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Discussion paper

# An Economic Analysis of Debarment

BY  
**Emmanuelle Auriol AND Tina Søreide**

# An Economic Analysis of Debarment\*

Emmanuelle Auriol<sup>†</sup>

Tina Søreide<sup>‡</sup>

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## Abstract

With a view to reducing the consequences of corruption in public procurement, many governments have introduced debarment of suppliers found guilty of corruption and some other forms of crime. This paper explores the market effects of debarment on public procurement. Debarment is found to make little difference in markets with high competition, while in markets with low competition it may deter corruption as long as firms value public procurement contracts in the future and there is a certain risk of being detected in corruption. On the other hand, debarment – when it works – has an anti-competitive effect, and this effect will contribute to facilitate collusion between suppliers. Debarment may work as a tool against collusion, but only if targeting one firm at the time (such as a ring-leader or the specific beneficiary when the collusion is detected) – and not all the members of a cartel. If designed with an understanding of the market mechanisms at play, debarment can deter both collusion and corruption, thus improving the results of public procurement. If so, most current debarment regimes need modification.

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<sup>†</sup>Toulouse School of Economics, emmanuelle.auriol@tse-fr.eu

<sup>‡</sup>Norwegian School of Economics (NHH), tina.soreide@nhh.no

# 1 Introduction

In many jurisdictions, suppliers convicted of certain forms of crime, such as corruption, collusion, organized crime, or money laundering, are “debarred” from public tenders, meaning that they cannot be awarded any government contracts. Those who are only suspected of having been involved in illegal affairs, perhaps because of an ongoing investigation, can be debarred on a discretionary basis (that is, at the discretion of the procurement agent rather than automatically). The literature on debarment is written by legal scholars who address important dilemmas such as the question of identification (what unit is to be debarred – a company, its owners, a company division or country office?); whose judgment or verdict provides sufficient basis for debarment (which courts are accepted or not, whose suspicion or investigation should be taken into account); what rights pertain to the offender; and what a supplier must do to regain status as trustworthy (a process referred to as self-cleaning).<sup>1</sup> As a result, the literature focuses primarily on the act of debarring, on due process, and on the legal status of those debarred. While debarment is expected to lead to greater integrity in markets, this instrument has been enacted in many countries around the globe without the support of economic analysis. No systematic attempts have been made to explore the impact of debarment in markets. This paper aims to fill this gap. It first reviews the evidences available on the actual practices of debarment and shows that there are many problems with the enforcement of debarment. It next conduct an economic analysis of the impact of debarment on corruption and collusion in public markets, assuming it is properly enforced. Keeping focus on incentives and payoffs, while ignoring subtle/indirect signal-effects on moral standards, the analysis shows that debarment is an inadequate policy instrument for the problems it is supposed to reduce. It might deter corruption only when the number of firms competing for the market is not too large, they care about future sales, and the probability of detection is substantial. In all other cases the policy instrument is ineffective. Similarly debarment of all the firms involved in a cartel is a poor instrument to fight collusion. Upon debarment of the whole cartel there might be no firm left to serve the public demand, while indiscriminate debarment threat might undermine leniency programs.

A quick attempt of understanding where debarment comes from, brings us to the United States - where the US Congress enacted a law in 1884 requiring the executive branch to award contracts only to the lowest “responsible” bidder, and active debarment as a preventive strategy was introduced by the Comptroller General in 1929.<sup>2</sup> However during the twentieth century, most governments rarely excluded contractors; when they did, it happened primarily as a result of criminal indictments and convictions. As concern about the consequences of corruption intensified, starting in the mid-1990s, the option of debarring fraudulent suppliers was brought to the fore by various actors in the development community. Debarment increasingly was seen as a strategy to curb the risk of

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<sup>1</sup>For introductions, see Piselli (2000), Williams (2006) and Arnaiz (2009).

<sup>2</sup>For details, see the US Department of the Interior, “A Brief History of the Debarment Remedy,” [http://interior.gov/pam/programs/acquisition/upload/Brief-History-of-Debarment-Remedy\\_Final-3.2.15.pdf](http://interior.gov/pam/programs/acquisition/upload/Brief-History-of-Debarment-Remedy_Final-3.2.15.pdf). The legal reference to responsible bidders can be found in the Act of July 5, 1884, Ch. 217, 23 Stat. 109.

corruption. This idea was advanced by nongovernmental organizations and multilateral organizations concerned about the propensity of private sector suppliers to exploit institutional weaknesses in developing countries, but also by the US government, the European Union (EU), and the Organisation for Economic Co-operation and Development (OECD). The United Nations Office on Drugs and Crime, for example, states “as anti-corruption initiatives around the world gain momentum, one device for fighting corruption – debarment, or blacklisting, of corrupt or unqualified contractors and individuals has emerged as an especially noteworthy tool.” The same report maintains that “suspension or debarment from public contracts has proven to be an effective tool in the fight against corruption” (UNODC 2013: 25). The statement is made without any reference to empirical research, and we have not managed to find evidence that supports the claim.<sup>3</sup> Despite the lack of evidence of its efficiency, during the first decade of the 2000s, the debarment option extended in scope, with procurement agencies required to perform their own assessments of suppliers’ trustworthiness, regardless of any criminal justice proceedings in the case. As a consequence, public procurement agencies were given authority to exclude suppliers (or threaten to exclude them) merely upon reasonable doubt of their integrity. Combined with more efficient whistleblower programs, increasing requests for suppliers’ self-disclosure of fraudulent conduct, and rising voter demands for anticorruption vigilance, debarment from public procurement became a real concern for many suppliers.<sup>4</sup>

Today’s debarment regimes send a signal to the private sector that access to public procurement markets requires compliance with laws and regulations, a signal that may well have a long-run positive effect on overall integrity and productivity. In practice, however, the debarment instrument implies challenging trade-offs. Excluding a competitor leads to reduced competition, and this in turn may result in higher prices or lower quality, quite the opposite of what procurement rules are supposed to deliver. Oligopolistic markets are particularly exposed to these risks, and this typically characterizes markets where large government contracts are awarded. Shifting to an alternative supplier may be costly and cumbersome, in some cases because of unique technical solutions with horizontal and/or vertical spillover effects on other acquisitions. From a legal perspective, exemptions from debarment rules are possible, and they are frequently used in practice, but this is not a good solution since it easily leads to a situation in which rules are applied differently depending on the player’s market position. If debarment is only applied to firms operating under competitive pressure or whose services are not preferred in any case, we are left with rules that condone illegal practices by the strong and powerful. And for all we know, their market position could be a result of the very practices supposed to trigger debarment, that is, it may be based upon corruption or money laundering that provides the extra

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<sup>3</sup>Likewise, Huguette Labelle, then Chair of Transparency International, commented in a press release on 26 June 2014: “The World Bank’s sanctions process is critical to eradicate fraud, corruption and collusion from the projects it finances” (Reuters: “Fraud tops list of cases handled by World Bank’s sanctions office -report”.)

<sup>4</sup>For discussion of the altered use of the debarment instrument, see Gordon and Duvall (2013) and J. Crawford “How Proposed Debarment Became Equal To Suspension” at Law 360 on 2 February 2015, see <http://www.law360.com/articles/616957/how-proposed-debarment-became-equal-to-suspension>

profits needed to outbid a competitor.

This study is motivated by concerns about corruption in public procurement and about the market consequences of debarment, both of which represent departures from the premise of equal treatment. We want to better understand how debarment rules harmonize with the aims behind more fundamental procurement principles, introduced to help governments optimize the price-quality combination of their acquisitions and thus maximize value for money in public spending. For this purpose, we need to analyze the economic trade-offs between excluding firms not found trustworthy and ensuring competition. The direct price-quality consequences of excluding a competitor follow from elementary microeconomics, with normative implications against debarment. What complicates that logic are the more general importance of trusting business partners, the need to secure state revenues against crime, and the desire to realize the long-term benefits of more integrity among actors in public procurement markets.

From a policy perspective such insights into the mechanisms of debarment are greatly needed. The EU recently revised its procurement rules, but the new EU directive leaves much space for member states to decide the nuances of their rules on debarment.<sup>5</sup> In the United States and Canada, there are frequent debates about the functionality of debarment rules, with particular concerns about arbitrary exclusion of bidders and about consequences for the economy.<sup>6</sup> International development banks boldly apply debarment rules to their own procurement operations and those of their clients (Seiler and Madir 2012; Williams 2007; Søreide et al. 2016). Based on its own investigations, the World Bank debars suppliers found “more likely than not” to be guilty, meaning that a debarred supplier cannot tender for a World Bank-financed contract anywhere in the world (Leroy and Fariello 2012). Moreover, the largest multilateral development banks - including the African Development Bank Group, Asian Development Bank, European Bank for Reconstruction and Development, Inter-American Development Bank and the World Bank Group have agreed to mutually enforce each other’s debarment actions with respect to the four harmonized sanctionable practices, i.e. corruption, fraud, coercion, and collusion; a supplier excluded by one development bank is automatically excluded by the others in the sense of being excluded from all government-steered procurement covered by loans or grants from these institutions (Fariello and Daly 2013).

This article continues with a study of debarment in public procurement. While there are hardly any systematically collected data available on debarment, there are numerous illustrative examples of such sanctions. Observations and common challenges are described in Section 2. Section 3 presents the formal economic analysis of debarment

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<sup>5</sup>See Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement and repealing Directive 2004/18/EC, OJ 2014 L 94/65. Hjelmeng and Søreide (2014) describe the space that EU member states have for nuancing their procurement rules.

<sup>6</sup>For an early critical debate about debarment, see the collection of papers in The George Washington University Law School Public Procurement Law Review Volume 13, and especially Schooner (2004) More recently, Tillipman (2013) discusses the motivation behind debarment rules and warns against using these rules to supplement criminal law sanctions. In Canada it has been suggested that an automatic ten-year ban on convicted suppliers will harm the economy. See Barrie McKenna, “SNC Case Shows Downside of Ottawa’s Strict Anti-corruption Regime,” *Globe and Mail*, February 19, 2015.

in public procurement, with a focus on how such steps alter the risk of corruption and collusion in procurement. Discussion follows in Section 4.

