Corruption in public projects and megaprojects: There is an elephant in the room!

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Abstract

Despite the relevance of corruption in project selection, planning and delivery, the project management literature pays little attention to this crucial phenomenon. This paper sets the background to foster the discussion concerning how to select, plan and deliver infrastructure in corrupt project contexts. It presents the different types of corruptions and the characteristics of projects that are more likely to suffer from it. Corruption is particularly relevant for large and uncommon projects where the public sector acts as client/owner or even as the main contractor. Megaprojects are "large unique projects" where public actors play a key role and are very likely to be affected by corruption. Corruption worsens both cost and time performance, and the benefits delivered. This paper leverages the institutional theory to introduce the concept of "corrupt project context" and, using the case study of the Italian high-speed railways, shows the impact of a corrupt context on megaprojects.
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1. Introduction

Corruption is one of the key issues for public policies. It is one of the major impediments to the development of emerging countries and to further improve the quality of life in developed countries (Loosemore and Lim, 2015; Tabish and Jha, 2011; Treisman, 2007). The eradication of corruption is one of the key challenges that the world faces. Scholars, e.g. (Akbar and Vujić 2014; Auti and Skitmore 2008), agree that corruption might be eradicated by enhancing education and with cultural changes leading to a better government capable of producing policies tackling this issue. According to (Rose-Ackerman, 1996), government policies can reduce corruption "increasing the benefits of being honest, increasing the probability of detection and punishment, and increasing the penalties levied on those caught […] Such measures usually require substantive law reform and the introduction of more transparency (p. 47)". (Tabish and Jha, 2012) show a positive correlation between "corruption free indicators" and professional standard, transparency, fairness of punishment, procedural compliance and contractual compliance. (Vee and Skitmore, 2003) extend the view and show that ethical behaviours in the construction industry are promoted by ethical guidelines and policies of private organizations and professional bodies together with the leadership of public sector procurement agencies. More recently, (Kenny, 2012) indicates transparency in public procurement as a key practice for fighting corruption.

Unfortunately, achieving all these essential processes and cultural changes might take decades, while projects need to be constantly planned and delivered. Therefore, while the sociological and political communities cope with the long-term issues, such as the cultural and policy changes, the project management community should face the issue of corruption in projects without further hesitation.

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Several factors can undermine the performance of projects, such as complexity or "technological sublime", weakness in organizational design and capabilities, optimism bias, strategic misinterpretation or even certain project characteristics, etc. (Garemo et al., 2015; Locatelli et al., 2014). Corruption should be one of these factors, but surprisingly it is not considered in the project management literature. According to an enquiry on Scopus in May 2016, only three papers published in leading project management journals[1] (i.e. the International Journal of Project Management, the International Journal of Project Organization and Management and the Project Management Journal) have the word "corruption" in either the article title, abstract or keywords. These papers are:

- (Sonuga et al., 2002) that indicates corruption, inadequate sources of funding and price variation as major factors that lead projects to failure in Nigeria.
- (Ling et al., 2014) that undertakes a comparative analysis of drivers and barriers to adopt relational contracting practices in public construction projects in two different markets: Sydney and Beijing. The authors underline that this type of contract may lead to allegations of corruption.
- (Bowen et al., 2015) that analyses the impact of corruption on the South African construction industry.

In project management, corruption is the "elephant in the room" that needs to be acknowledged and discussed. This paper summarizes the key aspects known from the wide literature concerning such "elephant", shows the relevance of this topic in project management and suggests a research agenda.

As explained later, corruption is particularly relevant for megaprojects because of their intrinsic characteristics. Megaprojects are projects characterized by: large investment commitment, vast complexity (especially in organizational terms), and long-lasting impact on the economy, the environment, and society (Brookes and Locatelli, 2015). Megaprojects and their contexts are mutually interdependent since they influence each other (Miller and Lessard, 2000). According to (Kenny, 2006) "the major impact of corruption in infrastructure is usually going to be on what is built where, not how much is paid to build or connect it (p.18)". Therefore, the investigation of corruption in projects and megaprojects needs to consider the mutual interlink with the project context, which is usually, and prevalently, dominated by public policy and by public procurement framework. The concept of "corrupt project context", as introduced by this research, is functional to this investigation.

The topic of corruption is highly controversial. Furthermore, the definition of a corrupt project context is particularly challenging and to some extent contradictory; this happens because, in legal terms, the concept of corruption applies to physical persons as a matter of penal liability. However, pragmatically, it is necessary to attribute the concept of corruption to complex socio-economic systems (e.g. organization, country, etc.). Therefore, this research defines a corrupt project context as an environment where the phenomenon of corruption is endemic.

To introduce the concept of "corrupt project context", this research leverages the institutional theory, which provides a flexible and adaptive way of conceptualize institutions. According to (Henisz et al., 2012; Scott, 2005), institutions can be conceptualized adopting three main perspectives: regulative, normative and cultural-cognitive. These perspectives permit to identify shared rules, norms, values, beliefs and understandings that characterize institutions.

From one side, institutional theory enables to identify the project context (Müller et al., 2015; Scott, 2012; Winch, 2000a). To the other one, it permits to investigate corruption as a social/institutional phenomenon rather than an individual crime (Hauser and Hogenacker, 2014; Shleifer and Vishny, 1993; Uberti, 2016; Williams et al., 2015). For pragmatic reasons, this research assumes that the country-level institutionalizes corruption as a social phenomenon; this is justified due to a sufficient stability and uniformity of rules, cultural values, and shared beliefs. The consideration of the country-level is consistent with (Jensen and Jr., 2000) and it is also valid for the project context; similar researches confirmed the tendency to consider the country as a reliable institutional context. For instance, a description of the project context of Germany and Great Britain is provided by respectively (Bremer and Kok, 2000) and (Winch, 2000b). The Italian case, with all its scandals and the endemic corruption, is presented in (Bologna and Del Nord, 2000) and further detailed later in the paper.

As a result, the overlap of these two institutional levels (i.e. project context and corruption as a social phenomenon) originates the concept of "corrupt project context". This conceptualization implies a major challenge to assess and quantify the extent to which a socio-economic system is endemically corrupt. This challenge lies in the ability to demonstrate and quantify the actual presence of corruption.

Since often corruption cannot be directly assessed, this paper considers (through a case study) two drivers of the perception of corruption specifically in the project context, i.e. the Indexes of Corruption (Section 4.1) and the Historical Perspective (Section 4.2). Therefore, the paper focuses on public corruption, particularly about public policy and public megaprojects. In doing so, it paves the way to this research stream in the project management by providing a relevant and updated background. In particular, the paper focuses on two research questions:

- RQ1: Which project characteristics favour corruption?

This first question is necessary to understand if there are attributes that make the projects more likely to suffer from corruption. The answer to this question is crucial, particularly for decision-makers and policy-makers in corrupt countries. For example, let us assume a "functional objective" (e.g. provide a certain amount of electricity in a certain area) that can be satisfied by two different projects, type and A and B, and one of these (e.g. B) is more likely to attract corruption. Then, according to

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[1] Other journals published papers about "corruption in projects". This sentence stresses how this topic is under-researched and under-published. Relevant contributions from other journals are quoted in this paper.

this criteria, A should be the correct choice in a corrupt project context.

- RQ2: How does a corrupt context affect project performance?

Since projects might have poor schedule and budget performance even in "non-corrupt countries" this question aims to highlight the impact of corruption by comparing similar projects in different countries.

This paper leverages secondary data, mostly outside the project management literature. Section 2 introduces the methodology, Section 3 summarizes the most salient literature about corruption in projects, Section 4 presents an original contribution about the Italian high-speed system, Section 5 discusses the findings against the available literature, and Section 6 summarizes the key contributions providing a research agenda.

2. Methodology

This research methodology is designed to answer the two RQs previously presented. RQ1 is answered with a critical literature review (Section 3) of sources mostly outside the project management domain. RQ2 is addressed by the literature review and further investigated with the Italian case study in Section 4. Firstly, the literature review enables to formalize the key constructs useful for this research: corruption, project context, corrupt project context, megaproject, etc. Secondly, it permits to answer the RQ1 with a list of key drivers describing the typologies of projects that are more likely to involve corruption. Thirdly, it introduces the effect that projects involving corruption have on their performance, during their lifecycle. In summary, the literature review highlights two main aspects: the drivers of corruption, and the effect that corruption has on project performance.

