tetra Pak case that was investigated by the SAIC, Tetra Pak was required not to: (1) tie in packing materials when supplying equipment and technical services without justifiable reasons; (2) restrict the supply of kraft back papers from packing paper suppliers to third parties without justifiable reasons; or (3) design and implement loyalty discounts that would eliminate or restrict competition in the packing material market.\(^{22}\) We note that Article 45 of the AML stipulates that an antitrust investigation may be suspended if the firm under investigation “commits themselves to adopt specific measures to eliminate the consequences of their conduct within a certain period of time.” Therefore, in some ways, Article 45 may be interpreted as the potential legal basis for proactive remedies. Of course, it remains to be seen if Article 45 will be interpreted in this way for cartel and abuse of dominance conduct in practice.

Again, to the extent algorithmic price discrimination by online platforms was deemed an element of abuse of dominance, whether and how aggressively the Chinese antitrust agency would impose proactive behavioral remedies exactly under the AML still remains unclear. This is largely due to the lack of precedents as well as the associated challenges, some of which are discussed in this article.

**The Potential “Chilling Effect” of Algorithmic Transparency**

On various issues resulting from the use of algorithms, including algorithmic discrimination, the global community has begun to consider promoting algorithmic transparency as a safeguard. In 2017, the Association for Computing Machinery US Public Policy Council issued a statement on algorithmic transparency and accountability, listing several principles to support the benefits of algorithmic decision making while addressing concerns with the potential for harmful bias and discrimination.\(^{23}\) Margrethe Vestager, the European Commissioner for Competition, also advocated that companies are obligated to design algorithms in accordance with data protection and antitrust laws and regulations.\(^{24}\) German Chancellor Angela Merkel has expressed similar opinions, calling on internet giants, such as Facebook and Google, to disclose their algorithms, saying that “The algorithms must be made public . . . . These algorithms, when they are not transparent, can lead to a distortion of our perception. They narrow our breadth of information.”\(^{25}\)

Of course, promoting algorithmic transparency is not without its own limitations and challenges. As noted by the OECD, “[E]nforcing algorithmic transparency and accountability might turn out to be a challenging task in practice, especially when facing black box algorithms . . . . Merely publishing (or disclosing to a regulator) the source code of the algorithm may not be a sufficient transparency measure. Complete transparency would require that someone could explain


\(^{23}\) Association for Computing Machinery US Public Policy Council (USACM), Statement on Algorithmic Transparency and Accountability (2017), [www.acm.org/binaries/content/assets/public-policy/2017_usacm_statement_algorithms.pdf](http://www.acm.org/binaries/content/assets/public-policy/2017_usacm_statement_algorithms.pdf).


why any particular outcome was produced, but that might be an impossible task when machine
learning systems have made autonomous decisions that have not been instructed by anyone."26

In China, with respect to algorithmic discrimination such as Shashu through big data, some
hold that such conduct has infringed consumers’ right to information about firms’ pricing prac-
tices.27 Therefore, in the context of using antitrust enforcement to address algorithmic discrimi-
nation, the public may also demand increased algorithmic transparency in the future. However,
whether it is appropriate to use the AML to require or dictate algorithmic transparency remains
unsettled. In addition, even if one ignores the legal obstacles to imposing behavioral remedies
mentioned above, how to implement and supervise behavioral obligations to increase algorithmic
transparency, while at the same time avoiding the potentially chilling effect on market innovation,
will be a challenge.

**Avoid Imposing FRAND Obligations.** To the extent that algorithmic price discrimination by
online platforms falls under the scope of the AML, one logical way to interpret the remedy of “dis-
continuance of violation” is to discontinue price discrimination. As a result, the antitrust agency
may impose non-discrimination obligations or even broader fair, reasonable, and non-discrimi-
natory (FRAND) obligations on the online platforms. Although non-discrimination or FRAND obli-
gations have not been imposed in cartel and abuse of dominance cases, the Ministry of
Commerce (MOFCOM) has imposed non-discrimination obligations, including FRAND obliga-
tions, in a number of conditionally cleared merger cases during the last ten years. For example,
in the case of Bayer’s acquisition of Monsanto, which was conditionally cleared in March 2018,
MOFCOM found that the resultant concentration could potentially eliminate or restrict competition
in the global digital agricultural market and imposed a behavioral remedy on the merged entity to
allow all Chinese digital agricultural software applications to connect to its digital agricultural plat-
forms “in accordance with fair, reasonable and non-discriminatory provisions,” and to allow all
Chinese users to access its digital agricultural products or applications for a specified number of
years.28

In early 2018, the three Chinese antitrust agencies were combined into one under the gover-
nance of the SAMR. Consequently, merger review and investigation of cartels and abuse of dom-
inance are consolidated within a single agency, as are the staff from the three agencies. With the
consolidation, it is possible that MOFCOM’s experience in the past decade with non-discrimina-
tion or FRAND remedies may influence the design and implementation of remedies in abuse of
dominance cases, including those that involve algorithmic discrimination.