## 2 Debarment practices

Over the past two decades, most countries around the globe have reformed their procurement rules, and while debarment is one of the principles associated with best practice legislation, there is no standardized way to introduce this instrument. The most important difference is between debarment administered by public procurement agencies and debarment imposed on suppliers as a criminal justice penalty. While many countries include debarment as one among alternative criminal law penalties, it is rarely used as such in practice. In the United States, where examples of debarment (or professional disqualification) used as a criminal justice verdict are most easily found, the prosecuting authorities are more inclined to point at such penalties as a threat thus speeding up their process toward a non-prosecution (or deferred prosecution) agreement with firms accused of for example corruption (Rose-Ackerman and Palifka (2016 Ch. 6)).<sup>7</sup> As the practice of actually imposing debarment as a punishment is rare, debates about debarment as a policy instrument refer, almost without exception, to how it is administered by public procurement agencies.

Within the world of public procurement, the specific rules and practices differ substantially across countries - especially regarding optional versus mandatory debarment, the use of registers to list debarred suppliers, and whether there is a clear time limit for debarment. The United States appears to have the most developed and predictable debarment regime, with a procedural system intended to ensure just treatment, including options for appeal, and federal decisions applied to procurement at the state level. The British rules resemble the US system, but in the United Kingdom the system appears less effective. According to Sue Hawley, a British anticorruption expert, “there is little evidence that the few companies convicted for corruption did in fact face any form of exclusion from public procurement contracts.”<sup>8</sup> In the European Union more generally, each country can determine the details of their debarment rules within the rules set forth by the EU procurement directive.<sup>9</sup> Debarment is not a practice applied in the Western world alone. In both Africa and Asia a good number of countries introduced debarment rules in the early 2000s; they include the large economies of China, Nigeria, India, Indonesia, and Japan, but also poorer countries like Bangladesh, Liberia, Egypt, Mongolia, Pakistan, the Philippines, and Vietnam. Across these countries there are numerous cases of public

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<sup>7</sup>Debarment appears to be used infrequently in the United States. An audit report prepared by the US Department of Justice found that the rules intended to secure debarment allow too much space for (de facto) discretion when enforced at the state level. In practice the instrument is weakly enforced when in use. See US Department of Justice (2012).

<sup>8</sup>Sue Hawley, “Yawn and You’ll Miss It: New EU Debarment Rules, Old Problems,” Corruption Watch, March 4, 2015, [www.cw-uk.org](http://www.cw-uk.org).

<sup>9</sup>Directive 2014/24/EU on public procurement provides for a combination of mandatory and facultative debarment, and governments have substantial space for detailing the rules (Hjelmeng and Søreide, 2014).

procurement debarment for corruption and other crimes. The disqualified suppliers differ in size and industry, the alleged offenses differ, and the cases occur in countries at all income levels; in lack of data it is difficult to describe common patterns.

Lack of harmonization in debarment rules and practices may stem from the lack of economic analysis of the debarment instrument. There is no consensus of what an efficient debarment regime might look like. Some basic problems appear unaddressed by most regimes. First, many procurement agencies face difficult trade-offs: while predictable enforcement of debarment rules is expected to bring integrity benefits, flexibility may be needed to avoid undesired results or unreasonable costs to society. Consequently, governments may be hesitant to implement debarment rules fully. With rules on the books, however, governments and organizations can claim to be acting on corruption, regardless of how the rules are enforced. Second, debarment rules are at risk of being abused when a procurement agency, lacking other apparently legitimate excuses to exclude certain suppliers, uses the rules for this purpose. This may even be done to facilitate corruption, thus undermining the purpose of the debarment regime.<sup>10</sup> This section describes some common challenges.

## 2.1 Enforcement under conditions of high market concentration

The notion of debarment as an important anticorruption response is obviously contingent on the assumption that governments enforce their own debarment rules. As already indicated, this is not necessarily the case. In 2014 Transparency International complained to the European Union, which spends around EUR 2.5 trillion a year on goods and services, that it had so far blacklisted only six companies for fraud and corruption.<sup>11</sup>

According to a report by the OECD (2014), only two out of a total of 427 foreign bribery cases in the OECD area resulted in debarment. One reason why the rules are disregarded might be the importance of protecting competition. In all categories of countries, there are sectors with significant constraints on competition; this is especially a problem in infrastructure and utility provision, which represent the largest procurement expenses for many governments.<sup>12</sup> According to Iimi (2011), who studied worldwide in-

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<sup>10</sup>The extra authority given to procurement agencies creates new risks of extortive corruption and facilitates what Rose-Ackerman (1978, chapter 4) describes as "milking suppliers"- i.e. given wide discretion associated with the rules, suppliers that could be debarred within the rules may avoid such a consequence by paying a bribe. This unintended consequence is pointed out by the Asian Development Bank and OECD: "Debarment is a two-edged sword: while it might deter corruption, it could also be part of a corrupt scheme of competitors or corrupt officials to extort bribes or to eliminate honest competitors, especially if the conditions for debarment are not clearly specified. Worse, under certain conditions, qualified and honest companies consider abstaining from bidding to avoid being subject to debarment" (ADB/OECD 2006: 23) - a report that summarizes initiatives to curb corruption in 25 Asian countries. The risk of abuse of debarment rules, due to the extent of discretion associated with such rules, is explicitly mentioned in the review of practices in Bangladesh, Kyrgyzstan, and Pakistan.

<sup>11</sup>Transparency International, "Blacklisting the Corrupt: Why the EU Debarment System Does Not Work," January 13, 2014, <http://www.transparency.org>. The World Bank has debarred many more suppliers headquartered in the EU area for their involvement in fraud and corruption.

<sup>12</sup>In many markets, competition is limited, especially on large projects.

infrastructure projects financed by aid or development loans, the average number of bidders is 5.2 in the water and sewerage sector, 6.2 in the roads sector, and 4.6 in the electricity sector. In the majority of electricity works and water auctions only two or three firms were competing for the contracts (Iimi 2011: 129-140, see also Estache and Iimi 2012).<sup>13</sup> With few bidders, governments may find that they cannot afford to exclude a supplier for the sake of promoting integrity in markets. Corruption could be one of the reasons why there are so few suppliers in the first place, however.<sup>14</sup> In concentrated markets there might be a high risk of collusion, and this problem adds to the enforcement difficulties.<sup>15</sup>

Under some regimes, such as the World Bank sanctions regime, cartel collaboration is a stand-alone reason for debarment, while in others, as under the EU procurement rules, it is not. In either regime, in cases where the cartel has been facilitated through corruption, all those involved are supposed to be debarred. In practice, enforcement will then hinder a government from procuring needed goods and services, leading in turn to a high propensity to grant exemptions from the rules. There are examples of circumstances where all suppliers present in a market have been found ineligible for future contracts. In 2009, for example, the World Bank debarred seven road construction companies on grounds of cartel collaboration for contracts in the Philippines.<sup>16</sup> In a case in South Africa in 2013, 15 construction firms were found guilty of collaboration in a cartel, starting with tenders for construction of World Cup stadium projects in 2006. The majority of the firms reached a settlement with the competition authority, and as a result these suppliers were not debarred. In April 2014, this leniency resulted in public outcry as the press revealed that the firms found guilty of cartel collaboration had been given a number of new public construction contracts.<sup>17</sup>

Some markets are concentrated because of corruption, and thus the government representatives involved in the scheme will have incentives to prevent the enforcement of debarment rules. In another case in South Africa, for example, the politician Julius Malema reacted fiercely to calls for debarment, calling them politically motivated, when a firm he co-owns, On-Point Engineering, was found to have won a contract illegitimately and to have received much higher payments than other suppliers would have demanded. Initially 16 suppliers bid for the contract in question, but the procurement agency dis-

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<sup>13</sup>This is not different in competition-friendly countries, like the United States. Studies some years ago found the average number of bidders for highway construction contracts to be around 5.0 in Florida (Gupta 2002) and 3.3 in Oklahoma (Da Silva et al. 2003). According to Pittman (2011), mergers and alliances between rail freight carriers in adjacent territories in Europe and the US have weakened competition, and each new entrant/excluded supplier may matter to the price-quality combination (somewhat dependent on how customers consider rail in comparison to other transport options).

<sup>14</sup>Several authors find a clear empirical correlation between corruption and market concentration, including Ades and Di Tella (1999) and Treisman (2007).

<sup>15</sup>See Lambert-Mogliansky (2011) for a review of the mechanisms.

<sup>16</sup>World Bank press release, January 14, 2009. The Philippine government's immediate reaction to the case raised suspicions that corruption could be part of the scam, as the president's response, widely quoted in the press, was, "We can always find another development bank."

<sup>17</sup>The new contracts awarded in the months following the cartel case totaled at least R1.5 billion, according to Business Report, April 13, 2014: "Call to blacklist big construction firms."

qualified 15 of them on various grounds. On-Point Engineering was the only remaining supplier, even though this firm had been established only one month ahead of the tender, had no employees, and, obviously, lacked qualifications.<sup>18</sup>

The debarment rules are particularly hard to enforce in cases where cartel collaboration is combined with political corruption. The purpose of reinstating trust in the incumbent regime might call for enforcement, while at the same time, exemptions from these rules are necessary for the procurement of needed services. This is exactly the problem in Brazil, where a comprehensive corruption scandal was revealed in the fall of 2014. A large number of suppliers to the national oil company Petrobras have been involved in corrupt schemes, with parts of their bribes being channeled to Brazil's political elite. The case involved a number of Brazilian and foreign suppliers, including several large Brazilian construction companies. These construction firms, it was revealed, had formed a cartel. According to the country's public procurement regulations, they should all be debarred, but the government's demand for infrastructure and other construction services suggests that they will not be.<sup>19</sup>

The difficulty of enforcing the public procurement debarment rules when a good or service is in high demand has led to calls for more flexible rules. Instead of strictly excluding suppliers, there is now an increasing propensity to come to some (administrative) settlement agreement, an option that gives procurement agencies discretion to list far-reaching demands. In exchange for a shorter debarment period or even complete leniency, a supplier might agree to dismiss managers, accept external monitoring, or make some form of restitution payment.<sup>20</sup> For example, as part of a settlement with the World Bank investigators, Siemens agreed to make a US \$100 million payment to "support anticorruption work," while parts of the corporation were also debarred.<sup>21</sup> Another example is a three-year World Bank debarment of parts of the Alstom corporation combined with a restitution payment of \$9.5 million.<sup>22</sup>

## 2.2 Universal debarment irrespective of perceived risks

An important aspect of these procurement rules is that suppliers are debarred because of their involvement in corruption *elsewhere*. The OECD and the World Bank, for example, emphasize the importance of operating with universal debarment rules in the global fight

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<sup>18</sup>A different story about the company was falsely presented in the bidding documents. See among other media sources, The Guardian: "Julius Malema profited from corrupt government deals, says watchdog" . According to the South African press, it has been difficult to hold Julius Malema responsible, although he has been charged with corruption, money laundering, and tax evasion. A planned trial has been postponed several times.