A case study regarding a megaproject in a "highly corrupt context" integrates the literature review. The case study aims to shed light on the role of the context on project performance. In fact, if on the one hand corruption is often particularly present in megaprojects, on the other hand megaprojects are often associated with poor performance even in countries with low signals of corruption. Therefore, the methodology compares megaprojects involved in the high-speed rail programmes in Europe and globally (Section 5). The comparison considers two main perspectives; firstly, the project contexts and the extent to which it is corrupt. Secondly, the megaprojects performance, normalized and adjusted to consider different environmental, urbanistic and technological circumstances. The comparison is developed around the case study of the Italian high-speed rail programme. This case is used as a reference because it is delivered in a corrupt project context and is technologically comparable to the other European high-speed rail programmes. The case study is designed to highlight the relationship between the endemic phenomenon of corruption and lower project performance; this approach is implemented according to the principles stated by (Yin 2013; Brookes et al. 2015). The case study is made up of three main perspectives: the project context, the longitudinal view over the project lifecycle and the transversal view about the project performance. The case study is designed in such way for pragmatic reasons because (1) it is difficult to demonstrate directly the presence of corruption in projects and (2) the focus of the research is not on single corruption episodes, but on the project delivered in a "corrupt project context". Therefore, the paper indirectly shows the presence of corruption, by referring to the project context and by showing the results of the judicial processes and the investigations associated with the project. Fig. 1 summarizes the key research constructs and their casual interlinks along with the two RQs.

In particular, by adopting the research framework from (Merrow, 2011), this paper shows how the project and project management performance evolves over the project lifecycle. The Merrow's framework evaluates the megaproject performance through five parameters. Each parameter is associated with the threshold value, which permits to judge whether the performance is satisfactory or not (Table 1).
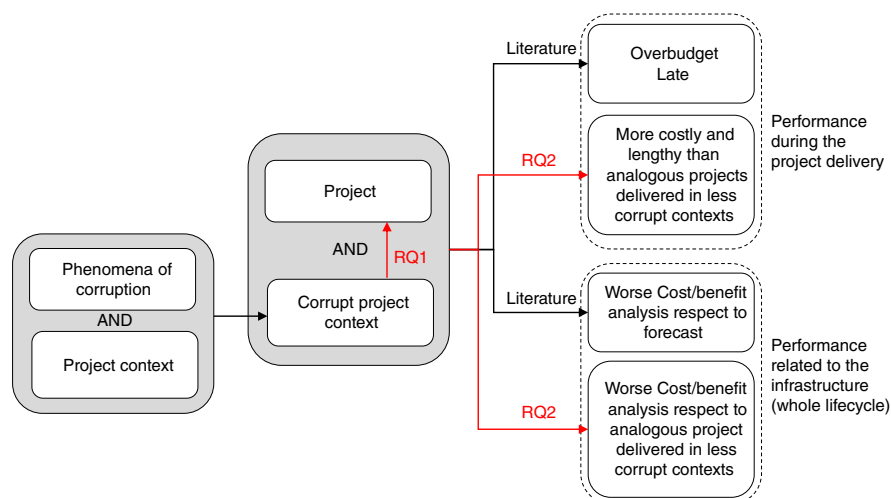

Fig. 1. Research framework.

Table 1
parameters and threshold for megaprojects evaluation (Merrow, 2011). The data about schedules competitiveness are not analysed because the different length of sections makes the evaluation too uneven.

Category	Parameter	Threshold
Cost	Cost overruns	>25%
Time	Slip in execution schedules	>25%
Quality	Production versus plan	Reduced production into year 2
Cost	Cost competitiveness	>25%
Time	Schedule competitiveness	>50%

3. Salient facets of corruption

3.1. Introducing corruption

Transparency International defines corruption as "the abuse of entrusted power for private gain". (Transparency International, 2015a). According to (Aidt, 2003), there are three conditions favouring corruption:

1) Discretionary power: public officials must have the power of design or administer regulations and policies in a discretionary manner (Ling and Tran, 2012)
2) Economic rents: the manipulation of decisions must derive some return for the decision-makers.
3) Weak institutions: the structure of government institutions and the political processes are very important determinants of the level of corruption (Shleifer and Vishny, 1993).

Corruption is usually divided into two categories (Transparency International, 2015a): "petty corruption" refers to everyday abuse of entrusted power by low- and mid-level public officials in their interactions with ordinary citizens; "grand corruption" refers to acts of corruption committed by relevant institutions such as governments and courts. A sub-category called "political corruption" refers to the manipulation of policies, institutions and procedural rules in the allocation of finances, or other resources, perpetrated by policy-makers.

The Anti-Corruption Resource Centre (Anti-Corruption Resource Centre, 2015) classifies corruption according to the frequency of the phenomenon: "sporadic corruption" is linked to occasional opportunity; "systemic corruption" is an integrated and essential aspect of the economic, social and political systems. The Global Infrastructure Anti-Corruption Centre (GIACC, 2008) describes 47 possible acts of corruption that may occur during the realization of an infrastructure. These acts are divided into three phases: pre-qualification & tender, project execution, and dispute resolution. Corruption may occur in several ways, the most common are (Anti-Corruption Resource Centre, 2015; GIACC, 2014).

- Bribery, which is committed when a person either offers/gives some benefits to another person, or incentives to act dishonestly. A bribe is not necessary a cash transaction, but can involve a variety of non-cash advantages for the rogue, for example services like free holidays, low tenancy fees in prestigious accommodations, etc.

- Extortion: describes the crime of obtaining money or some other valuables by the abuse of office or authority.
- Fraud: involves rogue deceiving innocent party to gain some financial or non-financial advantage.
- Abuse of power: occurs when a person in public office deliberately acts in a way that is contrary to his/her duty and is in breach of his position of public trust.
- Embezzlement: refer to the misappropriation of property or funds legally entrusted to someone in their formal position as an agent or guardian.
- Conflict of interests: occurs when an individual with a formal responsibility to serve the public participates in an activity that jeopardizes his or her professional judgement, objectivity and independence.
- Nepotism: happens when the decision makers grant favouritisms to their relatives.

These ways of corruption are fairly similar worldwide. For instance, in the case of the case of South African construction industry, ethical issues include: collusion, bribery, negligence, fraud, dishonesty and unfair practices (Bowen et al., 2007).

3.2. The role of corruption on economic growth

3.2.1. Historical positive–negative dilemma on corruption

Sometimes, it is possible to hear unofficial conversations of practitioners and policy makers about the theory of "efficient corruption". Historically, even scholars have been debating about the existence of this peculiar concept. According to the supporters of this theory, corruption may play a role as "grease on wheel" on economic growth, especially where public institutions are weak. (Leff, 1964) is one of the first authors to support the efficient corruption theory. He tries to overcome the criticism based on moral grounds and he defines corruption as "an extra-legal institution used by individuals or groups to gain influence over the action of the bureaucracy (p. 389)". (Leff, 1964) shows that corruption may have a positive impact on economic growth because:

- It can make the bureaucrats work harder because bribes motivate them.
- It could avoid the "red tape", i.e. the excessive bureaucracy or adherence to rules and formalities, especially in public business. Hence, the bribe acts as "speed money", or rather it speeds up the bureaucracy.
- It can act as a "helping hand" to attract foreign direct investments.
- It can introduce an element of competition in situations of close markets (e.g. natural monopolies). It introduces a sort of competitive bidding among the entrepreneurs where those who can perform the work more efficiently, are also willing to pay the highest bribe.

Subsequent studies have tried to confirm the existence of the "efficient corruption". (Lui, 1985) proposes a model where customers can decide to pay bribes for buying better positions in a bureaucratic queue, for example to obtain a licence. This

model assumes that a person who gives the greatest value to time, is willing to pay the greatest bribe. The author identifies a Nash equilibrium that minimizes the average value of the cost of time in the queue and maximizes the revenue (in the form of bribes) for the decision-makers. (Beck and Maher, 1986) compare an equilibrium model of bribery to a competitive bidding model. They explain that the same firm will win the contract in both cases. Where the public policies are weak corruption could be efficient (Lien, 1988). (Egger and Winner, 2005) investigate the role of corruption as a "helping hand" for foreign direct investment. This work identifies as negative effects of corruption: payment of bribes, resource wasting in rent-seeking activities, additional contract risk. While as positive effects of corruption it identifies the following: speed up of bureaucratic processes, the possibility to access to the publicly funded project.

Other scholars have raised sharp criticism against these studies because they do not consider fundamental aspects in judging the effects of corruption. These studies contend that corruption needs secrecy that makes it distortionary, unmanageable and costly (Shleifer and Vishny, 1993). Corrupt public officials may deliberately amplify the delay of the bureaucratic system to extort more bribes. The consequence is that countries where corruption and bribery prosper are, on average, also those in which the firms in the country waste more (not less!) time with government officials haggling over regulations (Kaufmann and Wei, 1999). Lastly, history shows that when the corruption system is centralized and well organized the effects on country's economy are extremely harmful (Wedeman 1997).