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competition-policy-in-the-digital-age.htm. It is worth noting that these comments also reflect the fact that antitrust authorities typically lack
the requisite technical expertise. In the academic community, Ezrachi and Stucke, and Harrington, have proposed ways to better understand
the impact of algorithms on competitive outcomes. See *Ariel Ezrachi & Maurice E. Stucke, Virtual Competition: The Promise and
Perils of the Algorithm-Driven Economy* (2016); Joseph E. Harrington, Jr., *Developing Competition Law for Collusion by Autonomous
Artificial Agents* (2017), https://ssrn.com/abstract=3037818; Ai Deng, one of the authors of this article, gives reasons why algorithmic trans-
parency is not always necessary to detect anticompetitive algorithms. See Ai Deng, *4 Reasons Why We May Not See Colluding Robots
Anytime Soon, LAW360* (Oct. 3, 2017); Ai Deng, *What Do We Know About Algorithmic Tacit Collusion?*, *ANTITRUST*, Fall 2018 (forthcom-
ing) (manuscript available at https://ssrn.com/abstract=3171315) [hereinafter Deng, *Algorithmic Tacit Collusion*]. In a later section, we argue
that having a robust expert support system will substantially enhance the capabilities of Chinese antitrust agencies in the digital economy.

27 Jing Chen, *Didi, Ctrip and Other Companies Exposed to Apply Shashu, Suspected of Infringing Right to Information of Consumers*, CHINA

28 The MOFCOM Announcement No. 31 of 2018 on Anti-monopoly Review Decision Concerning the Conditional Approval of Concentration of
Undertakings in the Case of Acquisition of Equity Interests of Monsanto Company by Bayer Aktiengesellschaft Kwa Investment Co., Mar.
Although the non-discrimination or FRAND remedies may seem like an obvious choice for regulating algorithmic discrimination, if it is determined to be anticompetitive, we would caution the antitrust agency against using such remedies too liberally. What exactly can be deemed as non-discrimination in algorithmic design may not be so straightforward. For example, borrowing the concept from the standard essential patent (SEP) context, FRAND obligations refer to non-discrimination among “similarly situated” licensees, not all licensees. Whether a condition such as “similarly situated” should apply if FRAND obligations were imposed on algorithmic discrimination, and what types of users would be deemed as “similarly situated,” remain to be answered. In addition, the mechanism for implementing and monitoring such remedies needs to be carefully designed.

Having recognized both legislative and practical difficulties faced by the Chinese antitrust agency when trying to address algorithmic price discrimination through the AML, in the next section, we discuss several specific proactive actions that the SAMR could take.

How to Approach Algorithmic Price Discrimination: Our Recommendations to the SAMR

Understand the Development and Evolution of the Theory of Harm in the Digital Economy.

China’s digital economy is developing rapidly. The rate of adoption of mobile payment, bike sharing, and online shopping is among the fastest in the world. With the increasing adoption of digital services also comes public skepticism about the new modes of competition. In fact, there have been controversies around the use of big data and algorithms in China in recent years. New modes of competition enabled by the digital economy have also challenged the effectiveness of the traditional anti-monopoly legal system. Are the traditional theories and tools of analyzing potential harm to competition still applicable in the digital economy? Are the issues related to data and algorithms really “new” competition issues? We note that the vagueness of the purpose of the AML—there are additional rights and interests protected by the AML beyond consumer welfare, as reflected in Article 1—as well as the vagueness of other provisions leave room for new theories of harm to be developed. For example, should privacy protection be considered as one type of right protected by the AML? This is a topic being heatedly debated all over the world right now.

In reality, the legal environment in China is more complicated. With the promulgation of a series of new laws like the Internet Security Law of the People’s Republic of China in recent years, it is no easy task for the Chinese anti-monopoly agency to balance the promotion of openness to data to enhance competition with the protection of personal information.

In summary, as the digital economy continues to develop, the Chinese authority should proactively think about how the AML could be applied to technical innovations in the future. We should ask, among other questions, how to analyze new issues and problems under the traditional antitrust framework. We believe that the antitrust agency should approach innovations from the

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29 For a discussion of this question, see CEPS, Competition Policy in the Digital Economy: Towards a New Theory of Harm? Seminar organized by the CEPS Digital Forum (June 1, 2016), https://www.ceps.eu/sites/default/files/EventSummary%20Competition%20in%20the%20Digital%20Economy_0.pdf.