<sup>19</sup>The case has been well covered by the international press. See, for example, Joe Leahy, "Multinationals Face Scrutiny on Petrobras," Financial Times, February 22, 2015.

<sup>20</sup>See Gordon and Duvall (2013).

<sup>21</sup>World Bank press release, July 2, 2009.

<sup>22</sup>World Bank Press release, February 22, 2012.

against corruption.<sup>23</sup> With universal debarment, the geographical location or exact market where a supplier's involvement in corruption has taken place is not supposed to matter to a procurement agent. As long as involvement in corruption anywhere in the world has been reliably confirmed, the supplier is supposed to be disqualified from bidding. Under the World Bank's debarment rules, for example, a firm found guilty of corruption in Argentina will be ineligible to place bids for contracts in Mongolia. It is not supposed to matter whether the risk of corruption is different in the different countries – or whether the Argentine and Mongolian divisions of the firm operate with very different business practices.

Compliance with these regulations has proven difficult for governments that need to buy services from a certain supplier, especially when they find the firm's past performance excellent and have experienced no problems with corruption. The helicopter producer AgustaWestland, for example, paid bribes to senior officials in the Indian defense sector to secure a contract for the delivery of 12 helicopters. The case was well documented and was tested in an Italian appeals court that had to decide whether funds frozen in an Italian bank as a guarantee for payment of the helicopters could be retrieved by the Indian government upon cancellation of the helicopter acquisition. According to debarment rules, such as those stipulated by the EU, this case should lead other governments to reconsider AgustaWestland's qualifications for participating in their future tenders. Despite knowledge about the corruption in India, the Norwegian government nonetheless decided to offer the company a contract for the delivery of 16 helicopters (with the option of six more) at the cost of around EUR 2 billion.<sup>24</sup> The helicopters' technical merits apparently overrode any concerns about the supplier's former involvement in corruption. As far as we are aware, no extra conditions or controls were placed on the contract or the company, despite its proven willingness to offer bribes. This case too confirms the difficulty of making universal debarment rules work in very concentrated markets, as discussed above.

Another example from Norway, where questions about the reasonableness of universal debarment have been raised, was a case in which the Norwegian firm Norconsult was found guilty of bribery in Tanzania. A Norwegian appeals court referred to the World Bank administrative sanction as it decided not to impose corporate criminal sanctions on the firm. The verdict underscored that a finding of corporate criminal liability would expose the supplier to further debarment from public procurement in Norway, on top of the debarment period imposed by the World Bank. These expected consequences were deemed unreasonable, and thus the court found the supplier not criminally liable, partly because of the debarment rules.<sup>25</sup> Such reasoning undermines the enforcement of debarment as well as the aim of imposing predictable penalties upon corporate criminal liability, while at the same time it must be seen as a pragmatic attempt to reach a reasonable solution.

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<sup>23</sup>See the OECD 2014 Draft Recommendation of the Council for Public Procurement (GOV/PGC7ETH(2014)7/REV3). Also see the World Bank website for various reports about its sanctions regime, including one by the Office of Suspension and Debarment (OSD 2014).

<sup>24</sup>The Norwegian government made its decision despite clear allegations of corruption in India but before the case had been confirmed by an Italian appeals court.

<sup>25</sup>Norwegian Supreme Court judgment of June 28, 2013, in case 2012/2114.

## 2.3 Discretion regarding evidence and identification

The enforcement of debarment rules is also challenged by a common space for discretionary interpretation of the principles. The standard of proof, for example, can be much lower for an administrative judgment like debarment than for criminal law sanctions. From a pragmatic perspective, it should be possible to debar firms simply because they are not considered trustworthy. It is up to each jurisdiction to decide whether debarment should follow upon suspected corruption or upon court decisions only. Countries not only apply different standards of evidence in these cases, they also tailor their decisions to the case. The problem, however, is that governments have a duty to secure value for money in their acquisitions. In debarring firms without sufficient reason, they impose an illegitimate cost on society. In Tanzania, for example, the country's Public Procurement Regulatory Authority suspended 19 firms from competing for public procurement contracts for one year, starting in October 2014. The authority justified the debarment as a more efficient anticorruption sanction than single-case contract termination. While the suppliers were debarred due to their engagement in corrupt practice and their failure to fulfill contractual obligations, the details of each individual case were not provided.

For all we know, there may be clear evidence behind each of these debarments in Tanzania. In general, however, a tendency to exclude suppliers on suspicions of corruption, or because of general underperformance, will pose different forms of risk to good procurement. One concern is a possible inflation in the number of firms found ineligible for bidding. Another is that the debarment rules may become a handy tool for those seeking a reason to exclude a supplier or terminate a contract. Society may find it difficult to tell in these cases whether the debarment decision is motivated by a supplier's underperformance or corruption or by some challenge on the side of the procurement agency, such as lack of funds to finance the completion of a contract. A procurement agency's opportunity to cancel contracts and exclude suppliers on a discretionary basis may increase the risk of arbitrary deviation from contractual obligations – with potentially damaging consequences for the country's trade and investment.

The space for discretionary judgment can also undermine enforcement in cases where there is uncertainty regarding which corporate entity should be debarred. In some cases, the disqualified supplier restructures and reappears in the market with a different name. This is what happened in a case involving the German corporation MAN. In December 2009 the company was found guilty of bribery for contracts in Africa, Asia, and Europe, with proven bribe transactions totaling around EUR 75 million. According to EU procurement rules, the corporation should have been disqualified from taking part in public procurement tenders as a result of the verdict. One month after the verdict, however, the corporation had established Rheinmetall MAN – owned 49% by MAN and 51% by another corporation allegedly involved in corruption, Rheinmetall – and had already entered into a contract with the Norwegian Ministry of Defense. Even though the Norwegians had negotiated the contract with the sentenced MAN corporation, they claimed that the actual contractor was the newly established unit, a completely different (and honest) supplier – and that, therefore, the debarment rules would not apply.

A further example of such circumvention of the principles was observed in Pakistan.

A contract for construction of a hydroelectric power project was awarded to Sinohydro Group, a newly established daughter company of Sinohydro Corporation, which had been suspended from tenders because of proven and admitted corruption in Africa. Sinohydro Group shared the same address as Sinohydro Corporation, and when listing its qualifications for a contract, Sinohydro Group included the projects conducted by Sinohydro Corporation. Nonetheless, as pointed out by Dawn, an English-language Pakistani newspaper, the authorities chose to ignore the obvious connection between the entities.<sup>26</sup>

## 2.4 The shortcomings of a one-sided approach

Compared to the law enforcement situation twenty years ago, when firms could offer bribes without much risk of facing consequences if the corruption was revealed, the reaction against firms and the willingness to hold them responsible is a sign of progress. Sending a signal that bribery is not tolerated is important and may have a good effect on some business environments. To some extent, a regime with automatic reaction against corrupt suppliers can compensate for the inability to hold government representatives responsible for the crime. However, if a debarred supplier is easily replaced by another supplier who is willing to offer bribes, despite the risk of debarment, then a one-sided strategy focusing on firms is not necessarily efficient. In such cases the notion of “dealing with the problem” is false.

Our main concern with the various observed debarment practices is therefore that a large number of such cases entail a one-sided reaction against the suppliers, while few attempts are made to address corruption on the side of the procurement agents by determining their responsibilities and involvement.<sup>27</sup> Under such circumstances, the debarment rules can easily come to define corruption as a problem that resides outside the procurement agencies’ sphere of control.

For various reasons, including reputational risks, bonds of loyalty between state administrative institutions, political corruption, or diplomatic sensitivities, it can be difficult for governments to react against “their own” procurement agencies, even if these agencies appear to be distorted by corruption. A case from India, regarding the construction of a highway between Nagpur and Betul, illustrates how governments fail to hold procurement agents responsible, regardless of their involvement in corruption. The case was revealed because a whistleblower in India’s National Highways Authority (NHAI) informed the Central Bureau of Investigation (CBI) that the tender process was about to be manipulated. The police acted quickly to secure evidence and arrested four involved individuals who represented both sides of the deal. However, the arrested individuals were released

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<sup>26</sup>In response to the newspaper, the relevant authorities explained that they would never award a contract to a firm suspended from taking part in public procurement. See “Wapda Awarded Contract to Firm Suspended by World Bank,” *Dawn*, February 6, 2014

<sup>27</sup>The World Bank Integrity Vice Presidency’s annual reports, including the one for fiscal 2014, include details and updates on World Bank investigators’ attempts to spur investigations in public procurement corruption at the national level. Even when the World Bank shares the facts from investigations that have led to World Bank debarment of suppliers, there are disappointingly few criminal justice responses at the national level. See World Bank (2014). See also Søreide et al. (2016) for debate.

on bail because a certain charge sheet had not been filed by the CBI investigators. The case was paused as the country's highways minister, protecting the accused, did not allow the CBI to question NHAI management and board members. According to an article first published in Forbes India on November 2, 2010, corruption frequently influences tender processes in the country's construction sector. Contract allocations are manipulated, and the contracted suppliers are allowed to operate with huge cost overruns. As part of the country's anticorruption strategy, corrupt suppliers are supposed to be debarred from procurement. According to the Forbes article, however, there is a preference for black-listing foreign players that are already pulling out of projects, while domestic suppliers are greatly needed for the construction of roads and are therefore not debarred, whatever their performance.<sup>28</sup>

As described in this section, the enforcement of principles introduced to enhance integrity in markets through debarment is challenged in different ways: It is impractical to disqualify the supplier of a good or service in high demand. The debarment of all suppliers in a market hits those in need of the services unreasonably hard. Universal debarment implies exclusion from tenders with a very low risk of corruption. Discretionary debarment can easily be exploited by corrupt public officers to serve other agendas than promoting value for money. And, as just pointed out, taking action against corrupt suppliers (or promising to do so) can make it appear as if something has been done to address the issue of corruption, while in reality it might be more efficient to address the corruption risk on the government side.

