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The World Bank
Integrity Vice Presidency

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Curbing Fraud, Corruption, and Collusion in the Roads Sector



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Simon Robertson/World Bank

Foreword

From earliest times one of the strongest indicators of a society's development has been its road infrastructure, or lack thereof. At its height, the Roman Empire reputedly built the best engineered and most complex road network worldwide. The Old Testament also contains references to the ancient King's Highway. Corduroy roads were built in Glastonbury, England in 3300 BC with street paving going back to early human settlement around 4000 BC in the Indus Valley on the Indian sub-continent. Our history speaks roads.

Well planned, properly maintained, and safe roads are critical for economic growth and overcoming poverty in developing countries. The roads sector has been a major target for development financing over the entire history of the World Bank and remains important today. Between 2000 and 2010, the World Bank committed close to \$56 billion for road construction and maintenance and expects to continue its active support for the roads sector in its client countries for years to come.

While roads projects supported by the World Bank Group have had consistently positive development results, dangers of fraud, corruption, and collusion plague the sector worldwide. Though this is a problem for both developed and developing countries it is much more costly in terms of opportunity costs and lost economic growth for developing countries. Given the importance of roads to the poor, this challenge is of special significance to the World Bank.

To help our clients safeguard their roads projects from fraud, corruption, and collusion, the World Bank must

be innovative and learn more systematically from our experiences and those of our development partners and client countries. This report of the Preventive Services Unit of the World Bank's Integrity Vice Presidency (INT) supports this effort by turning both the results of INT's investigations and the experiences of developed and developing countries into practical advice about a range of measures in order to stem collusion in tenders for roads contracts, and fraud and corruption in contract execution.

Einstein said, *"We can't solve problems by using the same kind of thinking we used when we created them."* So we need to revisit past practices, drawing on the knowledge of those on the ground in client countries.

The report recognizes that conditions across borrowing countries differ significantly, as they do in developed countries, and that what works in one country may not in another. The measures we offer are not panaceas, or "cookbook" solutions. Diagnoses of the nature of the problems are important in devising possible solutions. Our aim is to spur dialogue among all stakeholders on how to improve the way the World Bank and its clients do business in the roads sector.

The bad news is that ensuring the integrity of roads projects is a challenge for many developed and developing countries since fraud, corruption and collusion historically prove resistant to easy treatment or simple solutions. The encouraging news is that the countries that are committed to stamping out these problems can draw upon the learning and successful experiences of

many others. The corrupt can be bested. Fraud can be thwarted. Colluding networks can be countered and even broken.

We want this report to be a living document, the breeding ground for new solutions, as we seek to protect and

safeguard an important driver of growth. The World Bank and other development partners stand ready to help.

Robert B. Zoellick
May 2011

Executive Summary

Because an extensive, well maintained network of roads is essential for economic development, road construction and maintenance projects have been a mainstay of the World Bank's lending portfolio since its founding. This long experience in the roads sector is reflected in favorable project evaluations. The Bank's Independent Evaluation Group reports that roads and other transport projects consistently score higher on measures of outcomes, institutional development, and sustainability than non-transport projects and the Bank's Quality Assurance Group has found that roads projects are well-supervised.

At the same time, roads projects around the globe remain plagued by fraud, corruption, and collusion. A Transparency International poll ranked construction as the industry most prone to corruption and a survey of international firms revealed that companies in the construction industry were more likely than firms in any other sector to have lost a contract because of bribery. World Bank-financed projects are not immune. Roughly one-fourth of the 500 plus projects with a Bank-funded roads component approved over the past decade drew one or more allegations of fraud, corruption, or collusion; to date, the Bank's Integrity Vice Presidency (INT) has confirmed allegations in 25 projects resulting in 29 cases of misconduct under Bank rules.

The most common forms of wrongdoing in these 29 cases are collusion among firms bidding on a project and fraud and corruption in the execution of the resulting contract. The Bank has controls to reduce these forms of misconduct—procurement process reviews, financial audits, and field supervision—and evidence

suggests that losses in Bank-financed programs are less than in those not subject to Bank oversight. Nonetheless, for the developing countries of the world, any loss on a road project, whether funded by the World Bank or not, is unacceptable.

This report explores how the World Bank and developing nations can reduce losses from collusion in procurement and fraud and corruption in contract execution, drawing on what INT has learned from its investigations of Bank-funded roads projects, investigations and reports by borrowing country governments, and the experience of developed countries. The aim is twofold: (a) to provide input into the World Bank's review of its policies and processes as part of the ongoing reform of its business model, and (b) to inform a broader dialogue on ways to prevent collusion in procurement, and fraud and corruption in contract execution in all roads projects—no matter the funding source.

The report begins with a review of the findings in 29 cases of misconduct in World Bank-funded projects. It follows with an analysis of the incidence of collusion in procurement in non-Bank projects and estimates of its impact on project price. It then examines measures developed countries have taken to attack collusion and suggests how they can be adapted to the environment in developing countries. Some steps will be the same regardless of the country context. A country should have laws penalizing bid rigging, market division, and other forms of collusive behavior along with the commitment and capacity to enforce them. Other steps will depend upon the market conditions and other country-specific circumstances and risks.

Some countries may wish to limit subcontracting or revise the rules governing how firms qualify to bid on contracts. Other countries may decide that more significant changes in procurement procedures are required. The report suggests that in considering such reforms, trade-offs may be required to ensure that the values of transparency, capacity-building through subcontracting, and other goals are pursued in a manner that does not inadvertently limit competition by facilitating collusion.

While preventing fraud and corruption during the execution of a road contract should be everybody's job, the standard road contract used by the World Bank and most developing countries assigns this responsibility to the consulting engineer. The engineer approves all payment requests and change orders, ensuring in every instance that the road is built according to specifications and that value for money is received. The engineer is thus the guardian of project integrity. In World Bank-supported projects, however, INT has found instances where the engineer was asleep at the post and others where the post was altogether deserted. Strengthening the engineer, changing the incentives faced on the job, or even retaining a second guardian to guard the first guardian are some of the suggestions the report advances.

A need to appoint someone to guard the guardian is a sign of a systemic problem and INT's findings echo earlier reports by governments, NGOs, academics, and donor agencies; collusion and corruption are sometimes deeply ingrained in the roads sector. The schemes may involve not only firms but roads agency personnel and even senior officials. In these later cases, the system feeds off itself. The higher the colluders raise the price, the more they can pay in bribes and kickbacks. The more they pay, the more they have to cheat the government to make a profit. The more corruption, the more all wrongdoers stand to gain. Thus all have a shared interest in business as usual.

When collusion or corruption is systemic, change requires breaking the cycle of abuse by bringing in someone from the outside—a prosecution service, anti-corruption agency, competition law authority, supreme audit institution, or, in the case of a local government, the national government. If senior officials are involved, introducing an outsider can be particularly challenging. When corruption is deeply ingrained, short-term palliatives, such as an independent procurement evaluator or technical auditor, may be the answer. More drastic measures may also be required and the report reviews three: the use of bid ceilings, competitive negotiation, and turning procurement over to an independent agent.

Not all corruption is systemic, and thus not all reforms require such significant steps. In the World Bank-supported *Bali Urban Infrastructure Project*, the circulation of tender notices to firms in other provinces defeated a local bidding ring. In the Philippines, civil society monitors uncovered corrupt schemes in a variety of government contracts, and in the second phase of the *National Road Improvement and Management Project*, civil society groups will monitor all phases of the work.

The report suggests that, in addition to expanding project-level preventive measures, more attention should be paid to project supervision, especially in high-risk environments, with a particular focus on verification of cost estimates and the identification of collusive bidding. A review of the World Bank's supervision strategy for roads projects may also be in order, something that might include ensuring that seasoned road engineers are available to assist clients and enhance technical supervision of the projects.

None of the steps recommended are costless, but the losses from collusion, corruption, and fraud can be substantial. This report seeks to spur a dialogue inside and outside the World Bank on how to more effectively combat collusion, fraud and corruption and thus produce better development outcomes.

I

Introduction

The World Bank's Integrity Vice-Presidency investigates misconduct in Bank-funded projects and advises World Bank staff and borrowing country personnel on corruption prevention measures. When INT finds misconduct in a World Bank-funded project, the Bank can bar the firms or individuals involved from bidding on future World Bank-financed contracts. It can also provide information to national law enforcement authorities in the country or countries where the misconduct occurred or where the companies or individuals reside for possible criminal prosecution. Its preventive unit distills investigative findings into thematic reports like this and other documents that it shares with World Bank staff and borrowing country personnel to help them reduce misconduct in future projects.

While documenting cases of misconduct, INT often learns of corrupt schemes prevalent in a country or across an entire industry. For example, INT's investigation into the Philippine *First National Road Improvement and Management Project* revealed practices that inflated highway construction costs throughout the nation. INT also found evidence of schemes involving bribery and siphoning of funds during contract execution in roads projects in Bangladesh, Cambodia, India, Indonesia, the Philippines, and Senegal.

Development Impact of Roads

In the period 2000–2010, the World Bank lent close to \$56 billion for road construction and maintenance—slightly less than 20 percent of the Bank's total lending over the past decade. Lending for roads constitutes a

significant portion of the World Bank's portfolio for good reason: an extensive and well-maintained network of primary, secondary, and feeder roads is critical for economic growth and poverty alleviation. As the Bank's transport strategy for 2008–2012 explains, "Because of their high and diverse functionality and wide range of beneficiaries, roads have become an essential component of all national transport systems, usually consuming the greatest proportion of public and private investment resources in both infrastructure and services" (World Bank 2008a, 48). A cross-country analysis done for the 1994 World Development Report confirms the importance of roads for development, finding a strong and consistent linear relationship between the extent of a country's road network and its level of development (World Bank 1994, 16).

Country-level studies also show the development impact of road construction. In rural India, road investment sharply boosted agricultural productivity and growth (Fan, Hazell, and Thorat 1999). In China and Thailand, road investments contributed significantly to growth in both farm and non-farm output (Fan et al. 2000, 2002, 2004), a finding recently replicated in Uganda (Gollin and Rogerson 2010). In Mexico, increases in investment in roads led to a strong and positive increase in labor productivity (Deichmann et al. 2002). An analysis from the United States pointed to the steep decline in public spending on road infrastructure as the likely cause of a fall-off in productivity in manufacturing in the 1970s (Fernald 1999).

Roads projects are an important part of the World Bank's portfolio because, as the Bank's Independent

BOX 1

World Bank Definitions of Misconduct

The World Bank debars any contractor found to have engaged in one or more of the following forms of misconduct on a Bank-funded contract:

Corrupt practice: offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party.

Fraudulent practice: any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation.

Collusive practice: an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party.

Coercive practice: impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party.

Obstructive practice: deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation, or acts intended to materially impede the exercise of the Bank's inspection and audit rights.

Source: World Bank (2006a).