30 Wei Han & Yajie Gao, Promote Openness or Strengthen Protection? Application of Law to Data Competition in China, CPI ANTI-TRUST CHRON. (May 15, 2018). In addition, mergers and acquisitions in the digital arena are rather common in China. In early 2018, the acquisition of Eleme by Alibaba and the acquisition of Mobike by Meituan attracted much attention in Chinese society. Issues raised by these transactions, such as pre-emptive acquisition of disruptive innovators, input foreclosure, and even the applicability of the theory of conglomerate leverage, are also well worth the Chinese anti-monopoly agency’s attention.
perspective of antitrust based on harm to competition. Ultimately, the agency should try to understand innovative business models and market competition from comprehensive technical, business, economic, and legal perspectives.

**Protect the Right of Defense.** According to Article 17 of the AML, discriminatory conduct by online platforms with dominant market positions may be illegal only if they do not have “justifiable reasons” for doing so. This offers companies a way to defend themselves by identifying justifiable reasons.31 Article 8 of the Provisions on Prohibiting Abuses of Dominant Market Positions promulgated by the SAIC offers some guidance on what may qualify as such justifiable reasons. Specifically, the following elements will be taken into account: (1) whether the relevant act is adopted by a business operator for its normal business activities or normal benefit; and (2) impact of the relevant act on the efficiency of economic operations, public interest, and economic development.

China’s advocacy for “tolerant and prudent” regulation for emerging industries is mainly aimed at avoiding excessive intervention that inhibits incentives for innovation. From the perspective of antitrust enforcement, full protection of the rights of enterprises to defend themselves, an open attitude towards a dynamic efficiency defense, as well as procedural justice are important safeguards for “tolerant and prudent” regulation.

**Promote Research Efforts and Establish an Expert Support System.** Research into antitrust issues with respect to algorithms is still at an early stage.32 Globally, actual cases that involve algorithms are still rare.33 The limited experience also calls for a prudent antitrust enforcement approach to algorithmic discrimination by online platforms. Excessive law enforcement can easily lead to chilling effects on innovation, which could in turn undermine consumer welfare.

The antitrust community still lacks sufficient understanding of how algorithms work and the full extent of the influence artificial intelligence may have on business models and market competition. Considering the limited knowledge we possess at this early stage, an important step is to conduct market research and industry surveys. For the new problems like algorithmic discrimination, China’s antitrust law enforcement agency should conduct market research as soon as possible to understand the applications of big data and algorithms in China’s digital market and identify major potential issues to lay a good foundation for potential antitrust law enforcement in the future.

To start with, it would be helpful for the antitrust agency to have some basic knowledge of the relevant technologies used in algorithmic discrimination in order to fully understand the conduct. In addition to inviting technical experts to assist in actual investigations, a long-term solution for the newly established SAMR also is to consider setting up an independent technical support department. In fact, the “technical investigator” instituted within the Chinese court system is a good example of such a mechanism, and a similar model could be adopted by the antitrust agency.

Since 2015, these “technical investigators” have helped with complicated technical issues in the

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31 In the three abuse of dominance cases discussed above, the companies under investigation all tried to defend their conduct, although none of the defenses was accepted in the end.


33 In a well-publicized case, David Topkins, a former e-commerce executive, was charged with price fixing in the DOJ’s first online market prosecution. Topkins pled guilty to conspiring to fix the prices of merchandise sold online. https://www.justice.gov/opa/pr/former-e-commerce-executive-charged-price-fixing-antitrust-divisions-first-online-marketplace. In early June 2018, Reuters reported on an algorithmic pricing case in France. The case is currently still developing. See https://www.reuters.com/article/us-autos-software-pricing-insight/software-and-stealth-how-carmakers-hike-spare-parts-prices-idUSKCN1Z07L.
intellectual property courts in Beijing, Shanghai, Guangzhou, and other cities. In early 2018, as part of the government restructuring, the State Intellectual Property Office (SIPO), which has a large number of experienced technical experts, was consolidated into the SAMR. Accordingly, the SAMR could consider taking advantage of in-house technical expertise to better deal with issues such as algorithmic discrimination in today’s digital economy.