### 3 Economic Analysis of Debarment

Since debarment is not enforced properly, nor in a predictable way, it is intuitive that it cannot deter corruption. The question is, *if* it were applied properly, would debarment then deter corruption? Before promoting a strict enforcement of debarment rules, we need to show that the rules will work as intended. In what follows we will, therefore, try to answer the following question: under what circumstances will debarment of corrupt suppliers reduce the risk of corruption in public procurement?

#### 3.1 Analytic preliminaries

In order to further investigate the function of debarment we need to make certain assumptions and clarifications. First of all, in what follows we assume a society where there is a government agency (a principal) that oversees public spending, while various procurement agencies conduct the contract allocations given stipulated procurement rules. These procurement agencies cannot be assumed 100% honest - since if so, there would be no need for anticorruption initiatives, and for this study we assume that procurement agencies can accept bribes from suppliers.<sup>29</sup> The principal governance unit aims at securing

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<sup>28</sup>For details, see K. P. Narayana Kumar, "A Crooked Path," Forbes, November 5, 2010.

<sup>29</sup>This assumption may stand in contrast to some real life expectations. Under the EU procurement directive, for example, many governments decide to let the procurement agents themselves determine

value for money to the benefit of society. Debarment rules are introduced as a strategy to secure this aim. The rules are expected to exclude dishonest suppliers and deter bribery among the remaining suppliers. As a result, markets work more efficiently as the system promotes efficient and honest competition - which is expected to secure low prices for a given quality. Upon these aims, members of society (voters) can rely on the procurement system and implicitly, can be expected to have trust in the government.

If debarment is not working when quality is fixed, there is little hope that it will work when quality is variable. To avoid unnecessary technicalities we therefore assume that the quality of the procured commodities is fixed. This allows us to focus on the impact of debarment on the corruption problem.

Secondly, regardless of the practical problems with these rules, we will assume for now that debarment rules function as intended once they are introduced. With a certain probability, corruption is detected and the suppliers involved are truly debarred. Procurement agencies have sufficient information about disqualified suppliers to reveal any attempts of restructuring operations in order to compete for contracts under a new company name.

Thirdly, the consequence of debarring suppliers must be expected to depend on the circumstances. The mechanisms at play will differ in the case of bribery and cartel collaboration. We briefly discuss each in turn.

*Bribery* refers to the cases where a procurement officer receives a bribe from a firm in exchange for granting the firm a contract, often at a higher price than what would be the outcome of fair and undistorted competition. A case of fair and honest contract allocation with heterogeneous bidders with respect to cost efficiency would lead the most efficient firm to win the contract at a price that is marginally below the costs of the second most efficient firm. Corruption increases the expected cost for the contract. A threat of debarment is expected to deter suppliers from entering into corrupt schemes, but the longer term consequences for future procurement auctions are unclear because debarment reduces the number of firms that may compete in the market in the future. This in turn will increase the likelihood of future cartel formation as fewer firms make collusion more likely.

In *cartel cases* debarment may have several effects. These effects depend on how competition takes place in the given market. If there is competition *for* the market, as is typically the case in procurement auctions, only one firm will actively supply the market both under competition and collusion. When firms compete for the market collusion may be structured in several different ways. For example, firms can agree explicitly or implicitly to bid in separate auctions, i.e. they divide the market between them, they can pay each other side payments for not submitting bids in a specific auction, or alternate on submitting bids when auctions are run on a regular basis. In the analysis below - when we come to the problem of cartel formation - we focus on the latter case. First debarment reduces future profits in the market by depriving the firms from future participation, which may have effects on cartel formation. Second, debarment alters the set of bidders in future auctions. The respective impact of debarment on corruption and collusion are

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whether a deviation from the debarment rules is required. This solution indicates high trust in procurement agencies, while at the same time, these expectations are inconsistent - since the debarment rules are after all introduced to avoid the impact of bribery.

now investigated by help of the following model.

### 3.2 The model

We consider a repeated purchase game between a public purchaser and  $N \geq 1$  potential suppliers. The horizon is infinite. The paper considers a three-tier hierarchy: principal, delegate, firms. The principal (i.e., an agency acting on behalf of the taxpayers), conventionally referred to as “he”, wants to acquire in each period of time a commodity or a service on the best possible terms. He entrusts the responsibility of the acquisition to a delegate (i.e., a public purchaser), conventionally a “she”. The principal’s objective is to maximize the net social surplus associated with the public acquisition. All the players are risk-neutral.

The size of the market varies from one period to the next in a random way:  $Q_t = \underline{Q} + \epsilon_t$  where  $\epsilon_t$  is dependently and identically distributed over  $[0, \bar{\epsilon}] \forall t = 0, 1, 2, \dots$ . The distribution of  $Q_t$  is common knowledge. The minimum size of the market,  $\underline{Q}$ , is known to all, but not the random part  $\epsilon_t \geq 0$  so that  $Q_t \in [\underline{Q}, \overline{Q}]$  with  $\underline{Q} > 0$  and  $\overline{Q} = \underline{Q} + \bar{\epsilon}$ . The idea is that there are random shocks affecting public demand, which therefore must be adjusted at each period. And very often these adjustments are made throughout the production stage. We denote by  $EQ$  the expected value of  $Q_t$ . Procuring  $Q_t$  generates in period  $t$  a gross surplus  $S(Q_t) \geq 0$  increasing with  $Q_t$  ( $S'(Q_t) > 0$ ). We assume that  $S(Q)$  is large so that it is always worth producing the commodity even for the lowest possible quantity  $\underline{Q} > 0$ .

*The firms:* There are  $N (\geq 1)$  firms in the economy that can produce the good. To produce a quantity  $q \geq 0$  the firm  $i = 1, \dots, N$  is confronted with cost

$$C(\beta_t^i, q) = \beta_t^i q \tag{1}$$

where the marginal cost  $\beta_t^i$  is drawn at the beginning of period  $t = 0, 1, 2, \dots$  in  $[0, 1]$  according to the uniform distribution.<sup>30</sup>

**Assumption 1**  $\beta_t^i$  is independently and uniformly distributed over  $[0, 1] \forall i = 1, \dots, N, \forall t = 0, 1, \dots$ .

The firms are hence symmetric. We assume that at the pre-contracting stage a firm does not know the exact value of  $\beta_t^i$ . This assumption reflects the fact that there are idiosyncratic shocks affecting the production process. The firm needs to prepare a bid to discover the exact value of its marginal cost to serve the market in period  $t$ . Moreover, once it is revealed  $\beta_t^i$  is private information of firm  $i = 1, \dots, N$ . By contrast, the quantity produced by firm  $i$ , and the law of  $\beta_t^i$  are common knowledge. Finally the firms all have the same discount factor  $\delta < 1$ .

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<sup>30</sup>The density  $f(\beta) = 1$  is associated with the distribution function  $F(\beta) = \beta$  for  $\beta \in [0, 1]$ . The uniform distribution assumption is not crucial for our results. It simplifies the exposition as we are able to find closed form solutions.

*The delegate:* The delegate's job is to collect information to implement the optimal acquisition procedure. She has two options. She can negotiate the market with a producer, in which case she needs to identify one supplier without competition. If so, this corresponds to the case of limited tendering as termed by the General Procurement Agreement (GPA). Alternatively, she can allocate the contract through a competitive bidding procedure; this corresponds to open tender, as termed in the GPA. The optimal decision depends on the relative cost of fostering competition compared to the expected benefit. The cost of running an open tender is  $K_t \geq 0$   $t = 0, 1, 2, \dots$ . It embodies the monetary and non-monetary (delay) costs of the procedure. In practice these costs are very high and vary from one market to the next.<sup>31</sup> We assume that  $K_t$  is independently and identically distributed in the set  $[\underline{K}, \overline{K}]$ . We denote by  $EK$  the expected value of  $K_t$ . Intuitively it is more profitable to organize a competitive bidding procedure when  $K_t/Q_t$ , is low than when it is high.

*Sole Sourcing:* In the sole source case,  $N = 1$ , the acquisition cost is equal to the monopoly price  $t(1) = Q_t$ .<sup>32</sup> The sole-source case corresponds to fixed-price purchase. The identity of the producer then is irrelevant to the taxpayers. The principal's net surplus is  $W(1) = S(Q_t) - Q_t$  and the firm's net expected profit is  $\pi(1) = Q_t \int_0^1 (1 - \beta) d\beta = \frac{Q_t}{2}$ .

*Competitive Bidding:* Since the firms' cost parameters are independently and identically distributed, it is optimal under asymmetry of information to organize a type of second-price auction (see Myerson (1981)).<sup>33</sup> The rent expected by a producer  $i = 1, \dots, N$  when being one of  $N$  bidders in this auction is:

$$\pi(N) = Q_t \int_0^1 [1 - \beta]^{N-1} \beta d\beta = \frac{Q_t}{N(N+1)} \quad (2)$$

Compared with the sole source case, the expected rent in (2) is reduced by  $[1 - F(\beta)]^{N-1} = (1 - \beta)^N$  which is the probability that a firm of type  $\beta$  is not minimizing the acquisition cost. Let  $f_{[2]}^N(\beta) = N(N-1)\beta(1-\beta)^{N-2}$  denote the density function of the second lowest draw of  $(\beta_1, \dots, \beta_N)$ :  $\beta_{[1]} \leq \beta_{[2]} \leq \dots \leq \beta_{[N]}$ .<sup>34</sup> The expected cost of the purchase with a

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<sup>31</sup>It takes time and money to organize open tenders. First the purchasing entity has to specify its need in writing. Next it has to advertise tender information in official gazettes, newspapers, bulletin boards, or bidding information journals. If the firms that receive the information are interested they have to work out detailed offers. The purchasing entity has to review and evaluate the offers, and finally, it has to write a report to justify its choice. For instance in 2011 the annual procedural costs of compliance with EU public procurement legislation were estimated by the European Commission at 5.3 billion euro in 2009 terms or 1.4% of the value of procurement covered by the EU Directives. Consistently with our assumption the study shows that procurement costs are almost invariant across a wide range of contract values (i.e., there are fixed cost). The average procurement procedure took 108 days to complete and the average cost per procedure was approximately 28000 euros, with considerable variance depending on the country and the nature of the market (see European Commission 2011).

<sup>32</sup>With a single producer we drop for notational simplicity the index of the firm.

<sup>33</sup>Each firm submits independently a price above which it accepts to serve the market. The contract goes to the firm with the lowest bid, but the price it gets in exchange for the production is the second-lowest bid. With this form of auction it is a dominant strategy for each producer to announce its true marginal cost.