Evaluation Group has observed, the poor are often their prime beneficiary (World Bank 2007, 4). In Ethiopia, access to all-weather roads reduced poverty by almost seven percent and increased consumption growth by 16.3 percent (Dercon et al. 1998). Ahmed and Hossain (1990) found that better road access by the rural poor in Bangladesh increased household income from both wages and micro-business earnings. In rural Vietnam, the poor reported that the greatest benefit they realized from improved access to roads was educational; children were able to attend school year-round (Songco 2002). An assessment of a World Bank-funded road project in Morocco found that it not only boosted productivity and encouraged the planting of higher-value crops but also improved access to health services and increased school attendance levels (Khandker, Lavy, and Filmer 1994).

Because roads projects are especially important for poverty reduction, the impact of fraud, corruption, and

collusion in such projects is of special significance to the World Bank. Evidence gathered by INT shows that this impact can be quite substantial. In the *Cambodia Provincial Rural Infrastructure Project*, collusion sharply inflated construction costs. In Indonesia, the use of substandard construction materials reduced the useful life of a road and damaged the vehicles using it. According to trucking association representatives in Bangladesh, poorly maintained roads halve the useful life of members' vehicles. INT also saw contractors fraudulently failing to comply with such essential safety features as lane markings, resulting in a sharply increased risk of accidents.

One of the challenges in preventing fraud, corruption, and collusion in the roads sector is that there are so many ways they can seep into the process of designing, tendering, and managing construction contracts (Patterson and Chaudhuri 2007). The 2006 Project Appraisal Document for the *Paraguay*

Road Maintenance Project identified 36 areas at risk of corruption in the design, planning, award, and management of a roads contract and recommended monitoring 59 different indicators (World Bank 2006b, 146–154). While in an ideal world borrowing country personnel overseeing roads projects would watch

everything everywhere always, time and other resources are limited. The aim of this report is to help policymakers prioritize oversight resources by identifying recurring forms of misconduct in roads projects that cause significant harm and suggesting measures to reduce or eliminate them.



II

World Bank Investigative Findings

A review of INT cases in the last ten years provides critical insights into the nature of the problems that may arise in roads projects in terms of the various forms of fraud, corruption and collusion, and the World Bank's ability to detect, investigate, and sanction such misconduct. This data can inform and guide the reforms underway in the Bank's business model and the related policies and processes. Given its limitations, however, this data cannot be used to extrapolate the scale of the problem. Moreover, many of the preventive measures being introduced in projects are relatively recent and their impact and cost effectiveness require close observation and adaptation.

In the 10-year period July 1, 1999, to June 30, 2009, INT found misconduct in 25 World Bank-funded roads projects. Sanctions were imposed in ten cases and proceedings are pending in another five. Sanctions were not pursued in the remainder for one of several reasons: the government had already imposed effective penalties, the evidence was too dated or was insufficient, or the severity of the violation did not merit the commitment of resources required to see the matter through the sanctions process. There were also instances when the pursuit of sanctions would have required revealing information that was obtained in confidence or that might put witnesses in jeopardy.

All cases that result in sanctions are in the public domain and summaries are posted on INT's website (www.worldbank.org/integrity). Table 1 lists the ten roads cases by country with a brief description of the project, its dates of operation, and the principal forms of misconduct found. More than one case may arise from a

single project or misconduct on separate projects may be treated as a single case. Thus, for ease of reference, cases in the table are separated by highlighting. Cases where proceedings are pending or where sanctions were not sought remain confidential. Table 2 provides a general description of each of these 19.

The data in the two tables must be interpreted with care:

- ◆ The 29 cases arising from the 25 projects were opened on the basis of complaints INT received, not as the result of drawing a representative sample of the 540 projects with a road component approved during this period. Therefore, no inference about the incidence or degree of fraud, corruption, or collusion in the World Bank's roads portfolio can be drawn from these data alone.
- ◆ The fact that some countries have more cases than others does not necessarily mean there is more fraud, corruption, and collusion in their roads sector than in the roads sector in other countries. Cases vary significantly in scope and, as noted above, there are instances where misconduct on separate projects was lumped together in a single case and others where more than one case arose from a single project.
- ◆ The data do not capture all attempts to corrupt the procurement process. Depending upon risk levels and national procurement capacity, a certain percentage of contracts in every Bank-funded project is reviewed. Because roads projects are considered high risk for corruption, the World Bank's procurement specialists review a large number of contracts in these projects and have uncovered efforts to falsify

TABLE 1 Misconduct Cases in World Bank Roads Projects: Sanctions Imposed

Country	Project	Project dates	Collusion	Fraud in implementation	False documents
Bangladesh	<i>Third Road Rehabilitation and Maintenance</i> : One contract for supervision of road reconstruction.	1997–2005			✓
	<i>Third Road Rehabilitation and Maintenance</i> : One contract for design and supervision of feeder roads.	1997–2005			✓
Cambodia	<i>Provincial Rural Infrastructure</i> : Seventeen road rehabilitation contracts, total \$8.9 million.	2003–2010	✓	✓	✓
India	<i>Andhra Pradesh State Highway</i> : Two contracts for road widening and strengthening of highways, total \$91 million.	1997–2004		✓	
Indonesia	<i>Sumatra Region Roads</i> : Twenty-two road rehabilitation contracts, ranging from \$56,025 to \$614,415.	1997–2005	✓		
	<i>Second Sulawesi Urban Development</i> : One contract to refurbish roads in villages, \$18,300.	1997–2002		✓	
	<i>Second Sulawesi Urban Development</i> : One contract to oversee design engineering work, \$320,000.			✓	
Kenya	<i>Urban Transport Infrastructure</i> : A contract to build a GIS database of urban road inventory and condition survey, \$2.7 million.	1993–2005	*		
Philippines	<i>First National Road Improvement and Management</i> : Two contracts to rehabilitate and upgrade roads and bridges, \$33.2 million.	1999–2007	✓		✓
Senegal	<i>Urban Development and Decentralization Program</i> : Two road rehabilitation contracts, \$99,270 and \$133,440.	1997–2004		✓	✓
	<i>Urban Mobility Improvement</i> : Three contracts for road construction works.	2000–2008		✓	✓

Key: ✓ violation substantiated; * violation reasonably suspected

a bidder's prior experience, financial strength, and other qualifications; the submission of fraudulent bid securities; and bidding patterns that suggest collusion. When misconduct is suspected, remedial action can be taken on the spot. INT is also notified and depending on its priorities, may open an investigation. INT data thus does not capture all

instances of misconduct in World Bank-funded projects or remedies applied to address it.

Despite the caveats, these 29 cases do provide important insights into misconduct in World Bank-funded roads projects. They show first the different ways in which World Bank staff either discover or learn of the

TABLE 2 Misconduct Cases in World Bank Roads Projects: Sanctions Pending or Not Sought

Region	Project description	Project dates	Collusion	Fraudulent Implementation	False documentation
Africa, Eastern Europe, Central Asia	<i>Works and Employment:</i> One contract for preparation of tender documents for paving three streets, two for technical studies, and one for road pavement supervision, total \$57,634.	2000–2007			
	<i>Transport Development:</i> One road rehabilitation contract, \$7.5 million.	2005–2010			✓
	<i>Roads Improvement Project.</i> Contract to improve major highway, US\$24 million.	2006–2013	✓		
	<i>Municipal Development:</i> Contract to rehabilitate four city streets, \$727,000.	2002–2007	*		✓
East & South Asia	<i>Transport:</i> Three contracts for rehabilitating flood-damaged roads, each \$2.5 million.	1998–2005			✓
	<i>Transport:</i> One contract for supply and installation of equipment, \$128,700.	1998–2005		✓	
	<i>Infrastructure Development</i> Fourteen contracts for repair of flood-damaged roads, \$35 million total.	1997–2007	✓		
	<i>Rehabilitation:</i> Two road rehabilitation contracts, \$83,524 and \$69,261.	2001–2005	✓	✓	✓
	<i>Road Improvement:</i> Six contracts for widening and strengthening highways.	2001–2008			✓
	<i>Regional Roads:</i> Three maintenance contracts, ranging from \$83,853 to \$267,005.		✓	✓	
	<i>Urban Development:</i> One contract to refurbish roads in villages, \$13,700.		✓		
	<i>Urban Development:</i> One contract to refurbish roads in villages, \$16,000.		✓		
	<i>Urban Development:</i> Contract for pedestrian road improvement, \$120,000.				
	<i>Roads Infrastructure:</i> A contract for consulting services for project preparation, \$2.89 million. <i>Regional Transport:</i> One training contract and one design and supervision contract, \$2.7 million total.	2001–2009 2001–2009			
	<i>Regional Transport:</i> Two contracts to build two roads, \$14.5 million total.		✓		

(continued on next page)

TABLE 2 Misconduct Cases in World Bank Roads Projects: Sanctions Pending or Not Sought (continued)

Region	Project description	Project dates	Collusion	Fraudulent Implementation	False documentation
	<i>Highways Management</i> : One consultancy contract for the development and implementation of a Central Roads Database System, a Bridge Management System and a Road Maintenance System, \$2.5 million.	2002–2013	*		
Latin America	<i>Rural Investment</i> : Eleven road and one bridge rehabilitation contract, ranging from \$30,000 to \$300,000.	1998–2006	*	*	
	<i>Road Rehabilitation and Maintenance</i> : Fifty-four contracts for maintenance of roads, ranging from \$6,200 to \$47,000.	1998–2005		✓	
	<i>Road Rehabilitation and Maintenance</i> : One contract for supply and transport of cobblestones, \$2.7 million.	2006–2011			✓

Key: ✓ violation substantiated; * violation reasonably suspected.

misconduct. In eight instances, the World Bank was alerted by competitors of the firms sanctioned; in another seven Bank staff discovered the misconduct; in five evidence was uncovered in the course of a fiduciary review jointly conducted by INT and regional staff; borrowing country officials flagged suspicious activity in three and the supervising engineer in two.

These data also show the types of misconduct most often found in World Bank-funded projects. In the 29 cases the three most common forms were:

- ◆ *Collusion*—bidders agreed among themselves who would win the bid (see Box 2).
- ◆ *False documentation*—typically, the submission of false documents to qualify to bid.
- ◆ *Fraud in the implementation of a contract*—usually overbilling or undersupplying materials during contract execution, often with the connivance of project overseers.

As the tables indicate, in many cases more than one type of misconduct was substantiated; for example, in the Cambodian *Provincial Rural Infrastructure Project*, INT documented all three. Across all 29 cases, INT substantiated ten instances of collusion and had reasonable

BOX 2**Collusion and Cartels**

Collusion refers to any combination or agreement—no matter how informal—among sellers, to raise or fix prices or rig bids or to reduce output in order to increase profits. Although the term *cartel* is often used when the collusive arrangement is a formal agreement, the economic effects of collusion and cartels are the same. In line with usage in many OECD countries, this paper uses the terms interchangeably.

Source: OECD (1990).

grounds to believe it was present in four more projects. It also substantiated 11 instances of fraudulent documents and nine of fraud during contract execution.

Other forms of misconduct were less common. In a project in Asia INT uncovered evidence that officials of the project overseeing the ministry had hidden interests in the winning bidder; kickbacks to career government employees, elected officials, political parties, or some combination were alleged in several projects in South and East Asia and Latin America. Two World Bank staff skimmed

funds from a project in Africa and were subsequently dismissed and then prosecuted by national authorities.