Conclusion

By focusing on “Shashu” through big data, one of the hottest topics in China’s digital economy, this article explores the challenges the Chinese competition authority faces in dealing with competition issues raised by algorithms and big data. Indeed, given that no administrative antitrust decision has been issued against price discrimination so far, there remains a great deal of uncertainty as to how the SAMR would approach algorithmic price discrimination going forward. It is important to recognize that under certain conditions, price discrimination can be procompetitive and can increase consumer welfare. We believe a cautious approach to antitrust enforcement regarding online platforms’ algorithmic discrimination is warranted.

To better address the potential regulatory challenges, we have recommended in this article several preemptive measures that the SAMR could take. While it is reasonable for the antitrust authority to follow the “tolerant and prudent” principle to avoid hindering the growth and innovations in China’s digital economy, it is still necessary to study and understand the conduct and evaluate the potential competitive harm such conduct might cause.


Understanding the Role of Computing Infrastructure in Economic Analysis in the Changing World of “Big Data”

Allan Shampine, Loren Poulsen, and Michael Sabor

Computing has always played an important role in economic consulting and economic testimony in antitrust investigations and litigation. However, computing work covers a wide range of projects and capabilities, ranging from exposition of simple statistics to complex iterative econometric models on millions of data points.

On the one hand, personal computers can be used by consultants to perform empirical analyses using, e.g., Excel, and to rely on software packages to estimate regressions involving smaller data sets. On the other hand, larger data sets have always required greater computational power and therefore more powerful computing infrastructures.

Over the years, the meaning of “big data” has evolved, as has the ability to process such data. For example, with the growth of the “Internet of Things,” and the increase in inexpensive storage capacity, data sets available for use in economic analysis are rapidly transitioning from gigabytes to petabytes (millions of gigabytes) or even zettabytes (trillions of gigabytes) of information. Such large data sets can include transactional data from retailers, trading/exchange data, health insurance claims, page click/view data, and other granular usage data. These data sets can grow even more when married to macroeconomic data or demographic data that may be used to understand consumer behavior or competitive reactions to market changes over time. For example, Walmart reportedly processes 2.5 petabytes (or 2.5 million gigabytes) of transactional data per hour.¹ Now imagine combining that transactional data with detailed customer information, information on local demographics, and information on regional and national economic trends, making the already “big data” even bigger.

These sorts of scales were unimaginable 30 years ago. Trading and retail transactional data in particular have often been used in economic consulting and litigation, such as merger analyses, price-fixing cases, and securities litigation, but historically such use has been limited by the ability of consultants to process the data, and for some time, the data sets were smaller than many now available as firms collect more data than ever before. There are also more types of data available than in the past, such as usage data for products like television set top boxes.

The availability of more and larger data sets has enabled consultants to develop larger and more complex analyses for more precise estimation of antitrust effects. New types of projects are being undertaken, as are more complex versions of the type of analyses offered in prior matters. This is an evolving area, and even counsel who have often worked with consultants on empirical work may be surprised that projects which had become seemingly routine in the past are now

proving slower and harder to adjust to changing circumstances—due to both the increase in “big data” availability and the more complex analytic tools developed to process those data.

This article tries to pull back the curtain on what is happening on the consultant side. What equipment and software are being used? When and where do issues tend to arise? And how can those issues be avoided or mitigated?

### Hardware and Software

There are four primary computing infrastructure setups that counsel are likely to encounter: (1) mainframes; (2) personal computers/work stations; (3) data centers; and (4) cloud computing. Each has strengths and weaknesses, and a given consultant will likely have access to several of these.

Historically, larger data sets typically were analyzed on a mainframe. Consultants working in an academic setting may have access to mainframes owned and maintained by their university. However, use of those facilities for economic consulting or litigation may be restricted by university policy. Furthermore, some universities have provisions for handling confidential data for consulting engagements by professors, but others may not. However, while consultants are relatively unlikely to be using mainframes today, some corporations may still be doing so, which can raise issues during the data preparation process (discussed below).

Personal computers are commonly used to analyze data sets, but their capabilities are relatively static. If their physical components are inadequate for a particular application, they cannot be readily upgraded. While one can add some memory or increase processing power in a pinch, one cannot increase the capabilities of modern personal computers a hundredfold if needed without buying an entirely new computer.

A “workstation” is a term for a more powerful computer, but one short of a mainframe. As computers have grown more and more powerful, the distinction between a personal computer and a workstation has grown increasingly blurred. Today’s personal computers are capable of processing hundreds of millions of observations and performing regression analyses of what historically have been considered very large data sets. A consultant’s office may have a mix of personal computers and one or more workstations that are accessed through a local area network of some type. This is the most common set-up, particularly among smaller consultancies.

