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## Administrative capacity and speed of public spending

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### Abstract

Local institutions are crucial in fostering economic progress. This article assesses the impact of administrative capacity on the speed of public spending at several levels of government. Administrative capacity serves as a foundation for institutional quality and plays a critical role in enhancing the efficiency of local institutions in providing public services and managing finances. Using a sample of about 60,000 public projects co-funded by European funds in the period 2010-2019, the empirical analysis considers ‘internal’ and ‘external’ administrative factors contributing to spending speed. Project duration is used as an inverse proxy for spending speed. Preliminary results highlight the fundamental role of administrative capacity and institutional quality in shaping spending speed, with administrative capacity mediating the impact of institutional quality.

**Keywords:** Administrative capacity; Decentralization; Public spending; Efficiency; EU funds; OpenCoesione

**JEL Classification:** D73, H11, H70, R50

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## 1. Introduction

The historical evidence regarding public projects and investment dynamics highlights Italy's tendency towards a slow speed of public spending. This slowness in expenditure often characterizes the country's approach to public initiatives and investments. The duration of public works is therefore particularly high in Italy compared to other European countries (Agenzia per la Coesione Territoriale 2018). Serious concerns have indeed surfaced regarding Italy's ability to effectively plan and utilize European Union (EU) funds. The persistent sluggishness in spending public funds has long been recognized as a weakness in Italian economic policy (Del Monte et al. 2022 b). The effect of the European Union(EU) Cohesion Policy is greatly affected by territorial context and public administration capacity of local government in which such policy is implemented. It is therefore important to understand which factors affect such aspects. In Italy, Putnam et al. (1993) documented disparities in the quality of local administrations between Northern and Southern regions. Charron (2014) studied the quality of local administrations in more than 200 European regions, and found that the top Italian region was in 118th place. Southern Italian regions were at the lowest levels of this ranking. Del Monte et al. (2022 a) examine the impact of government decentralization on the duration of public projects in Italy. They discover regional disparities in project duration, noting that in the South and certain Central regions, projects took longer at the lowest government level but were faster at more centralized levels. This implies that decentralization in these areas decreased the pace of public spending and, consequently, spending efficiency. In contrast, in the North and most Central regions, the findings were inconclusive, with regional differences primarily influenced by the quality of local institutions. With reference to the impact of administrative capacity on public funding Bachtler et al. (2023) focus on the 'internal' and 'external' administrative factors that contribute differently to measures of performance-absorption, regularity and effectiveness of EU Cohesion Policy<sup>4</sup>.

Incaltarau et al. (2020) examine how administrative capacity and political governance impact the utilization of structural and cohesion funds, advocating for an emphasis on capacity development and measures to combat corruption. Bachtrögler-Unger et al. (2022) emphasize the mediating role of governance quality in the relationship between regional growth, Cohesion Policy impact, and support for local manufacturing firms.

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<sup>4</sup> More in detail the authors said that the 'internal' components of administrative capacity are variously defined and analysed as: human, organisational structures, physical resources, systems and tools, leadership, openness to external knowledge. Differently to a range of other factors that has also been identified, as 'external' to the administrative system for Cohesion Policy but influencing the ability of the system to achieve its objectives, especially: the quality of public administration, legal stability/regulatory quality, centralisation/decentralisation of governance, political influence

The limited availability of comprehensive measures for local administrative quality contrasts with the acknowledged importance of local governance as a driver for local economic development (e.g., North, 1990; Acemoglu and Robinson, 2010) and could result in an oversight of substantial local heterogeneity, with the risk of these differences being aggregated and disregarded (Cerqua et al., 2024).

Administrative capacity is influenced by policy measures and norms governing public spending. In Italy, there is a debate regarding whether current norms increase the complexity of procedures and thus decrease the speed of public spending. It has been suggested to reduce the number and type of controls. However, a reduction in controls on public spending could compromise the quality of institutions and GDP. In this paper, we will demonstrate that in the case of Italy, the speed of quality spending is more negatively impacted by a decline in the quality of institutions than by an improvement in the quality of public project management.

The aim of this paper is to examine whether the speed of public spending differs across various levels of government based on administrative capacity in Italy. We considered a large sample approximately 60,000 of public projects co-financed by the European Union (EU) fund during the period 2010-2019 and managed by various levels of Italian government (municipalities, provinces, regions, and central administrations) to examine if their speed of spending depends both 'internal' and 'external' administrative factors. The duration of these projects was used as a measure of spending speed and therefore of efficiency in the use of public resources by the different levels of government (Del Monte et al. 2022 a). The speed of expenditure plays a fundamental role in assessing the ability of government administrations to utilize public resources effectively. The swiftness with which funds are assigned and utilized serves as a necessary gauge of project execution, especially in nations such as Italy, where efficient utilization of public resources is a challenge. The efficient absorption of EU resources, for example, is a prerequisite for the effectiveness of EU regional policy (Bachtler et al. 2018). Preliminary results highlight the fundamental role of institutional quality and administrative capacity in shaping spending speed, with administrative capacity mediating the impact of institutional quality.

