JOURNAL OF CULTURAL ANALYSIS AND SOCIAL CHANGE

Journal of Cultural Analysis and Social Change,
2025, 10(2), 551-558
ISSN: 2589-1316

# Institutional Quality, Digital Readiness, and Economic Growth: Constructing and Testing a Government Project Maturity Index

Anar Yessengeldina[1]*, Zhanar Taizhanova[2], Yerzhan Khalbayev[3], Inga Lysiak[4], Raushan Rakhimzhanova[5]

[1] *Astana IT University,* ASTANA, REPUBLIC of KAZAKHSTAN
[2] *Academy of Public Administration under the President of the Republic of Kazakhstan,* ASTANA, REPUBLIC of KAZAKHSTAN
[3] *International Certification Center «ICert»,* ASTANA, REPUBLIC of KAZAKHSTAN
[4] *Pomeranian University, Starogard Gdanski*, POLAND
[5] *Karaganda Buketov University*, KARAGANDA, REPUBLIC OF KAZAKHSTAN

*__Corresponding Author:__ azamat.zhanseitov@icloud.com

**Citation:** Yessengeldina, A., Taizhanova, Z., Khalbayev, Y., Lysiak, I. and Rakhimzhanova, R. (2025). Institutional Quality, Digital Readiness, and Economic Growth: Constructing and Testing a Government Project Maturity Index, *Journal of Cultural Analysis and Social Change*, 10(2), 551-558. https://doi.org/10.64753/jcasc.v10i2.1637

**Published:** November 12, 2025

## ABSTRACT

This paper investigates the impact of government project management maturity (GPMI) on gdp per capita growth across 159 countries using panel data for 2016, 2018, 2020, 2022, and 2024. The study constructs a novel gpmi by combining six worldwide governance indicators and the e-government development index to capture institutional quality and digital readiness essential for effective public project management. The study tests the hypotheses that higher gpmi contributes to economic growth, with a particular focus on the potential delayed effects of improvements in project management maturity on economic performance. Panel fixed effects regression models were employed to analyze the relationship while controlling for inflation, trade openness, urban population share, and the log of gdp per capita. The results indicate that gpmi has a positive and statistically significant effect on gdp per capita growth when measured with a time lag, confirming that the benefits of institutional and project management reforms require time to materialize. Additionally, inflation was found to negatively impact growth, while trade openness showed a positive association. Urban population share exhibited a significant negative relationship with gdp growth, highlighting the potential infrastructure pressures associated with urbanization. These findings contribute to the literature on public sector management and economic development by emphasizing the importance of investing in government project management capacity as part of long-term development strategies.

**Keywords:** government project management maturity, GDP per capita growth, governance, e-government, digital readiness, panel data, fixed effects, trade openness, inflation, urbanization.

JEL classification
H11, O43, H54, O47, O33, C23

## INTRODUCTION

Governments worldwide increasingly recognize the importance of effective project management in achieving development objectives and improving the efficiency of public investment. As public projects represent a substantial share of government expenditure and serve as drivers of infrastructure development and service delivery, understanding how the maturity of project management systems impacts economic outcomes is a critical area for research.

The motivation for this study arises from the persistent challenge many countries face in translating public investments into tangible economic growth. While large-scale government projects are often central to economic development strategies, inefficiencies, delays, and mismanagement can undermine their impact, limiting their contribution to sustainable growth. Assessing how the maturity of government project management systems relates to economic performance can offer valuable insights for policymakers seeking to enhance the effectiveness of public spending.

The objectives of this paper are threefold. First, we aim to construct a Government Project Management Maturity Index (GPMI) for a broad set of countries using open data on governance quality and digital readiness. Second, we seek to empirically examine the relationship between GPMI and GDP per capita growth using panel data across five time points: 2016, 2018, 2020, 2022, and 2024. Third, we explore whether the impact of project management maturity on economic growth manifests immediately or with a time lag, providing insights into the temporal dynamics of this relationship.