A data center is a location with centralized computing facilities. Data centers are more expensive to create and operate than just having a few laptops and workstations around the office, but they offer many advantages. In addition to raw computing power and greater storage capacity, these centers are typically connected to individual offices by dedicated data connections, helping anchor a fast and secure internal network. A data center may have multiple petabytes of storage on hand and the ability to rapidly add more—a capability not easily replicated with laptops or desktops. Not all data centers are created equal, but typically they are located in remote facilities hardened against power loss and natural disaster and have geographically diverse backup facilities. Consultants can own and operate their own data center, locate their equipment in a professionally managed data center, or utilize a hybrid where they lease a private room within a professionally managed facility.

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2 The authors’ economic consulting firm, Lexecon, later Compass Lexecon, resolved these concerns by purchasing and operating its own mainframe platform beginning in the early 1980s, now retired and replaced by a dedicated data center, although this solution was, so far as the authors are aware, unique.

3 Data centers also provide various valuable services that a consulting group could not afford to duplicate, such as high levels of physical security, fire sensing and protection systems, and multiple sources for electric power.
Data centers allow for much easier upgrades than personal computers and workstations. Indeed, that capability is one of the most attractive aspects of creating and maintaining a data center: the centers are specifically designed to be readily upgradeable. If additional storage or computing power is desired, the data center can typically accommodate that in a relatively efficient and expeditious fashion. To be clear, expansion is not instantaneous, particularly for substantial upgrades. Some upgrades can be completed in days, and software license upgrades can happen very quickly, but large hardware upgrades may take weeks, particularly if purchasing specialized equipment.\(^4\)

Security arrangements within a data center or on workstations or personal computers can vary widely and are often customized to address particular client needs. For example, counsel may wish the consultants to have internal firewalls limiting access to particular data. Further restrictions may be appropriate, or may even be required by law. Customized solutions are common, but there are also industry standards that practitioners can inquire about, such as a HiTrust or Cybertrust certification.\(^5\) For medical information in particular, being able to ensure compliance with HIPAA standards is critical. Sometimes the security needs are clear, i.e., if HIPAA compliance is required. Other times there may be sensitivity about data, but no specific legal requirements, in which case the available security options should be discussed. If clients express concerns about security, consultants should be able to explain clearly what arrangements are in place, and being able to point to industry standard certifications may be useful in reassuring the clients of the safety of their data.

The last option, cloud computing, is available to all, but is typically obtained on an engagement-specific basis. Cloud computing consists of remotely accessed computer services provided by a third party, usually offered by hosting firms, such as Amazon and Microsoft. The computing resources are located in various large collections of servers, but the allocations are dynamic and can be scattered across many physical locations. Cloud computing comes in many forms with varying capabilities, costs, and security concerns. Most solutions are well suited for data preparation and aggregation tasks but less so for more sophisticated estimation tasks (e.g., regressions beyond ordinary least squares).

The advantage gained from “preparing data” with cloud platforms when there are massive data sets involved may itself warrant their use prior to estimation tasks conducted in other platforms. For instance, it may be appropriate to prepare a regression data set using cloud resources and then perform regression analyses locally (using the statistical package of choice on a workstation or data center, e.g., Stata, SAS, MATLAB, etc.). That is, immensely large transactional data sets could be aggregated, summarized, sampled, or condensed into a form better suitable for regression analysis, graphing, and general litigation use. In this way, cloud computing can be a complement to the other processing options. Cloud computing enables the most rapid upgrading of the four computing platforms, albeit within a limited range of capabilities. A properly designed cloud computing architecture can add the equivalent of thousands (or even hundreds of thou-

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\(^4\) An exception to this would be if consultants used a highly integrated data center vendor that typically provides IT functions, such as support, architecture, networking, and procurement. In this situation, significant vendors usually have hardware in stock and have database licensing streamlined (though they likely do not have licenses for common econometric applications). Another exception would be if consultants located their infrastructure in an on-demand cloud vendor. As discussed below, in this scenario hardware options are more limited but capacity additions are nearly instantaneous.

\(^5\) A certification typically is granted after a third party reviews the security arrangements of the firm. The particulars will vary with the certification. HiTrust, for example, has a special focus on HIPAA compliance.
sands) of PCs literally at the push of a button. Indeed, the single greatest advantage of cloud computing is that the relatively quick availability of computing and storage units in the cloud can provide scale otherwise unattainable to most consultants. Consultants may choose to configure, install, and orchestrate software on hosted infrastructure themselves or they may choose to operate within a vendor-provided environment with service and support.