3.2.2. Harmful effect of corruption

(Mauro, 1995) analyzes a dataset consisting of indices of corruption, red tape, and efficiency of the judicial system. He finds that corruption is negatively correlated with the investment rate, which in turn is associated with economic growth. (Mauro, 1998) underlines that corruption leads to spending more on those components of public expenditure on which it may be easier or much more lucrative to levy bribes. Consequently, corruption reduces the share of spending on education, one of the major drivers for economic growth. This is a vicious circle since the low level of expenditure on education might cause further corruption (Mauro, 1998). (Mo, 2001) asserts that a 1% increase in the corruption level reduces the growth rate by about 0.72%. Since the money paid for corruption might reduce the profit the construction company might be keen to recover part of the profit by subcontracting at the lowest cost, losing out on quality and value for money (May et al., 2001). (Tanzi and Davoodi, 1998) focus on qualitative effects and show how corruption:

- Reduces public revenue and increases spending, contributing to the fiscal deficit.
- Increases income inequality because it allows well-positioned individuals to take advantage of government activities at the cost of the rest of population.
- Imposes regulatory controls and inspections for market failures.

- Distorts incentives.
- Acts as an arbitrary tax.
- Reduces the role of government in the enforcement of contracts and on the protection of property rights.
- Reduces the legitimacy of the market economy and a democracy.
- Acts as a barrier to entry in the market for small size and emerging firms.

(Lambsdorff, 2003) analyses the relation between corruption and productivity showing that an increase of corruption by one point on a scale of from 0 (very corrupt) to 10 (very clean) lowers productivity by 2%. (Wei, 2000) studies the effects of corruption on foreign direct investment demonstrating that corruption negatively affects the ability to attract foreign direct investment. (Tanzi and Davoodi, 1998) study the casual link between corruption in projects vs. quality and cost of infrastructure. According to them, corruption is correlated with (i) higher public investment, (ii) lower government revenue, (iii) lower expenditures on operation maintenance, (iv) lower quality of public infrastructure. Furthermore, corruption reduces growth by (i) higher public investment while reducing its productivity, (ii) lower quality of existent infrastructure, (iii) lower government revenues needed to finance productive spending.

3.3. Corruption in projects

3.3.1. Key drivers for corruptions in projects and megaprojects

The Bribe Payment Index by Transparency International presents the likelihood of bribery in 19 different business sectors. (Transparency International, 2011) indicates that bribery is perceived to be common across all sectors: no sector scores above 7.1 (on a 10 point scale, where 10 means very low chances of paying), but the worst one, by far, is "public works contracts and construction" with a score of 5.3. Furthermore, firms operating in public works and construction sector not paying bribes are those with more chances to lose business and see corruption as a deterrent for projects otherwise attractive (Graf Lambsdorff et al., 2004). Not all projects are the same, specific features characterize projects and make it more or less susceptible to corruption (Stansbury, 2005). These characteristics are:

- Size: this is the most important feature because it is easier to hide bribes and inflated claims in large projects than in small projects.
- Uniqueness: this makes budget costs difficult to compare and therefore it is easier to inflate.
- Government involvement: public administrators can use their arbitrary power especially where there are insufficient controls on how government officials behave.
- Number of contractual links: each contractual link provides an opportunity for someone to pay a bribe in exchange for the contract award.
- Project complexity: when projects are very complex, factors like mismanagement or poor design can hide bribes and inflate claims.

- Lack of frequency of projects: winning these projects may be critical to the survival or profitability of contractors, which provides an incentive for contractors to use bribes.
- Work is concealed: subsequent processes cover the basic components of the work. The quality of the components can be very costly or difficult to check.
- Culture of secrecy: even if public funds subsidize the projects, costs could be kept secret.
- Entrenched national interests: the government selects local and national companies justifying the choice to favour national interests. These positions have often been cemented by bribery.
- Lack of 'due diligence': frequent lack of due diligence on participants in construction projects allows corruption to continue.
- The cost of integrity: in several cultures bribery and deceptive practises are often accepted as the norm: not paying these bribes means not doing the project.

(Zarkada-Fraser and Skitmore, 2000) show that stakeholders more susceptible to corruption are younger, not affiliated to professional bodies and less loyal to their organization, with generally lower levels of job satisfaction. (Tang et al., 2012) analyse the role of corruption to win contracts on the international market. In particular the procurement is critical, since corruption can be associated with (Søreide, 2002):

- Invitation: the public officials may have the power to decide which enterprises to invite to the tender.
- Short listing/pre-qualification: limiting the number of competitors according to previous experience.
- Technology choice: aiming to require particular characteristics for the tender.
- Confidentiality of information: there are numerous ways for public officials holding confidential information to misuse their position.
- Deviation from the public competitive procurement process: for example in case of emergency

The "megaproject" is a particular class of projects that shares most of the aforementioned characteristics. Megaprojects are very large investment projects that tend to be massive, indivisible, and long-term artefacts, with investments taking place in waves. Megaproject "effects are felt over many years, especially as auxiliary and complementary additions are made" (Miller and Lessard, 2000). Public policy strongly affects the performance of public megaprojects. In fact, megaprojects "remain under political scrutiny well after the official final decision is made. Decisions made early on can have disastrous effects when abstract political ambitions crystalize in specific technical challenges (p. 782)" (Giezen, 2012). Despite their fundamental economic and social role, megaprojects are often implemented after a weak (or however not optimal) phase of project planning, which leads such megaprojects to failure. Indeed, (Flyvbjerg et al., 2003) show that public infrastructure megaprojects are affected by cost overrun, delays in different

phases of the project development, and their operating results do not justify the implementation of the project.

3.3.2. Impact of corruption on project performance

(Tanzi and Davoodi, 1998) are among the firsts to investigate the link between corruption and poor quality of the scope delivered. (Gillanders, 2014) shows that regions with higher corruption than the national average tend to have worse infrastructure than others. (Van de Graaf and Sovacool, 2014) demonstrate that corruption can be a source of project failure, especially in highly corrupt countries. (Ma and Xu, 2009) identify two major acts of corruption:

1. To obtain unlawful the qualifications during bidders and/or tender;
2. To raise prices or reduce the quality of engineering standards during construction.

Therefore, corruption causes at least two major effects, market distortion and worse cost/benefit. Regarding market distortion, decision makers may prefer to situate projects in locations under the physical control of particular corrupt officials with the aim to enforce corruption (Kenny et al., 2011). Furthermore, decision makers may push for the use of complex technologies that require non-standard procurement (see the case of TAV in 4.4). (Flyvbjerg and Molloy, 2011) show how costs, time and benefits forecasts are deliberately and systematically overoptimistic to promote a project at the expense of another. In exchange, politicians might obtain either bribes, support to their election campaigns, or both. Therefore, corruption affects projects and megaprojects performance leading to the delivery of works with limited social benefit, poor economic returns and over-cost (Wells, 2014), and building poor quality infrastructure in the wrong place. Corruption affects the quality of the project starting from the project preparation and it continues during its implementation with major acts of corruption (Wells, 2014).

In summary, corruption negatively affects project performance because:

- It delays delivery times and increases infrastructure costs.
- It reduces the potential economy of infrastructure because sub-optimal projects are implemented.
- It reduces efficiency, favouring construction firms with corrupt connections rather than the most efficient ones.
- It reduces the quality of infrastructure services.
- It increases the operating cost of providing a given level of infrastructure services. It limits access, especially for the poor, because of the higher price of service associated with higher costs in construction, operation and maintenance.
- It favours the creation of monopolies and market concentrations.

4. Context and project selection

This section provides the rationale for selecting Italy as project context and TAV ("Treno ad Alta velocità", i.e. "High-speed train")
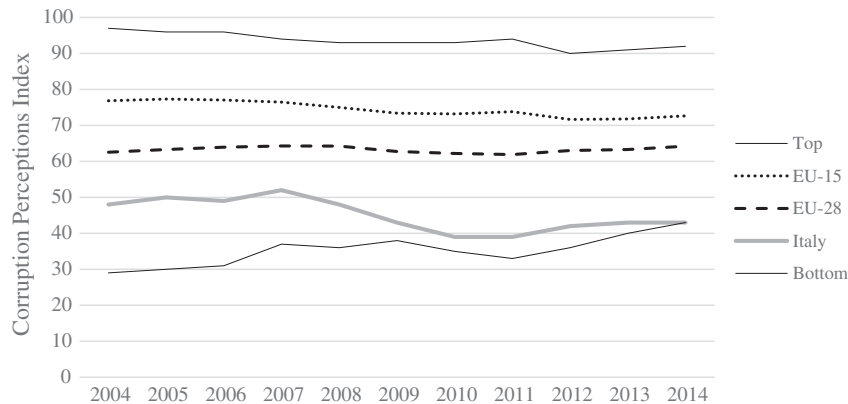
Fig. 2. Corruption Perception Index trend in the EU and Italy. Elaboration from (Transparency International, 2014).

as a representative project. According to the statistics reported in Subsection 4.1, Italy seems one of the most corrupt European countries with key concerns in "anti-corruption agency" and "Public Sector". Several infrastructure projects have been delivered in Italy and most of them were reported as affected by corruption. The availability of public information about judicial proceedings and projects characteristics in Italy allow studying the role played by corruption in megaprojects Among the others, megaprojects delivered in Italy, the research focuses on TAV. Indeed, TAV is the largest infrastructure investment programme in Italy over the past 20 years and evidence of corruptions have emerged. Therefore, consistently with the framework in Section 2, the study of planning and delivery of TAV in Italy is an exemplary case of megaproject(s) delivered in a corrupt project context.