This article makes three key contributions to the extant literature. First, it adds to the debate on the effectiveness of EU regional development funds, showing that a low quality of local government that manage the public projects can have a detrimental effect on the speed of public spending. Previous studies have largely analysed a favourable correlation between quality of government and absorption of Structural and Investment Cohesion Funds (Baun & Marek, 2017; Milio, 2017; Terracciano & Graziano, 2016) but few studies (Del Monte et al., 2022 a & b) have investigated how

a high quality of institution has a positive impact on the speed of spending. As for the speed of public spending, our paper contributes to the ongoing debate regarding the relationship between the speed of spending and administrative capacity. More in detail, previous studies have largely analysed a favourable correlation between administrative capacity and financial absorption (Milio, 2007; Terracciano & Graziano, 2016; Hagemann, 2019; Incaltarau et al., 2020; Surubaru, 2017; Tignasu, 2018), ignoring the impact it may have on spending speed. Lastly, our results appear innovative for the question about whether the speed of public spending varies at different levels of government with a certain quality of institutions and administrative capacity. Some articles have examined the efficiency of spending at a specific government level. For example, Belanguer-Coll et al. (2010) analysed the efficiency of Spanish municipalities, but did not compare municipalities with other levels of governments. Our findings have implications for the debate on the absorption of EU resources, both from cohesion policy and Next Generation EU recovery plan. The amount of EU funds is growing over time, but many countries still face considerable difficulties in spending these resources, especially in the early years of the programming periods. Italy has a problem with late spending, which reduces the effectiveness of EU funds. Decentralization may help to explain the late spending problem in some countries and regions characterized by low quality of local governments and scarce administrative capacity.

The remainder of the paper is structured as follows: Section 2 contextualizes the quality of institutions and public spending within the existing literature, reviewing selected studies on the effects of local institutional quality on economic growth through various policies and investments. This section also examines the influence of administrative capacity on public funding, focusing on its ‘internal’ components. Additionally, the role of decentralization in public spending is discussed. Section 3 describes the dataset and the methodology, and Section 4 shows the main results. Section 5 provides concluding remarks and some policy implications.

## **2. Literature review**

### **a. Quality of institution and Public Spending**

Most scientific research shown that local institutional quality effects on economic growth through its outcome on different policies and investments, such as interventions to promote innovative and entrepreneurial behaviour (Baumol, 1990), entrepreneurship (Nistotskaya et al., 2015; Aparicio et al., 2016; Huggins and Thompson, 2016), innovation (Rodríguez-Pose and Di Cataldo, 2015), regional

competitiveness (Annoni and Dijkstra, 2017), productivity (Kaasa, 2016), industrial diversification (Cortinovis et al., 2017), resilience (Ezcurra and Rios, 2019), or infrastructure (Crescenzi et al., 2016). Corradini (2021) finds robust evidence of a causal effect of formal institutional quality over economic growth, across a panel of Italian NUTS-3 regions, supporting the hypothesis that ‘institutions rule’ also at the sub-national level. This effect is found to be more pronounced in areas with lower levels of economic development and no evidence is found of a reverse effect of growth on local institutional quality. In addition several contributions highlights that local government quality is a fundamental shaper of economic growth (Ketterer and Rodríguez-Pose, 2018) and that the connection between the quality of local institutions and economic performance is achieved through how variations in government quality shape the design, implementation, and monitoring of public policies.

More in detail, over the last two decades, there has been a growing focus on the role of government quality as a determining factor in the effectiveness of European Union (EU) Cohesion Policy, beside as a determine effects on economic growth. There have been several studies that demonstrate a relationship between quality of government and absorption of Structural and Investment (Cohesion) Funds at national level and in some case study regions (Baun & Marek, 2017; Milio, 2017; Terracciano & Graziano, 2016). Institutional quality and good governance are important factors in explaining how ‘weak’ regions can have momentum through spending public funds (Crescenzi et al., 2020). Rodríguez-Posé and Garcilazo (2015), for example, demonstrated by empirical evidence, it is evident that the poor institutional quality can shape the ineffectiveness of EU regional development funds, and Accetturo et al. (2014) suggested that the quality of local government affects the economic impact of EU Structural Funds. Empirical evidence has shown that regions with better quality institutions obtain larger funding allocations of European Structural and Investment Funds (Bouvet & Dall’Erba, 2010; Charron, 2016), have higher levels of absorption (Terracciano & Graziano, 2016; Tosun, 2014), and realise faster economic growth (Bachtrögler, 2016; Becker et al., 2013; Rodríguez-Pose & Garcilazo, 2015). Del Monte et al. (2022 a) demonstrated that the quality of governance contributes to explaining the different pace of spending across Italian regions. In Southern Italy, the low quality of institutions was clearly associated with longer project durations, thus indicating less efficient local governments.

### **b. Administrative Capacity and Public Spending**

Another literature strand focuses on the impact of administrative capacity on public funding. Bachtler et al. (2023) focus on the ‘internal’ and ‘external’ administrative factors that contribute differently to measures of performance – absorption, regularity and effectiveness- of EU Cohesion Policy. More in

detail the authors said that the ‘internal’ components of administrative capacity are variously defined and analysed as: human, organisational structures, physical resources, systems and tools, leadership, openness to external knowledge. Differently to a range of other factors that has also been identified, as ‘external’ to the administrative system for Cohesion Policy but influencing the ability of the system to achieve its objectives, especially: the quality of public administration, legal stability/regulatory quality, centralisation/decentralisation of governance, political influence<sup>5</sup>.