There are some situations for which cloud computing may represent the only feasible approach, such as when an analysis will involve data sets measured in petabytes or zettabytes with billions or trillions of observations. Not only do workstations lack the physical capacity to analyze such large data sets, the software normally used can be inadequate to handle such massive data sets. Indeed, many software packages used on workstations and personal computers cannot even open a data set of such size. That is not to say that cloud computing is literally the only option available. It depends on the type of analysis to be conducted and the physical facilities available. However, few economic consultants are likely to have the physical facilities to handle such a large data set.

For the right type of problem, then, cloud computing can be used as an alternative, but it is not a panacea. Cloud computing is particularly well suited to problems where the computation to communication ratio is high. That is, with cloud computing, running lots of parallel calculations remotely is relatively inexpensive, so the key is breaking up the problem in a way to take advantage of the strengths of cloud computing. However, complex estimation algorithms of the type often used in economic consulting have not really been optimized for cloud computing at this point. A tricky situation arises when truly massive data sets are being used, but the situation calls for complex regression analysis that is difficult to do in a cloud computing context. As noted above, the consultant may then prep the data in a cloud computing environment and sample, condense, or summarize it in ways that allow it to then be analyzed on workstations or a data center. This allows the consultant to take advantage of the additional data even when it cannot be used wholly or directly.

Counsel should be aware that use of cloud computing in this context by its nature involves the economic consultant subcontracting with other firms. There is significant variation between the solutions used, and the interactions between the economic consultants’ own facilities and staff and the cloud computing entities can vary widely. Not all solutions are created equal, and the costs, strengths, weaknesses, and security issues can vary. In particular, data security issues may be addressed on an individualized basis, and the cost for different levels of security will vary. Consultants may independently or collaboratively with a vendor address security concerns, such as single vs. multi-tenancy, public vs. private IP-addresses, and SOC\textsuperscript{6} vs. HIPAA compliance. Generally speaking, costs directly relate to the increase of computing units, data storage units, service/support availability, and security complexity. For example, HIPAA compliance will generally be more costly than a vendor’s standard “enterprise” level security arrangements. Close coordination between the consultant and counsel can help avoid any unpleasant surprises as a cloud computing solution is deployed.

**Obtaining and Preparing Data for Analysis**

During the initial data development process (whether internal or as a formal part of discovery in litigation), one of the first issues to be considered is a gating issue. Counsel and the consultant

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\textsuperscript{6} SOC (System and Organization Controls) reports evaluate a firm’s security, confidentiality and privacy controls. Third-party firms like PWC can offer SOC reports on how a firm safeguards its data and information, which may also be done in conjunction with certifications like that of HiTrust.
need to discuss how processing the data might be addressed given the consultant's computing infrastructure—hardware, software, and staff. This can be an issue both with extracting data from legacy client systems and relying on data sets using current formats that may be ill-suited to the massive size of today's definition of "big data." For example, if data are going to be produced using old legacy formats, such as magnetic tapes, can the consultant even read the physical media? If the database being produced is extremely large, can the consultant actually ingest, store, and analyze the data?

Physical production of extremely large data sets can also have challenges of its own, as the physical media for such a large data set may be very bulky. For example, the data might be transferred as an entire rack of hard drives, which may have to be transported by truck, possibly under guard. A data center is particularly well suited to handling such a production but, lacking a data center, where will the consultant store the rack and how will it be secured? Usually data transfers can be managed by FTP, e-mail, encrypted hard drive, USB drive, or some other commonly used mechanism, but really large data sets can pose unusual challenges. In those circumstances, counsel should be aware that the transfer process itself can become time consuming and expensive. Sometimes third-party vendors are brought in to handle data productions, particularly if there are multiple plaintiffs or defendants. The vendor can then provide a centralized repository for data. However, such arrangements can also produce friction if the consultants do not have direct access to the data and must make repeated queries to the vendor for different pulls from the data.

Clients with unusually large data sets almost certainly are experts at processing their data, but systems, security, networking, geography, and expertise all can generate significant cascading delay. For instance, clients may store their data in a system not possessing standard backup facilities to formats amenable to consultants or regulatory bodies. Additionally, security policies may limit additional means of exporting and/or warrant time-consuming encryption. Clients' networking capabilities may be insufficient to transfer the data in a reasonable amount of time and their data centers may be located remotely, thereby delaying shipping times (which, in these situations, likely would involve a professional courier, or, as noted above, armed guards). Lastly, clients' internal expertise may not extend to exporting/converting data to formats they do not commonly work with. Similarly, consultants not familiar with unusually large data sets may need time to consider their best location to receive the data, the time needed to decrypt and/or decompress the data, their physical storage limitations, their physical connectivity options, and their infrastructure capability. Simply sorting through these issues can take substantial time even before the transfer process begins, often requiring extensive discussions among counsel, the consultant, and the client.

