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IMPROVING PUBLIC INVESTMENT EFFICIENCY IN THE G-20

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IMPROVING PUBLIC INVESTMENT EFFICIENCY IN THE G-20

EXECUTIVE SUMMARY

Public investment supports the delivery of key public services, connects citizens and firms to economic opportunities, and can serve as an important catalyst for economic growth. After three decades of steady decline as a share of GDP, the public capital stock has begun to recover in G-20 countries. Higher public investment rates in emerging G-20 countries has led to some convergence with advanced G-20 countries in the quality of and access to social infrastructure (e.g., schools and hospitals), and, to a lesser extent, economic infrastructure (e.g., roads and electricity).

However, the economic and social impact of public investment critically depends on its efficiency. Comparing the value of public capital expenditure (input) with measures of infrastructure coverage and quality (output) across the G-20, reveals average inefficiencies in public investment processes of around 22 percent. For advanced G-20 economies inefficiencies stand at 13 percent (relative to the best performer), while for emerging G-20 countries they are higher at 31 percent.

Improvements in public investment management (PIM) could significantly enhance the efficiency of public investment in the G-20. The IMF's new Public Investment Management Assessment (PIMA) finds significant scope to strengthen the 15 key institutions, which shape the planning, allocation, and implementation of public investments. Strengthening PIM institutions could improve the predictability, credibility, and integrity of public investment budgets and close up to two-thirds of the 22 percent "efficiency gap" across the G-20. The economic growth dividend from closing this efficiency gap are also substantial: the most efficient public investors would get twice the growth "bang" for their public investment "buck" than the least efficient.

Priorities for strengthening PIM institutions vary across the G-20. Advanced G-20 countries need to strengthen central-local coordination, enhance medium-term budget frameworks and integrate them with national and sectoral strategic planning. Emerging G-20 countries need more transparent project selection processes, stronger project management, and improved monitoring of and accounting for infrastructure asset. All G-20 should look to make their fiscal frameworks more supportive of sustainable, stable and adequate investment levels, improve the rigor and transparency of project appraisal, and enhance the oversight and control over public-private partnerships (PPPs).

Approved By
Vitor Gaspar

Prepared by a staff team from the Fiscal Affairs Department that included Marco Cangiano, Richard Hughes, Holger van Eden, Torben Hansen, Mario Pessoa, Geneviève Verdier, Benoit Chevauchez, Teresa Curristine, Renaud Duplay, Israel Fainboim, Almudena Fernandez, Lesley Fisher, David Gentry, Jason Harris, Tim Irwin, Javier Kapsoli, Samah Mazraani, Maximilien Queyranne, Isabel Rial, Maura Francese, Sandeep Saxena, Johann Seiwald, Tom Josephs, Yasemin Hurcan, and Ha Vu. Amyra Asamoah, Kaitlyn Douglass, and Ryan Espiritu provided research assistance; Molly Abraham provided production assistance.

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Glossary

AE	Advanced Economies
COFOG	Classification of the Functions of Government
EM	Emerging Markets
FAD	Fiscal Affairs Department
ICRG	International Country Risk Guide
LIDC	Low Income Developing Countries
PI	Public Investment
PIE-X	Public Investment Efficiency Indicator
PIM	Public Investment Management
PIMA	Public Investment Management Assessment
PIMI	Public Investment Management Index
PPP	Public-Private Partnership
SOE	State-Owned Enterprises
TA	Technical Assistance
TSA	Treasury Single Account

I. INTRODUCTION

1. Through the provision of both social and economic infrastructure, public investment can serve as an important catalyst for economic growth. A significant body of theoretical and empirical research underscores the positive relationship between investment in high-quality public infrastructure and economy-wide productivity.¹ Against the background of a steady decline in public investment as a share of GDP in advanced economies, evidence of infrastructure bottlenecks in emerging economies, and the sluggish global economic recovery, the G-20 has called for ramping up public investment to raise long-run economic growth (G-20, 2014).² However, the economic and social impact of public investment crucially depends on its efficiency. Despite anecdotal evidence of projects plagued by time delays, cost overruns, and inadequate maintenance, there are few robust empirical studies of the determinants of public investment efficiency.³

2. This paper explores the link between public investment management (PIM) institutions and the efficiency of public investment for the G-20 countries. Based on the analysis from a recent IMF study, the paper finds that better PIM enhances public infrastructure quality, and pinpoints key institutional reforms needs to boost public investment efficiency (IMF 2015). These findings and recommendations are based on a comprehensive data set on investment, infrastructure and capital stocks, and two analytical innovations: (i) a new cross-country Public Investment Efficiency Index (PIE-X); and (ii) a new Public Investment Management Assessment (PIMA) which is applied to G-20 countries.

3. The paper is structured as follows. Section II examines trends in public investment and infrastructure quality, and presents estimates of public investment efficiency for G-20 countries based on the IMF's new Public Investment Efficiency Index (PIE-X). Section III uses the IMF's new Public Investment Management Assessment (PIMA) to evaluate the strength of PIM institutions in G-20 countries. Section IV explores the relationship between the PIMA estimates of institutional strength and public investment efficiency, and a number of other public investment performance measures in the G-20. Section V concludes by identifying priorities for enhancing public investment management and performance in the G-20 countries based on case studies carried out for all G-20 members.

¹ See for example Buffie and others, 2012; Ghazanchyan and Stotsky 2013; IMF 2014.

² This was echoed by the IMFC. See IMFC 2014e.