A considerable portion of the research conducted thus far on Cohesion Policy has concentrated on examining the significance of administrative capacity in shaping the outcomes of European Structural and Investment Funds (ESIF) programmes. These studies assert that the success of the policy is conditional on the ability of national, regional and local administrations to design robust strategies, allocate resources effectively, administer EU funding efficiently and ensure better financial compliance (e.g., Bachtler et al., 2014; Mendez & Bachtler, 2017; Milio, 2007; Polverari et al., 2020; Surubaru, 2017; Terracciano & Graziano, 2016; Tosun, 2014). Incaltarau et al. (2020) study the influence of administrative capacity and political governance on the absorption of structural and cohesion funds, recommending a focus on capacity-building and anti-corruption efforts. Bachtrögler-Unger et al. (2022) show that the regional administrative capacity is significant as a mediator between regional growth and the effect of Cohesion Policy on growth and is particularly important when regions implement measures to support local manufacturing firms, as these measures are more effective in a better institutional environment. Aivazidou et al. (2020) found that low administrative capacity of regional strategies ‘may increase the absorption rate, though without supporting regional growth’. Some authors indicates a favourable correlation between administrative capability and financial absorption, as demonstrated by analyses conducted in two Italian regions (Milio, 2007; Terracciano & Graziano, 2016), in Eastern European member states (Surubaru, 2017; Tignasu, 2018) and Central European member states (Hagemann, 2019). Mendez & Bachtler (2022) analyses the relationship between the quality of government and multiple dimensions of administrative performance in Cohesion Policy. Their results show that government quality is a key determinant of administrative performance in terms of financial compliance, timely spending and outcomes.

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<sup>5</sup> More in detail, as specified later, Bachtler et al. (2023) classify the different internal components as: human resources (qualified staff, training, turnover, incentive systems), organisational structures (allocation of tasks, cooperation, coordination), physical resources (information and communication technology), systems and tools (management by objectives, performance audit), leadership (goal-setting, vision, motivation, collective commitment), openness to external knowledge (advice, networks). Differently, authors identified, as ‘external’ component: the quality of public administration (including administrative culture), legal stability/regulatory quality, centralisation/decentralisation of governance, political influence (stability, leaders).

### **c. Decentralization and Public Spending**

The assertion that decentralization brings about remarkable economic advantages is founded in the classical fiscal federalism literature. In 1959, Musgrave proposed a comprehensive theory of State and public finance, delineating three primary functions of government: the provision of public goods and services (resource allocation), income redistribution, and the stabilization of economic activities to mitigate fluctuations in the business cycle (macroeconomic stabilization). According to this theory, the central government ought to handle income redistribution and macroeconomic stabilization, while revenue assignment should be decentralized to other levels of government. The contributions of Tiebout (1956) and Oates (1972) emphasized that local governments possess the capacity to align public spending more effectively with the preferences of individuals residing in diverse territories. Decentralization, furthermore, purportedly enhances the efficiency in mobilizing underutilized resources through competition among subnational governments (Oates, 1996; Rodríguez-Pose and Ezcurra, 2010). Some authors have argued that decentralization leads to greater dynamism and well-being for citizens wherever they live (Oates 1972; Putnam 1993). In a decentralized system, local administrations can better identify the needs and preferences of citizens and offer public services that are more suited to the needs of the local community. Citizens, moreover, thanks to a greater “proximity”, can better monitor and evaluate the services managed and offered by local levels of government. This in turn gives governments a greater incentive to operate efficiently. Intensified competition among subnational entities can also stimulate productive efficiency as regions specialize in their comparative advantages (Rodríguez-Pose and Bwire, 2004). Faguet (2004) show that decentralization led to higher investment in human capital and social services as the poorest regions of the Bolivia chose projects according to their greatest needs. Additionally, the heightened proximity of political power to citizens may enhance accountability and transparency, foster increased participation, and mitigate corruption (Ebez and Yilmaz, 2002; Putnam, 1993).

Another strand of literature emphasizes that the effect of decentralization can be negative, especially in large countries (Rodríguez-Pose and Gill 2005). Local governments may face challenges in efficiently managing complex public services due to financial limitations, technical constraints, or a deficit of qualified personnel. Conversely, central governments can achieve substantial economies of scale in providing public services, often offering them at a lower cost compared to local levels of government. Viesti (2019) highlight that the devolution of functions and resources to subnational governments can also undermine the redistributive power of the State.

Transparency and the reduction of corruption may not necessarily improve through decentralization, particularly when resources are limited. Inadequate human and financial capacity can hinder efforts

to effectively monitor and prevent corruption (De Mello and Barenstein, 2001). Del Monte and Papagni (2007) show that the experience of the Italian regions since their establishment in the 1970s has not been positive, with a growing trend towards corruption. Corruption is often linked to the closeness between politicians, bureaucrats and citizens. The contiguity in local communities means that individuals or organized groups can “capture” politicians and bureaucrats for their own personal interests.

A further argument supporting the negative view of decentralization is that national administrations often offer better opportunities than local administrations and attract more qualified and skilled workers (Prud'homme 1995). In a decentralized system, the competition among regions can disadvantage weaker areas while favouring wealthier ones, thereby exacerbating regional disparities. This phenomenon is especially pronounced in countries like Italy, where there are significant disparities between the North and South, with the latter experiencing considerable lag in development.

Charron (2014) studied the quality of local administrations in more than 200 European regions, and found that the top Italian region was in 118th place. Southern Italian regions were at the lowest levels of this ranking. The recent experience of regional policies during the COVID-19 pandemic has also shown a lot of inefficiencies, both in Italy and in other countries such as the United States (Agnew 2022). Tanzi (1996; 2001) pointed out that the disadvantages of decentralization exceed the advantages if the quality of local institutions is low. Sacchi et al. (2019) corroborated this view by analysing the relationship between decentralization and the provision of local public services when the quality of institutions varied. They found that when the institutional context was unfavourable—that is, there was high corruption, reduced independence of mass media, low quality of politicians, and low political participation of citizens—decentralization led to a reduction in the quantity and quality of local public services provided to citizens. Rodriguez-Pose and Mustra (2022) emphasize that the economic benefits of decentralization are more pronounced in areas with highly efficient local governments. They further suggest that when surrounded by other regions characterized by both high levels of decentralization and high government quality, the positive impacts of transferring powers and resources to subnational tiers of government are amplified. This phenomenon can potentially surpass the effects of directly transferring authority and resources to local governments, as well as the quality of those local governments themselves.