<sup>34</sup>The density function of the second lowest draw of  $N$  independently and uniformly distributed vari-

second price auction is  $Q_t \int_0^1 \beta f_{[2]}^N(\beta) d\beta = Q \int_0^1 \beta^2 N(N-1)(1-\beta)^{N-2} d\beta$ . Integrating the expected cost by part yields  $Q_t \int_0^1 \beta f_{[2]}^N(\beta) d\beta = Q_t \int_0^1 2\beta N(1-\beta)^{N-1} d\beta$ . Let  $f_{min}^N(\beta) = N(1-\beta)^{N-1}$  denotes the density function of  $\beta_{[1]} = \min(\beta^1, \dots, \beta^N)$  the minimum of  $N$  independent variable of type  $\beta^i$ , and  $F_{min}^N(\beta) = 1 - (1-\beta)^N$  the cumulative distribution function. We deduce that the net expected surplus from competitive sourcing with  $N$  bidders is:

$$W(N) = S(Q_t) - Q_t \int_0^1 2\beta f_{min}^N(\beta) d\beta - K_t = S(Q_t) - \frac{2Q_t}{N+1} - K_t \quad (3)$$

A comparison of the welfare under sole sourcing with the welfare under competitive bidding omitting the fixed cost, yields after an integration by part  $W(N) - W(1) + K_t = Q_t \int_0^1 2(F_{min}^N(\beta) - F(\beta)) d\beta = Q_t \frac{N-1}{N+1} \geq 0$ . By introducing competition, the delegate reduces the producers' expected rent. Since this rent reduction implies a gain on the principal, competitive bidding increases his surplus by the same amount. The benefit grows as competition intensifies (the difference between  $F_{min}^N(\cdot)$  and  $F(\cdot)$  increases with  $N$ ). Indeed, when the number of bidders is large they collectively bid more aggressively, which reduces the final cost. We define  $k(N)$  as the marginal social benefit of introducing competition:

$$k(N) = \frac{N-1}{N+1} \quad (4)$$

The choice between sole sourcing and competitive bidding is now reduced to a trade-off: Competitive bidding yields a fixed procedural cost  $K_t \in [\underline{K}, \overline{K}]$  but gives a higher probability of a small acquisition cost, resulting in a net effect that is captured by  $k(N)Q_t$  (i.e., the sampling effect).<sup>35</sup> We deduce that competitive bidding is the optimal acquisition strategy if and only if  $k(N)Q_t \geq K_t$ . Otherwise, sole sourcing is the superior strategy.

Competitive acquisition is more valuable when the number of bidders  $N$  is large and when the level of procedural cost  $K_t$  is low. Moreover, the expected gain associated with competitive bidding increases with  $Q_t$ . The impact of a decrease in the marginal acquisition cost is proportional to the market size. Efficiency is not a big issue for small markets (flexibility and rapidity are more important factors), but it is crucial for large ones. This is why most countries operate with minimum thresholds for open tendering. With this framework for analysis we now turn to the optimal delegation scheme when the delegate is corruptible.

### 3.3 Corruption in the stage game

As  $K_t$  and  $Q_t$  are unknown ex ante, the benefit of organizing a competitive procedure is uncertain. The optimal acquisition policy consists of choosing open tendering whenever  $K_t$  is lower than  $Q_t k(N)$  and limited tendering otherwise. When  $\overline{Q}k(N) \leq \underline{K}$  the optimal acquisition policy is always limited tendering (i.e., the market is too small to organize an auction), and when  $\underline{Q}k(N) \geq \overline{K}$  it is open tendering (i.e., the market is too big for sole

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ables is  $f_{[2]}^N(\beta) = N(N-1)(1-F(\beta))^{N-2}F(\beta)f(\beta) = N(N-1)\beta(1-\beta)^{N-2}$ .

<sup>35</sup>For more on the sampling effect, see Auriol and Laffont (1993) and Auriol (1996).

sourcing). In both cases there is therefore no risk of corruption. When  $\frac{EK}{EQ} \leq k(N) \leq \frac{\bar{K}}{Q}$  in the absence of information the optimal acquisition strategy is open tendering. Since debarment is a strategy to fight capture (i.e., grand corruption), we rule out here the possibility of extortion.<sup>36</sup> In order to make the analysis interesting we focus on cases where capture can occur:

$$\frac{K}{Q} \leq k(N) \leq \frac{EK}{EQ} \quad (5)$$

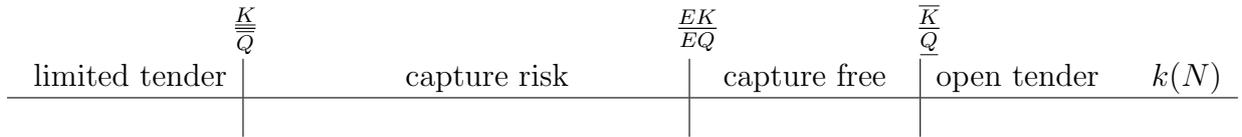
Condition (5) implies that if  $\frac{K}{Q} \leq \frac{K_t}{Q_t} \leq k(N)$  the optimal acquisition strategy is competitive bidding, while if  $k(N) < \frac{K_t}{Q_t} \leq \frac{EK}{EQ}$  the optimal acquisition strategy is sole sourcing. Moreover in the absence of information the acquisition strategy is sole sourcing:  $EK \geq k(N)EQ$ .

The job of the delegate is to collect information on the appropriateness of implementing an open tender. Following Laffont and Tirole (1993) we assume that the information acquisition process is exogenous. The delegate holds information, denoted  $\sigma$ , on the subset,  $C = [\frac{K}{Q}, k(N)]$  or  $M = (k(N), \frac{EK}{EQ}]$ , in which  $K_t/Q_t$  is drawn from. With positive probability  $\xi > 0$  the delegate information is pertinent:  $\sigma = S$  where  $S = M$  if  $\frac{K_t}{Q_t} \in M$  and  $S = C$  if  $\frac{K_t}{Q_t} \in C$ . And with complementary positive probability  $1 - \xi > 0$  it is uninformative.

**Assumption 2**  $\sigma \in \{S, \emptyset\}$  with  $\xi = Prob(\sigma = S) \in (0, 1)$

The information received by the delegate is hard evidence. When she is informed that implementing competitive bidding is optimal (i.e., when  $\sigma = C$ ) she can prove it in court. However she can always hide her information and pretend that  $\hat{\sigma} = \emptyset$ . This claim is impossible –extremely costly– to verify. Under assumption (5) the probability that  $K_t/Q_t$  belongs to  $C$  is  $\mu > 0$  and the probability that it belongs to  $M$  is  $1 - \mu > 0$ . We deduce that the probability that  $\sigma = C$  is  $Prob(\sigma = C) = \nu = \xi\mu$ .

Figure 1 represents the possibilities of capture in function of  $k(N)$ . “Limited tender” and “open tender” are corruption free zones. ”Capture free” is a zone where the only corruption that could occur is extortion, which is ruled out by assumption. In what follow we focus on capture cases where  $\frac{K}{Q} \leq k(N) \leq \frac{EK}{EQ}$ .



**Figure 1**

*The timing:*

$t = 1$  The principal sets the delegate’s contract and the acquisition rules. He entrusts the

<sup>36</sup>If the delegate has the proof that the optimal policy entails limited tendering she could extort a firm to pay a bribe by threatening to claim  $\hat{\sigma} = \emptyset$ . Extortion occurs when the optimal acquisition strategy is the fixed-price purchase and the delegate threatens to implement competitive bidding instead. For analyses of extortion see Rose-Ackerman (1978), Auriol (1996) and Auriol and Lassebie (2015).

enforcement of the acquisition rules to the delegate.

$t = 2$  Nature chooses  $K_t \in [\underline{K}, \overline{K}]$  and  $Q_t \in [\underline{Q}, \overline{Q}]$ ; The delegate obtains information  $\sigma \in \{\emptyset, S\}$ .

$t = 3$  The delegate who gets all the bargaining power, meets with one firm; side contracting occurs;<sup>37</sup>

$t = 4$  The delegate announces  $\hat{\sigma} \in \{\emptyset, S\}$ ; competitive bidding or sole sourcing is implemented according to the rule edited by the principal based on  $\hat{\sigma}$ .

– If competitive bidding, the delegate opens the market by sinking  $K_t$ , which value has been chosen by nature at stage  $t = 2$ ; nature chooses  $(\beta_t^1, \dots, \beta_t^N)$ ; the  $N$  potential producers discover  $\beta_t^i$ ; bidding takes place.

– If sole sourcing, the delegate selects a firm; nature chooses  $\beta_t^i$ ; the firm discovers  $\beta_t^i$ .

$t = 5$   $Q_t$  is revealed to all. Contracts are signed, production and transfer occur.

Stage 3 corresponds to the corruption stage. We assume that the delegate has all the bargaining power in the secret negotiation because if the firm refused her take-it-or-leave-it offer she would make the same offer to a competitor. The bribe she gets is the maximum that a producer is willing to pay to secure a monopoly position. It is not important which firm is chosen; at stage 3, they are all symmetric. Then if a firm successfully captures the delegate, the principal ends up with the wrong decision, namely limited tendering in favor of the briber, whenever  $\sigma = C$ .

Capture is damaging to society because it involves sole sourcing instead of competitive bidding when  $\sigma = C$  is pivotal information. The social loss associated with capture is

$$L(N) = Q_t k(N) = \frac{N-1}{N+1} Q_t. \quad (6)$$

The expected social loss associated with capture,  $L(N)$ , is increasing and concave in  $N$ , the number of bidders that would have competed in a fair open procedure. It varies between  $L(N) = \Pi(N) = \frac{Q_t}{3}$  when  $N = 2$  and  $L(N) = 2\Pi(N) = Q_t$  when  $N \rightarrow +\infty$ . This result is consistent with the empirical study by Iimi (2006) on procurement auctions for official development assistance. It shows that the bid prices decrease with the number of bidders in a convex fashion. Moving from open to limited tender hence yields a loss increasing and concave in  $N$ . In comparison the firm's benefit from capture is:

$$\Pi(N) = \pi(1) - \pi(N) = \frac{Q_t}{2} - \frac{Q_t}{N(N+1)}. \quad (7)$$

The firm's benefit from capture is smaller than the social loss from capture because  $L(N) \geq \Pi(N) \forall N \geq 2$ . In addition to undermining taxpayers confidence in public institutions and inflating the price they pay for the public commodities, capture thus implies a dead-weight loss. Even if the principal could tax the corrupt firm and the delegate to distribute their excess profits back to the taxpayers, he would not be able to restore efficiency.