³ There are some exceptions, including Warner (2014), Gupta and others (2014), found the strength of public investment management to be a significant factor in the relationship between public investment and growth.

II. PUBLIC INVESTMENT AND INFRASTRUCTURE EFFICIENCY

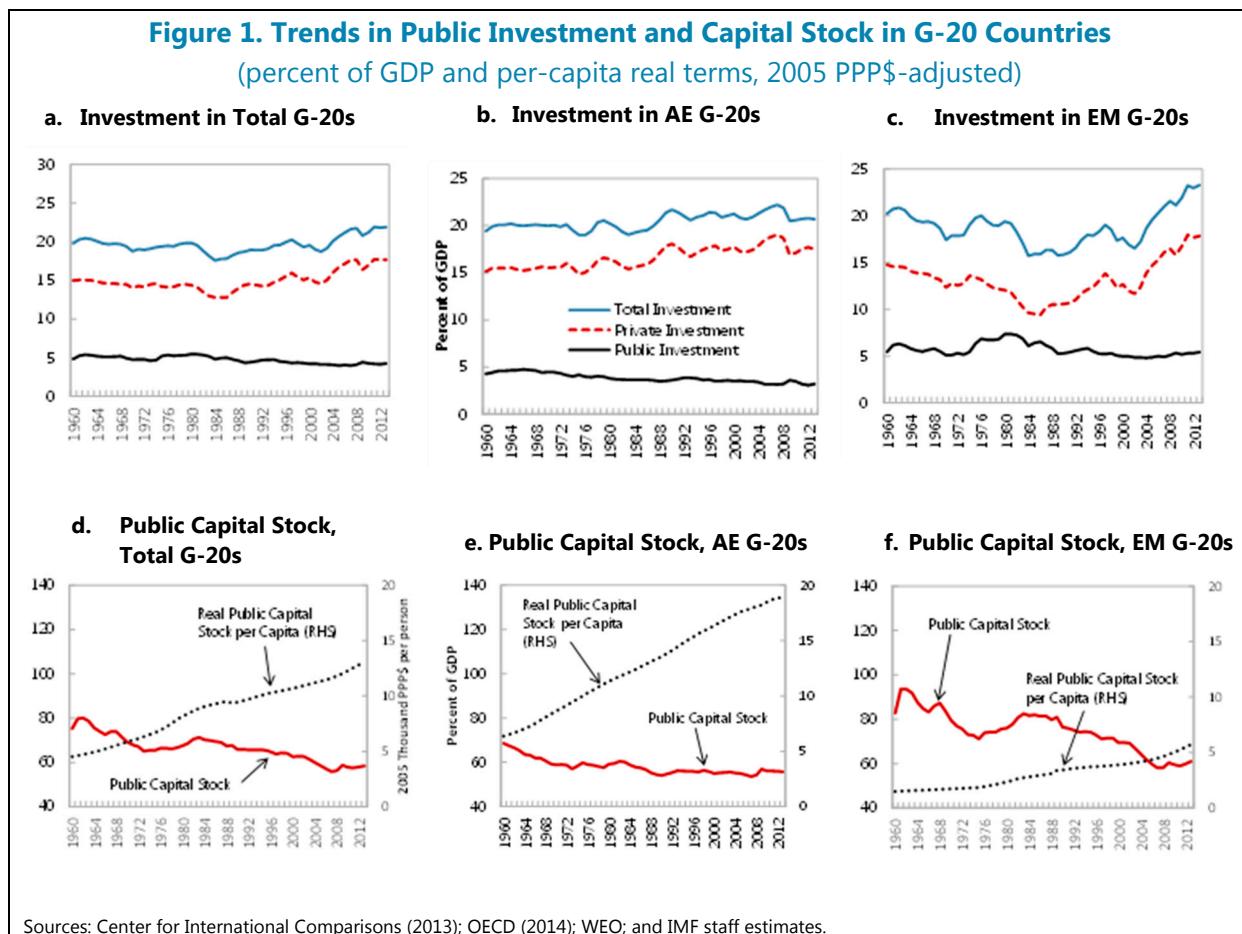
4. This section reviews cross-country trends in and relationships between public investment, infrastructure quality, and economic growth in the G-20. In doing so, it explores trends in public investment and the changing roles of the public and private sectors in the provision of infrastructure. The section also analyzes the impact of public investment on the size and quality of public infrastructure, using a new index measuring the efficiency of public investment.

A. Trends in Public Investment and Capital Stock

5. Following three decades of steady decline, public investment as a share of GDP has begun to recover in some G-20 economies. Public investment rates in advanced economies of the G-20 remain at historic lows, but have partially recovered in emerging markets over the last decade. In advanced G-20 countries, average public investment has steadily decreased from a high of under 5 percent of GDP in the late 1960s to a historic low of over 3 percent of GDP in 2012. In contrast, in emerging G-20 countries' public investment rates peaked at over 7 percent of GDP in the early 1980s, declined to around 4 percent of GDP in the mid-2000s, but have since recovered to 5 percent of GDP.⁴