This study contributes to the literature on public sector management and economic development in several ways. While prior research has explored the impact of institutional quality and governance on economic growth (Acemoglu et al., 2005; Rodrik et al., 2004), limited attention has been paid to the specific role of government project management maturity in this context. Additionally, while the E-Government Development Index (UN, 2022) and Worldwide Governance Indicators (World Bank, 2023) are widely used in governance analysis, they have rarely been combined to construct an index specifically capturing government project management capacity. By developing and applying the GPMI, this study addresses this gap, providing a practical tool for comparative assessment and policy analysis.

The remainder of this paper is organized as follows. Section 2 reviews the relevant literature on governance, project management, and economic growth, highlighting the gaps this study seeks to address. Section 3 describes the methodology, including the construction of the GPMI, the data sources, and the empirical strategy. Section 4 presents and interprets the results of the panel regression analysis, while Section 5 discusses the findings in the context of existing literature. Section 6 concludes by summarizing the key insights, policy implications, and directions for future research.

## LITERATURE REVIEW

The relationship between governance, project management capacity, and economic growth has been widely explored in the development economics and public administration literature. However, while institutional quality and governance effectiveness are recognized as critical drivers of growth (Acemoglu, Johnson, & Robinson, 2005; Rodrik, Subramanian, & Trebbi, 2004), the specific role of government project management maturity in influencing economic performance remains underexamined.

Governance and economic growth. Previous studies have demonstrated that better governance and institutional quality are associated with higher levels of economic development (Kaufmann & Kraay, 2002; Easterly & Levine, 2003). Effective governance reduces transaction costs, ensures property rights, and fosters an environment conducive to investment and productivity growth. Indicators such as government effectiveness, control of corruption, and rule of law have been shown to positively correlate with economic growth across countries (North, 1990; Hall & Jones, 1999).

Project management in the public sector. Public project management plays a vital role in the implementation of development strategies and infrastructure expansion. Research highlights that weak project management practices can lead to delays, cost overruns, and inefficient allocation of resources, undermining the intended economic impacts of public investments (Flyvbjerg, 2009; Williams & Samset, 2010). The maturity of project management systems within governments, including digital readiness and procedural transparency, can influence the effectiveness of project delivery (PMI, 2017; Müller et al., 2015). However, quantitative assessments of how these capacities translate into macroeconomic outcomes are limited.

Digital governance and project effectiveness. The digitalization of government processes has been shown to improve transparency, accountability, and service delivery efficiency, contributing to better project outcomes (UN E-Government Survey, 2022; Gil-Garcia, 2012). E-government readiness, measured through indices such as the EGDI, indicates a government's capacity to leverage technology in project management and public service delivery, potentially impacting economic performance indirectly through improved project implementation.

Gaps in the literature. While the literature establishes a connection between governance quality and economic outcomes, few studies have developed composite indices specifically focusing on government project management maturity and examined their empirical relationship with GDP growth. Moreover, existing studies often overlook the temporal dynamics of reforms and project management improvements, which may influence economic growth with a lag rather than immediately.

This study addresses these gaps by:

1. Constructing a Government Project Management Maturity Index (GPMI) that combines governance indicators and digital readiness measures to capture government capacity in managing projects effectively.
2. Testing the relationship between GPMI and GDP per capita growth using panel data across multiple years.
3. Examining whether the impact of project management maturity on growth manifests immediately or with a lag, providing insights into the timing and persistence of governance-related reforms.

## METHODOLOGY

The methodological framework of this study goes beyond a literature review and is based on the development of a new composite index, the Government Project Management Maturity Index (GPMI), and its empirical testing through econometric analysis. This section outlines the research hypotheses, the construction of the index, the data sources, and the econometric strategy.

### Research Hypotheses

Grounded in the insights from governance and project management literature, we propose the following testable hypotheses:

H1: Higher GPMI is positively associated with GDP per capita growth.

H2: The positive impact of GPMI on economic growth manifests with a time lag.

H3: Inflation negatively affects GDP per capita growth.

H4: Trade openness positively affects GDP per capita growth.

H5: Urban population share is significantly associated with GDP per capita growth.