In case of corruption, the firm has to give a bribe to the public official to obtain the market without having to compete with other firms. The bribe rate is  $b \in [0, 1]$  so that

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<sup>37</sup>At this stage of the game, both the firm and the delegate ignore the size of  $\beta^i$ . The bribe depends on the firm's future expected profit.

the net expected profit of the firm when it engages in corruption, assuming there is no risk of detection, is  $\pi(1)(1 - b) = (1 - b)\frac{Q_t}{2}$ . The maximum level of bribe  $\bar{b}^{static} \in [0, 1]$  that the firm is willing to pay ex-ante to avoid competition is so that:  $\pi(1)(1 - b) = \pi(N)$ . It yields:

$$\bar{b}^{static} = 1 - \frac{2}{N(N + 1)}. \quad (8)$$

### 3.4 Corruption in repeated purchases and debarment

Now we consider the infinite repetition of the purchase stage game. To keep the analysis simple we assume that when the optimal acquisition procedure is sole sourcing (i.e., when either  $\sigma = \emptyset$  or  $\sigma = M$ ) the delegate picks a firm at random to serve the market. We introduce some notations to ease on the exposition. Let  $E_C Q$  denotes the expected value of  $Q_t$  conditional on the fact that it belongs to set  $C$  and let  $E_M Q$  denote the expected value of  $Q_t$  conditional on the fact that it belongs to set  $M$ . Let  $E_{\sigma \neq C} Q = \xi E Q + \xi(1 - \mu) E_M Q$  denote the expected value of  $Q_t$  when  $\sigma \neq C$ . We have:  $E_M Q < E_{\sigma \neq C} Q < E Q < E_C Q$ . Corruption might arise when the delegate information is  $\sigma_t = C$ , which occurs with probability  $\nu = \xi\mu > 0$ .

In the infinite repeated public purchase game the expected payoff of a firm when there is no corruption is:

$$\sum_{t=0}^{+\infty} \left\{ \frac{\nu E_C Q}{N(N + 1)} + \frac{E_{\sigma \neq C} Q}{2N} \right\} \delta^t = \frac{1}{1 - \delta} \left\{ \frac{\nu E_C Q}{N(N + 1)} + \frac{E_{\sigma \neq C} Q}{2N} \right\}. \quad (9)$$

By contrast, if the selected firm is corrupt, in addition to the bribe it has to pay to the public official, the firm faces the risk of detection and punishment (i.e., debarment). Let  $1 - p \geq 0$  be the probability that corruption is uncovered (i.e.,  $p$  is the probability that corruption is not discovered). If corruption is detected the firm is debarred permanently from the public market. There are two options for debarment. Either debarment is market specific or it is universal. If it is market specific the firm will be debarred from the market where corruption occurs but it will be able to operate in other markets. If it is universal it will be debarred from all future public procurement markets, which here means that it will also lose the possibility to procure  $E_{\sigma \neq C} Q$ . We compute the expected profit of the firm in the latter case. The case of market specific debarment is simply obtained by setting the loss  $E_{\sigma \neq C} Q = 0$  in our formulas – a ratio which plays an important role in the analysis below is

$$\Delta Q_{univ} = \frac{E_{\sigma \neq C} Q}{\nu E_C Q}. \quad (10)$$

The expression in (10) denotes the volume of public contracts available outside the corrupt transactions relative to the volume of corrupt public contracts. In case of universal debarment the firm loses both the access to  $E_C Q$  and to  $E_{\sigma \neq C} Q$ . The ratio  $\Delta Q_{univ}$  is therefore a measure of the additional loss imposed on the firms by universal debarment.

So if corruption occurs, there is a probability  $1 - p$  that a firm will disappear from the pool of potential bidders. The probability that a corrupt firm is not debarred and therefore is around in the next period is  $1 - \nu(1 - p)$ . To ease the computation of the

firms' payoff, we assume that if corruption occurs it is always the same firm that is chosen for the corrupted deals until it is permanently debarred. This assumption is consistent with the fact that the public agent faces search/switching costs when she wants to ask for bribes. She sticks with the firm she knows is willing to pay bribes quietly. In practice the firms that benefit from corrupt deals tend to be always the same (e.g., because of a political connection). The corrupt firm's expected payoff is:

$$\sum_{t=0}^{+\infty} \frac{(1-b)\nu E_c Q + \frac{E_{\sigma \neq C} Q}{N}}{2} (1-\nu(1-p))^t \delta^t = \frac{1}{1-\delta(1-\nu+\nu p)} \left\{ \frac{(1-b)\nu E_c Q}{2} + \frac{E_{\sigma \neq C} Q}{2N} \right\} \quad (11)$$

A firm is not willing to enter into a corrupt deal if:

$$\frac{1}{1-\delta+\delta\nu(1-p)} \left\{ \frac{(1-b)\nu E_c Q}{2} + \frac{E_{\sigma \neq C} Q}{2N} \right\} \leq \frac{1}{1-\delta} \left\{ \frac{\nu E_c Q}{N(N+1)} + \frac{E_{\sigma \neq C} Q}{2N} \right\} \quad (12)$$

We next need to check that the firm - starting from a baseline of honest behavior - does not want to deviate for  $T \geq 1$  periods and take the corrupt deal, before returning to the honest behavior. If such deviation is profitable then the forever-honest strategy is not subgame perfect. The payoff of a deviation of  $T \geq 1$  periods at any time  $\tau \geq 0$  from the honest strategy to the corrupt strategy is

$$\begin{aligned} & \sum_{t=0}^T \left\{ \frac{(1-b)\nu E_c Q}{2} + \frac{E_{\sigma \neq C} Q}{2N} \right\} (1-\nu(1-p))^t \delta^t + (1-\nu(1-p))^{T+1} \delta^{T+1} \sum_{t=0}^{+\infty} \left\{ \frac{\nu E_c Q}{N(N+1)} + \frac{E_{\sigma \neq C} Q}{2N} \right\} \delta^t \\ &= \left\{ \frac{(1-b)\nu E_c Q}{2} + \frac{E_{\sigma \neq C} Q}{2N} \right\} \frac{1-((1-\nu(1-p))\delta)^{T+1}}{1-(1-\nu(1-p))\delta} + \frac{(1-\nu(1-p))^{T+1} \delta^{T+1}}{1-\delta} \left\{ \frac{\nu E_c Q}{N(N+1)} + \frac{E_{\sigma \neq C} Q}{2N} \right\}. \end{aligned}$$

A firm will never find it profitable to deviate from honest behavior and be corrupt for any  $T \geq 1$  periods if

$$\begin{aligned} & \left\{ \frac{(1-b)\nu E_c Q}{2} + \frac{E_{\sigma \neq C} Q}{2N} \right\} \frac{1-((1-\nu(1-p))\delta)^{T+1}}{1-(1-\nu(1-p))\delta} + \frac{(1-\nu(1-p))^{T+1} \delta^{T+1}}{1-\delta} \left\{ \frac{\nu E_c Q}{N(N+1)} + \frac{E_{\sigma \neq C} Q}{2N} \right\} \\ & \leq \frac{1}{1-\delta} \left\{ \frac{\nu E_c Q}{N(N+1)} + \frac{E_{\sigma \neq C} Q}{2N} \right\} \end{aligned} \quad (13)$$

One can easily check that condition (13) is equivalent to condition (12), which is also equivalent to  $b \geq \bar{b}$ , where

$$\bar{b} = 1 - \frac{2}{N(N+1)} - \frac{\delta\nu(1-p)}{1-\delta} \left\{ \frac{2}{N(N+1)} + \frac{\Delta Q_{univ}}{N} \right\} \quad (14)$$

The maximal bribe rate  $\bar{b}$  that the public official can demand increases with  $N$  and  $p$ , and decreases with  $\delta$ . Comparing equations (8) and (14) it is straightforward to check that  $\bar{b} < \bar{b}^{static}$  for all  $p < 1$  and  $\delta > 0$ . By contrast if either  $p = 1$  or  $\delta = 0$  then  $\bar{b} = \bar{b}^{static}$ . This result is intuitive. If the firm does not care about the future (i.e., if  $\delta$  is very small), debarment is useless as a deterrence tool. Similarly if the probability of being caught is 0 the debarment threat carries no weight. If  $p > 0$  the risk of being detected and punished by debarment reduces the benefit of corruption, and hence, the public purchaser's room

for demanding bribes. This is the desired effect of debarment rules. The effect is larger when debarment is universal (i.e., when  $\Delta Q_{univ} > 0$ ) than when it is market specific (i.e., when  $\Delta Q_{univ} = 0$ ). The more the firm has to lose with debarment, the less it will be inclined to pay bribes:  $\bar{b}$  decreases with  $\Delta Q_{univ}$ .

Now it remains to be seen whether the effect is sufficient to deter corruption. Let

$$\delta_p = \frac{N(N+1) - 2}{N(N+1) - 2 + (1-p)\nu(2 + (N+1)\Delta Q_{univ})} \leq 1 \quad \forall p \in [0, 1]. \quad (15)$$

We deduce the next result.

**Proposition 1** *Debarment will deter corruption if and only if  $\delta \geq \delta_p$ .*

*Proof:* Firms might be willing to enter into a corrupt deal if the bribe demanded by the public official is low enough (i.e., if  $b < \bar{b}$ ). Debarment will deter corruption if there is no positive bribe rate  $b$  that can be lower than  $\bar{b}$  defined in condition (14). That is, if  $\bar{b} \leq 0$ . The critical value of  $\delta$  so that  $\bar{b} = 0$  is (15). We deduce the result. QED

If the probability of corruption detection,  $1 - p$ , is almost 0 then  $\delta_p \rightarrow 1$  and the public official can ask for large bribes. Conversely if  $1 - p$  and  $\Delta Q_{univ}$  is large enough, then  $\delta_p$  is small, and it is harder to find firms that are willing to pay bribes. Universal debarment implies the loss of a larger production volume of public procurement than market specific debarment. This additional loss matters when the detection threat is real and the firm is patient enough. If the firm values future payoffs almost as much as its payoff today (i.e.,  $\delta$  is larger than  $\delta_p$ ), then there is no bribe rate that will lure the firm into corruption.