As the sections below demonstrate, INT's findings are consistent with the most common integrity risks

affecting roads projects in developing and developed countries. Better understanding of these risks should enable the World Bank and its borrowers to detect and address them more effectively.



III

Collusion in Road Tenders

The World Bank's mandate requires that it give "due attention to considerations of economy and efficiency" when funding a project; its Procurement Guidelines therefore require that, in all but a few narrowly circumscribed instances, the contracts it finances be let competitively (World Bank 2010a, 7). In roads projects, competition most commonly takes the form of a one-stage sealed-bid auction. The agency responsible for the project prepares a description of the work required and solicits bids from eligible firms. Bids are kept confidential until a specified day, when they are opened in public and the bidder offering the lowest price is declared the winner. When bidders have equal access to information about the proposed work and compete with one another to win the tender, this method of awarding contracts produces economy and efficiency (Milgrom 2004; McAfee and McMillan 1987).

Evidence gathered by INT, however, suggests that road contract awards are not always the result of competition. For example, Bank-funded roads contracts require a bidder to submit a bill of quantities, a document showing the materials, equipment, and labor it expects to use to build the road along with their costs. In a competitive market, a bidder calculates unit prices for each item on the basis of its cost structure, estimates the amounts required, and arrives at its bid price. But in a series of contracts in an Asian country INT found anomalies and inconsistencies in unit costs and totals for line items that showed that bidders had worked backwards from a pre-determined price.

In an investigation in Bangladesh, evidence showed that companies paid project officials up to 15 percent

of the contract value in exchange for contract awards. A Kenyan informant said that "collusion was rife" in the nation's roads sector, an allegation later confirmed by the Kenyan Roads Authority and the Kenyan Anticorruption Commission (Government of Kenya 2007, 2004). After interviewing several firms and government officials in Cambodia, INT investigators concluded that there were strong indications that "a well-established cartel," aided and abetted by government officials, controlled the award of roads contracts. In the Philippines, "Numerous witnesses independently informed INT investigators that a well-organized cartel, managed by contractors with support from government officials, improperly influenced [Department of Public Works and Highways] contract awards and set inflated prices on projects funded by the Bank and others." (World Bank n.d., 3) One Indonesian respondent explained that "the Indonesian collusive system had been operating for 32 years, and many viewed the 'free market' system as counter to the cultural norm of consensus and cooperation," a statement consistent with reports by Indonesia's competition law authority (Soemardi 2010) and scholarly research (Van Klinken and Aspinal (2011).

Besides these examples, some INT cases labeled "false documentation" in the tables may be the result of collusion as well. In a project in Eastern Europe, a World Bank procurement specialist alerted INT to a pattern in the bids on a street rehabilitation contract that suggested bid rigging. The cost figures in the bids submitted by the only two firms competing were virtually identical—down to the same typos in both. The only difference in the two bids was the total price: one was 1 percent below the engineering cost estimate, and the other was

BOX 3**Ten Indicators of Collusive Bidding**

1. Number of contract awards to a specific firm
2. Project bid tabulations
3. Firms that submitted a bid later became a subcontractor on that project
4. Rotation of firms that are the low bidder
5. A consistent percentage differential between the firms' bids
6. A specific percentage of the available work in a geographic area goes to one firm or to several firms over a period of time
7. A consistent percentage differential between the low bid and the engineer's estimate
8. Location of the low bidder's firm versus location of the second and third low bidders' firms
9. Variations in unit bid prices submitted by a bidder on different projects in the same setting
10. Number of firms that requested bid packages versus the number actually submitting a bid

Source: Government of the United States (2004).

1 percent higher. While INT could not substantiate collusion in this case, it did find that the high bidder had provided a false bid security. When firms have agreed in advance which one will “win” the contract, the designated losers frequently submit higher “cover bids” to camouflage the agreement (Khumalo, Nqojela, and Njsane 2009). Further, because banks charge for issuing a bid security, cover bidders often falsify the security to save money. Collusion was also likely in a case in Latin America in which three firms that submitted low bids on a contract were disqualified for reasons that INT suspected were aimed at keeping new entrants out, a common strategy for preserving a bid-rigging scheme (Lambert-Mogiliansky forthcoming).

How common is collusion in roads projects? Neither the data in INT files nor information from any other source can provide a definitive answer. But the INT findings, considered with the results of other case studies of the roads sector in developing countries, the experience in developed countries, and cartel theory, suggest that collusion in roads projects in developed and developing countries is significant.

A. Evidence from Non-Bank Projects

Staff of the Overseas Development Institute reported evidence of an industry-wide cartel to fix prices on roads contracts in Uganda (Booth and Golooba-Muteb

2009). In Tanzania, a review by a former Prime Minister disclosed an industry-wide cartel in the roads sector (Government of Tanzania 1996). In 2005 Indian Deputy Government Secretary Sanjeet Singh told participants at an international conference that cartels in the roads sector operated in various Indian states (Singh 2005). A joint study by the Government of Nepal, the Asian Development Bank, the U.K.'s Department for International Development, and the World Bank concluded that in recent years no tender in the Nepalese construction industry had been free of collusion (Government of Nepal 2009). A statistical analysis of bids in road tenders by the Lithuanian competition agency strongly suggested collusion among firms there (Government of Lithuania 2008); a 2009 World Bank study of public procurement in Armenia noted widespread reports of collusion in tendering (World Bank 2009b); and in 2005 the Slovakia Anti-Monopoly Office uncovered a cartel among road construction firms (Government of Slovakia 2005). At the 9th Global Forum on Competition in 2010, the governments of Columbia, Peru, Pakistan, and Turkey all reported that cartels were operating in their roads sector (OECD 2010a).

B. Cartel Theory

It is not surprising that cartels are common in the road construction industry in developing countries. Road

construction and repair markets tend to be dominated by the same few firms; the “product,” a road, is standardized; prices are relatively insensitive to demand; entry is often difficult, and market conditions are predictable. In addition, would-be competitors often exchange information about both past and future opportunities and develop ties through subcontracting, joint ventures, and membership in trade associations. The presence of any one of these factors increases the likelihood of collusion. When all are present, the probability of collusive behavior is very high (Grout and Sonderegger 2005).

The awarding of contracts through public tenders aggravates the tendency toward cartelization in the sector. To ensure that contracts are fairly awarded and corruption risks minimized, both borrowing country governments and Bank procurement rules require that tenders be conducted transparently. Yet, as explained below, disclosure of some kinds of information facilitates collusion.

C. Developed Country Experience

Collusion in the bidding for road contracts is a problem for developed countries as well. The U.S. Department of Justice launched a vigorous effort in the late 1970s to stamp out bid rigging in auctions for state highway contracts, bringing cases in 20 states that resulted in 400 criminal convictions, fines of \$50 million, and 141 jail sentences between 1979 and 1983 (Flax 1983). Despite these efforts, one-third of all Justice Department cartel prosecutions in the following four years were for bid rigging on state highway construction contracts (Joyce 1989). Only in the 1990s did cartel prosecutions begin to decline, a trend officials attribute to both the imposition of stiff penalties for collusion and changes in state procurement laws to abolish publication of contract estimates, public opening of bids, and convening of meetings where all bidders can attend (Government of the United States 2008).

The United States is not the only industrialized nation where cartels are active in the roads sector. Representatives of Denmark, France, Germany, Japan, Sweden, and the United Kingdom told a 2008 OECD

forum that cartels operated in their roads and construction industries (OECD 2008b). In 1992, the Dutch parliament concluded that the entire construction industry in the Netherlands was cartelized (Van den Huevel 2006); in 2000 the Swiss Competition Commission concluded that the market for road surfacing in the northeastern part of the country was controlled by a cartel (Hüschelrath, Leheyda, and Beschorner 2009), and in 2010 the *Konkurransetilsynet*, Norway’s competition authority, fined two companies for colluding on highway bridge maintenance tenders (Government of Norway 2011). Another indication that collusion continues to be a problem in developed countries is the work of the OECD. Over the past decade it has held five conferences and issued half-dozen papers on how to combat bid rigging and cartelization in the construction sector.

D. Effect of Collusion on Tender Prices

The effect of a cartel is to raise prices above what they would be in a competitive market. An analysis of bids from the American state of Florida showed that collusion on highway contracts increased prices by 8 percent (Gupta 2001) and a similar study found prices in South Korean highway construction markets to be 15 percent higher than they would have been without collusion (Lee and Hahn 2002). The Dutch parliament estimated that cartelization added as much as 20 percent to the price the government of the Netherlands paid on construction contracts (Van den Heuvel 2006), and collusion on construction contracts in Japan is thought to have raised prices anywhere from 30–50 percent (Woodall 1996: 48). Surveying economic studies and judicial decisions containing 1,040 estimates of cartel overcharges, Connor (2009) found the median cartel overcharge was 25 percent.

These estimates are almost all drawn from cartels operating in developed nations. What evidence there is from developing countries suggests the impact is even greater there. Using information from donor-funded roads projects in 29 countries, Estache and Iimi (2008) estimated that collusion can increase the per-kilometer cost for building a road by as much as 40 percent—from \$0.5 million to \$0.7 million. INT compared the winning

TABLE 3 Estimated Cartel Overcharges

Road contracts	
State of Florida	8%
Republic of Korea	15%
Tanzania	15–60%
Philippines	20–60%
Sample 29 developing countries	40%
All construction contracts –	
Netherlands	Up to 20%
Japan	30–50%
All cartels	25%
See text for sources.	

bids on donor-financed roads projects in the Philippines against engineering costs estimates and found a 30 percent variance; earlier estimates range from 20–60 percent (Batalla 2000). Prices in Tanzania in the 1990s were found to be 15–60 percent above competitive prices (Government of Tanzania 1996); a 2003 investigation in Romania revealed that contractors conspired to mark up the price of concrete used in road construction by 30 percent (Oxford Business Group 2004); and a Turkish government study showed that, thanks in part to cartelization, road construction costs in Turkey were 2.5 times higher than in the United States (Gönenç, Leibfritz, and Yilmaz 2005).

Cartel-set prices in developing countries are higher than those fixed by cartels in developed countries for two reasons.

- ◆ Fear of prosecution moderates cartel overcharges in developed countries. Members of a New York State highway bid-rigging ring counseled each other to limit excess profits on tenders to 20–25 percent rather than 40–50 percent. As one conspirator explained during a trial, “getting too greedy” might trigger an investigation (*State of New York v. Hendrickson Brothers Inc.*, 840 F.2d 1065 (2nd Cir. 1988)). By contrast, cartels in many developing countries often

have little reason to fear law enforcement authorities. Bangladesh, Cambodia, and the Philippines, three countries where roads sector cartels have operated, have no comprehensive anti-cartel legislation (Dabbah 2010). Even where an effective law is on the books, many developing countries have yet to create institutions that can enforce it (Stewart, Clarke, and Joeke 2007; Zoghbi 2009).