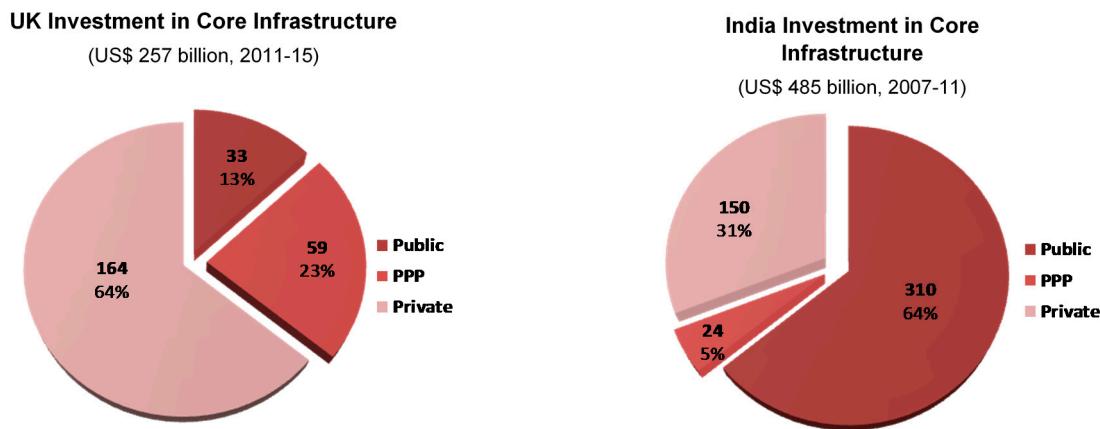
6. While the real value of the accumulated public capital stock has risen steadily on a per capita basis across G-20 economies, it has generally lagged behind economic output. Since 1960, the real value of the public capital stock has nearly doubled on a per capita basis in G-20 economies—particularly in advanced countries, though to a lesser extent in emerging markets. However, the public capital stock has failed to keep pace with rising output throughout this period. In advanced G-20 countries, the public capital stock has stabilized in recent years. After a significant recovery of their public capital stocks in the 1980s and 1990s, emerging G-20 countries saw a reduction in their public capital/output ratios over the past decades, which has only begun to reverse in the past few years (Figure 1).

⁴ Throughout this period, China has maintained a much higher investment rate than the G-20 average. However, the trends in the average are not driven by developments in China. The G-20 recovery in recent years has taken place despite somewhat lower public investment in China.



7. While the public sector continues to dominate the provision of economic infrastructure in emerging G-20 countries, the private sector plays an increasingly important role in advanced G-20 economies. Over the past half century, innovations in technology and financing arrangements, along with a reassessment of the role of the state, have enabled the commercialization of a growing array of infrastructure networks. In many advanced economies, the private sector has largely displaced governments in providing economic infrastructures, such as communications, energy, transport, and water supply networks. The privatization of infrastructure provision is most pronounced in advanced countries like the United Kingdom, where private companies account for almost two-thirds of investment in these sectors. By contrast, in emerging markets these networks remain largely in public hands. In India, for example, the private sector accounts for less than a third of infrastructure investment (Figure 2). In addition, the public sector is still the main provider of social infrastructure such as education and health. In education, the public sector accounts for more than half of total investment in G-20 economies; while significant dispersion exists across countries in the provision of health infrastructure.

Figure 2. Private vs. Public Investment in Core Infrastructure in the UK and India
 (percent of total investment)

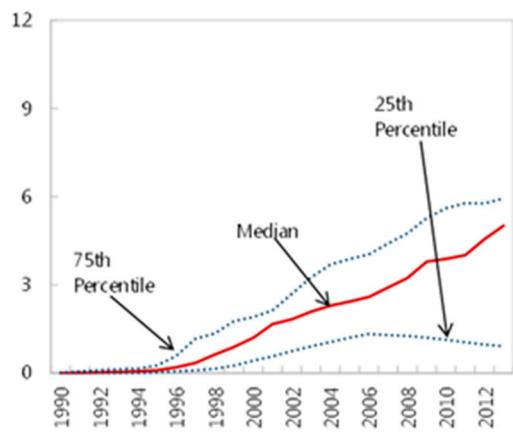


Source: McKinsey Global Institute (2013).

8. In the last decade, a growing proportion of infrastructure services in the G-20 has been delivered through PPPs, though with significant differences across countries (Figure 3).

In the G-20, the PPP capital stock averaged around 4.5 percent of GDP in 2013 (about 10 percent of the public capital stock). This is most likely driven by emerging G-20 countries. The number of G-20 AE countries is limited in the sample but the broader sample analyzed in IMF (2015) suggests that the PPP capital stock was less than 1 percent of GDP in AEs as a whole.⁵

Figure 3. PPP Capital Stock in G-20 Economies
 (percent of GDP)



Sources: EIB, WB, and IMF staff estimates.

The full line corresponds to the median level of PPPs capital stock as percent of GDP, while the dotted lines show the ratios for countries in the 25th and 75th percentiles.

⁵ The number of G-20 AE countries in the sample is limited due to lack of consistent reporting of PPP operations.