Finally, Rodriguez-Pose and Vidal-Bover (2022) showed that the disadvantages overcame the advantages if the State did not provide local governments with adequate monetary resources to manage the functions that were delegated to them. This negative effect was stronger in politically and economically decentralized regions and in regions with the greatest wealth effect.



However, one key factor behind the decentralized governments have generally been overlooked in past scholarly literature: if the efficiency of public spending depends on government decentralized and what is the role of quality of the institution. Del Monte et al. (2022 a) investigate whether government decentralization affects the duration of public projects in Italy. Analyzing a large sample of 415,378 projects co-funded by European funds within the 2007–13 programming period, they find regional differences in project duration and these regional differences were driven by the quality of local institutions.

### **3. Data and methodology**

To evaluate the speed of spending of the various levels of government, a rich dataset from a variety of sources is constructed. Data on speed of spending come from Open Coesione<sup>6</sup>, the open government initiative on EU cohesion policies in Italy coordinated by the Department for Cohesion Policy of the Presidency of the Council of Ministers. The data are available for all programming cycles from 2007 onward (to 02/2023 for this paper) and the database is updated bimonthly. This dataset encompasses a wide range of information related to government expenditures, projects, and initiatives at various levels of administration, such as regional, provincial, and municipal. Furthermore, this source provided information on the type of funding (ERDF, FSC, ESF, National Fund), the amount of funding, the level of expenditure, the location of the project, the type of managing organisation, and whether the subject is implementer, programmer or beneficiary. Extensive information is also provided on the timing of implementation and payments for individual projects. Further information can be obtained on the sector in which the project is classified and the thematic area of Cohesion Policy expenditure.

The analysis encompasses projects financed under the 2007-2013 EU programming period since many projects from the subsequent programming period (2014-2020) are still ongoing. A comprehensive dataset of 415,378 projects was extracted from OpenCoesione, providing a detailed overview of initiatives funded during the specified time frame.

#### **3.1 Dependent variable and Regressors**

In the baseline analysis, the primary dependent variable focus on the duration of projects and their association with various levels of government overseeing them. Specifically, binary variables were employed to categorize projects based on the level of government management. The levels considered

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<sup>6</sup> <https://opencoesione.gov.it/it/>

include Regional governments (Region), Provincial governments (Province) and Municipal government (Municipality).

These binary variables serve as indicators to identify and analyse how project durations are influenced by the different levels of government involvement, providing valuable insights into the temporal aspects of projects across various administrative tiers.

Building upon the findings of a prior study (Del Monte et al., 2022), which examined the influence of decentralization on spending speed and identified regional disparities linked to the quality of local institutions, this current research aims to incorporate an additional crucial factor, i.e administrative capacity of the local public authorities. The speed of public spending and administrative capacity are essential pillars for success in the implementation of government policies. A rapid implementation of public funds is considered crucial to achieving predetermined objectives, ensuring a positive impact on the communities involved. Effective administrative competence is equally crucial, as it contributes to managing projects efficiently, reducing delays, and maximising the use of available resources. The synergy between speed in spending and a robust administrative capacity is essential to ensure that public investments translate successfully into tangible results. Ultimately, efficient management of public funds requires a balance between speed and capacity, ensuring that resources are used responsibly and effectively for the benefit of the community.

Various studies have employed different approaches to measure administrative capacity. The scientific literature on the subject measured administrative capacity by assessing government effectiveness and regulatory quality, while political factors and governance were evaluated through the analysis of political stability levels and corruption (Incaltarau, 2020). Other studies utilized the Quality of Government Index (EQI), as proposed by Charron et al. (2014, 2015) and Charron & Lapuente (2013). The EQI draws from data collected through surveys conducted in 2010 and 2013.

Finally, some studies used direct measures include capacity grades based on institutional arrangements and other factors (Bowman & Kearney, 1988; Hou et al., 2003; Krueger & Walker, 2010), the total number of government employees per capita (Collins & Gerber, 2006; Hall, 2008), full-time (rather than part-time) employment status (Lofton & Ivonchyk, 2022), and administrative spending (Park & Matkin, 2021). Alternatively, some studies use factors likely associated with administrative capacity as proxy measures, such as population (Simonsen et al., 2001), population density (Manna & Ryan, 2011), poverty (Bell & Smith, 2022), inter-jurisdictional collaboration (Bickers & Stein, 2004), and civic capital (Lowe et al., 2016).

Compared to the scientific literature on the topic, the further value added of this study lies in utilizing information on administrative capacity at the individual Public Entity level. To assess administrative

efficiency, we utilized a comprehensive dataset sourced from multiple sources. Specifically, we gathered information from the Annual Accounts about the personnel of the Public Administration, processed by the State General Accounting Office<sup>7</sup>. Additionally, we incorporated data indicators reflecting the activity of public administration, which were compiled by ISTAT (the Italian National Statistical Institute). Data from both sources was collected for each public entity, spanning the period from 2010 to 2019.