- ◆ As staff in the Bank’s transport sector have observed, “government officials are often involved” in the cartel (World Bank 2009a, 42). INT investigators were told that foreign firms wanting to bid on roads contracts in Bangladesh were warned by a senior roads agency official that they would be disqualified if they undercut the price local firms had agreed on. In India, a senior official reported that “road mafias” of contractors, engineers, the local police, civil servants, “and last but not least local politicians” all conspire to keep prices on road contracts above market rates (Singh 2005); and in explaining roads sector corruption in the state of Jharkhand, a civil society activist told the *New York Times* that “the nexus of politicians, contractors and bureaucrats is very strong” (Polgreen 2010). In Uganda, “the tendering process has been turned into a business by politicians at the district to settle their economic problems. . . . [They] pressure evaluation teams” to select certain contractors (Oluka and Sennoga 2008).

For a cartel to “succeed,” its members must (a) agree on who will “win” the tender and at what price, (b) curb “cheating” or undercutting the agreed price by individual members, and (c) prevent nonmembers from disrupting the agreement by submitting a lower bid (Levenstein and Suslow 2006). Cartels rarely find permanent fixes to these problems. Some members cheat to boost short-term profits or new entrants succeed in submitting a winning bid. Even when the cartel is able to dictate who can bid and how much, there are often periods of instability during which the price to some customers is at or near the market price. But when government officials participate in the cartel, its durability is virtually assured. They can dictate which member will “win” the bid and at what price, rejecting bids that undercut the agreed price and refusing to permit non-cartel members

to bid. Gambetta and Reuter (1995) reported that organized crime families perform the same functions for cartels in Sicily and New York: where family members police compliance with the cartel agreement through

intimidation and violence and take a share of the cartel's profits in return. The effect is the same as when government officials enforce a cartel agreement: the long-term stability of the cartel.



IV

Fraud and Corruption in Contract Implementation

The risk of misconduct in roads projects does not end with contract award. A winning bidder may fraudulently bill for work not done, materials not supplied, or both. Evidence INT gathered in a project in Africa shows fraudulent claims amounting to 15–20 percent of the bid price. An INT analysis of two contracts let under a road project in Asia found that fraud may have inflated the final price on each contract by as much as 25 percent. INT substantiated misconduct during contract performance in nine of the 29 cases shown in Tables 1 and 2 and suspected, although was unable to substantiate, its presence in several more.

Reports from Zambia suggest the scope of one form of fraud—furnishing substandard materials during contract implementation. Zambian contractors, engineers, and government officials surveyed in 2008 reported that providing materials of lower quality than the contract called for was the single most “unethical” practice in the industry (Sichombo et al. 2009) and a 2010 audit of 18 Zambian roads projects jointly financed by the government and donors, shown in Table 4, confirmed their view (Government of Zambia 2010). As the data there reveals, substandard cement was supplied in all projects while in half the projects the concrete was weaker than required. INT found similar levels of fraud in a contract in Indonesia: the road was 40 percent thinner than the contract specified and the contractor used 13 percent less asphalt than required.

For the construction of roads and other civil works, the World Bank requires borrowers to use a variation

TABLE 4	Results of Audit of Zambian Roads Projects	
	Defect found in project	Percentage of contracts affected
	Improperly sized aggregate particles	44%
	Too much clay	75%
	Aggregates did not meet crushing strength	67%
	Base thinner than required	81%
	Surface dressing layers thinner than required	82%
	Cement content less than specified	100%
	Concrete samples weaker than required	50%
	Source: Government of Zambia (2010).	

of a form contract for construction developed by the International Federation of Consulting Engineers, known by its French acronym “FIDIC” (Jaeger and Hök 2010). The FIDIC contract provides that the government agency issuing the contract will hire an engineer—an individual, or, for large projects, a firm—to oversee contract performance (World Bank 2010b, ¶3.1). The engineer must be expert in the design and construction of roads, for the FIDIC contract requires that he observe the work as it progresses, testing completed sections to ensure they meet specifications, certifying the contractor’s invoices, evaluating and passing on its requests to

vary from the original plans, and resolving conflicts between the borrower and the contractor (Ndekugri, Smith, and Hughes 2007). If the engineer finds that the builder is supplying substandard materials or less material than required, inflating invoices, or otherwise trying to milk the contract, he must refuse to certify the contractor's payment requests. The engineer is explicitly responsible for the quality of the project and thus becomes the implicit guardian of its integrity.

Despite the engineer's responsibility for project integrity, there is evidence that engineers have either failed to spot fraud or corruption in project execution or become willing participants. In a project in Latin America, INT

investigators uncovered evidence that the engineer certified invoices for charges not covered by the contract. In Indonesia, engineers admitted they were bribed to ignore fraud, explaining that if they did not go along, local officials "in on" the fraud would refuse to hire them on future government projects. In a project in Africa, INT received information that in return for approving inflated invoices the engineer received 15 percent of the amount overbilled. The practice is apparently widespread in that country; during the investigation INT learned that the builder had instructed its local affiliate to "develop partnerships with local consultants," so that if they were appointed engineers on future projects, they would be sure to cooperate with similar schemes.

V

Combating Collusion, Fraud, and Corruption

This section describes a range of measures policymakers should consider to mitigate the risks of collusion, corruption and fraud in road contract procurement and project execution. “One size does not fit all” is a staple of the development literature and one that holds for both procurement rules and mitigation measures (Mariel 2003). Accordingly, in discussing the various recommendations, the report identifies the risk profiles and country contexts where they are most likely to be appropriate.

The recommendations advanced range from modest changes in procurement procedures to more fundamental, experimental measures that may be required where corruption is particularly entrenched. Some country-level reforms, such as laws severely penalizing bid rigging or changes to public procurement rules, can be put in place relatively quickly. Some project-level preventive measures, such as retention of independent watchdogs or strict scrutiny of procurement officials’ finances, may take more time. Over the longer term the goal should be to build effective institutions to enforce anti-cartel laws and manage the nation’s road network. But again, none of the measures described are meant to be adopted without close analysis of market conditions, the strength of national institutions, the degree of political commitment to reform, and other country-level factors.

A. Measures to Reduce Collusion

Punish cartelization severely

To combat collusion and cartelization, countries should enact laws that make bid rigging, market division, and other cartel-related behavior illegal. These laws need to contain “effective sanctions of a kind and at a level adequate to deter firms and individuals from participating in cartels.” (OECD 1998) Deterring collusion can require more than criminal penalties; a European Commission White Paper argues that to effectively deter cartels, sanctions must give those harmed by cartel pricing, such as road users, the right to sue for damages (European Commission 2008).

To enable effective enforcement, the anti-cartel laws may need to be supplemented with reforms to the laws of evidence. Until recently, most developed country courts required direct evidence of an agreement to prove the existence of a cartel, a demanding standard often interpreted to require testimony from one of the participants. Contrary to that thinking, as Annex 1 explains, once American and European courts had heard more cartel cases, they became more comfortable relying on indirect or circumstantial evidence. With what is now known about the harm cartels cause (Transparency International 2009), developing country courts should

ensure that they do not make it too difficult for their enforcement agencies to prove the existence of a cartel.

Create incentives for the exposure of cartels

Even if courts accept circumstantial evidence, nothing provides surer proof of a cartel than the testimony of a participant or witness to a bid-rigging scheme. Those with information about a bid-rigging ring should be encouraged to come forward. To do so, governments should consider granting immunity to witnesses willing to provide credible evidence of a cartel. Consideration also may be given to offering whistleblowers rewards commensurate with the savings realized from the break-up of a cartel. Allowing whistleblowers to share in the recovery can provide a powerful incentive for coming forward (Depoorter and De Mot 2005).

Members of cartels should also be given an incentive to disclose the names of the other participants. The OECD (2003) recommends granting immunity to the first firm or individual to reveal the cartel's existence and the World Bank itself encourages contractors to reveal previous misconduct on World Bank-financed contracts. Recent research shows that such leniency programs not only are effective in revealing the existence of cartels but can also discourage their formation (Miller 2009).

Revise tendering rules

To ensure fairness and reduce corruption in the procurement process open, transparent procedures for the award of public contracts are recommended (Transparency International 2006). The more transparency, the more likely the contractor is fairly chosen and the less likely corruption will seep into the process. But disclosure of certain kinds of information may also increase the risk that firms will fix prices (Anderson, Kovacic, and Müller 2010; OECD 2008b; Government of the United Kingdom 2004). The data in Box 4 provides an illustration; cost estimates on 46 separate contracts were publicly disclosed prior to tendering, and in every

case the winning bid was virtually identical to the estimate—an almost certain sign of collusion.

Because transparency in public procurement can facilitate collusion, agencies that enforce the competition laws in both developed and developing countries caution procurement staff to consider carefully what information about a tender to release (Government of the Netherlands 2010; Government of El Salvador 2010; Government of Brazil 2008; Government of the United Kingdom 2004, Government of France 2003, 2000). The dilemma for policymakers is that the more they try to reduce the risk of corruption through greater transparency, the greater the risk of collusion. Because cartelization is so prevalent in public tenders of all kinds, many OECD countries have revised their public tender rules to reduce transparency in several respects. A list of the reforms different OECD countries have introduced is contained in Annex 2.

Policymakers in developing countries may wish to consider such revisions as well to ensure rules governing public tenders strike the right balance between transparency on the one hand and the risk of collusion on the other. While different economic conditions and different institutional settings make it unlikely that any will adopt the OECD reform list wholesale, the accumulating evidence shows that some changes are effective in a wide array of institutional and economic settings. Following are some examples of procurement process changes to consider in appropriate situations. (Box 5 illustrates how changes to the procurement process helped combat collusion).

a. Bidder pre- and post-qualification

Road agencies understandably want to ensure that firms bidding on a tender will have the financial strength and technical capacity to perform the work if they win the tender. Potential contractors are thus commonly required to “prequalify,” that is, to document their financial and technical ability to execute the contract in the event they win the bid. Indeed, for all major civil works contracts, the World Bank's Standard Bidding Documents provide that only “exceptionally” and “with previous approval of the World Bank” can a post-award

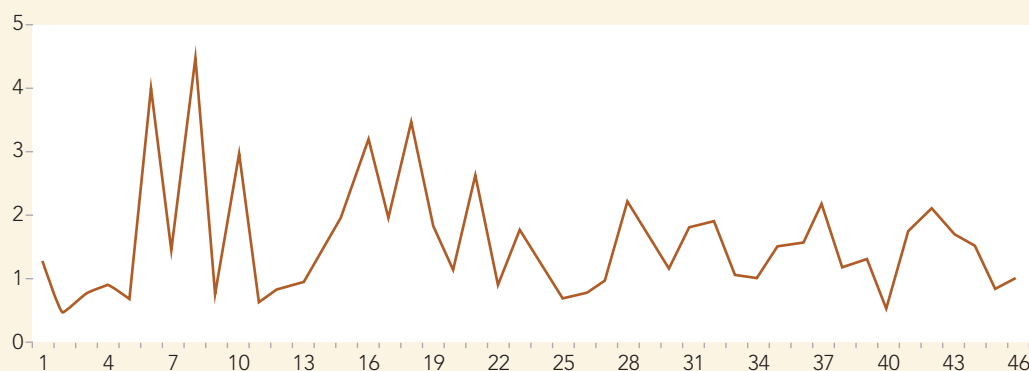
BOX 4

Publishing Cost Estimates: the Trade off Between Transparency & Collusion

In the name of transparency, many countries publish their engineers' estimates of the cost of building a road and in its loan agreements the World Bank sometimes requires publication. When the market is competitive, publishing the estimates can produce lower bids (De Silva et al. 2008). Publishing the estimates also ensures that all bidders are on an equal footing, for companies with close ties to the roads authority often obtain the estimates "under the table."