9. Within the public sector, subnational governments and public corporations are major contributors to public investment. This is particularly true in advanced and emerging G-20 economies with a federal form of government, where regional and local governments undertake more than half of public investment. Public corporations (government-owned or controlled companies), also account for a large share of total public sector investment in some advanced and emerging G-20 economies (Table 1).⁶

**Table 1. Composition of Public Sector Investment, Selected G-20 Economies, 2013
(percent of GDP)**

Institutions	Australia	France	Mexico	UK
Central government	0.5	1.3	3.4	1.7
Local government	2.6	2.8	0.8	0.9
Public corporations and other entities	1.6	1.7	2.0	0.3
Public sector (consolidated)	4.7	5.8	6.2	2.9

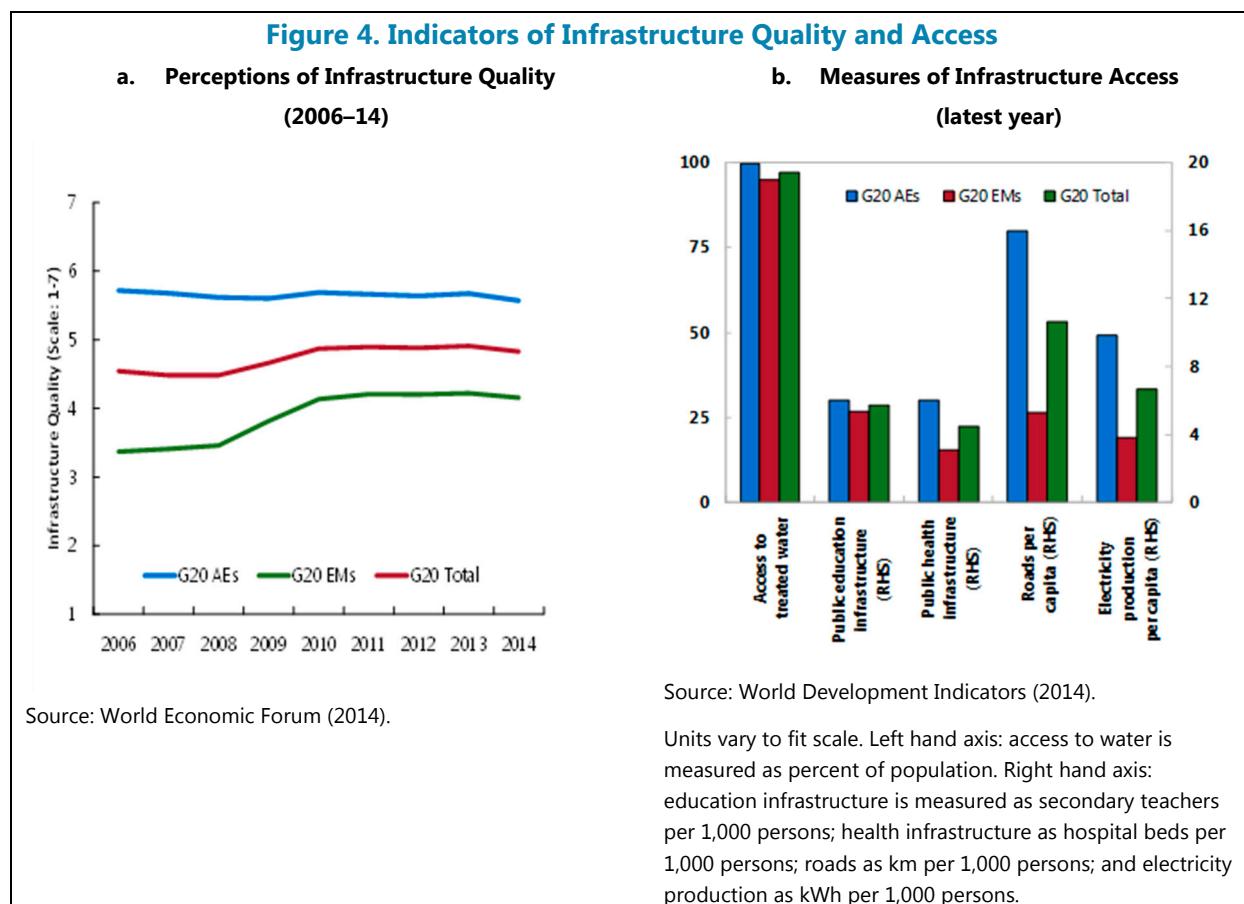
Source: IMF staff estimates.

For Mexico, local government data are estimated from OECD National Accounts Database 2012, and may not be fully consistent with central government data.

B. Infrastructure Coverage and Quality and Public Investment Efficiency

10. While higher rates of public investment in emerging G-20 countries have brought about some convergence in access to social infrastructure, significant disparities in the economic infrastructure persist. Survey-based measures of infrastructure quality suggest that the recent ramping up of public investment in emerging G-20 countries has helped reduce the perceived disparity in infrastructure across countries (Figure 4a). Physical measures of infrastructure also suggest significant convergence across countries in the coverage of social infrastructure (e.g., schools, hospitals, and water). However, large and persistent disparities between advanced and emerging G-20 countries remain within the coverage of economic infrastructure (e.g., roads and electricity networks) (Figure 4).

⁶ Table 1 is illustrative, as data on the breakdown between central and local government investment is limited.