4.1. European and Italian indexes of corruptions

The Corruption Perceptions Index measures the perceived levels of public sector corruption in 175 countries (Transparency International, 2014). In the last report (2014), Italy was 69th worldwide with a score of 43/100 (where 100 indicates a very low perception of corruption) and was the worst in the European Union (EU-15 and EU-28[2]). Fig. 2 shows that in the last ten years the Italian level of Corruption Perceptions Index has not undergone improvement and recently Italy became the most corrupt country in the EU. The Control Corruption Index (Fig. 3) measures the extent to which public power is exercised for private gain and the strength and effectiveness of a country's policy and institutional framework to prevent and combat corruption (World Bank, 2013). In the last survey (2014), Italy occupied the 94th position out of 209 nations (one of the worst in the EU).

The lack of effective national anti-corruption efforts in Italy is also underlined by another Index developed by Transparency International, the National Integrity System. The index evaluates the key pillars in a country's governance system, both regarding their internal corruption risks and their contribution to fighting corruption in society, on a scale from 0 to 100. The average National Integrity System for Italy is 57.25, a quite poor value (Transparency International, 2015b). According to this index the three weakest pillars in Italy are 'media' (score 38), 'anti-corruption Agency' (38) and 'Public Sector' (42), whilst the strongest pillars are 'Supreme Audit Institution' (79), 'Judiciary' (75) and 'Electoral Management Body' (75). The comparison of the principal pillars (Politics, Society, Culture and Economy) with EU-15 (Fig. 4) shows that Italy is far from European excellence, and well beneath the average of EU-15 especially in Politics and Culture. (Transparency International, 2013) affirms that in Italy it is easy to circumvent mechanisms put in place to protect integrity by taking advantage of complex regulations, difficult access to information, and poor evaluation systems.

Another index related to corruption is the "Dealing with Construction Permits", developed by the World Bank. This index measures practices in construction regulation and assesses the quality control and safety mechanisms in place for the construction permitting system. As explained in (Kenny et al., 2011), more "red tape" is associated with higher corruption, thus a poor result in this index might be a sign of corruption. In the last survey (2014), Italy was 116 out of 189 countries with a score of 67.35 (on a scale from 0 to 100, where 100 indicates no problems with permits) and also in this case it is one of the worst countries in the EU. Finally, the Ethics and Corruption index, developed by the World Economic Forum, also shows Italy as one of the countries with more corruption. In the last survey (2015), Italy scored 2.8 on a scale from 0 to 7 (best), and it occupies the 102nd position out of 144 countries worldwide and the second to last position among the EU countries (World Economic Forum, 2015). In summary, all these indicators highlight Italy as one of the most corrupt countries in the EU, and one of the most corrupt among the

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[2] The term EU-15 refers to states that joined the EU within 2004 i.e.: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Ireland, Luxembourg, Netherlands, Portugal, Spain, Sweden, and the United Kingdom. EU-28 refers to all current Member States of the EU, so it includes the aforementioned EU-15 States plus Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia and Slovenia.
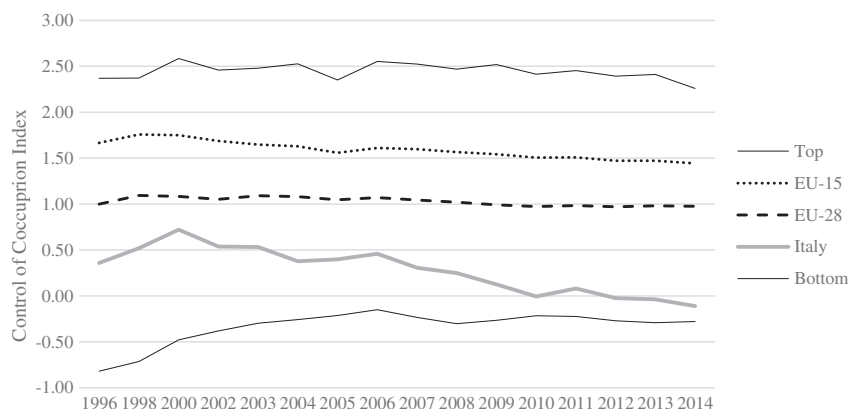
Fig. 3. Control of Corruption Index in the EU and Italy. The 2014 Italian score was −0.11 in a scale from −2.5 to 2.5, where higher values correspond to less corruption. Elaboration from (World Bank, 2013).

developed countries. Sadly, Italy is therefore ideal to study the issue of the "corrupt project context".

4.2. Evidence of corruption in TAV

This subsection highlights the signals of corruption occurred during the planning and delivery of the megaprojects related to the TAV programme. In doing so, it presents the major investigations related to corruption in the planning and delivery of TAV. Keeping in mind the idea of "corrupt project context" there are four important premises:

1. The purpose of the following analysis is not to reconstruct in detail the trials for corruption involved in the TAV megaprojects, but to highlight that several prosecution offices throughout Italy investigated the corruption in the TAV megaprojects.
2. Due to its nature, corruption is secret and stakeholders usually do not have an advantage in denouncing corruption acts, so corruption is very difficult to detect even for investigators.
3. All investigations for "petty corruption" are omitted because of the difficulty of finding official information, especially concerning the initial phase of the megaprojects.
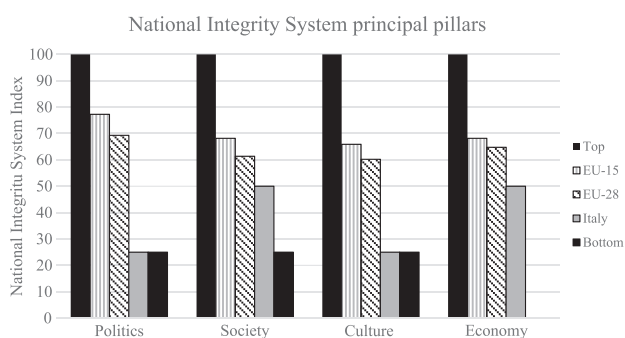

Fig. 4. National Integrity System principal pillars. Elaboration from (Transparency International, 2015b). Data from Austria, Croatia, Cipro, Ireland, Luxemburg and Malta not available.

4. Formally, the TAV was private up to 2006, and in Italy the crime of corruption between private entities at the time did not exist.

Fig. 5 includes the timeline with a selection of major events linked to corruption in TAV divided into three categories: inquiries, arrests and judicial acts. Table 2 summarizes the major inquiries for corruption in megaprojects and their outcome.

4.3. A corrupt project context: Italy

The concept of "corrupt project context" is derived from the institutional theory, which considers the regulative, normative and cultural-cognitive perspectives (Henisz et al., 2012; Scott, 2005). The research focuses on these three perspectives at country-level to identify evidence of corruption and therefore determines the extent to which the project context is corrupt. This section describes such evidence in Italy, which is the project context for the TAV case study.