Legacy systems can pose similar concerns. Some companies still have legacy systems that rely on magnetic tapes or tape drives to store and transfer their internal data. Parties do not always negotiate the media and formatting of data productions, and failure to do so can sometimes create complications, such as receiving a delivery of magnetic tapes. Even if the issues are negotiated, a company using a legacy system may insist that is the only cost-effective way for it to produce the data. The authors can attest that, while infrequent, these situations do arise. Few consultants still have the physical ability to read such tapes, and vendors with the capability can be quite slow in processing and making available such data.

Another issue that may arise is whether additional software packages or expertise will be called for. Software typically requires licensing, which has both a monetary cost and an administrative burden. Some assignments may be best handled by using a particular software package, especially if responding to another expert who uses a specific package, or by working with a client
that internally uses a particular package. The number of software packages used in economic consulting has proliferated in recent years, and includes SAS, Stata, MATLAB, SQL, Python, R, Mathematica, and many others. Adding a new license can be both time consuming and costly, and if the consultancy does not already have a license, additional time may be required for staff to get up to speed on the new package. A need for a new license may arise during the discovery process if, for example, data are being kept using a particular database package, or other experts have indicated what software packages they are using. Often, raw data can be analyzed using different packages, and, given good documentation and backup productions, one consulting group may choose to respond to another group using different software packages.

Nonetheless, during an engagement and particularly during litigation, counsel may be concerned that their expert may not be literally replicating the opposing expert’s work in terms of running and modifying the same computer code. That is, counsel may be concerned that replicating the opposing expert’s work papers in a different software package could open that work to the challenge that any differences may be due to the software implementation rather than the differences (or mistakes) in code, or vice versa. However, re-implementing the work in a different software package can be attractive as it involves careful attention to each step during the replication process, helping to ensure that the analysis is fully understood. Nonetheless, performing this type of analysis with a new software package unfamiliar to the consultant within the compressed time-frames of litigation or a regulatory review schedule may be impractical.

Depending on the application, licenses to third-party databases may also be helpful. For example, analyses involving trading data often will use data from the Center for Research in Securities Prices (CRSP), the Trades and Quotes database, and the Institutional Brokers Estimate System (IBES). Consultants working in these areas likely already have subscriptions to these services. However, consultants are less likely to have subscriptions to industry-specific third-party research firms (e.g., Nielsen for data on television show ratings, Dell’Oro for data on telecommunications infrastructure, or SNL Kagan for data on multichannel video programming distributors), but may have experience at licensing data from those firms for specific engagements. In either case, counsel should be aware that obtaining a license to third-party data can be time consuming and expensive.

Restrictions on usage by third-party firms can vary widely, but counsel should be aware that some third-party firms are well known for preferring their data not be used in litigation, and imposing limitations on their use. Third-party data licenses can also vary widely in expense, from a few thousand dollars to tens or even hundreds of thousands of dollars. Negotiating a license can also be time consuming. While third-party firms often have standard licenses, those typically involve different sorts of rights than may be desired for litigation or regulatory analysis purposes. The process of negotiating a license itself can therefore take anywhere from a few days to a few weeks, even under the best of circumstances.

Furthermore, obtaining the data itself after a license is signed can take time. One might think that after a license is signed, the research firm would simply e-mail the data or set up an FTP link, but that is the exception and not the rule. Do not assume that the third-party data will be quickly delivered. The third-party research firm may take weeks to pull the data together, even for data that one might have expected would already be sitting on a shelf. Counsel should also be cautious about use of third-party data already on hand from a client. It is important to check the license terms of the client, which likely impose restrictions on the sharing and use of the data, and which may require the client itself to negotiate an extension to the license.
Processing

Once the data have been produced, analysis does not immediately begin. Data are inevitably messy, and there will typically be a cleaning process prior to actual analysis. There will be duplicates to identify and eliminate, spelling differences to be standardized, and any number of oddities to be explored and rationalized. The cleaning process can be more time consuming and complicated than might be expected by those not intimately familiar with the data sets. The process is not necessarily related just to the size of the data sets. The number of data sets is also very important, particularly when they are to be combined as part of an analysis. Many small data sets may take more time to process and combine than one large data set (e.g., if you are trying to combine multiple data sets based on hundreds of thousands of customer names, where those names are spelled inconsistently both within and between data sets).