Set against these benefits is the risk that publication of the estimate will facilitate collusion. When firms are negotiating an agreement on a collusive price, cost estimate provides a target or focal point for their agreement (Knittel and Stango 2003). This effect is illustrated in an INT comparison of the estimated price against the winning bid on 46 contracts for road construction and repair let during 2009 and 2010 under a Bank-financed project in an Eastern European country. The chart below plots the differences in millions of U.S. dollars between the two. The red line is the estimate; the blue line, almost invisible because it tracks the red one so closely, is the winning bid. This degree of correspondence is unimaginable in the absence of collusion.

Cost Estimates v. Winning Bids



review of the winner's capabilities be substituted for prequalification (World Bank 2010b, v). At the same time, prequalification requirements can discourage some firms from bidding, and the fewer firms that bid, the higher the winning bid (Estache and Iimi 2008; Froeb and Shor 2005; Brannman and Klein 1992). The OECD (2008a) thus recommends that prequalification conditions be carefully drawn to ensure that qualified firms are not excluded from the competition.

Policymakers may want to consider in at least some cases eliminating prequalification all together in favor of a post-qualification review of the winner's qualifications. The World Bank recommended that Indonesian officials consider scrapping prequalification

requirements on simple goods and small works in its 2001 report on Indonesia's procurement policies (World Bank 2001, 20). A more recent review of World Bank-funded roads projects in Africa recommended expanding post-qualification to larger contracts (Alexeeva, Padam, and Queiroz 2008, 41). Post-qualification was introduced into the *Bali Urban Infrastructure Project* in Indonesia and is being used in the second phase of the *National Roads Improvement and Management Project* in the Philippines and the *Northern Corridor Transport Improvement Project* in Kenya. Post-qualification increased the number of bidders on contracts in the Bali project, and the early results from Kenya are promising. On all three Kenya tenders for which post-qualification was used, the tenders attracted three or four qualified

BOX 5

Combating Collusion by Changing the Procurement Process: The Bank's Experience with the Bali Urban Infrastructure Project

World Bank staff became suspicious when only three bids were submitted for one of the first contracts on the *Bali Urban Infrastructure Project*. Suspicions were heightened when, despite wide variations in labor and materials prices on the bidders' bills of quantity, the prices submitted by all three were within 0.02 percent of the engineer's estimate. When additional investigation confirmed the existence of a bid-rigging cartel, the Bank made a number of changes to the procurement process to increase competition:

- Procurement notices were widely publicized in both national and provincial papers in prominent place and in large typefaces.
- Local authorities' attempts to limit eligible bidders to local firms were rebuffed.
- Bidders' qualifications were evaluated after, rather than before, the tender.
- Mandatory participation in pre-bid meetings, which had given colluders an opportunity to agree on prices and intimidate firms not part of the ring, was ended.
- A complaint handling mechanism was introduced that allowed contractors and community members to anonymously report fraud, collusion, corruption, and intimidation.

The impact of the changes was dramatic. As the table below shows, bids dropped from amounts virtually identical to the engineer's estimate to amounts 35–40 percent less. Overall, the project team estimated savings of 15–30 percent on contracts let post-changes.

Bids for \$50,000 Contract: Best Three Bids as Percentage of Engineer's Estimate

Original	Post-changes
98.9%	58.0%
99.7%	67.6%
100.0%	68.0%

bids, more than the average when prequalification was required. More tellingly, the winning bids were below the engineer's estimates, rare in Kenyan road tenders.

b. Bid package design

Procurement officials often have significant discretion when deciding how to let a road construction project. A project to build a 500 km road might be tendered as a single contract or divided into two contracts of 250 km each or ten contracts of 50 km each. Different packages have different competitive effects. While larger packages encourage interest from international firms and are subject to the more rigorous international competitive bidding procedure, they also can reduce competition

by discouraging participation from small firms that can build one or two 50 km segments, but lack the experience or financial strength to build a 500 km road. One way to balance the competing interests is to tender the larger 500 km project as ten 50 km contracts, but allow larger firms to combine segments in their bids and even submit a single bid for the entire road. Knowing that smaller companies are competing on shorter segments, the large firm will have an incentive to "sharpen its pencil"—that is, cut its price—to win the contract. At the same time, knowing that large international firms can bid on a package can deter local firms from rigging bids among themselves.

Besides allowing firms to bid on one or more predetermined segments, the tender might also allow them

to offer to build segments of their choosing. As is sometimes done in World Bank-funded projects, bidders could submit a bid on the condition that the total award will not exceed a specified amount. The bids on the various components of the project would be opened sequentially. Once a firm's specified limit is reached, its bids would not be considered on the remaining components. Sequential bidding provides incentives for firms to bid on more projects without worrying about taking on more work than they can handle (Allen, Culkins, and Mills 1988). Mixing up the "menu" of contract offers in these ways makes it harder for firms to agree beforehand on who will win what.

c. Pre-bid meetings and subcontracting

Pre-tender meetings should, whenever practical, be limited to one firm at a time. As the author of the first economics textbook warned, "People of the same trade seldom meet together, even for merriment and diversion, but the conversation ends in a conspiracy against the public or in some contrivance to raise prices" (Smith 1937 [1776], 128). While one-on-one meetings increase the risk that a procurement official will provide a favored firm with confidential information or otherwise tilt the procurement process, safeguards can be introduced to minimize this risk. An outsider can attend, or video recordings or transcripts can be made and circulated.

Subcontracting can also facilitate collusion, for it can be a way of dividing the profits realized from bid rigging. Testimony in a criminal prosecution of collusion in roads contracting in Oklahoma revealed such a scheme. Competitors of the Boce Company allowed it to win a tender "without having to fight," and in exchange Boce agreed to subcontract all the work in one region to a competitor (*United States v. Metropolitan Enterprises, Inc.*, 728 F.2d 444 (10th Cir. 1984)). Countries with a large number of capable firms should consider banning subcontracting among competitors altogether or, as the January 2011 European Commission Green Paper on procurement reform suggests, barring subcontracting by firms which participated in the tender (EC 2011). If subcontracting is permitted, data should be kept and analyzed periodically for any signs that suggest collusive arrangements.

Require independent bid certificates

Successful prosecution of a road construction cartel requires showing that members actually agreed to rig bids on a tender. Although, as Annex 1 explains, many courts now accept circumstantial evidence of collusion, proving collusion can still be difficult and time-consuming. By contrast, it is relatively easy to show that firms traded price lists, shared cost data, or exchanged information about the bids they intended to submit, practices that the U.S. Supreme Court has held are anticompetitive (*United States v. Container Corporation*, 393 U.S. 333, 337 (1969)) and that the European Commission has recently said should be considered a restriction of competition (European Commission 2010). Thus, one approach to easing a prosecutor's burden is to (a) require firms to submit a certificate that they did not communicate with one another and (b) make falsification of the certificate a serious crime. To prove a violation, all the prosecution would then have to do is show that firms communicated. Box 6 describes the elements of such a certificate; model certificates are available in English (Government of the United States 2007), French (Government of Canada 2010), and Spanish (Government of El Salvador 2010).

Retain an independent procurement evaluator

INT has found evidence in some cases that those responsible for policing the tendering process condoned, or even encouraged, collusion. Where this risk is present, introduction of an outsider into the tender evaluation process can reduce that risk. For example, in the second phase of the Philippine *National Roads Improvement and Management Project* an independent procurement evaluator has been hired to work alongside the Department of Public Works and Highways procurement officials. The terms of reference provide that the evaluator must develop "specific systems to identify or detect indicators of corrupt practices in the bids, including collusion, price-rigging, fraud, obstruction or coercion." (Government of the Philippines 2007a) Although the evaluator cannot veto the highway department's decisions, he must regularly report his findings to the World

BOX 6

Certificate of Independent Price Determination

A Certificate of Independent Price Determination requires the bidder to warrant that:

- The prices in the bid have been arrived at independently, without any consultation, communication, or agreement with any other bidder or competitor relating to (a) prices, (b) the intention to submit a bid, or (c) the methods or factors used to calculate the prices offered.
- The prices in the bid have not been and will not be disclosed by the bidder, directly or indirectly, to any other bidder or competitor before bid opening (in the case of a sealed solicitation) or contract award (in the case of a negotiated solicitation), unless otherwise required by law.
- No attempt has been made or will be made by the bidder to induce any other firm to submit or not to submit an offer for the purpose of restricting competition.

The statement is made under the provisions of a law that imposes stiff penalties for lying in the statement filed. The bidder can be prosecuted, if the only evidence is that it disclosed bid prices to its competitors or attempted to convince its competitors to rig bids. The evidence needed to prove a violation of the Certificate of Independent Price Determination is significantly less than that needed to prove an illegal agreement.

Source: Government of the United States (2007).

Bank and other partner organizations. Lessons from the Philippine experience will be used to guide future arrangements.

B. Measures to Reduce Fraud and Corruption

Strengthen the engineer

As the discussion above showed, the engineer in a FIDIC works contract is the first line of defense against fraud and corruption. Whenever a roads agency uses this or any contract that grants similar powers to the engineer, the engineer's role in combating corruption should be made explicit and measures taken to help him discharge his responsibility. Thus, for example, the common practice of hiring the engineer after the contractor has begun work, which immediately puts the engineer in a "catch-up" mode, should be discouraged.

Road construction contracts should expressly require the engineer to immediately report any activity that suggests fraud or corruption. Because line managers in roads authorities are sometimes participants in corrupt schemes, the engineer should send the report to others

as well, or in lieu of, its roads agency counterpart: the head of the agency, the transport minister, or the chief prosecutor or head of an anticorruption agency. With World Bank-supported contracts, it should include the World Bank itself. A suspicion of corrupt or fraudulent activities should be highlighted in a covering note or executive summary.

Policymakers should also examine the utility of (a) creating incentives for the engineer to expose fraud and corruption, (b) penalizing engineers that fail to detect either, and (c) severely sanctioning those who participate in fraudulent or corrupt schemes. Sanctions could range from repayment of fees to fines and stiff prison terms. Because the engineer enters into a relationship of trust with the borrower, which he betrays if he participates in corruption, harsher penalties than those levied on other participants may be warranted.

How engineering services are procured may also merit review. Should price be the only factor as it is often so now? Or should selection follow a two-step process that focuses on "quality" first (including past general performance, and success in deterring or rooting out fraud and corruption in particular), and price second, for

those who have met the quality requirements. Would it make sense to adopt a point system that factors in quality and price? What criteria could help ensure an objective evaluation of the engineer's quality?

Different ways of determining the engineer's fees should also be explored to ensure that all incentives, including the fee structure, are consistent with the engineer's quasi-fiduciary role. For example, where the risk of corruption during contract performance is particularly high, would it make sense to agree to a combination of a fixed fee for basic work and an hourly rate for certain kinds of tests and inspections relating to integrity risks? What safeguards could be introduced into such arrangements to avoid unnecessary testing and verification procedures to simply increase the fee? These and similar issues should be examined with a view of strengthening the engineer's role in helping detect and address fraud and corruption during contract implementation.