Remarkable cases of corruption characterized the history of Italy since its unification (1861). The first scandals, the "Manifattura Tabacchi" (1868, in English "Tobacco Manufacturing") and the "Banca Romana" scandal (1893, in English "Roman Bank") (Pezzella, 2011), occurred during the monarchical period (1861–1946). During the First World War and the following years, the reconstruction of the infrastructure network demanded a substantial new financial commitment and public works reached 50% - 60% of total state investments. During the years of fascism, although road works have retained a dominant place, the state has undertaken the realization of a major national programme of drying up swamps and exploitation of waters (Stanghellini, 2000). In this context corruption flourished (Bosworth, 2000) and, during the 50s, corruption was widespread especially in the local government. The "INGIC scandal" showed that political parties, even of opposite factions, can collaborate to promote corruption (Camera dei deputati, 1964). In the 70s many corruption scandals involved large state-owned enterprises (Almerighi, 1993). During the 80s, corruption further expanded becoming systemic and widespread. In the early '90s the growing corruption led to a set of inquiries, e.g. "Tangentopoli" or "Mani

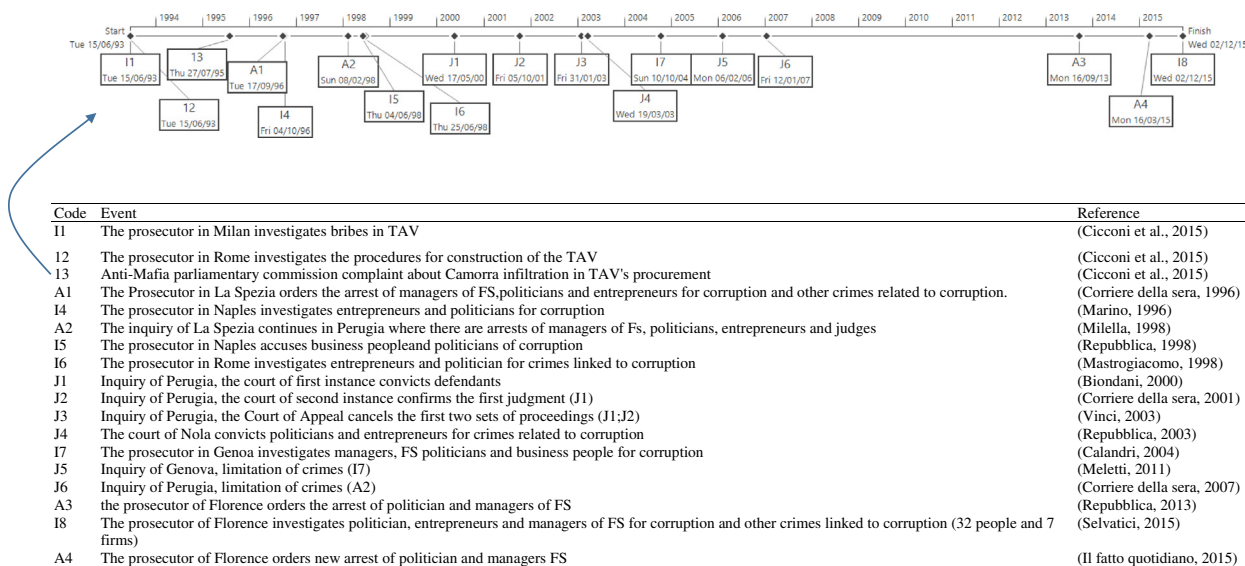| Code	Event	Reference
I1	The prosecutor in Milan investigates bribes in TAV	(Cicconi et al., 2015)
I2	The prosecutor in Rome investigates the procedures for construction of the TAV	(Cicconi et al., 2015)
I3	Anti-Mafia parliamentary commission complaint about Camorra infiltration in TAV's procurement	(Cicconi et al., 2015)
A1	The Prosecutor in La Spezia orders the arrest of managers of FS,politicians and entrepreneurs for corruption and other crimes related to corruption.	(Corriere della sera, 1996)
I4	The prosecutor in Naples investigates entrepreneurs and politicians for corruption	(Marino, 1996)
A2	The inquiry of La Spezia continues in Perugia where there are arrests of managers of Fs, politicians, entrepreneurs and judges	(Milella, 1998)
I5	The prosecutor in Naples accuses business peopleland politicians of corruption	(Repubblica, 1998)
I6	The prosecutor in Rome investigates entrepreneurs and politician for crimes linked to corruption	(Mastrogiacomo, 1998)
J1	Inquiry of Perugia, the court of first instance convicts defendants	(Biondani, 2000)
J2	Inquiry of Perugia, the court of second instance confirms the first judgment (J1)	(Corriere della sera, 2001)
J3	Inquiry of Perugia, the Court of Appeal cancels the first two sets of proceedings (J1;J2)	(Vinci, 2003)
J4	The court of Nola convicts politicians and entrepreneurs for crimes related to corruption	(Repubblica, 2003)
I7	The prosecutor in Genoa investigates managers, FS politicians and business people for corruption	(Calandri, 2004)
J5	Inquiry of Genova, limitation of crimes (I7)	(Meletti, 2011)
J6	Inquiry of Perugia, limitation of crimes (A2)	(Corriere della sera, 2007)
A3	the prosecutor of Florence orders the arrest of politician and managers of FS	(Repubblica, 2013)
I8	The prosecutor of Florence investigates politician, entrepreneurs and managers of FS for corruption and other crimes linked to corruption (32 people and 7 firms)	(Selvatici, 2015)
A4	The prosecutor of Florence orders new arrest of politician and managers FS	(Il fatto quotidiano, 2015)

Fig. 5. Major events linked to corruption in TAV. Legend Codes: I = Inquiry, A = Arrest, J = Other Jurisdictional act. Elaboration from (Biondani, 2000; Calandri, 2004; Corriere della sera, 1996; Corriere della sera, 2001; Corriere della sera, 2007; Il fatto quotidiano, 2015; Marino, 1996; Mastrogiacomo, 1998; Meletti, 2011; Milella, 1998; Repubblica, 1998; Repubblica, 2003; Repubblica, 2013; Selvatici, 2015; Vinci, 2003).

pulite" ("Bride town" or "Clean hands") leading to the dissolution of the three major Italian political parties caught with an agreement to manage and distribute bribes (Bologna and Del Nord, 2000). In 1993, the inquiry reached the highest point with the discovery of the maxi-bribe Enimont/Montedison, reaching a value of about €127 million in 2015 equivalent value. In that case, 4520 people were investigated, and 1121 were sentenced. The majority of them were quickly returned to public and ordinary life, in part for the statute-barred of the crimes and in part because the political sanctions imposed against politicians involved in corruption scandals were quite mild (Sargiacomo et al., 2015). Despite the scandal, the Italian legislators apparently failed to prevent the problem of corruption. For instance, the reform of the law about public work contracts about the Italian building process following Tangentopoli (Bologna and Del Nord, 2000) had little effect. "After Tangentopoli the Italian legislation has not implemented mechanisms to combat the problem of corruption, but sometimes, has favoured its diffusion". These words come from Raffaele Cantone, the current President of Italian National Anti-Corruption Authority (Il fatto quotidiano,

Table 2
Major inquiries for corruption in TAV and their outcome. Elaboration from reference in Fig. 5.

Prosecution office	Defendants	Outcome of Inquiry
Rome	Unknown	No further actions
Milan	Unknown	No further actions
La Spezia/Perugia	Politician, managers FS and entrepreneurs	Limitation of crimes
Naples/Nola	Politician and entrepreneurs	Convictions for crime related to corruption
Rome	Politician and entrepreneurs	No further actions
Genova	Politician, managers FS and entrepreneurs	Limitation of crimes
Florence	Politician, managers FS and entrepreneurs	In progress

2014). Thanks to the evidence provided by the judicial inquiries, Italy is a model of the failure of ordinary institutional mechanisms to control corruption in an advanced democracy (Vannucci, 2009). In recent years, corruption scandals have become even more common for projects and megaprojects. Investigators have discovered criminal associations sharing public contracts and the vast majority of megaprojects performed in Italy (e.g. EXPO, TAV, and MOSE) are under investigation. As also reflected by the indicators later presented, after the period of Tangentopoli the corruption remained rooted in the system and much more difficult to detect. For example, infrequently the scandals in the recent years are characterized by "traditional cash bribes". Conversely, bribes are paid with, for example, with false consultancies jobs.

Table 3 summarizes the most relevant Italian projects. The average cost increase is 179% for the whole sample, 216% for railways and 103% for roads. These numbers are huge compared to the average increase suggested by the literature (see Section 5).

Also major events face corruption. Among the last major events held in Italy (the 2006 Winter Olympics in Turin, the G8 meeting in 2009 scheduled in La Maddalena and then moved to L'Aquila, the 2009 World Aquatics Championships in Rome and EXPO 2015 in Milan) only the Winter Olympics games were not involved in major corruption inquiries. In addition, the structures built for these events (including the Winter Olympics games) are very often abandoned at the end of the event, or even worse never finished, which is a clear symptom of poor planning.

4.4. A project delivered in a corrupt project context: TAV

4.4.1. TAV case study

TAV started in the 1991 with the announcement of the construction of seven high-speed railways with new technical standards allowing the trains to reach 300 km/h: Rome-Naples

Table 3
Cost overrun for Italian megaprojects during the period 2011–2014. *First cost estimation from the first resolution of the Italian government "Interdepartmental Committee for Economic Planning" (Prima stima costi all. 1 delibera CIPE 121/2001) Elaboration from (CGIA, 2014).