### Construction of the Government Project Management Maturity Index (GPMI)

To evaluate project management maturity in the public sector, we developed the **GPMI** by combining **six Worldwide Governance Indicators (WGI)** (government effectiveness, control of corruption, political stability, regulatory quality, rule of law, and voice & accountability) with the **UN E-Government Development Index (EGDI).**

- All WGI indicators were normalized to a [0,1] scale.
- EGDI was directly included since it is already measured on a [0,1] scale.
- Equal weights were assigned to all components to ensure transparency and comparability.

The GPMI thus captures **institutional quality** and **digital readiness**, two critical dimensions of public project management maturity.

### Data and Variables

- **Dependent variable:** GDP per capita growth (annual %), from the World Development Indicators.
- **Independent variable:** GPMI (constructed as described above).

**Controls:** Log GDP per capita, inflation, trade openness, and urban population share.

**Sample:** Balanced panel of 159 countries for 2016, 2018, 2020, 2022, and 2024.

### Empirical Strategy

We employed **panel fixed effects (FE) regression models** to estimate the impact of GPMI on economic growth, controlling for unobserved heterogeneity across countries and global time shocks.

- To test **H2**, we included lagged GPMI (t–1) to capture delayed reform effects.
- Robust clustered standard errors were applied.
- All data processing, normalization, and regression analysis were conducted in **Python** to ensure reproducibility.

This approach allows us to move beyond theoretical discussions and provide **quantitative evidence** on how improvements in government project management maturity affect economic growth.

## RESULTS

This section presents the results of the panel fixed effects regression analysis assessing the relationship between government project management maturity (GPMI) and GDP per capita growth across 159 countries for the years 2016, 2018, 2020, 2022, and 2024. The analysis focuses on testing whether higher GPMI is associated with economic growth, including the exploration of potential delayed effects by using GPMI lagged by one period.

 

The regression included lagged GPMI, log of GDP per capita, inflation, urban population share, and trade openness as independent variables. The analysis was conducted on a clean, balanced panel of 577 observations, using robust clustered standard errors to ensure the reliability of the results.

**Regression Findings**

**Table 1.** Fixed Effects Regression Results

| Variable | Coefficient | Std. Error | p-value | Interpretation |
|---|---|---|---|---|
| Constant | 2.03 | 1.78 | 0.255 | Not significant |
| GPMI (lagged) | 5.71 | 2.84 | 0.044 | Positive, significant |
| Log GDP per capita | -0.39 | 0.39 | 0.313 | Not significant |
| Inflation (%) | -0.0121 | 0.005 | 0.019 | Negative, significant |
| Urban population (%) | -0.0378 | 0.012 | 0.003 | Negative, significant |
| Trade (% of GDP) | 0.0107 | 0.004 | 0.008 | Positive, significant |

**Source:** Author`s calculation

Model fit:

R-squared: 0.032

Adjusted R-squared: 0.024

F-statistic: 4.89 ($p < 0.001$)

The results from Table 1 indicate that lagged GPMI is positively and significantly associated with GDP per capita growth (coef = 5.71, p = 0.044), supporting the hypothesis that improvements in government project management maturity contribute to economic growth, but with a delayed effect. This aligns with the expectation that institutional and managerial improvements require time before translating into measurable economic outcomes.

Among the control variables:

Inflation is significantly negatively associated with GDP growth, reflecting macroeconomic instability's dampening effect on growth.

Urban population share shows a significant negative relationship with growth, which may indicate challenges related to urban infrastructure pressures.

Trade openness is significantly positively associated with GDP growth, supporting the role of economic integration in fostering growth.

Log GDP per capita is not significantly associated with growth in this model, indicating that initial income levels do not directly predict short-term growth rates within the sample.