Hire a technical auditor

Where there is a risk that the engineer will be drawn into a circle of corrupt actors, it can be minimized or eliminated by retaining another overseer to "guard the guardian" (Hurwicz 2007). The classic guardian of the guardian in a roads project is a technical auditor. Unlike a financial auditor, whose review is confined to the financial statements and supporting documentation, a technical auditor periodically inspects the project to ascertain that the materials and labor provided "were appropriate to their intended purpose and were delivered in the quantity, quality, and location or disposition specified" (Patterson and Chaudhuri 2007, 181). A technical auditor will be hired for the second phase of the Philippine *National Roads Improvement and Management Project*. The terms of reference provide, among other things, that the auditor will (a) investigate the quantity and quality of site surveys at completed works, (b) review the audit support provided to the project, (c) review all supervision reports on the contracts carried out under the Bank's international competitive bidding rules, (d) test on-site the quality of contractors' materials, (e) audit all change orders that

would increase the contract price by 15 percent or more, and (f) conduct a comprehensive completion review of all civil works and of the highway department's supervision of each contract (Government of the Philippines 2007b).

Even the threat of a technical audit can reduce corruption. In a field experiment conducted as part of the Bank's *Kecamatan Development Program* in Indonesia, one group of villages participating in a nationwide road construction program was told beforehand that their projects would be audited and all projects were subsequently audited. In a second group, audits were neither threatened nor conducted. The difference between amounts claimed on the contractors' invoices and the amounts actually spent was on average 8 percent less in those villages that were subject to audit than in those villages that were not (Olken 2007).

The challenge when hiring a technical auditor is ensuring that this second guardian remains a faithful guardian, serving the interests of the borrower rather than being drawn into a scheme to cheat it. While professional norms and the auditor's character provide one guarantee of faithfulness, creating a powerful economic incentive for the auditor to remain honest provides more assurance. This can be accomplished by fostering economic conditions that handsomely reward honesty and severely punish its absence. Auditors who perform a job well should be paid well and those who succumb to corruption fined and imprisoned.

More important than changing the cost-benefit calculus for a single job is creating a market in which those who perform well will enjoy a steady stream of remunerative work and those who don't, won't—in short, a market where the discounted present value of future revenues exceeds the immediate profit realized from the one-time acceptance of a bribe. In many markets, from the long-distance trade in commodities in the Middle Ages to the sale of consumer appliances in modern times, the benefits of a good reputation and the harm from a poor one have deterred bribery and other types of short-term, opportunistic behavior (Greif 2006; Klein 1997). The key in every instance is seeing that information about an auditor's

performance is widely circulated to future employers, a role the World Bank could assume as part of its knowledge-sharing work. It is also important that employers consider reputation when hiring an auditor—an approach that may, as it did in the U.S., require revisions to public tender rules (Kellman 2002).

Engage civil society monitors

Nongovernmental organizations (NGOs) or community advocacy groups can be watchdogs, too. For civil society groups the challenge is less remaining independent of the corrupt scheme than having the resources and expertise to effectively monitor a roads project. Although the Indonesian research found that community-level monitoring did not prevent corruption in roads projects (Olken 2007), Philippine NGOs have enjoyed a good deal of success in monitoring procurements and uncovering corruption in the health and education sectors (Ramkumar 2008, 52–61). Indeed, in one case a local group, albeit one whose membership included a civil engineer, discovered the use of substandard cement in a provincial road construction project (Cadapan-Antonio 2006–07, 656–657).

An important complement to engaging civil society monitors is requiring the publication of the contract and related documentation such as audit reports, fund disbursement schedules, and project performance reports. As Kenny (2010) argues, publication of such information raises the threat of scrutiny by the media and civil society, thus reducing the likelihood of bribery and other corrupt payments. The Construction Sector Transparency Initiative, a joint DFID-World Bank initiative, financed a working paper that itemizes the information that should be disclosed (CoST 2009).

A number of well-resourced NGOs are monitoring the second phase of the Philippine *National Roads Improvement and Management Project* and one, the Transparency and Accountability Network, has produced a sophisticated guide to monitoring procurement contracts for roads and other civil works (Cerna 2009). Funds to support this monitoring arrangement are

provided by the Australian Aid Agency. It is co-financing the project with a \$1.1 million grant supporting the Network and other civil society monitors (World Bank 2008b, 68).

Develop accurate cost estimates

Critical to evaluating bids are reliable, independent, current estimates of the projected cost of the contract. Cost estimates should be prepared using the same level of detail the industry uses, and should reflect what the procuring authority is willing to pay for performance of the contemplated work. The U.S. Department of Transportation advises that estimates should be within 10 percent of the low bid for at least half of the projects. “If this degree of accuracy is not being achieved over . . . one year, confidence in the engineer’s estimates may decline” (Government of the United States 2004). Where there is a history of cartelization in the roads sector, care must be taken to ensure that current estimates do not reflect past instances of overpricing (Feinstein, Block, and Nold 1985).

Check the wealth of key procurement agency officials

More than 100 World Bank client countries require designated civil servants and elected officials to periodically submit statements showing their income and assets (Messick 2009). These statements can be used by enforcement agency personnel or civil society to compare what is reported about the values of homes, the number of cars owned, and so forth, with what real estate and automobile registries show and what visual inspections and interviews with neighbors and friends reveal. The Philippine Center for Investigative Journalism conducted such “lifestyle checks” on mid-level officials of the country’s tax service, finding that many had significantly understated the value of their homes or lied about the number of cars they owned (Batino 2003), and an Indonesian magazine recently reported that the country’s Auditor General had accumulated enormous undeclared wealth during a career in the tax agency (Tempo 2010). Countries without

income and asset declaration laws should enact them; those with such laws should ensure that key procurement agency personnel are covered and the laws vigorously enforced.

C. Longer-Term Capacity-Building Measures

Modernize the roads sector agency

While independent watchdogs, civil society monitoring, and the other short-term measures discussed in this report offer ways to defeat the collusion and fraudulent schemes INT found most prevalent in Bank-funded roads projects, no solution will succeed in the long run without a modern, professional, and capable entity to manage a nation's road network. To be effective, the road agency must have appropriate powers, skills and resources, and operate within an effective framework of accountability, internal controls, and performance measurement. It must have the authority and capacity to carry out its regulatory, planning, finance and investment, coordination, and management responsibilities; it also must have the technologies, equipment and efficient and transparent processes and procedures to enable efficient use of resources allocated to the roads sector, including effective management of risks. Helping a country build such an entity begins with a candid assessment of the authority's weaknesses and identification of measures needed to address them. The second phase of the Philippine *National Road Improvement and Management Project* is a good example of such efforts. As reflected in the Project Appraisal Document, the loan budgets \$6 million to support strengthening measures for the Department of Public Works and Highways, including the introduction of new business processes, a more robust internal audit staff, and improved financial management (World Bank 2008b, 52–56). To achieve sustainability and move to scale in helping client countries build and maintain sustainable road networks with minimum losses to fraud, corruption and collusion, it is essential that the World Bank and its partners support the countries' efforts in building strong, effective and accountable roads sector institutions.

Strengthen competition law enforcement

Road construction and maintenance is just one of many industries in which law enforcement authorities have discovered cartels. Over 300 cartels in industries as diverse as ready-mix concrete, vitamins, fine art, snow removal, and intravenous solutions have been unearthed in developed countries (OECD 2003). Like roads sector cartels, these others have also caused enormous damage by raising prices, furnishing shoddy goods, and corrupting government officials. To detect and prosecute cartels, the OECD (2003) recommends that law enforcement authorities have in place the following powers:

- ◆ The power to grant leniency to cartel participants willing to give evidence against other members
- ◆ The ability to conduct unannounced visits to members' offices to review documents and electronic evidence
- ◆ The authority to take oral testimony from members' employees for use in criminal and civil proceedings
- ◆ The right to use listening devices and other special investigative measures to collect information and evidence

Building an institution that can wield these powers responsibly and effectively takes time, but the damage cartels in any sector do to the economy and polity of developing nations argues for giving priority to strengthening the entities that enforce competition law. A number of organizations provide technical assistance to competition law authorities; the United Nations Conference on Trade and Development sponsors peer reviews of enforcement efforts and hosts an annual meeting of competition law agencies from developing nations (UNCTAD 2010) and the OECD, the World Bank, and other multilateral and bilateral agencies also furnish various forms of technical assistance.

D. Experimental Measures

Where the risks of fraud, corruption and collusion are particularly high, traditional reform measures, such as training staff, modernizing facilities, and upgrading information and communications technology, will not

by themselves be effective (World Bank 2008c, 32). To address the issues, innovative, creative, and less conventional steps may be required. This section describes three such measures for consideration in high-risk situations.

Impose ceiling on bids

The Philippines is experimenting with a cap on bids; for each contract the procuring agency calculates a maximum price. With roads and other infrastructure contracts, implementing regulations specify in detail how the maximum price is to be calculated (Government of the Philippines 2003). Bids over the budget are rejected and if, after two rounds of bidding, no company has submitted a price equal to or less than the maximum, the agency then “directly negotiates a contract with a technically, legally and financially capable supplier, contractor or consultant.” (Government Procurement Reform Act, Republic Act 9184, § 43(e))

There are risks to this approach. Absent genuine competition, the ceiling price almost certainly puts a floor on the bid price, something that appears to have happened in Japan when road cartels were in existence (McMillan 1991). In addition, cost estimates on road contracts can be unreliable because market conditions change, engineers can make errors in the estimation process, and there is always the possibility that corruption will creep into the process. Moreover, if no company bids at or below the ceiling price and the procuring agency decides to go forward with the procurement, it will have to enter into direct negotiations with a firm, an action which, as explained below, creates its own set of problems.

An analysis of the early experience with the Philippines’ use of bid ceilings is expected to appear in 2011. While in the meantime the World Bank is not permitting the Philippines to use ceiling prices on Bank-funded contracts let under its international competitive bidding procedures, the Bank has agreed to permit the practice on contracts using national competitive bidding procedures so long as four conditions are met: (a) the bid documents are freely and easily accessible, (b) the ceiling price is based on the engineering cost estimate, (c) the procuring

agency staff is trained on price estimation techniques and bid variance analysis, and (d) a system is in place to monitor and compare bid prices against the estimate.

Use competitive negotiation

Where roads cartels are particularly entrenched, policymakers might experiment with a form of competitive negotiation. The procuring agency chooses a firm it believes qualified to build the road in question and negotiates a price. It could be lump sum, cost-plus, or some combination. If the firm is not interested or is unwilling to accept the price offered, the agency goes on to another firm. There is a risk of corruption in the form of favoring one contractor over another or negotiating too high a price. To help address such risks, competitive negotiation should: (a) be limited to clearly defined situations, (b) subject to appropriate safeguards, such as a prior short-listing of firms based on specific criteria and (c) adopt clear and transparent objectives against which to conduct negotiations with each short-listed firm to obtain the best proposal.