Type	Project Name	2001 cost (M€)*	2014 cost (M€)	% cost overrun
Rail	Collegamento ferroviario Torino-Lione	1808	4564	152%
	Sempione traforo ferroviario	1808	3005	66%
	Asse ferroviario Monaco-Verona	2582	9223	257%
	Corridoio 5 Lione-Kiev (Torino-Trieste)	7902	30,280	283%
	Accessibilità ferroviaria Malpensa	1133	4280	278%
	Gronda Ferroviaria Merci Nord Torino	1291	4393	240%
	Asse ferroviario Brennero-La Spezia	1511	2766	83%
	Asse ferroviario Ventimiglia-Milano	4380	9102	108%
	Asse ferroviario Salerno-Catania	12,292	41,149	235%
	Asse ferroviario Bologna-Taranto	742	2299	210%
	Asse ferroviario Milano-Firenze	1291	13,135	917%
	Trasversale ferroviaria Orte-Falconara	1926	3719	93%
	Sistema integrato di trasporto nodo Napoli	3886	6624	70%
Road	Accessibilità stradale Valtellina	481	2410	401%
	Autostrada Cuneo-Nizza	837	3000	258%
	Asse stradale pedemontano	3099	9336	201%
	Passante di Mestre	2737	4487	64%
	Asse autostradale Brennero-La Spezia	1033	4682	353%
	Pontina-A12-Appia	1136	4937	335%
	Asse autostradale Salerno-Reggio Calabria	13,449	13,843	3%
	Asse viario Fano-Grosseto	1854	5119	176%
	Asse viario Marche Umbria	1808	2508	39%
	Collegamento A1-A14. Termoli S. Vittore	1549	3371	118%
	Asse Nord-Sud Tirrenico-Adriatico	1738	4960	185%
	Corridoio Jonico	3099	20,171	551%
	Nodo stradale e autostradale di Genova	2765	4829	75%
TOTAL RAIL		42,552	134,539	216%
TOTAL ROAD		41,225	83,653	103%
TOTAL ALL THE PROJECTS		78,137	218,192	179%

The procurement of major infrastructure is always critical for corruption, even "fixed criterion weights ensure objectivity and reduce the risk of unfairness and corruption in the evaluation of bidders' proposals, but only provided they accurately reflect the relative importance of the evaluation factors to the owner. However, it is still possible to create an unfair evaluation system in which too much emphasis is placed on particular evaluation factors, thus favouring (intentionally or unintentionally) those bidders that score highly in the corresponding factors" (Ballesteros-Pérez et al., 2015).

The procurement of the TAV megaprojects has been highly controversial and to some extent unclear. (Cicconi et al., 2015) highlights major dysfunctions in perpetrating the public objectives, particularly in terms of transparency, market freedom (i.e. selection of the contractor, of the technology, etc.) and financial fairness. Fairness is intended e.g. as giving to the Italian citizens a fair and acceptable financial condition in relation to the public debt and giving to the contractors (especially sub-contractors) a reasonable return and satisfaction (Masrom et al., 2013).

According to the declaration of Mario Moretti (former CEO of Trenitalia) during a parliamentary inquiry (Senato della Repubblica, 2007), originally, the TAV was set up as a private project. At the time of incorporation of the TAV SpA (1991) the majority shareholders were private institutions, primarily financial institutions (Cicconi et al., 2015). This initial set up permitted them to avoid the public procurement process, which includes prescriptions concerning transparency, market freedom, etc. The private procurement process permitted them to pre-select the main contractors (of the various infrastructure sections composing the TAV programme) and the infrastructure technology without an open tendering process (Senato della Repubblica, 2007). The contractual framework was issued without a public safeguard according to the "freedom of contracts" (Furmston et al., 2012) that is typical of private bargains.

Afterwards, before the construction phase, the financial institutions (i.e. the private parties) did not subscribe the capital increase required to finance the delivery of the infrastructure. Hence, in 1998 Ferrovie dello Stato (FS – "State Railways") acquired control of TAV SpA. The infrastructure has been financed by the capital increase and by a private debt (about 40% of the whole capital cost) guaranteed by the State (Senato della Repubblica, 2007). According to Mario Moretti, the TAV programme suffered vast delays and cost overruns caused, among other factors, by the choices made during the private procurement process (Senato della Repubblica, 2007). The lack of an open-ended procurement process leads to a selection of expensive technical solutions (Senato della Repubblica, 2007). In particular, the design of the high-speed network for both the passengers and the freight trains appears questionable. Freight trains have higher weights, increasing the cost of the whole infrastructure for various reasons including limitation on slopes and requirement of a larger power supply. This unconventional technical choice is an Italian peculiarity. After almost 7 years from the completion of the first high-speed railway in Italy no freight trains use these lines (Cicconi et al., 2015).

(RO-NA), Florence-Bologna (FI-BO), Bologna-Milan (BO-MI), Genoa-Milan (GE-MI), Milan-Turin (MI-TO), Milan-Verona (MI-VR) and Verona-Venice (VR-VE). These new lines were also built to reduce the traffic on traditional lines allowing a better management of freight and regional trains (Senato della Repubblica, 2007). In 1998 the project expanded its scope: from an AV system to an AV/AC system (High-Speed/High-Capacity) to support freight trains (Senato della Repubblica, 2007). Since 1997, these Italian projects were integrated into a larger European programme called TEN-T (European Commission, 2015). In 2001 five new lines were proposed: Torino-Lyon (Italian part), Verona-Munich (Italian part), Salerno-Catania, Naples-Bari and Venice-Trieste (Beria and Grimaldi, 2011).

In 2015, after 24 years, only four of the original railways were complete: RO-NA, FI-BO, BO-TO, TO-MI. The sub-section Milan-Treviglio and Padua-Venice were built with traditional standards and integrated with HS railways. The railways GE-MI and MI-VR still have sections under construction. The rest of the railways are still in the design phase (RFI, 2015).

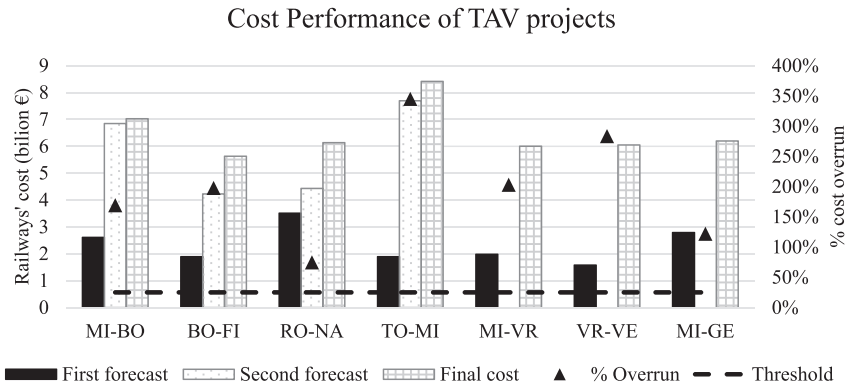## Cost Performance of TAV projects

Fig. 6. Cost overruns for TAV railways (currency actualized to 2015). The bar chart (scale on the left — billions of €) shows the absolute value of TAV cost trend (constant currency). The triangles (scale on the right) is the % Cost overrun for TAV railways respect to the 25% threshold. Elaboration from (ANAC, 2007; Camera dei deputati, 2015a, 2015b; Cicconi, 2011; Repubblica, 1994; Rossi, 2000).

4.4.2. Project evaluation

The project evaluation entails the comparison of cost overruns, time overruns, benefit in the operation of Italian TAV with similar projects developed in less corrupt countries.

4.4.2.1. Cost overruns. The cost analysis considers three phases:

1) First forecast, i.e. the first forecast with the cost declared during the launch of the project in 1991.
2) Second forecast, i.e. the cost determined by supplementary contract, or rather the signature of the contract between the General Contractors and FS.
3) Final cost, i.e. the final cost of the railway, or the last estimate available for those still under construction.

Fig. 6 shows the cost overrun for each railway. Costs are actualized to March 2015. As evident, all the projects are dramatically overbudget and well above the 25% threshold of (Merrow, 2011).

4.4.2.2. Slip in execution schedules. Fig. 7 shows the difference between the time scheduled and real progress of the railways RO-NA, FI-BO, and BO-TO, TO-MI, the only projects completed. The work started with a considerable delay

and the execution schedules are longer than expected. The figure also shows the overrun in execution schedules.

4.4.2.3. Scope and operation. The scope is assessed by comparing the number of trains travelling daily on high-speed lines with respect to the maximum number of trains that the line can support. The lines were built to manage the passage of a train every 5 min (Ferrovie dello Stato, 2015) and in particular the goal is the passage of 120 passenger trains and 40 freight trains per day for each direction (Cicconi et al., 2015). Table 4 clearly shows how the TAV railways are dramatically underused.