Further explanatory variables, such as the quality of institutions have been used in this work. In particular, the composite indicator proposed by Nifo and Vecchione (2014) assesses the quality of local institutions in Italy at subnational levels (NUTS-2 and NUTS-3). It is similar to the World Governance Indicators (WGI) but focuses specifically on Italy and uses actual data rather than survey-based assessments. The indicator comprises five dimensions: 1) Participation in public elections and cultural vitality; 2) Quality of public services in health, waste management, and environment; 3) Government's ability to promote policies benefiting firms and the private sector; 4) Rule of law, including crime rates, tax evasion, and the shadow economy; 5) Degree of corruption among public officials.

The regression model employed in the analysis incorporated a comprehensive set of controls to account for various characteristics of the projects under scrutiny. These controls were essential for understanding the nuances and complexities inherent in the projects and their contexts. Here's a breakdown of the key components integrated into the model:

Firstly, the variable "*Amount*" was utilized as a proxy for project size, representing the total financing allocated to each project, encompassing both public and private funds. This variable provided insights into the scale and scope of the projects under examination.

Secondly, the variable "*Beneficiaries*" was employed to capture the number of beneficiaries associated with each project. This variable was used to understand who the subjects responsible for the start-up, implementation and functionality of the project are.

Additionally, projects were categorized into 13 thematic areas, such as digital agenda, environment, culture and tourism, among others. This categorization allowed for the differentiation of projects based on their thematic focus and provided insights into the varying degrees of complexity and resource requirements across different project types.

Moreover, the model accounted for the diverse sources of financing for the projects, including *EU Structural Funds, Cohesion Funds, and national funds*. Binary indicators were utilized to control for

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<sup>7</sup> <https://openbdap.rgs.mef.gov.it/it/Home/>

the different categories of financing sources, enabling the analysis to capture the influence of funding mechanisms on project outcomes and implementation dynamics.

Furthermore, geographically fixed effects were incorporated into the model to capture unobserved heterogeneity across different geographical areas. This accounted for the variations in local contexts and environments that could potentially impact project outcomes.

Lastly, fixed effects were included for the growth rate of the local economy at the provincial NUTS-2 level during the implementation period of each project

In summary, the regression model utilized a robust set of controls to comprehensively analyze the characteristics, complexities, and contextual factors associated with the projects under investigation.

In the baseline analysis, the primary dependent variable focus on the duration of projects and their association with various levels of government overseeing them. Specifically, binary variables were employed to categorize projects based on the level of government management. The levels considered include Regional governments (Region), Provincial governments (Province) and Municipal government (Municipality).

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Compared to the scientific literature on the topic, the further value added of this study lies in utilizing information on administrative capacity at the individual Public Entity level. To assess administrative efficiency, we utilized a comprehensive dataset sourced from multiple sources. Specifically, we gathered information from the Annual Accounts about the personnel of the Public Administration, processed by the State General Accounting Office<sup>8</sup>. Additionally, we incorporated data indicators reflecting the activity of public administration, which were compiled by ISTAT (the Italian National Statistical Institute). Data from both sources was collected for each public entity, spanning the period from 2010 to 2019.

Further explanatory variables, such as the quality of institutions have been used in this work. In particular, the composite indicator proposed by Nifo and Vecchione (2014) assesses the quality of local institutions in Italy at subnational levels (NUTS-2 and NUTS-3). It is similar to the World Governance Indicators (WGI) but focuses specifically on Italy and uses actual data rather than survey-based assessments. The indicator comprises five dimensions: 1) Participation in public elections and cultural vitality; 2) Quality of public services in health, waste management, and environment; 3) Government's ability to promote policies benefiting firms and the private sector; 4) Rule of law, including crime rates, tax evasion, and the shadow economy; 5) Degree of corruption among public officials.

The regression model employed in the analysis incorporated a comprehensive set of controls to account for various characteristics of the projects under scrutiny. These controls were essential for

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<sup>8</sup> <https://openbdap.rgs.mef.gov.it/it/Home/>

understanding the nuances and complexities inherent in the projects and their contexts. Here's a breakdown of the key components integrated into the model:

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Additionally, projects were categorized into 13 thematic areas, such as digital agenda, environment, culture and tourism, among others. This categorization allowed for the differentiation of projects based on their thematic focus and provided insights into the varying degrees of complexity and resource requirements across different project types.

Moreover, the model accounted for the diverse sources of financing for the projects, including *EU Structural Funds, Cohesion Funds, and national funds*. Binary indicators were utilized to control for the different categories of financing sources, enabling the analysis to capture the influence of funding mechanisms on project outcomes and implementation dynamics.

Furthermore, geographically fixed effects were incorporated into the model to capture unobserved heterogeneity across different geographical areas. This accounted for the variations in local contexts and environments that could potentially impact project outcomes.

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In summary, the regression model utilized a robust set of controls to comprehensively analyze the characteristics, complexities, and contextual factors associated with the projects under investigation.

### 3.2 Methodology

We conducted econometric modelling to ascertain the determinants of project duration, disaggregated by geographical macro-areas and project types.

We conduct our analysis on a dataset comprising projects implemented by public entities, we exclude all projects carried out by private entities. The temporal interval refers to the period spanning from 2010 to 2020. As a result, the number of observations significantly decreases, from over 400,000 projects extracted to approximately 60,000.

As mentioned earlier, the dependent variable was *Duration*, while the main regressors of interest were binary indicators representing various levels of government. In each regression, the category of managing institution excluded concerns regarding municipalities, thus the signs associated with the binary indicators of managing institution need to be interpreted against this level of government.