Contract out procurement

When state capacity is especially weak and the involvement of high-level political officials in procurement widespread, a foreign company can be retained to administer the entire procurement process from project identification to design, tendering, and contract management. This is a broader application of the independent watchdog approach described above, and the same concerns about ensuring that the procurement agent is genuinely independent and that reputation mechanisms are in place apply—only on a much larger scale.

Hiring an independent procurement agent is not without its problems, however. Newly hired agents face steep learning curves that often delay procurements and national agencies displaced by the agents can lose interest in, and ownership of, the projects handled by the agents (Ali and Moss 2010). The biggest drawback with independent procurement agents is that they can undercut efforts to build local procurement capacity.

BOX 7**Using Competitive Negotiation to Circumvent a Cartel: the US experience**

The American military used competitive negotiation to circumvent a cartel in the Republic of Korea in the 1970s.

The military regularly tendered for goods and services from Korean firms and its rules required that all but the very smallest contracts be let competitively. Procurement officers encountered the same problems evident in the roads sector today, collusion coupled with corruption underpinned by a culture that eschewed competition.

At first procurement officials sought to overcome these problems through stricter enforcement of the Republic's competition laws. Cartels were infiltrated and evidence of collusion was turned over to South Korean prosecutors. Local procurement staff caught furthering cartel activities were prosecuted. Although a few cartels were broken up, the results were disappointing; cartels regrouped and worse, in several cases, informants were murdered.

Frustrated with the lack of progress, senior procurement staff turned to negotiated procurements, similar to the two-stage tendering often used in tight construction markets (Davis and Dornan 2008). The procurement officer chose a firm he believed capable of doing the work and invited it in to negotiate a deal. A fixed price might be negotiated or sometimes, as in the case of two-stage tendering, the firm would work on a cost-plus basis. The results exceeded expectations; prices were 10–15 percent less than those under "competitive" bids, and the kickbacks and violence associated with "competitive" tenders disappeared.

The key to the military's success was its "clean," independent procurement personnel. Procurement staff stood outside the network of collusion and corruption that authorities sought to defeat, administering the rules evenhandedly and with integrity, thus acting as a de facto independent procurement agent.

Source: Martin (1983).

World Bank experience with independent agents in Southern Sudan and Cambodia shows two pitfalls to avoid when retaining an independent agent. In Southern Sudan the agent did not field sufficient staff to provide the training required (Price Waterhouse Coopers 2008) while in Cambodia the agent's terms of reference omitted capacity building (Ali and Moss 2010). Bank experience with independent agents in customs in Angola and Mozambique, however, illustrate the advantages when these problems are avoided. In both countries the customs function was contracted out, with a deadline for turning responsibility back over to the government. Corruption was sharply reduced in the short run and over the long term national capacity was built (Mitchener and Maurer 2010; Mwangi 2004). Common to both efforts was not only a clear understanding on the deadline for handing back responsibility, but also sufficient resources for the

independent agent to run the customs agency and to train national staff.

E. Issues for Consideration by Bank Operations Staff

The four objectives underlying the World Bank procurement policy—transparency, fair treatment, capacity building, and competition—are sometimes in tension. Policies that advance transparency, fair treatment, or capacity building can undercut competition; on the other hand, those that further competition may inadvertently compromise one or more of the other three. As the World Bank reviews its procurement policy, it would be important to consider trade-offs between these objectives, adapted to the specific country's risks and circumstances, including the state of competition, the

capacity and performance of the responsible agencies, such as highway authorities, the effectiveness of anticorruption and competition laws, and the track record of the prevention and enforcement authorities. The following discussion covers some issues that emerged in the context of this review that may merit consideration as part of the reform.

Trade-offs between Transparency and Collusion

As discussed above, while open and transparent procedures for the award of public contracts help ensure fairness and reduce corruption in the procurement process, disclosure of certain kinds of information may also facilitate cartelization and price-fixing. (Anderson, Kovacic, and Müller 2010; OECD 2008b). The most clear-cut example is the requirement that the name of each bidder and the amount of the bid be publicly disclosed. Publishing all bids received both eliminates the risk that a corrupt official will accept a high-priced or nonconforming bid and reassures firms submitting bids they are being treated equally. But as Stigler (1964) explains in a classic article on collusion, cartels are under constant threat of breakdown from secret price cuts by a member seeking to expand business at the expense of the other members. How can colluders protect against an outbreak of competitive pricing?

“The system of sealed bids, publicly opened with full identification of each bidder’s price and specifications, is the ideal instrument for the detection of price-cutting. There exists no alternative method of secretly cutting prices (bribery of purchasing agents aside). Our . . . prediction, then, is that collusion will always be more effective against buyers who report correctly and fully the prices tendered to them” (48).

Where the risk of collusion is particularly high, thought should be given to achieving the goals of transparency in alternative ways. Such alternatives should be designed in a manner that maintains public confidence in government institutions and processes and addresses the

risk of corruption. Limiting the pre-bid conferences to one firm at a time, while requiring that each meeting be attended by an independent party and include a video-recording or a meeting transcript, is a good example of an alternative that can be considered in high-collusion environments. Having an independent evaluator certify that the lowest price was chosen is another.

Subcontracting as a facilitator of capacity-building and collusion

Allowing less experienced local companies to subcontract with experienced international firms gives them the chance to learn new techniques and build domestic capacity. However, when losing bidders are permitted to become subcontractors to the winning firm, subcontracting can be a way colluders pay one another off for sticking together. As suggested above, where the risks of collusion are high, consideration should be given to prohibiting subcontracting with losing bidders or at least monitoring subcontracting patterns to identify collusion risks.

Customizing measures to address fraud and corruption in civil works contracts

Faced with the risk of fraud and corruption in World Bank-funded civil works contracts, the Bank’s procurement specialists have developed various mitigation measures, summarized in Box 8. The effectiveness and replicability of these measures merit further evaluation and discussion by the World Bank’s transport sector and procurement specialists as part of the reform process.

Developing expertise on cost estimating and detecting collusive bidding

To prevent collusion and corruption in roads projects, accurate cost estimates and the ability to spot collusion are essential. The World Bank should consider becoming a center of excellence for both, creating a cadre of experts on each topic who can follow developments in the field, train country counterparts, and step in when country capacity is weak. With its Road Costs

Knowledge System, a database of historical information on roadwork costs per kilometer, the World Bank has taken the first step with cost estimating. An easy first step for identifying collusive bidding would be to begin analyzing bids submitted on projects. A number of tests have been developed to determine whether bids were arrived at independently and they can be programmed using standard statistical packages (Bajari and Ye 2003; Porter and Zona 1993). The World Bank should ensure that firms bidding on Bank-funded projects submit the data necessary to conduct these tests in machine-readable form. The investment required to build on these first steps would be minimal and the potential payoffs—with a projected lending program of \$7–8 billion for FY11—enormous.

Reevaluate current contract management form

Like the FIDIC model on which it is modeled, the World Bank's works contract form makes the engineer the central figure in contract administration. This form

of contract management originated in 19th century England and in the 1950s spread to developing countries where it seemed well suited to their needs (Lyon 1995). The uncertainties in building public works in the then largely unknown settings in developing countries created significant risks, ones that could not be specified, let alone allocated by detailed contract language. Much had to be left to work through on the ground as the project progressed, creating the possibility that the construction of roads and other critically needed infrastructure would be stalled as the contractor and the government squabbled over who was responsible for what unforeseeable event. Exacerbating the tension, the builder was inevitably from a developed country and possessed a high degree of technical knowledge, while the developing country client had little. A strong, technically competent engineer, independent of both (and, importantly, with the power to mediate their disputes and so keep the project on track) provided a workable solution.

As developing countries gained experience and expertise with infrastructure construction, however, they

BOX 8

Reducing Fraud and Corruption in Civil Works

1. Ensure accurate cost estimates (quantities and, more importantly, unit rates) to exclude the up-front inflated padding that serves as a reference cover to hide the high bid prices downstream.
2. Be sure the bill of quantity is correct to minimize variations in the downstream implementation of unit rate/ad-measurement contracts.
3. Encourage, where feasible, a lump sum output-based approach for tendering and contract implementation to reduce the possibility of downstream quantity variations during contract implementation. Provide concurrent training of borrower staff and private sector contractors in the application of the lump-sum output-based approach in the procurement and implementation of civil works contracts.
4. Include contract provisions that provide an incentive for contractors to deliver cost savings at the end of the completed contract (final completed contract price vs. initial contract award price) — for example, bonuses or a percentage of the cost savings.
5. Closely supervise construction supervision, preferably through external international engineering firms, along with independent technical audits and a higher level of quality checks by the Bank during project supervision.
6. During project supervision, the Bank or its appointed auditors should randomly check the contractor's and supervisory consultant's financial records, applying in practice the provision in the Bank's Procurement Guidelines, standard bidding documents, and standard forms of contract, which allows the Bank to undertake such audits.

Source: World Bank procurement staff.

saw less need for a powerful engineer; in response, the World Bank and other international financial institutions have progressively modified the FIDIC contract to strengthen the government's control of the engineer. Whereas the engineer once independently determined whether a contractor's invoice was in order and therefore should be paid, that is no longer the case. Likewise, the current version of the FIDIC contract used by the World Bank gives the government the power to replace the engineer at any time with no real input from the contractor.

While the move away from a powerful, independent engineer was prompted by many factors, project integrity does not appear to have been one. With the growing recognition of the harm from fraud and corruption in road works, the development community should reevaluate the way roads contracts are managed. Is a weakened engineer overseen by a sometimes-corrupt agency the best guarantor of project integrity? Are those forms of project management that assign the engineer's responsibilities to different entities more likely to reduce corruption? Should the engineer be more independent of government? Advances in the economic study of construction contracts (Chakravarty and MacLeod 2006) and the accumulated experience from different forms of construction contract management (e.g., Klunker 2001) provide a wealth of information for considering such issues.

Target enforcement on engineering firms

If the engineer's role in project integrity is to be strengthened, then corrupt engineers must be severely sanctioned. INT will do its part by targeting engineers in its investigations of misconduct in Bank-funded road and infrastructure projects. Whenever it is determined that an engineer has been involved in corruption, that engineer should be debarred for a lengthy period and borrower countries should be urged to cease hiring him on non-Bank-financed projects. Tanzania already does so. Its procurement law provides that any firm that has been debarred "by a foreign country, international organization or other foreign institutions on grounds of fraud or corruption" cannot compete for a government

contract for the same length of time (Government of Tanzania 2004). These steps will help to create a market where only honest engineers prosper.