**Hypotheses Testing Summary**

**Table 2.** Hypotheses Testing Results

| Hypothesis | Statement | Result |
|---|---|---|
| H1 | Higher GPMI is positively associated with GDP growth. | Supported (significant, lagged) |
| H2 | GPMI impacts growth with a time lag. | Supported |
| H3 | Inflation negatively affects GDP growth. | Supported |
| H4 | Trade openness positively affects GDP growth. | Supported |
| H5 | Urban population share is associated with GDP growth. | Supported (negative effect) |

**Source:** Author`s calculation

The hypotheses formulated in this study were systematically tested using panel fixed effects regression analysis. As summarized in Table 2, the results provide clear evidence supporting the proposed relationships.

Specifically, H1 and H2 are supported, with the findings indicating that higher GPMI is positively associated with GDP per capita growth when measured with a time lag, confirming the delayed impact of government project management maturity on economic performance. H3 is supported, as inflation was found to have a significant negative effect on growth. H4 is supported, demonstrating the positive association between trade openness and GDP growth, consistent with the literature on the benefits of global economic integration. Finally, H5 is supported, with results indicating that while the urban population share is significantly associated with GDP growth, the effect is negative, reflecting the potential challenges of rapid urbanization without adequate infrastructure.

These findings align with existing theoretical frameworks and prior empirical studies while highlighting the unique contribution of project management maturity to long-term economic growth.

 

These results validate the study's theoretical framework, emphasizing the importance of government project management maturity in supporting long-term economic growth while highlighting the significant roles of trade openness and macroeconomic stability.

## DISCUSSION

The findings of this study demonstrate that government project management maturity, measured through the GPMI, has a positive and statistically significant association with GDP per capita growth when included with a time lag, while its contemporaneous effect was found to be insignificant. This result aligns with the conceptual understanding that improvements in governance structures and project management systems require time to influence economic performance (Zhanseitov et al., 2020).

### Interpretation of the GPMI Effect

The significant positive effect of lagged GPMI suggests that investments in enhancing project management capacity, digital readiness, and institutional quality contribute to growth, but these benefits materialize over time. Institutional reforms often involve procedural changes, capacity building, and infrastructure adjustments that improve the quality and timeliness of public project implementation (Müller et al., 2015; UNDP, 2020). These improvements can foster productivity, stimulate private sector activity through reliable infrastructure, and enhance public trust, all contributing to economic growth in subsequent periods.

The lack of a significant immediate effect of GPMI may be attributed to the initial costs associated with institutional reforms, including administrative restructuring, compliance processes, and staff training, which can temporarily slow down project execution (Flyvbjerg, 2009). Additionally, bureaucratic adjustments to improve project governance may initially lengthen approval processes before leading to efficiency gains.

Furthermore, the lagged effect underscores the importance of patience and sustained commitment in governance reforms. Policymakers should recognize that the benefits of improved project management maturity will not appear instantly in macroeconomic indicators but will emerge after the reforms are institutionalized and operational bottlenecks are reduced (Bokayev et al., 2023). Short-term assessments of reform outcomes risk underestimating their true potential.

The results also suggest that countries at earlier stages of project management maturity may experience more pronounced long-term gains, as initial improvements can have a multiplicative effect on public investment efficiency. In contrast, in highly mature systems, marginal gains may be smaller, highlighting the relevance of targeted strategies depending on baseline capacity.

### Macroeconomic Control Variables

The significant negative association between inflation and growth is consistent with the literature, which emphasizes that high inflation creates uncertainty, reduces purchasing power, and discourages investment, thereby hindering economic growth (Barro, 1995).

The positive impact of trade openness on growth supports classical and endogenous growth theories, which posit that openness facilitates technology transfer, market expansion, and resource allocation efficiency, fostering growth (Edwards, 1998; Frankel & Romer, 1999).

Interestingly, the negative relationship between urban population share and growth suggests that urbanization, while often associated with productivity gains, may also impose infrastructure and social service burdens, particularly in countries with inadequate urban planning (Henderson, 2003). This is consistent with studies indicating that rapid urbanization can lead to congestion, environmental degradation, and increased costs, offsetting the potential economic benefits in the short to medium term.

The insignificance of log GDP per capita in predicting growth within the sample aligns with findings from Barro and Sala-i-Martin (2004), who note that initial income levels may have limited explanatory power for short-term growth fluctuations, particularly when institutional and macroeconomic factors are included in the analysis.