4.4.2.4. Cost competitiveness. The comparison between the Italian high-speed project and other European high-speed railways is challenging due to the differences concerning the technological designs, i.e. the Italian technology is unconventional compared to the other EU countries. However, the following analysis compares the costs of the Italian railways with the Spanish AVE (Alta Velocidad Española) and the French TGV (Train à Grande Vitesse). Table 5 lists the railways used for the analysis.

The relative average cost for the Spanish and the French railways is € 18.01 million per km. To obtain the threshold of failure this value should be increased by 25%, so the value of
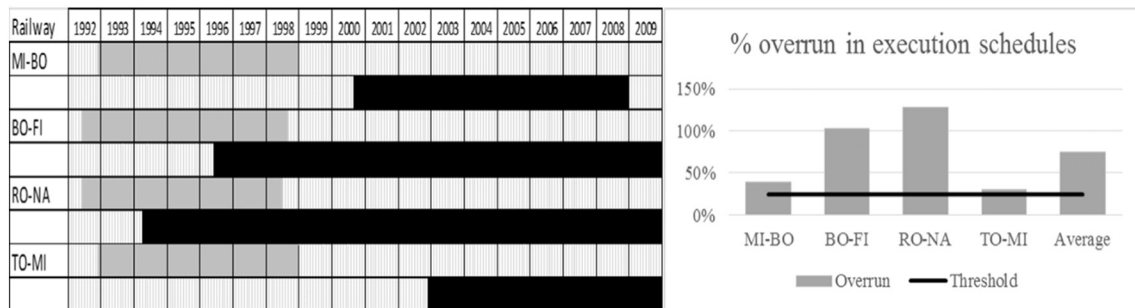

Fig. 7. On the left, difference between time scheduled (grey cells) and real progress (black cells) for completed railways (left). On the right, time overrun in execution schedules overrun for TAV railways (right). Elaboration from (Repubblica, 1991)(RFI, 2015)(Oice, 2007)(Cirillo, 1994)(Repubblica, 2000)(Regione Emilia-Romagna, 2015).

Table 4
Number of trains for each HS railways and percentage of utilization respect to the capacity of 240 trains per hour (Cicconi et al., 2015; Italo, 2015; Trenitalia, 2015).

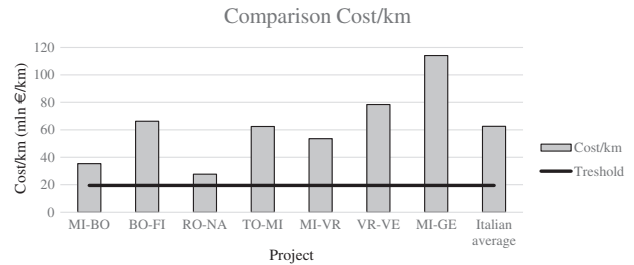| Railways	N° of trains ITALO	N° of trains FS	Total N° of trains	% of utilization
MI-TO	14	28	42	17,5%
BO-MI	18	78	96	40%
FI-BO	22	126	148	62%
RO-NA	16	62	78	32,5%

Fig. 8. Cost/km comparison between Italian, French and Spanish HS railways Cost/km comparison between Italian, French and Spanish HS railways. Elaboration from (Fernández et al., 2012)(Recarte, 2013)(Ministry of Ecology, 2007)(Railway Gazette, 2010)(Railway Gazette, 2011).

the threshold is 22.51 million €/km. Fig. 8 compares the Italian railways with the threshold of failure. Also in this case, all Italian railways are above the threshold. During an inquiry of the Senate, the management of FS justified the differences of costs between Italian, French, and Spanish high-speed railways with technical factors shown in Fig. 9. Even accepting the factors and the maximums of the cost increases proposed by FS (i.e. 23 M€/km), the cost of the Italian railways remains higher than the Spanish and French railways. Remarkably, as showed in Fig. 10 Spain and France were less corrupt than Italy all over the programme life cycle. In conclusion, in the parameter "cost competitiveness" the megaproject fails, also considering planning and territorial differences with respect to other projects.

5. Discussion

5.1. Benchmark with international performance

Table 3 shows that the average overbudget of the 27 Italian infrastructure projects is globally 179%. Table 6 compares the overbudget of Italian infrastructure with analogous infrastructure delivered in other countries. It is clear that the overbudget for the Italian infrastructure (including TAV) is much higher than analogues infrastructure delivered in other countries. The escalation is even higher than what observed in multi billions unique infrastructure such as the Eurotunnel (increased by 59% "alone" or 69% considering the related projects (Winch, 2013)).

Several arguments can explain the overbudget of infrastructures. (Cantarelli et al., 2010) summarizes the most important ones emerged from Flyvbjerg' studies (see key reference in Table 6):

- Technical: forecasting errors including price rises, poor project design, and incompleteness of estimations, scope changes, uncertainty, Inappropriate organizational structure, inadequate decision-making process, inadequate planning process.
- Economical deliberate underestimation due to: lack of incentives and resources, inefficient use of resources, dedicated funding process, poor financing/contract management, strategic behaviour.
- Psychological: Optimism bias among local officials, Cognitive bias of people, Cautious attitudes towards risk.
- Political: Deliberate cost underestimation, Manipulation of forecasts, Private information

Certainly optimism bias, — strategic misrepresentation (two of Flyvbjerg and Cantarelli's central arguments) and, in case of a programme, the escalation of commitment (Winch, 2013) might account for a portion of the overbudget. However, not only in Italy, but also in other countries such as France and Spain (see 4.4.2) and arguably everywhere (Table 6) the decision makers were subject to optimism bias, strategic misrepresentation and other issues. Yet, their overbudget in projects is in the region of 10%–50%. The cost performance of Italian infrastructure is dramatically worse than elsewhere, therefore there must be something more on top of the aforementioned list of factor from (Cantarelli et al., 2010). We argue that the high level of corruption is likely to play a critical role during the selection, planning and delivery of infrastructure projects.

Table 5
Spanish and French railways selected for the comparison. Costs are actualized to 2015 using conversion rate from http://rivaluta.istat.it/Rivaluta/. Elaboration from (Fernández et al., 2012; Ministry of Ecology, 2007; Railway Gazette, 2010; Recarte, 2013; SNFC, 2015).

Country	High-speed railway	Length (Km)	Opening years	Cost (B €)	Relative Cost (M €/km)	Year cost	Cost/km 2015 (M€)
Spain	Madrid-Barcelona	671	2008	8179	12,19	2010	13,07
Spain	Madrid-Valladolid	155	2007	2277	14,69	2010	15,75
Spain	Cordoba-Malaga	201	2007	3729	18,56	2010	19,89
France	Valence- Marseilles	250	2001	4778	19,11	2009	20,76
France	LGV-Est (1)	300	2007	4655	15,52	2009	16,85
France	LGV-Est (2)	107	2016	2010	18,79	2009	20,40
France	Tours-Bordeaux	279	2017	7200	25,81	2010	26,92
France	Le Mans-Rennes	180	2017	3300	18,33	2011	19,12

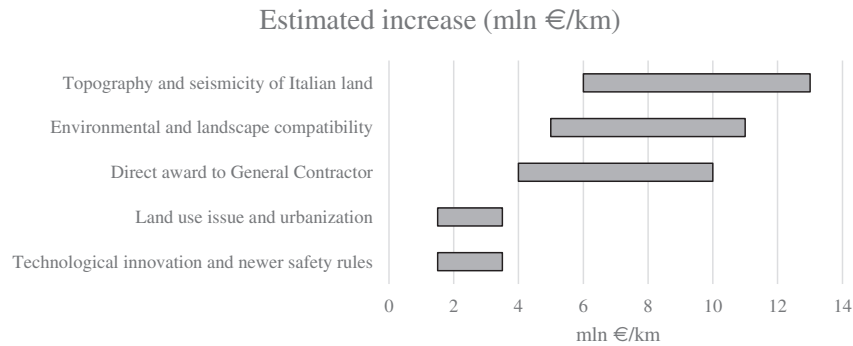## Estimated increase (mln €/km)

Fig. 9. Causes and estimating of the higher cost of Italian HS railways. Elaboration from (Senato della Repubblica, 2007).

The overbudget value of Italian infrastructure is systematically higher with no relevant improvement over time. This seems an example of "tolerance for deviation (Pinto, 2014)" i.e. people within the organization become so much accustomed to a deviant behaviour that they do not consider it as deviant any more. Normalization of deviance suggests that the unexpected becomes expected. Thus, a deviant culture such as the tolerance of corruption becomes accepted and causes counterproductive behaviours. In particular, politicians play the necessary "political games" and maintain important contacts to ensure broad-based support for the project despite the terrible project management performances (Pinto and Patanakul, 2015). This is a further conceptualisation of the temporary project/programme organization proposed by (Winch, 2014) where the permanent organizations are often participated by the Italian state. This implies having the policy makers as salient stakeholders in most of the key organizations all over the project and operation phase. A long term view, embracing the stakeholders over the life cycle is fundamental for the appraisal of the "project success" (Turner and Zolin, 2012).