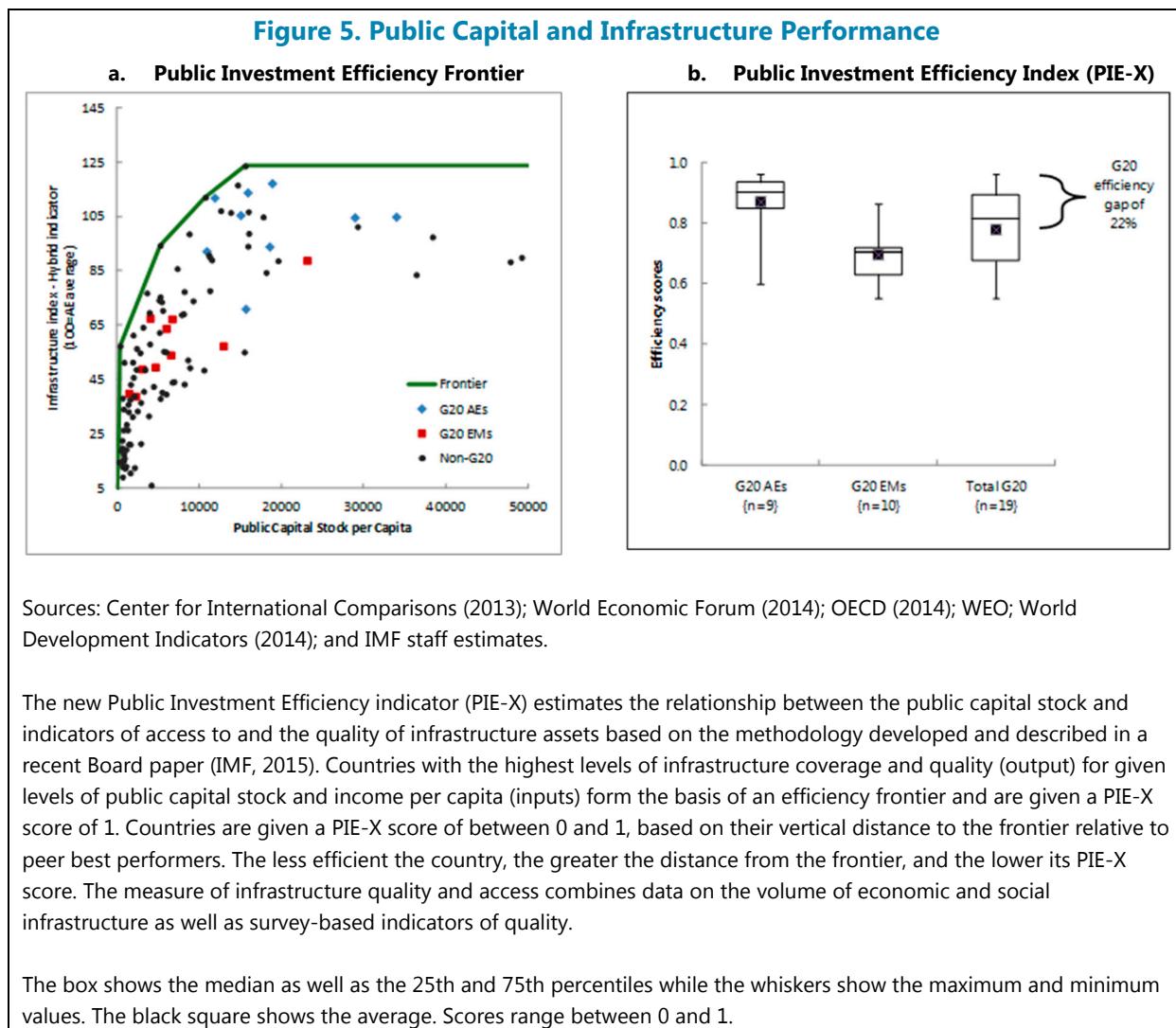


11. However, improvements in infrastructure are only loosely correlated with public investment, pointing to significant levels of inefficiency across countries. Staff estimates of a new Public Investment Efficiency Index (PIE-X) confirm that there is substantial scope for improving public investment efficiency in G-20 countries.⁷ Based on a sample of 114 countries, Figure 5 (left panel) shows a public investment efficiency frontier, which is defined by those countries with the highest coverage and quality of public infrastructure for a given level of public capital stock per capita. While the efficiency of public investment generally increases with income per capita, the slope of the frontier decreases, illustrating the decreasing marginal returns to additional investment.

12. The average efficiency gap for the G-20 is 22 percent, with some countries having much higher gaps (Figure 5). This efficiency gap is measured as the distance between each country and the frontier for a given level of public capital stock and income per capita (IMF, 2015). The size of the gap shrinks as income rises, with emerging G-20 countries facing a gap of 31 percent, and advanced of 13 percent on average. The economic dividend from closing the public investment efficiency gap could be substantial. Research on the relationship between public investment efficiency and growth suggests that moving from the lowest quartile to the highest

⁷ The estimates are based on recent IMF staff work (IMF, 2015).

quartile in public investment efficiency could double the impact of increases of investment on growth (IMF, 2015).



III. EVALUATING PUBLIC INVESTMENT MANAGEMENT

A. The Public Investment Management Assessment (PIMA) Framework

13. Differences in the efficiency of public investment across countries partly reflect differences in the relative strength of PIM institutions. Institutions determine how well investments are planned, whether allocations are made to priorities for economic development, and whether implementation avoids waste, delays, and integrity issues. The impact of public investment on infrastructure quality and economic performance is of course mediated by a range of factors. These include, for example, the level of economic development, structural characteristics of the

economy,⁸ quality of governance, geography, and climate. However, a growing body of literature underscores the role that the legal, institutional, and procedural arrangements for public investment management play in determining the level, composition, and impact of public investment. The analysis presented in Sections III and IV suggests that improvements in public investment management practices could significantly reduce the efficiency gap for G-20 countries identified above. Clearly, the necessary institutional changes cannot be introduced overnight; they entail significant legal and institutional changes, often require the development of new skills and capacities, and will take time to deliver the envisaged benefits. Countries need to invest in public investment management.