For instance, a positive and significant sign of the variable identifying regio government (*Regions*) would imply that region managed projects had longer durations than those managed by municipalities, suggesting that regional management is less efficient than local management. Conversely, a negative and significant sign would indicate the opposite – that central management was more efficient than local management. In the analysis of the factors influencing the time required to complete a project, several variables emerge as crucial. Among these, the education of the workers (*Education*) stands out as a significant factor: a high percentage of graduate workers is associated with a lower number of days required to complete the project, suggesting that advanced skills may expedite the process. Furthermore, a higher percentage change of employees ( $\Delta$  employees) during project development is associated with a reduction in completion time, indicating a certain organizational flexibility or rapid adaptation of human resources to optimize efficiency. The age of the employees (*Average age*) also plays a relevant role: a higher average age is correlated with a lower number of days required to complete the project, suggesting that experience and expertise may accelerate the process. Furthermore, the analysis suggests that the seniority of employees (*Seniority*) may influence the completion time, with a higher percentage of employees with long seniority correlated with a lower number of days required to complete the project, indicating a positive contribution of accumulated experience over time. Finally, another noteworthy finding was the influence of the quality of local institutions on project duration (*IQI*).

The amount of projects (*Amount*), the number of beneficiaries (*Beneficiaries*), and the share of private funds as a proportion of total project funding (*Private share*) were used as control variables. The first two of these variables are important controls for the complexity and size of the projects<sup>9</sup>.

The model was estimated using ordinary least squares (OLS) and included provincial fixed effects, as well as dummies for the types of projects and dummies for the sources of funding. Furthermore, the model was separately estimated using various steps (Tab.2). In the first step, we conducted basic estimations without the regressors of interest (column 1). In the second step, we introduced the variables of interest without *IQI* (column 2), and finally, we also introduced the *IQI* (column 3). Finally, the model was separately estimated for each of the three types of public implementer actors (municipalities, provinces, and regions), as shown in Table 3. Lastly, to reduce the problems of

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<sup>9</sup> In the appendix it is possible find a brief description of the variables used

unobserved heterogeneity and omitted variables, the model also included fixed effects for the different provinces, types of projects and sources of funding.

The main results obtained are reported in the following paragraph.

#### 4. Results

This work aims to investigate how the duration of public projects co-funded by European funds during the 2007-2013 programming period is influenced by both internal and external factors related to the quality of public administrations. Regarding external factors, we employed a measure of local institutional quality, termed "Quality of institutions," assessed through the Institutional Quality Index (IQI) proposed by Nifo and Vecchione (2014). This index, specifically developed at the provincial level, is grounded in objective data and encompasses indicators such as public services, local economic activity, justice, corruption, cultural level, and citizen participation in public life. Compared to other indicators of institutional quality, such as the World Government Index (WGI) and the European Quality of Government Index (EQI), the IQI distinguishes itself by its reliance on objective data rather than citizen perceptions, and its provincial-level analysis rather than national or regional. Concerning internal factors, we utilized proxies of administrative capacity, including the percentage of graduate workers (Education), the percentage change of employees during project development ( $\Delta$  employees), the total number of employees (Total employees), the average age of employees (Average age), and the percentage of employees with over 20 years of seniority (Seniority). The analysis aims to understand how these factors influence the duration of public projects, thereby providing valuable insights to enhance the efficiency and effectiveness of European funds utilization.

Table 2 and 3 shows the results of regressions. As previously mentioned in the preceding paragraph, Table 2 illustrates the results of the regression analysis conducted in three distinct phases. In the initial phase, basic estimations were performed without the inclusion of the variables of interest, as depicted in column 1. In the subsequent phase, the variables of interest were introduced, excluding the Institutional Quality Index (IQI), as highlighted in column 2. Lastly, in the third phase, the IQI was incorporated alongside the variables of interest, as represented in column 3. This systematic approach allowed for a comprehensive analysis of the impact of the variables of interest, both individually and in conjunction with the IQI, on the outcome variable. Recall that as previously described in the regression the omitted variable is *Municipalities*.

In column 3, the variable *Region* shows a significant reduction of 179 days compared to *Municipalities*, while *Provinces* exhibit an even greater reduction of 182 days compared to



*municipalities*. This suggests that projects conducted in regions and provinces are being completed more quickly than those carried out in municipalities.

Another noteworthy finding was the influence of the quality of local institutions on project duration. Institutional quality, measured by IQI, has a negative but weakly significant impact on project duration. This suggests enhanced efficiency in project management. Consequently, governmental efforts aimed at enhancing project efficiency should prioritize improvements in the quality of local institutions rather than decentralizing functions. In addition, variables such as education, average age, seniority of personnel, and percentage change in employees all show significant impacts on project duration. These results indicate that regions and provinces may be more efficient in project implementation compared to municipalities and that the characteristics of the employed personnel play a significant role in determining the overall duration of public projects.

Additionally, control variables demonstrated a positive coefficient for the number of projects, aligning with the expectation that larger and more complex projects typically have longer durations. For example, the variable *Amount* and *Beneficiaries* had positive and significant coefficients, indicating that project duration increased with increased total funding and number of beneficiaries.

Finally, R<sup>2</sup> indicates that these variables together explained 19% of project duration.

Table 3 shows the second set of estimates. The regression results presented entail separate models estimated for municipalities, provinces, and regions. Similarly, the estimations are structured in two steps. Initially, basic estimations were conducted without the regressors of interest, as depicted in column 1. Subsequently, in the second step, the variables of interest were introduced, as illustrated in column 2.