5.2. Answers to the research questions

This article explored the role of corruption in project management and megaproject management, taking the lead from two ambitious research questions.

The first research question aimed to understand which project characteristics favour corruption. An in-depth analysis of the literature allowed us to identify several characteristics that increase the odds of a project to suffer corruption, including project size, uniqueness, heavy involvement of the government and technical and organizational complexity. We observed that megaprojects match all these characteristics. Furthermore, projects delivered in "corrupt countries" or "corrupt project contexts" are more likely, ceteris paribus, to suffer corruption than in less corrupt contexts. Project context matters: discretionary power of officials, economic rents of policy/decision makers and weak institutions make a country ideal for corruption. In this case the investigation of the link between projects and strategy become essential, and the analysis must be carefully developed since the front end (Pinto and Winch, 2016), that is the "critical phase" for most of the megaprojects (Merrow, 2011).

The second research question investigated how corruption affects project performance. In order to address this question, the authors performed an in-depth analysis of the Italian high-speed railway system. The choice allowed comparing the Italian case with analogous European megaprojects, providing an explorative but thorough answer to the research question. Corruption is harmful for both project management success and project success. During the project phase, the infrastructure suffer extra-costs with respect to both their budget cost and to other comparable infrastructure. Similarly, looking at the schedule, there are remarkable delays. During the operation phase, the infrastructure fail to deliver the expected benefit, e.g. the high-speed Railway system in Italy is underused. Clearly, the role of the Italian state as a "strong owner" (Winch and Leiringer, 2016) is extremely problematic. This is further developed in Section 5, where all these dimensions of project evaluation listed in 4.4.2 have been analysed for the high-speed railway Italian projects. More generally, corruption leads to a
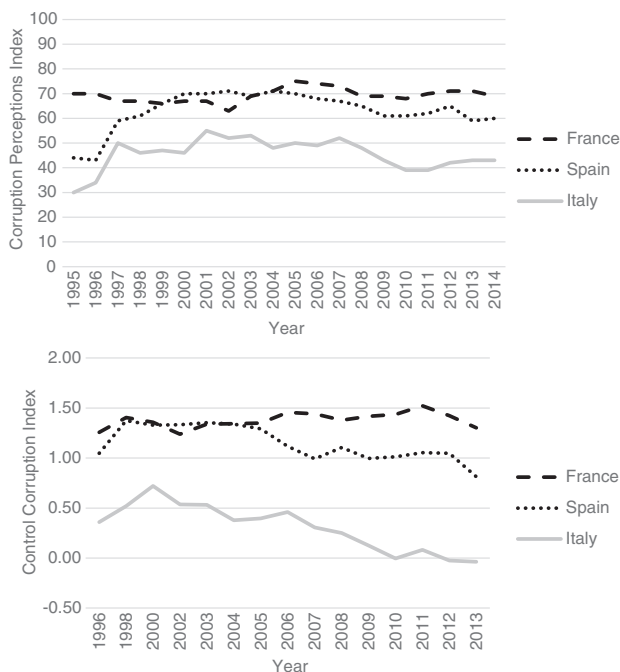

Fig. 10. Comparison of indexes of corruption between Italy, France and Spain. Elaboration from (Transparency International, 2014) top, (World Bank, 2013) bottom.

Table 6
Summary of the literature about overbudget in the Road, Rail and Fixed Links (Bridge and Tunnel).

Reference	Location	Sector/Infrastructure	Sample Size	Overbudget
Table 3 of this paper	Italy	Rail	13	+216%
		Road	13	+103%
		Total	36	+179%
(Flyvbjerg et al., 2016)	World	Roads	863	+20%
	Hong Kong's	Roads	25	+11%/+6%/−1%
(Cantarelli and Flyvbjerg, 2015)	World	Rail	58	+45%
updating		Fixed link	33	+34%
(Flyvbjerg, 2008)		Road	167	+20%
(Cantarelli and Flyvbjerg, 2015)	Europe	Rail	23	+34%
		Fixed links	15	+43%
		Road	143	+22%
		Total	181	+26%
	North America	Rail	19	+41%
		Fixed links	18	+26%
		Road	24	+8%
		Total	61	+24%
	Other geographical areas	Rail	16	+65%
(Cantarelli et al., 2012)	Netherlands	Road	37	+19%
		Rail	26	+11%
		Fixed links	15	+22%
(Lee, 2008) cited in (Cantarelli et al., 2012)	South Korea	Road	138	+11%
		Rail	16	+48%

sub-optimal allocation of resources. In order to carry this poor allocation over several projects "from a strategic misrepresentation perspective, the lie has to be repeated many times, and as evidence of escalation accumulates, that lie has to be repeated in the face of growing opposition from those who are providing the financial resources."(Winch, 2013 p.726).

6. Conclusions and further developments

There is plenty of literature about corruption. Unfortunately, most articles have not been published in project management journals and, more importantly, are not focused on the project management community. Despite the relevance of corruption in public projects and megaprojects, it seems that is not convenient to research, to talk and to write about it. In spite of the amount of papers published on relatively close fields (governance, stakeholders, risk, value), corruption seems a taboo and project management scholars seem afraid to write about it. However (and unfortunately), the context of the public sector and procurement of large projects is ideal for corruption.

This paper adopts the institutional theory to introduce the idea of "corrupt project context" to indicate the research needs of a systemic view. A major contribution of this paper is therefore to rethink the role of corruption in projects from a social and institutional level. Projects are not delivered in a vacuum environment, but a number of internal and external stakeholders links them to the project context. At the same time, the study of the project context alone is not fully appropriate since different project characteristics may favour or disfavour corruption. The investigation of successful planning and delivery of megaprojects, which have most the characteristics that can favour corruption, in a corrupt project context is therefore a key challenge that practitioners and academic will need to face in the next decades. If project

management practitioners and academics aim to reduce corruption is not enough to point out a "few rotten apples" when an entire area or country suffers endemic corruption. It is unrealistic and simplistic to say "don't deliver projects in that location", especially due to the urge for projects and megaprojects in the next decades, such as power plants and hospitals (just to name a few). So, there is a huge scope in the project management sector to research how to deliver successful projects in a corrupt project context. Maybe, in the case of power plants, corruption has to be fought through the delivery of several small standardized projects (with an established cost/benefit track record), rather than in megaprojects with unique characteristics and budgets difficult to estimate.

The case-study approach used in this article has some limitations, as it cannot quantitatively demonstrate exactly the specific impact of a corrupt context on a project poor performance. As discussed in the article, demonstrating such relationship is remarkably difficult in that corruption is often considered a phenomenon more associated to individuals than to projects. Furthermore, megaprojects often have unique characteristics and many influencing factors for their performance. The article therefore provides a first tentative to approach the problem, whereas further research will need to identify the most appropriate methods to in-depth analyse the phenomenon. If the debate is to be moved forward, a better understanding of corruption from the project management perspective needs to be developed.

Firstly, future research activities should deepen the correlation between corruption and project performances comparing the costs of similar megaprojects in countries with different levels of corruption. The biggest challenge is to isolate corruption from other factors that may lead megaprojects to failure.

Secondly, future studies should investigate the correlation between project management attributes (e.g. contract forms, risk allocation strategies etc.) and corruption and then investigate the causation behind the correlation.

Thirdly, it is necessary to develop tools and guidelines, expanding the work presented in (IPMA, 2015) which is a short, ten pages document with the Code of Ethics and Professional Conduct (actually the relevant section is three pages). Even if the document does not explicitly mention corruption, it acknowledges its existence and states that: "Whenever possible, we avoid real or perceived conflicts of interest, and disclose them to affected parties when they do exist. [...] We reject all forms of bribery. (p. 6)" So, this code of conduct is a starting point, even if it lacks an action plan.

Fourthly, corruption does not simply lead to extra cost and delay, but also increases the transaction costs such the effort to set a certain procurement and controlling system. For instance, Zhang et al. (2015), looking at land hoarding in China, found that when the net loss for corruption "income from corruption minus the penalties for corruption and cost of strict inspections" is less than the cost of strict inspections, the final evolutionary stable strategy of the inspectors is to carry out indolent inspections. The topic of increased project transaction costs is vastly under-investigated.

Lastly, it is necessary to develop tools and control systems to address the "corruption performance" of a project. Corruption in megaprojects is most likely the main cause of their inefficiencies, and the academic community should not deliberately ignore this aspect in the project management literature.

There is an elephant in the room, let's talk about it!

Acknowledgements

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