14. Fund staff has developed a new Public Investment Management Assessment (PIMA) to assess the quality of PIM practices.⁹ The PIMA evaluates 15 key institutions for planning, allocating, and implementing public investment (Figure 6). These PIM institutions are a subset of the broader framework of budget institutions that govern the public financial management process.¹⁰ For each of the 15 PIM institutions, three key design features are identified, each of which can be fully met, partly met, or not met. Based on how many of these key features are in place, countries are given a PIMA score of between 0 (no key features in place) and 10 (all 45 key features fully in place). The precise evaluation methodology is described in Annex I. The PIMA includes elements similar to other PIM diagnostic tools,¹¹ but provides a more comprehensive assessment of the public investment decision-making process at three key stages:

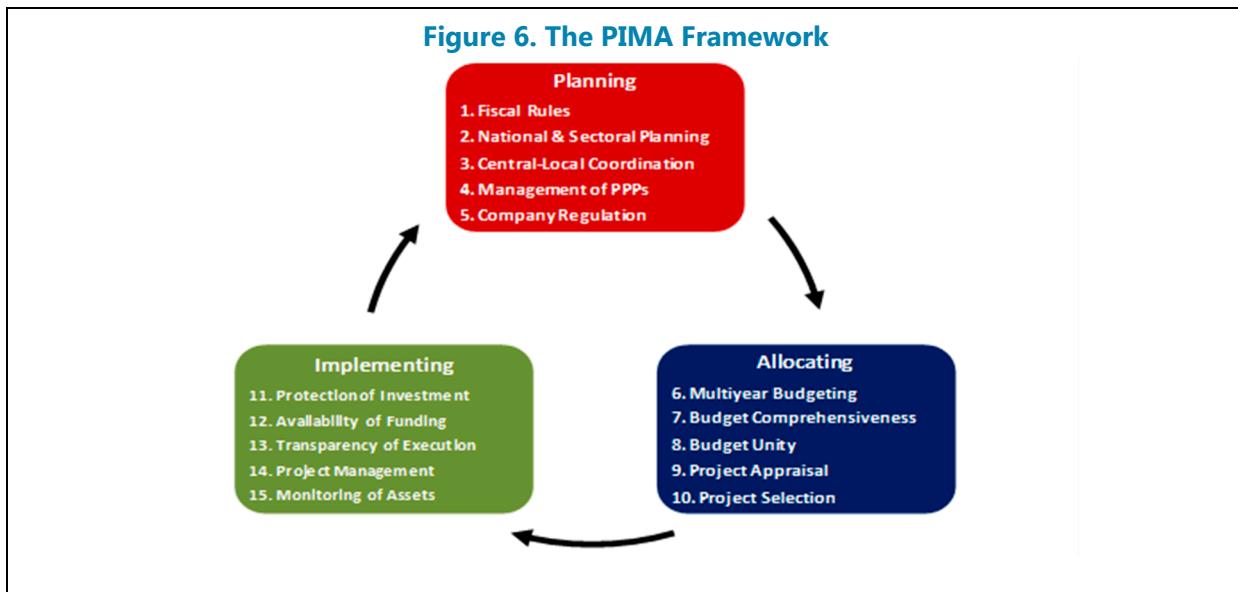
- i. **Planning** sustainable levels of investment across the public sector;
- ii. **Allocating** investment to the right sectors and projects; and
- iii. **Implementing** projects on time and on budget.

⁸ See (Albino-War, 2014) for a discussion of public investment in natural resource-rich MENA and CCA oil-exporting countries.

⁹ See IMF (2015) for a detailed description of the PIMA framework and the methodology used to generate the overall PIMA scores for countries.

¹⁰ See IMF (2014).

¹¹ Such as the Public Investment Management Index (Dabla-Norris and others, 2012) and the World Bank's "unified framework" (Rajaram and others, 2014).



15. The PIMA improves upon other evaluations of public investment management in a number of respects. The tool complements diagnostic tools on PIM developed by the World Bank and OECD, which have a more project cycle and governance focus respectively.¹² The PIMA is more comprehensive, bringing in elements related to macro-fiscal frameworks, integration of investment planning in medium-term budgeting, coordination of public investment across levels of government, and private sector participation in the provision of public infrastructure. The framework is also more relevant to countries at the higher end of the income scale, reflecting more advanced practices in the areas of fiscal principles, management of PPPs, project appraisal and selection, and monitoring of public assets. The tool was first applied in a recent IMF Board paper (IMF, 2015) on a representative sample of 25 advanced, emerging, and low-income countries.¹³