Increase contingent of professional World Bank staff with road engineering expertise

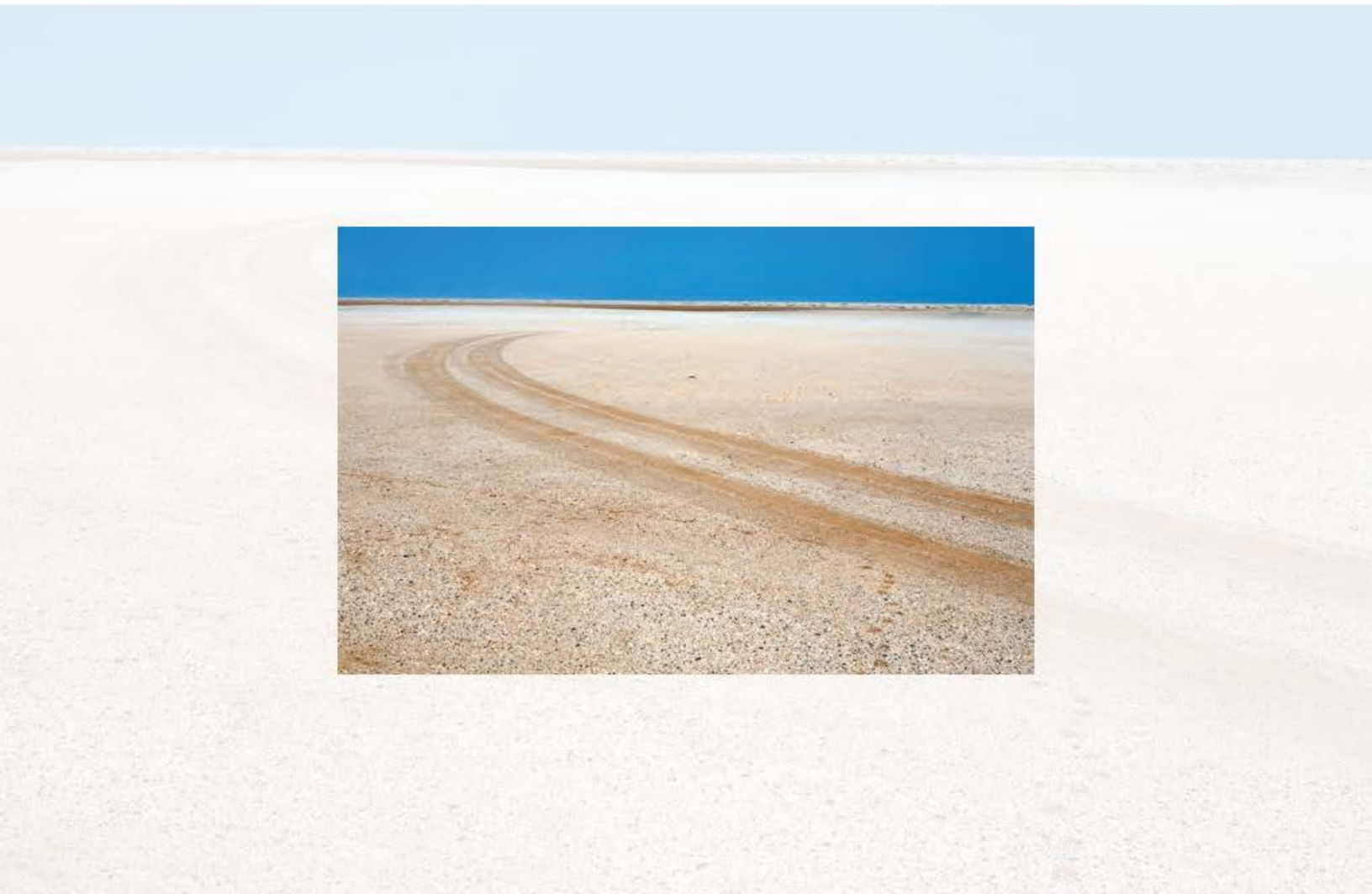
While World Bank supervision efforts now stress financial and fiduciary controls, despite their usefulness these efforts do little to detect malpractice and the practical impacts of corruption in the realization of the works. Since third party technical audit solution will remain expensive and impractical in many projects, a simpler remedy to start tackling this issue is to strengthen the professional technical capacity of the Bank's project teams. This means maintaining a sufficient number of seasoned road and highway engineers. At the design stage these professionals can detect potential weaknesses or omissions and help make bidding documents more reliable with less room for interpretation or deliberate misconception. At the construction stage they will know where to look and what to probe when supervising road construction or rehabilitation. Combined with the fiduciary controls, this approach would provide a much-improved protection against corruption in project implementation.

Spend more on corruption prevention in projects

Combating corruption requires not only technical skills, competence, and commitment, but also resources. An example of good practice is the second phase of the Philippine *National Roads Improvement and Management Project*, which earmarks \$7.54 million for anticorruption activities, of which \$1.14 million is part of the Bank loan and \$6.40 million a grant from the Australian Aid Agency. Although these amounts may seem high, between the loan and its own funds, the Government will spend \$240 million for roads through the project. Given the importance of corruption prevention to the ultimate success and sustainability of the roads projects and programs, the World

Bank should review its supervision strategy for the roads sector that looks at various factors, including budget and skills. In conducting such review, options to be considered may include: (a) reallocating resources towards

implementation support; (b) establishing a trust fund to finance independent procurement oversight; and (c) grouping audits, review, and supervision work for multiple projects to achieve economies of scale.



VI

Conclusion

As this report has shown, fraud, collusion, and corruption in roads projects wreak enormous damage on developing countries. Roads cost more to build than they should, do not last as long as they ought to, and the corruption proceeds can pollute a nation's political system. The aim of this report has been to help reduce these losses by sparking a dialogue among policymakers and stakeholders inside and outside the World Bank on developing solutions to these problems. This dialogue should include the following elements:

- ◆ A robust assessment of the impact and cost-effectiveness of different mitigation measures applied in different countries (including under World Bank-funded projects in Kenya, Indonesia, Philippines and others that include robust mitigation measures)

- ◆ A review of procurement policies to address areas that may constrain borrower authorities, the World Bank, and its staff from taking appropriate action
- ◆ An assessment of whether changes are needed in the current model for preparation and supervision of roads projects and the relative roles of government authorities, the engineering profession, World Bank staff, and civil society representatives
- ◆ An evaluation of experience to date with building effective public works institutions in borrowing countries.

INT is ready to work with its operational colleagues in the Sustainable Development Network, the regions, and Operations Policy and Country Services and with government counterparts, the private sector and civil society to advance this dialogue.

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Annex 1

Proving Bid Rigging on Roads Tenders

It does not have to be made in writing; no formalities are necessary, and no contractual sanctions or enforcement measures are required. The fact of agreement may be express or implicit in the behavior of the parties.

European Communities v. F. Hoffman-la Roche AG, 4 C.M.L.R. 22, 37 (2003).

As the European Court of First Instance observed in the above excerpt from the *Vitamin Cartel* case, collusive agreements come in many forms—written or oral, informal or formal, express or implied. Parties to such agreements generally go to great lengths to conceal their existence, and so, particularly when an agreement is informal or implied, establishing its presence in a legal proceeding can be a challenge. With courts and competition agencies hearing an ever larger number of allegations of collusive agreements, however, some common principles have emerged for proving collusion, a convergence furthered by a rich cross-national dialogue and an expanding body of comparative law scholarship.

All jurisdictions distinguish between direct and indirect evidence of collusion. Direct evidence is testimony describing, or documents showing, a collusive agreement. Indirect, or circumstantial, evidence consists of facts and circumstances from which an administrative body or a court of law can infer the existence of a collusive agreement.

In cases of bid rigging, direct evidence would include the testimony of one or more individuals who participated

in rigging by, for example, submitting a cover bid or agreeing not to bid. Other forms of direct evidence would include the testimony of those who witnessed the rigging, such as clerical or support staff of the companies involved, or firms that were invited to rig the tender but declined. Documents disclosing some or all of the details of the bid rigging would be another form of direct evidence.

Indirect evidence is generally broken down into two categories. There is first economic evidence showing the market is not competitive. In the case of road contracts, it would consist of evidence demonstrating that conditions make it likely that bidders do not compete for tenders. As the discussion in this report showed, in the roads sector in most countries a plethora of this type of evidence will likely be available: the product is highly standardized; prices are inelastic, that is, insensitive to changes in costs; and a few firms dominate the market. When coupled with a system of open public tendering, the economic case for collusion is very strong. Additional economic evidence of collusion in particular cases would include (a) bids significantly in excess of costs, (b) firms with excess capacity, or other economic incentives to bid, declining to do so, (c) the market shares of the large firms remaining stable over time, and (d) a pattern of winning bids showing firms taking turns “winning” over time.

No matter how strong the economic evidence, courts and competition law agencies almost always require some additional evidence to find collusion. The reason is

that the structure of some industries alone can produce noncompetitive conditions, what is termed “oligopolistic interdependence,” even without a collusive agreement. This interdependence is typically found in markets where a few firms manufacture a homogeneous product and prices are inelastic and publicly posted or announced. In these markets, it is in each firm’s long-run self-interest to maintain supra-competitive prices, and if all firms recognize this, an agreement not to compete may not be necessary. The use of a first-price, sealed-bid auction to award road construction and maintenance contracts makes oligopolistic interdependence in the roads sector unlikely. On the other hand, there can be circumstances—such as when engineering costs estimates are disseminated or the names of all bidders and the amounts each bid are revealed—under which firms in the roads sector might be able to avoid competing without a collusive agreement.

For this reason, some evidence of an agreement will be useful to assure the fact-finder that collusion is present. Such additional evidence is commonly termed a “plus factor,” and courts and commentators have identified various types, depending upon the

characteristics of the particular market and the type of collusive arrangement alleged. One fairly exhaustive list is in OECD 2006. Examples of plus factors in the roads sector would include (a) bids that are identical in all or almost every respect except price, (b) an econometric or statistical analysis showing that the bids were not prepared independently, (c) the submission of fraudulent bid securities by well-established firms, (d) oral or written communications about plans to bid or the amount of a bid, (e) agreements on subcontracting, (f) the purchase of bidding documents by firms that did not bid, and (g) communications and meetings just before a tender is due.

As in any factual determination, the evidence must be considered as a whole. Credible direct evidence of bid rigging is often sufficient to show collusion. In its absence, the economic and noneconomic evidence will be weighed together. In the roads sector, where the economic evidence of the absence of competition is likely to be strong, the plus factor or factors presented may not need to be as probative as they would have to be when the economic evidence is more problematic (OECD 2006, Posner 2001).

Annex 2

Reforms to Public Procurement in OECD Countries

- ◆ Banning pre-bid meetings with more than one potential supplier.
- ◆ Limiting communications between bidders during the tender process.
- ◆ Using negotiated tenders and framework agreements when collusive behavior persists.
- ◆ Using a ceiling price only if it is based on thorough market research and engineering estimates and officials are convinced it is very competitive. Ensuring it is kept confidential.
- ◆ Taking precautions when using industry consultants to conduct the tendering process; ensuring they have not established working relationships with individual bidders.
- ◆ Whenever possible, requesting that bids be filed anonymously (e.g. consider identifying bidders with numbers or symbols) and allowing bids to be submitted by telephone or mail.
- ◆ Keeping bidders' identities confidential and not limiting their number unnecessarily.
- ◆ Requiring bidders to disclose all communications with competitors and to sign a Certificate of Independent Bid Determination.
- ◆ Banning subcontracting in appropriate circumstance and at a minimum requiring bidders to disclose in advance if they intend to use subcontractors.
- ◆ Banning joint bids when appropriate as they facilitate communication and profit splitting among bidders.
- ◆ Subjecting external consultants to a reporting requirement if they become aware of improper competitor behavior or any potential conflict of interest.

Source: OECD n.d.