### 3.5 The dynamics of debarment

We focus in this section on cases where  $p < 1$  and initially  $N$  is large so that corruption occurs in equilibrium. As time passes, and corrupt suppliers are debarred, the number of firms qualified to compete for the market will be reduced. Indeed, in each period there is a probability  $\nu(1 - p)$  that a firm is caught and debarred. Let  $N_t$  denote the number of firms that are allowed to compete for the market at time  $t \geq 0$ . We can rewrite the maximum value in (15) as follow:<sup>38</sup>

$$\delta_{tp} = \frac{N_t(N_t + 1) - 2}{N_t(N_t + 1) - 2 + (1-p)\nu(2 + (N_t + 1)\Delta Q_{univ})} \quad (16)$$

If the probability of detection  $1 - p > 0$  is low and  $N_0$  is large, debarment will be an ineffective strategy to prevent corruption at date 0. From the welfare point of view, if debarment is not effective in preventing corruption, it does not decrease the cost of the purchase for the taxpayers. Indeed, if debarment is ineffective society ends up with the same decision as without debarment (i.e., sole sourcing in both cases). However, with debarment measures in place, the number of firms that are not debarred decreases over

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<sup>38</sup>As  $N_t$  decreases over time,  $k(N_t) = \frac{N_t-1}{N_t+1}$  decreases too so that  $EQ_{ct}$  increases. However this does not change the result from equation (12), and the limit value in (15) is preserved.

time, as more and more get caught, until  $N_t$  is either too low for competitive bidding to be optimal or for corruption to be a preferred strategy for the firm. In other words debarment has an anti-competitive effect that can undermine the debarment mechanism's intended incentive effect. Let

$$\underline{N}_c = \frac{\bar{Q} + K}{\bar{Q} - \underline{K}}. \quad (17)$$

If  $N_t$  falls below  $\underline{N}_c$  then the anti-competitive effect of debarment is so strong that organizing a competitive procedure is no longer optimal. That is, if  $k(N) = \frac{N-1}{N+1} \leq \frac{K}{Q}$  the optimal acquisition strategy is always to implement sole sourcing. In this particular case debarment has only costs and no benefit. This negative effect is stronger if debarment is universal.

More interestingly, the critical number  $\underline{N}_d$  that determines whether corruption is attractive to firms when debarment measures are in place is  $\delta = \frac{N(N+1)-2}{N(N+1)-2+(1-p)\nu(2+(N+1)\Delta Q_{univ})}$ . This second-degree equation admits two roots. Only one is positive.

$$\underline{N}_d = \frac{\sqrt{\left(1 + \frac{\delta}{1-\delta}(1-p)\nu\Delta Q_{univ}\right)^2 + 8\left(1 + \delta\nu\frac{1-p}{1-\delta}\right) - 1 + \frac{\delta}{1-\delta}(1-p)\nu\Delta Q_{univ}}}{2}. \quad (18)$$

Let  $Int\{X\}$  denote the inferior integer part of  $X$ . We deduce the following result:

**Proposition 2** *In the long run debarment reduces the number of firms to*

$$N_\infty = Int\{\max\{\underline{N}_d, \underline{N}_c\}\}, \quad (19)$$

*below which corruption does not occur anymore.*

As a result, once  $N_t$  has fallen below  $N_\infty$  because of debarment procedures, corruption stops. A critical parameter in determining whether debarment is effective in fighting corruption is the probability that firms will actually get caught while bribing a public official. Indeed, the threshold  $\underline{N}_d$  decreases with  $p$ , that is, with the probability that the firms' corruption goes undetected. For  $p$  close to 1 (i.e., corruption is rarely uncovered) or for  $\delta$  close to 0 (the firms do not care much about future contracts)  $\underline{N}_d = 1$ . In this case debarment has only an anti-competitive effect and no incentive effect. It yields a higher social loss than the status quo.

For  $p < 1$  (i.e., corruption is uncovered sometimes) and  $\delta \rightarrow 1$  (the firms are extremely patient), corruption will never occur in equilibrium:  $\underline{N}_d \rightarrow +\infty$ . It is worth noting that  $\underline{N}_d$  decreases with  $\Delta Q_{univ}$ . Provided that firms care about future sales and are patient enough, universal debarment is more effective at preventing corruption than market specific debarment.

Our analysis shows that debarment will be efficient in reducing corruption if the firms are in (an implicit) long-term relationship with the principal and value future sales, if the number of firms is not too large (i.e., lower than  $N_\infty$ ) and if the probability of corruption detection is high enough. In this context universal debarment is more efficient to fight corruption than market specific debarment. For instance, large international contractors seeking to secure on a regular basis projects financed by the World Bank or the French

Development Agency (AFD) might become more reluctant to bribe public officials if the threat of cross-debarment is perceived as real. Similarly the effect of debarment is substantial for small suppliers who operate on World Bank financed projects in one market only; those that have specialized on such markets may have no alternative customers. By contrast, debarment threats from international organizations will carry little weight for local contractors applying on a one-shot basis. The anticompetitive effect of debarring these contractors is limited as they do not intend to compete elsewhere.

We have considered only one instrument -debarment- which concentrates reactions on the suppliers in public procurement, and shown its limitation as an instrument for fighting corruption. As Rose-Ackerman (2010) points out, bribery is deterred if at least one side of the corrupt transaction faces penalties that reflect its own gains - that is a multiple of these gains because there will always be limits on the risk of detection. From a pure focus on deterrence, either side can be punished, but in practice, there are various obstacles to perfect sanctions and it is essential to keep open the opportunity to impose penalties on both sides of the transaction. In practice, debarment should therefore be combined with other sanctions such as prosecution of public officials, with fines and prison terms in case of conviction, as well as with financial incentives to encourage them to behave honestly (see Auriol 2006). Combining different law enforcement measures could help to cleanse public procurement of corruption. The problem is that in countries where corruption runs high, elite actors are often involved, and they will often discourage the enforcement of anticorruption legislation. Most countries have introduced a comprehensive set of integrity mechanisms to promote good governance and to detect misdealing in the state administration. The performance of these integrity mechanisms varies substantially across societies. Especially among development partners offering aid and cheap loans, debarment in public procurement is seen as an opportunity to “deal with the problem” when other integrity mechanisms fail. In this case, debarment is the only rule that international organizations can pass without the support of local authorities to fight grand corruption and as such, an attempt to act on corruption in the (second-best) ways possible. After all, there are circumstances where it will make a difference - on top of possible norm-generating indirect effects not included in this analysis. However in countries where the elite benefits from corrupt deals the probability of corruption being uncovered and prosecuted is very low and this problem neutralizes the potential benefit of debarment. The involvement of civil society (such as Transparency International) can play an important role in increasing firms’ exposure (see Auriol, Flochel, and Straub 2013), but as the examples presented in Section 2 illustrate, procurement-related corruption often continues despite media attention to the cases.

Debarment with the aim of fighting corruption has an anti-competitive effect by preventing the firms debarred from competing in future public markets. This in turn leads to a different concern: if there is a limited number of bidders in the market they can more easily collude in a bidding ring. If collusion occurs the principal ends up again with the monopoly price. The next section studies whether the debarment mechanism can be used efficiently to prevent collusion, or not.

### 3.6 Cartels and bidding rings

In this section we assume that  $Q_t$  is sufficiently large so that organizing a competitive bidding procedure is mandatory for all  $N \geq 2$ :

$$\underline{Q} \geq 2\bar{K}. \quad (20)$$

Since the public procurement officer has no influence on the acquisition procedure, there is no corruption threat in the context of our model. However with large repeated purchases, a cartel of firms can easily emerge and stall competition. We explore in this context how debarment rules might help in fighting such collusive practices.

We first compute the expected payoff of a firm  $i = 1, \dots, N$  when it participates in an infinite sequence of competitive auctions.

$$\Pi(N) = \frac{EQ}{N(N+1)} \sum_{t=0}^{+\infty} \delta^t = \frac{EQ}{N(N+1)(1-\delta)} \quad (21)$$

Second, we compute firm's expected profit when it colludes with other firms to bid the monopoly price. If the winning firm cannot or is not willing to compensate the other losing firms for not bidding (perhaps because of concern about detection), the best collusive mechanism involves rotating the winning bid among the cartel members so that the winner changes in each round (see Athey and Bagwell 2001).

To ease on notation we also denote by  $1-p \geq 0$  the probability that the winning firm is discovered as a cartel member (i.e.,  $1-p \geq 0$  is a generic notation for a firm being found guilty of a crime) and debarred permanently from this market. From the firm's point of view it does not matter whether all the cartel members are debarred or not. The only relevant payoff for the firm is its own. The expected profit of a firm  $i = 1, \dots, N$  in the cartel is:

$$\Pi^{col}(N) = \frac{EQ}{2N} \sum_{t=0}^{+\infty} (\delta p)^t = \frac{EQ}{2N(1-\delta p)} \quad (22)$$

Being a member of a cartel is profitable for firm  $i = 1, \dots, N$  if and only if  $\Pi^{col}(N) > \Pi(N)$ :  $\frac{EQ}{2N(1-\delta p)} > \frac{EQ}{N(N+1)(1-\delta)}$ . This is equivalent to:

$$N > \frac{2(1-p\delta)}{1-\delta} - 1. \quad (23)$$

Moreover the cartel is stable if deviating at any period  $t \geq 0$  from the collusive equilibrium is not profitable. We assume that the cartel uses a grim trigger strategy. This strategy works as follows. Firm  $i = 1, \dots, N$  starts by choosing the action that maximizes cartel profits. Firm  $i = 1, \dots, N$  keeps on choosing this action as long as all firms have done so in all previous periods. This corresponds to a cooperation phase. If one firm deviates, deviation "triggers" the start of the punishment phase. Firms choose the action that corresponds to the competitive equilibrium of the static game forever. The firms do not discover their cost unless they prepare a real bid. In a collusive equilibrium, the firms that

are not chosen to win do not pay the cost of discovering their true cost for this market. They do not submit a bid.