B. Applying PIMA to the G-20

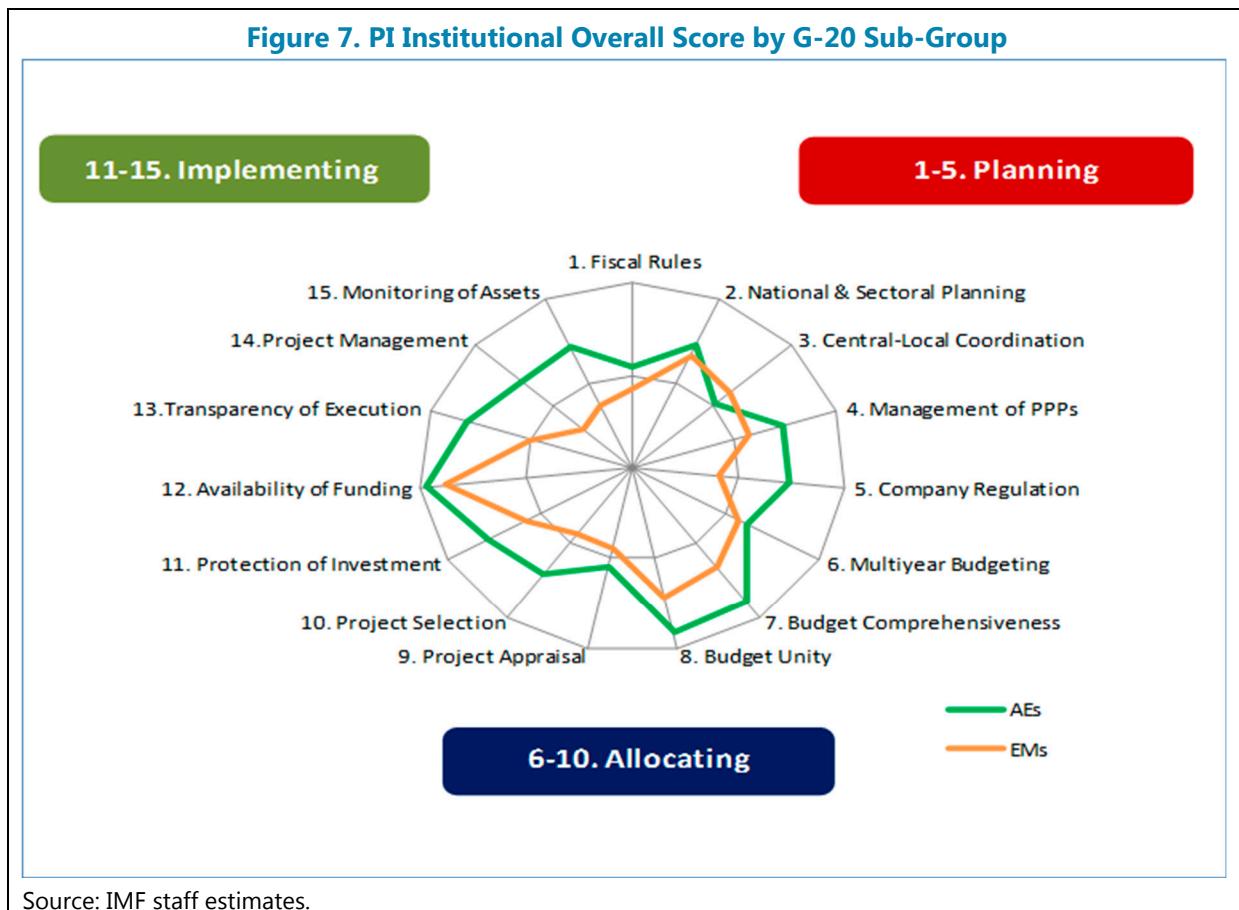
16. Applying the PIMA framework to the G-20 suggests that advanced economies have stronger PIM institutions than emerging markets overall, but with some interesting exceptions. The overall strength of PIM among G-20 countries is strongly correlated with income (Figure 7). Exceptions are national and sectoral planning, central-local coordination, and multiyear

¹² Consultations took place between IMF and World Bank (and OECD) staff at the technical level during the design of the instrument. Bank and Fund have since agreed to fully coordinate the further piloting and implementation of the PIMA in order to avoid any duplication of activities, and to participate in respective diagnostic missions and follow-up technical assistance missions.

¹³ The countries in the sample were selected to represent a broad range of countries in terms of income, geography, size, public investment levels, and public investment quality. They include seven AEs (Finland, Germany, Japan, Korea, Spain, the United Kingdom, and the United States); nine EMs (Algeria, Brazil, Chile, India, Jordan, the Philippines, Qatar, Romania, and South Africa); and nine LIDCs (Bolivia, Cambodia, Ethiopia, Ghana, Nepal, Niger, Senegal, Sri Lanka, and Uganda).

budgeting, where emerging G-20 countries score similar to or even better than advanced G-20 countries.

17. Institutional strength also tends to increase along the investment cycle, with planning institutions being the weakest and implementation the strongest. Yet, there are some important exceptions here too. Advanced G-20 countries are relatively strong in the management of PPPs, regulation of infrastructure companies, and budget comprehensiveness and unity. Emerging G-20 countries perform relatively poorly when it comes to project management and monitoring of public assets. Both G-20 AEs and EMs perform relatively poorly in fiscal rules and project appraisal.



IV. EXPLAINING PUBLIC INVESTMENT PERFORMANCE

18. This section relates the PIMA scores for the G-20 to four measures of public investment performance.¹⁴ These measures of public investment outcomes include indicators of the:

- **Efficiency of public investment** - measured by the PIE-X indicator of the infrastructure coverage and quality estimated in Section II.
- **Volatility of public investment** - measured by the standard deviation of GG investment growth.
- **Credibility of public investment** - measured by the absolute difference between budgeted and actual general government capital expenditure.
- **Integrity of public investment** – proxied by the International Country Risk Guide (ICRG) Corruption Index.¹⁵

19. Strong PIM institutions are linked to higher efficiency for the G-20 countries. Figure 8a shows the positive relationship between country PIMA scores and efficiency, which holds for both the 25 country representative sample evaluated in IMF (2015) and for G-20 countries specifically. As institutions get stronger, countries get more infrastructure “bang” for their investment “buck.”