Produced data often have basic data dictionaries, but it is important for counsel and consultants to solicit any relevant “business rules” that may help make sense of produced transactional databases. Soliciting the client earlier for the “business rules” alongside the common data dictionary can help reduce the amount of follow-up communications specific to a given database. This is especially relevant to second request productions, where a client simply provides a single backup database file. Getting the “business rules” earlier can allow for more rapid responses to interrogatories and help to substantially comply more quickly. Where possible, the consultant should work with counsel and address possible concerns directly with the entities producing the data. The schedules and business deadlines of staff at the producing entities may introduce further delays.

Once the data are ready to be analyzed, how time consuming will the analysis be? In many proceedings, a consultant may have only a few weeks to respond to another report. To put this problem into perspective, imagine that running a single regression takes two days, given a particular computing setup. Imagine receiving an expert report, taking several days to transfer and process the backup materials, then having only a few weeks to respond. Simple logistics dictate that only a small number of alternative models can even be tried. Cutting the time for each regression in half would presumably double the number of possible alternative avenues of inquiry and could make a significant difference. To be clear, these sorts of situations do not arise often, but when they do, they can put significant constraints on all the parties involved. The authors have personally been involved in litigations where exactly this sort of situation has arisen, and have witnessed firms confronted in the middle of litigation with data sets they were unable to handle, requiring an assignment to be handed off to a different consultant on short notice. This creates its own set of risks if another team must get up to speed on the details of the industry, the data, and the current theories of the case on short notice.

The timing constraints can be even more acute in a trial where the parties may have only days to respond. Close coordination among consultants, counsel, and client is critical to effectively handling such situations. It is also helpful during the early stages of empirical design to anticipate how difficult and time consuming the actual analysis will be. Sometimes that is difficult to tell in advance, but often the consultants will be able to anticipate that the size of the data will mean that

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7 In this context, “business rules” refers to logic applied to the database which is not seen by users querying the data. For instance, businesses often have standardized reporting tools/applications built on top of production databases, and it is common for regular users querying the data to be unaware of how the logic implemented affects the resulting database. This is especially true when the database of interest is the result of collecting and transforming data from many underlying source databases. For this reason, it can be helpful to interview both users and administrators of the database, or ensure that consultants have access to the database administrators.
running a particular regression may take hours or days. Given modern computing power these situations are uncommon, but if extremely large data sets are involved, counsel should understand that each time a new run is requested, that effort may take days between implementation and actual run time.

To some degree, timing problems can be anticipated based on the type of analysis being considered. Some analyses lend themselves to relatively rapid processing, even with very large data sets. Others do not. While extremely large data sets (petabytes or zettabytes) may require specialized software tools to manipulate (i.e., PC-based software packages could not handle petabyte-sized transaction data), for most data sets likely to be used in economic consulting the practical limitations today are the power of the computing platform and the time required for the analysis, which are directly related. As a general principle, the more powerful the computing infrastructure, the faster analyses can be performed. However, some analyses benefit more from advances in computing infrastructure than others. That is, for some types of analyses, data set sizes are growing faster than computing power. By contrast, problems that can be done in parallel, or “multi-threaded,” benefit greatly from modern computing infrastructure, particularly cloud computing. However, this is a function both of the type of problem (is the problem itself amenable to being broken down into pieces that can be run in parallel?) and the software used (does the software permit running aspects of the problem in parallel?). Stata, for example, is, like many statistical packages, “single-threaded,” which means that it executes one piece of an analysis at a time. For a very large problem, that can make the analysis using traditional personal computer and workstation software very slow, and sometimes prohibitively so. Cloud computing is particularly well suited to handle problems that are amenable to parallel processing and can provide both hardware and software to implement an analysis.

Conclusion
Progress in computing infrastructure and developments in data availability and size have opened up exciting new possibilities for analysis, but have also changed the playbook for implementing such an analysis. Close coordination among counsel, consultants, and clients at all stages is important to avoid unpleasant surprises in timing or capabilities. In particular, it is useful for counsel to have some understanding of the additional steps and complexities involved with unusually large data sets. More generally, counsel should be aware of the experience of the consultant in the use and analysis of large databases in particular for any specific engagement.

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8 This can vary by package. For example, SAS has some multi-threading capabilities, but on a limited basis. Similarly, Stata has introduced a multi-processor version, but notes in its documentation that multi-threading does not benefit many of the most commonly used algorithms, either because the underlying code is not written to take advantage of those capabilities or the underlying problems are such that they not amenable to parallel processing. See https://www.stata.com/statamp/statamp.pdf.