In this context a “losing” firm under the veil of ignorance - in the sense that it does not know the exact value of its marginal cost - will be tempted to deviate from the collusive equilibrium at date  $t \geq 0$  for an expected profit  $\frac{EQ}{2}$  at period  $t$  and  $\frac{EQ}{N(N+1)}$  forever after that. We deduce that deviation is ex-ante unprofitable if:

$$\frac{EQ}{2} - \frac{EQ}{N(N+1)} + \frac{EQ}{N(N+1)(1-\delta)} < \frac{EQ}{2N(1-\delta p)}. \quad (24)$$

Equation (24) is equivalent to:

$$p > \frac{1}{\delta} \frac{2\delta + (N-1)(N+1)(1-\delta)}{2\delta + N(N+1)(1-\delta)}. \quad (25)$$

Depending on the value of  $\delta$ , the right hand side (*RHS*) is not always lower than 1, in which case there is no way for the cartel to sustain collusion. In particular, if the firms are very impatient collusion is unstable and the firms will compete for the market. A necessary condition for collusion to be a problem is thus that the *RHS*  $< 1$  in (25), which is equivalent to

$$\delta > \frac{(N-1)(N+1)}{N(N+1)-2}. \quad (26)$$

It is a standard result in the collusion literature that firms must be patient for a collusive equilibrium to emerge. Condition (26) is a necessary condition for collusion to be stable, but it is not sufficient. In addition, condition (25) must hold.

To illustrate how these conditions come to effect, let us assume that  $N = 5$ . We deduce that condition (25) is equivalent to  $p > \frac{1}{\delta} \frac{\delta+12(1-\delta)}{\delta+15(1-\delta)}$  and condition (26) is equivalent to  $\delta > \frac{6}{7} \simeq 0.857$ . Let assume that  $\delta = 0.9$ . It implies that  $p > \frac{35}{36} \simeq 0.972$ . In other words if  $N = 5$  the firms have to be patient and the probability of detection low (i.e., lower than 2.7 percent) for collusion to emerge and be stable.

We deduce the next result.

**Proposition 3** *Debarment will deter collusion if and only if the probability of cartel detection  $d$  is so that:*

$$d \geq 1 - \frac{1}{\delta} \frac{2\delta + (N-1)(N+1)(1-\delta)}{2\delta + N(N+1)(1-\delta)} \quad (27)$$

If  $\delta$  is small the *RHS* is negative and (27) always holds. If  $\delta$  is large enough so that condition (26) holds, then the *RHS* is strictly positive and the probability of detection must be large enough to deter collusion.

It is worth noting that if the probability of detection is positive but lower than the threshold in (27) then debarment entails a competitive cost without generating any benefit: Debarment alters the set of bidders in future auctions. This is especially true if all the firms involved in the collusive conspiracy are debarred upon discovery. In this case debarment is a very poor instrument to fight collusion, and the principal ends up with nobody to serve its public markets. A better mechanism would be to debar the firm that

has benefited from the collusive agreement and let the other cartel members compete for future public tenders. *This mechanism has exactly the same disincentive effect as the debarment of all the firms but will not make procurement impossible in the future.* From a legal point of view this mechanism might be difficult to implement, although leniency programs for cartel members that report their offenses to the authorities suggest a certain policy space for solutions that deviate from principles of equal treatment. In cartel cases an important policy issue is therefore whether all firms in a cartel is debarred, or if certain members of the cartel, ring leaders for instance, are sanctioned more severely. If the debarment regimes are maintained as they now typically stand, the distortive consequences associated with a higher risk of collusion can be mitigated by the modification suggested above, that is, by excluding only one of the firms in cartel cases, rather than all the firms involved.

Second, debarment will affect existing cartels in the sense that it will undermine leniency granted by competition authorities (CAs). In most jurisdictions CAs have leniency programs that may reduce or eliminate fines for infringement of competition rules. Typically such immunity may be granted if the firms confess and cooperate with the CAs in prosecuting the other members of the cartel. Because CAs cannot grant leniency for debarment, the danger of debarment will make it less likely that firms will apply for leniency. In this sense, debarment of firms for their involvement in cartel collaboration will tend to undermine the efficiency of the leniency programs established by CAs. Hence, the total effects of debarment on cartel formation and the possibility of cracking cartels (exits) with leniency inducements, are far from trivial.

As discussed in section 2 there is variation across countries and multinational development banks in their design of debarment mechanisms. To the extent that cartel collaboration is listed among the crimes for which suppliers can be debarred, the common rule is to debar all suppliers involved. What this analysis shows is that the debarment mechanism will not work against collusion if this is the rule. With a modification, however - specifically, with debarment reserved for the ringleader or the specific beneficiary in the case when collusion was detected, the debarment instrument can in fact work as a tool that reduces suppliers' propensity to be involved in collusion. Today's rules, however, with debarment of all the suppliers involved in the crime, makes no sense according to our analysis, and if choosing between such a regime and a regime that debars suppliers upon corruption only,<sup>39</sup> the latter is preferred.

## 4 Discussion

Public procurement systems contain rules intended to promote competition and value for money in government acquisition of goods and services. Suppliers are judged not only as suppliers of goods or services, but also on how well they comply with the overall legal framework and whether they can be found trustworthy. The option to debar allows

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<sup>39</sup>This analysis focuses on the cartel collaboration and corruption, yet fraud is another relevant crime. Upon this analysis, the impact of debarment on crimes conducted by an individual supplier alone is straightforward, and therefore not included in the analysis.

discretion under circumstances where the acquisition would otherwise be strictly steered toward the best price-quality combination.

Debarring suppliers from auctions sends a strong signal to the private sector about demand for integrity in government-financed projects. This is especially important in countries where government institutions are unable to prevent procurement-related crime. However, the causes of corruption, and other forms of crime that call for disqualification of some suppliers are not to be found in the private sector alone. Clearly, corruption will not take place if governments and their public procurement agents are all honest, since under such conditions a bribe will be declined and there will be no need for debarment of suppliers as a means of securing integrity. When procurement agents are dishonest, on the other hand, the exclusion of some suppliers will not be sufficient to deal with the problem. For international development partners that see the shortcomings of their good governance recommendations, debarment makes sense as a strategy for disciplining international firms, but it will not solve the problems in public procurement, especially when politically connected local firms are involved.

For these reasons, debarment of suppliers can never be a complete anticorruption solution, but to some extent it is a relevant tool for governments and international organizations that do not know whether they can trust their procurement agents. Such asymmetric information is generally a problem for governments in all categories of countries, and it is therefore an assumption behind this analysis. Procurement agents are usually the ones who organize the auction and control whether pre-qualification criteria for a tender are met. In practice, irrespective of what public procurement procedures are specified and what technical integrity barriers have been put in place, the agents can let informal factors influence the allocation of contracts, deciding whether an acquisition should be determined by competitive bidding or sole-source negotiation. This reality is the point of departure for our analysis of debarment.

The analysis shows that debarment may deter suppliers from offering bribes as long as they place a sufficiently high value on the profits from future public procurement contracts. The problem with debarment as an integrity-promoting strategy, when it works (that is, when there is a de facto probability of being caught), is the effect on the number of firms in the market. When there are many competitors, the cost of excluding a competitor is low since each supplier can be replaced. For each corrupt acquisition, however, the price is set as if the market were a monopoly. As the number of firms decreases, debarment becomes an effective tool to deter corruption. With few suppliers in the market, however, cartel collaboration becomes a new threat. If collusion occurs and is the preferred strategy, monopoly prices will again impose costs on society. Debarment of dishonest suppliers will not be an efficient strategy in these cases because it can easily result in exclusion of all remaining suppliers.<sup>40</sup> To limit the anti-competitive effect a debarment regime should be

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<sup>40</sup>As a consequence of the analysis, we find that the maximum size of the bribe requested by a corrupt procurement agent increases with the number of competitors. Intuitively, each supplier has more to gain from sole-source procurement when there are many competitors and therefore will display a higher willingness to pay. In practice, however, we often associate corruption with few competitors, and logically, oligopoly should imply higher surplus and therefore also bribes, compared to more intense competition. The different effects on the size of the bribe will depend on what decision is being negotiated. This

combined with initiatives to bring back excluded suppliers so that they can contribute to competition as soon as they regain the trust of procurement agencies.<sup>41</sup> The decision as to whether or not a supplier is found trustworthy – for example, after some reorganization effort and compliance reform – should not be left up to a procurement agent. At present, however, this is a frequent practice, as if those who developed the debarment rules totally ignored the fact that corruption in procurement has two sides.

For these reasons, at the exclusion of international development banks and other international organizations that do not have other tools, it is difficult to defend a debarment strategy that works as intended. And clearly, it does not make much sense to introduce an inconsistent or dysfunctional debarment strategy unless it is merely a window-dressing initiative intended to impress voters. Debarment allows governments to be seen to act against damaging practices. As described in this analysis, the effect on procurement is positive only under very specific circumstances. It is a problem if the “seen to act” aspect of the strategy implies reduced attention to more efficient solutions. Despite the sensitivities associated with addressing corruption and fraud in politics and state administration, debarment strategies should never divert attention from the importance of strengthening government systems and enhancing competition in markets. There are other initiatives against corruption and crime that are more important for securing integrity in public procurement. In particular, pro-competition initiatives will usually reduce opportunities for corruption (for example, if combined with solid outcome control and/or price control). The most serious corruption problem, involving capture of political decision-makers, calls for legal harmonization and an expansion of the market that is regulated by the rules (Auriol 2006). Foreign bribery legislation and universal debarment are steps in such a direction. Looking more closely at the mechanisms, however, we find no efficient anticorruption solution in any of these strategies taken independently.<sup>42</sup>

A further argument for international legislation is associated with the risk of collusion. While most governments seek to control cartel collaboration in their own markets, there is generally a different law enforcement attitude when it comes to the export of cartels. Martyniszyn (2012) points out that many governments have a strong inclination to ignore cartel collaboration among firms – provided the consequences are kept abroad. In light of this observation and the analysis presented in this paper, we should see clearer anticorruption effects from international competition-enforcement initiatives than from universal debarment of unreliable suppliers.

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analysis focuses on a procurement agent’s choice between competition and sole-source procurement. A decision to keep high barriers to market entry is a different decision, which may imply positive correlation between profits and bribes – and involve different decision-making levels.

<sup>41</sup>See Hjelmeng and Søreide (2014) and Majtan (2013) for debate about criteria for returning to the market.

<sup>42</sup>Foreign bribery legislation makes a difference, but these rules too address the suppliers and will not reach the governments. Besides, the asymmetric enforcement of these rules distorts competition, and as a general rule it reduces the benefits of trade and investments to host countries (Bjorvatn and Søreide 2013).

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