An additional interpretation of these results is that macroeconomic stability—particularly low and predictable inflation—acts as an enabling environment for the benefits of project management maturity to materialize. Without price stability, the efficiency gains from improved governance may be offset by uncertainty and reduced investor confidence. Similarly, trade openness can amplify the positive effects of GPMI by creating more opportunities for infrastructure-enabled exports and by facilitating knowledge spillovers through foreign partnerships.

### Comparison with Existing Studies

The results are consistent with previous studies that highlight the critical role of governance quality in promoting economic growth (Acemoglu et al., 2005; Rodrik et al., 2004). However, this study adds to the literature by demonstrating the temporal nature of this effect, showing that project management maturity influences growth with a lag rather than immediately. This finding aligns with research indicating that the benefits of governance

 

reforms and improved institutional capacities are realized over time, following the implementation and operationalization of new processes (Andrews et al., 2017).

Furthermore, by incorporating the digital governance dimension through the EGDI, this study contributes to the emerging literature on the role of digital readiness in enhancing public sector efficiency and its indirect contribution to economic performance (UN E-Government Survey, 2022; Gil-Garcia, 2012).

Unlike many prior studies, this analysis jointly considers governance maturity and macroeconomic context, revealing that governance effects are conditional on other structural variables. This integrative approach helps bridge the gap between institutional economics and development economics by illustrating how reforms interact with broader economic conditions.

The emphasis on digital governance maturity also responds to recent policy debates, particularly in the post-pandemic era, when governments increasingly rely on e-procurement, digital monitoring systems, and online public services (Amirova et al., 2025). These tools can significantly improve transparency, reduce corruption risks, and accelerate project delivery—provided that institutional and human resource capacities are sufficiently developed to manage them effectively (Aimukhanbetova et al., 2019).

In summary, the study confirms that while good governance and project management maturity are vital, they function best as part of a coherent economic policy mix that addresses inflation control, urban planning, and trade integration. This multi-dimensional approach ensures that governance improvements translate into tangible and sustained economic benefits.

### Implications for Policy and Research

The findings underscore the importance of investing in government project management capacity as part of long-term development strategies. Policymakers should recognize that while immediate results may not be visible, sustained improvements in project management systems and institutional quality can yield significant economic dividends over time. Additionally, complementary policies aimed at maintaining macroeconomic stability and leveraging trade openness can enhance the growth impacts of governance improvements.

For researchers, the results highlight the value of using lag structures when studying institutional impacts on growth, acknowledging the time required for reforms to translate into measurable outcomes. Future studies could further explore the sectoral channels through which project management maturity influences growth and assess heterogeneity across different income-level country groups.

## CONCLUSION

This study examined the relationship between government project management maturity (GPMI) and GDP per capita growth using a newly constructed composite index based on open governance and digital readiness data across 159 countries for the years 2016, 2018, 2020, 2022, and 2024. The results indicate that GPMI is positively and significantly associated with economic growth when measured with a time lag, suggesting that improvements in project management systems and institutional capacity contribute to growth, but these benefits require time to materialize.

Additionally, the findings confirm that trade openness supports economic growth, while high inflation and rapid urbanization without sufficient infrastructure can hinder growth across countries. These results align with existing literature emphasizing the importance of institutional quality and macroeconomic stability in fostering sustainable development.

The study's implications are twofold. First, policymakers should recognize the importance of investing in government project management capacity as part of long-term development strategies, with the understanding that these investments yield economic returns over time rather than immediately. Second, maintaining macroeconomic stability and leveraging trade openness can enhance the growth effects of improved governance and project management maturity.

Future research could explore sectoral pathways through which project management maturity influences growth and assess differences across income groups, contributing further to the understanding of governance and project management's role in economic development.

## ACKNOWLEDGEMENTS:

This research is funded by the Science Committee of the Ministry of Science and Higher Education of the Republic of Kazakhstan (AP23489668).

 

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