The IQI (Institutional Quality Index) consistently exhibits significant coefficients across all models, suggesting its importance in influencing project durations. However, its effect varies considerably across different administrative levels. When the variables of interest are introduced, the IQI is found to be positive and significant only for the Municipalities, but not for the Provinces and Regions, where the coefficients are positive but not statistically significant.

The coefficient for *education* is negative and statistically significant, suggesting that a higher percentage of graduate workers is associated with shorter project durations and this is much more evident in the Regional Authority (-17.50 days) than in Provinces (- 10.70) and Municipalities (- 3.042). The positive and statistically significant coefficient for *average age* suggests that as the average age of employees increases, project durations also tend to increase. This implies that older employees may contribute to longer project durations. The impact of average age on project duration

is particularly pronounced in Provinces, with a coefficient of 390.4 days, and in Municipalities 127.9. However, in Regions, although the coefficient is lower, the effect is still present, albeit the magnitude is slightly lesser extent. Potential reasons for this could include factors such as greater caution or conservatism in decision-making, slower adaptation to new technologies or methodologies, or a lower pace of work compared to younger employees. The negative and statistically significant coefficient for *seniority* indicates that a higher percentage of employees with over 20 years of seniority is linked to shorter project durations, but this trend is observed only in Provinces and Regions. Municipalities, on the other hand, do not show statistically significant results in this regard. This suggests that in Provinces and Regions, a more experienced workforce, characterized by employees with longer tenures, may contribute to more efficient project completion. However, such a relationship is not observed in Municipalities, highlighting potential differences in workforce dynamics and project management practices across administrative levels. *Total employees* do not show a statistically significant coefficient, suggesting that the total number of employees does not significantly influence project durations.  $\Delta$  employees (Percentage change of employees): The coefficient for  $\Delta$  employees is negative and statistically significant. This implies that an increase in employees variation leads to a reduction of speed of spending.

The variables *Amount* had positive and significant coefficients, indicating that project duration increased with increased total funding, while the coefficient for beneficiaries varies across administrative levels. In municipalities and provinces, the coefficients are negative, indicating that a higher number of *beneficiaries* is associated with shorter project durations, though these results are not statistically significant. However, in regions, the coefficient is positive and statistically significant, suggesting that an increased number of beneficiaries corresponds to longer project duration. *Private funds* had a negative coefficient, but it was not significant.

The value of the R2 indicates that these variables together explained 31% of project duration.

**Table 2 Regressions for the whole sample including municipalities, provinces and regions**

	(1)	(2)	(3)
Region	-148.7*** (33.23)	-179.6*** (33.27)	-182.0*** (32.73)
Province	-145.7*** (25.45)	-171.6*** (28.75)	-172.8*** (28.76)
IQI	-139.2** (62.85)	-	-84.99* (48.07)
Education	-	-2.751*** (0.788)	-2.608*** (0.770)
Average age	-	-110.5*** (27.58)	-109.89*** (49.82)
Age squared	-	-1.196*** (0.293)	-1.188*** (0.293)
Seniority	-	-89.04* (46.65)	-91.36* (49.83)
Δ employees	-	-1.625** (0.708)	-1.627** (0.709)
Total employees	-	0.003 (0.003)	-
Amount	0.014* (0.008)	0.013* (0.006)	0.013* (0.006)
Private funds share	-175.7* (107.1)	-170.9 (111.0)	-174.9* (108.1)
Beneficiaries	98.29*** (27.84)	66.81* (35.58)	66.65** (33.41)
Dummies for the types of projects	Yes	Yes	Yes
Dummies for the sources of funding	Yes	Yes	Yes
Provincial dummies (NUTS 3 level)	Yes	Yes	Yes
Observations	59,236	59,236	59,236
R <sup>2</sup>	0.16	0.18	0.19

Notes: The dependent variable measures the duration of the projects in days. Standard errors clustered at the municipality level in parentheses. \*\*\*, \*\*, \* statistically significant at the 1%, 5% and 10% level.

**Table 3 Different regressions for municipalities, provinces and regions**

	Municipalities		Provinces		Regions	
IQI	-1697.2*** (497.1)	1458.9*** (412.1)	-429.1*** (209.0)	-36.86 (247.1)	-115.7* (66.88)	-76.42 (193.1)
Education	-	-3.042*** (0.578)	-	-10.70*** (4.221)	-	-17.50** (8.464)
Average age	-	127.9*** (17.40)	-	390.4** (149.7)	-	51.06* (30.75)
Age squared	-	-1.498*** (0.177)	-	-4.172*** (1.630)	-	-0.481* (0.279)
Seniority	-	10.91 (37.22)	-	-695.0*** (233.1)	-	-1192.5*** (197.3)
Δ employees	-	-1.543** (0.643)	-	-14.61*** (3.975)	-	-1.874*** (0.333)
Total employees	-	0.001 (0.001)	-	0.690 (0.648)	-	0.017 (0.011)

Amount	0.210*** (0.039)	0.202*** (0.038)	0.197*** (0.033)	0.153*** (0.032)	0.004** (0.002)	0.001 (0.001)
Private funds share	-165.7 (232.6)	-191.8 (217.6)	158.7 (294.0)	-154.6 (283.1)	100.7 (109.2)	293.0** (137.0)
Beneficiaries	-41.16 (56.38)	-50.78 (54.02)	16.51 (91.80)	-42.70 (92.54)	114.6 (15.8)	166.2*** (24.68)
Dummies for the types of projects	Yes	Yes	Yes	Yes	Yes	Yes
Dummies for the sources of funding	Yes	Yes	Yes	Yes	Yes	Yes
Provincial dummies (NUTS 3 level)	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9,198	9,198	21,231	21,231	28,807	28,807
R <sup>2</sup>	0.31	0.34	0.36	0.55	0.13	0.16

*Notes:* The dependent variable measures the duration of the projects in days. Standard errors clustered at the municipality level in parentheses. \*\*\*, \*\*, \* statistically significant at the 1%, 5% and 10% level.

## 5. Conclusion

This paper has analyzed the impact of ‘internal’ and ‘external’ administrative factors on the speed of public spending for the various levels of Italian government (municipalities, provinces, regions, and central administrations). The speed of spending was calculated for projects under OpenCoesione, an open government initiative focused on EU cohesion policies in Italy. The analysis encompasses projects financed during the 2007-2013 EU programming period, as many projects from the subsequent period (2014-2020) are still in progress. These projects provide valuable insights into various aspects, including the type and amount of funding, expenditure levels, project locations, managing organization types, and whether the entity is an implementer, programmer, or beneficiary.

Overall, external factors captured by the Institutional Quality Index, which includes indicators such as public services, local economic activity, justice, corruption, cultural level, and citizen participation in public life, exert a negative but weakly significant impact on project duration. Therefore, an improvement in institutional quality tends to decrease the speed of public spending. Consequently, governmental efforts aimed at enhancing project efficiency should prioritize improvements in the quality of local institutions rather than decentralizing functions. In addition to external factors, several internal administrative factors also influence the speed of public spending. A higher percentage of graduate workers correlates with shorter project durations. Moreover, the average age of employees indicates that as it increases, project durations tend to increase as well. Additionally, factors such as seniority of personnel and percentage change in employees exhibit significant impacts on project duration. These results underscore the significant role played by the characteristics of employed personnel in determining the overall duration of public projects.

Our preliminary analysis underscores the profound impact of both 'internal' and 'external' administrative factors on the velocity of public spending. Internally, factors such as the composition of the workforce - particularly the proportion of graduate workers - and workforce demographics, including average age and seniority, significantly influence project durations. Externally, indicators such as the quality of public services, local economic activity, judicial efficiency, corruption levels, cultural development, and citizen engagement play pivotal roles. Our empirical findings reveal that these factors are indispensable considerations for all levels of government entrusted with managing public funds. Whether at the local, regional, or national level, the effectiveness of public spending hinges on a nuanced understanding and management of these internal and external administrative dynamics.

Furthermore, the implications of our results extend beyond academic discourse to inform concrete policy actions. It is imperative for both local and central administrations to proactively implement

targeted policies aimed at bolstering institutional quality and enhancing administrative capacity. By prioritizing initiatives that foster transparency, accountability, and efficiency within administrative structures, governments can not only expedite project implementation but also optimize the utilization of public resources for the benefit of society at large

The analysis had some limitations. First, our analysis may be constrained by the availability and quality of data, particularly regarding certain internal administrative factors such as workforce demographics. Future research could benefit from more comprehensive and detailed datasets to provide a more nuanced understanding of these dynamics. Second, our study focuses on a specific type of fund and time period, which may limit the generalizability of our findings. Future research could explore how the influence of administrative factors varies across different funds, such as NPRR. Third, our analysis may not capture all relevant administrative factors that influence public spending dynamics. Future research could explore the impact of additional variables, such as bureaucratic procedures, project management techniques, or political factors, to provide a more comprehensive understanding of the administrative determinants of project duration. Finally, while we highlight the importance of improving institutional quality and administrative capacity, the effectiveness of specific policy interventions in achieving these objectives remains uncertain. Future research could evaluate the impact of various policy initiatives aimed at enhancing administrative performance and project efficiency. Addressing these limitations through further empirical research and methodological advancements can deepen our understanding of the complex interplay between administrative factors and public spending dynamics, ultimately informing more effective policy interventions and administrative practices.

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## APPENDIX

Description	Variable name	Source
Personnel feminization rate	FEMPER	ISTAT (Italian National Institute of Statistics)
Managerial personnel feminization rate	GENMAN	ISTAT (Italian National Institute of Statistics)
Human resource turnover index	HUMREP	ISTAT (Italian National Institute of Statistics)
Human resource turnover rate	HUMTUR	ISTAT (Italian National Institute of Statistics)
Managerial personnel to personnel ratio	INCMAN	ISTAT (Italian National Institute of Statistics)
Personnel under 35 years of age to total personnel ratio	PERYOU	ISTAT (Italian National Institute of Statistics)
Personnel with less than 20 years of seniority to total personnel ratio	SEMPER	ISTAT (Italian National Institute of Statistics)
Diploma-holding or higher-educated personnel to total personnel ratio	TRDEMPAL	ISTAT (Italian National Institute of Statistics)
Graduate or higher-educated personnel to total personnel ratio	TRDEMPDE	ISTAT (Italian National Institute of Statistics)
Graduate or higher-educated managerial personnel to total managerial personnel ratio	TRDMANDE	ISTAT (Italian National Institute of Statistics)
Average age of workers	AGE	State General Accounting Office
The total number of employees within each organization	TOTAL EMPLOYEES	State General Accounting Office
Percentage of graduate workers	EDUCATION	State General Accounting Office
Percentage of employees with more than 20 year of seniority	SENIORITY	State General Accounting Office
	AMOUNT	OPENCOESIONE
	IQI	