20. Improvements in PIM can cut the public investment “efficiency gap” by about two-thirds in the G-20. On average, the G-20 countries face an efficiency gap of 22 percent. They could close 67 percent of the distance from the efficiency frontier (discussed in Section II) by adopting the PIM practices of the best performer.¹⁶ Improving PIM institutions would have the largest payoff in emerging markets where institutions are relatively weaker than in advanced economies.

21. G-20 countries with strong PIM institutions tend to have more stable levels of investment. Figure 8b shows that strong PIM institutions are associated with less volatile investment flows, even when corrected for income levels. Various studies emphasize the importance of avoiding stop-go investment policies, given the consequences for the cost, timeliness, and quality

¹⁴ These relationships hold even when corrected for income, which has a strong correlation with the four performance measures.

¹⁵ The ICRG Corruption Index is a general measure of perceived corruption in society. The higher the score, the lower is corruption.

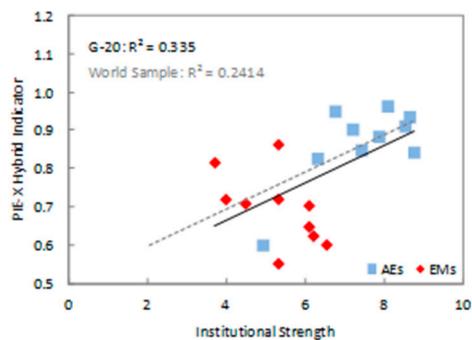
¹⁶ Regressions of efficiency on the overall PIM score, using the hybrid PIE-X indicator, suggest that an additional point in PIM overall score is statistically significantly associated with a 5 percent increase in PI efficiency. The result is consistent with other studies. For example, IMF (2014b) found that high public investment efficiency is generally associated with good institutional quality in oil-exporting countries.

of the resulting infrastructure assets.¹⁷ Rapid scaling up of investment, or efforts to use public investment for countercyclical purposes, have typically failed to deliver the desired impacts on growth, in part, due to the substantial inefficiencies generated in the process (Warner, 2014).

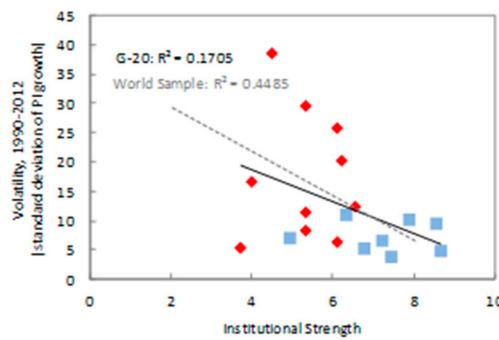
Figure 8. PIM Institutions and PI Performance Indicators

Strong PIM institutions are linked to higher public investment efficiency and lower volatility

a. Investment Efficiency to PIMA Score

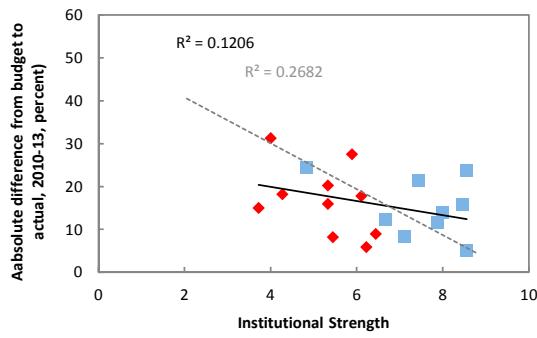


b. Volatility of Public Investment to PIMA Score

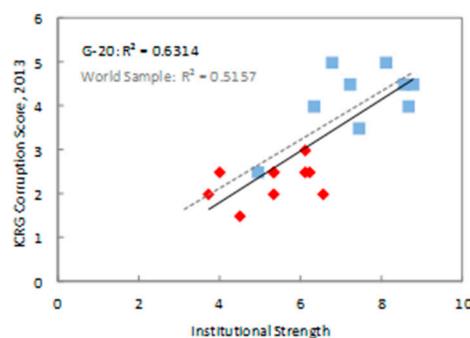


They are also linked to less deviation from the planned budget and higher integrity of government

c. Budget Implementation to PIMA Score



d. Corruption to PIMA Score



Source: IMF staff estimates; WEO.

22. G-20 countries with strong PIM institutions have more credible capital budgets. EMs tend to suffer from underexecution of their capital budgets due to overly optimistic assumptions about how soon projects can break ground, lack of funding, and weak implementation capacity. By contrast, AEs tend to overspend on large investment projects due to incentives for executing agencies to underestimate project costs and risks as a means of inflating benefit/cost ratios and securing project approval. Overall, both over- and underspending, relative to the approved capital budget decreases with stronger institutions (Figure 8c).

¹⁷ Stop-go investment policies were prevalent in the 1990s and early 2000s in many Latin American countries. See Perry, Servén, and Suescún (2008).

23. Strong PIM institutions are also associated with lower perceived levels of rent-seeking and corruption among G-20 countries. Public investment projects often provide lucrative opportunities for corruption and rent-seeking. Empirical studies have found corruption to be associated with higher overall levels of public investment and lower levels of public investment efficiency.¹⁸ Figure 8d shows a positive relationship between the strength of PIM institutions and perceptions of government integrity as measured by the ICRG Corruption Index. This result holds even when adjusted for income. Open, competitive, and transparent procedures for allocating and implementing public investment projects are particularly important in limiting opportunities for corruption.

V. STRENGTHENING PUBLIC INVESTMENT MANAGEMENT

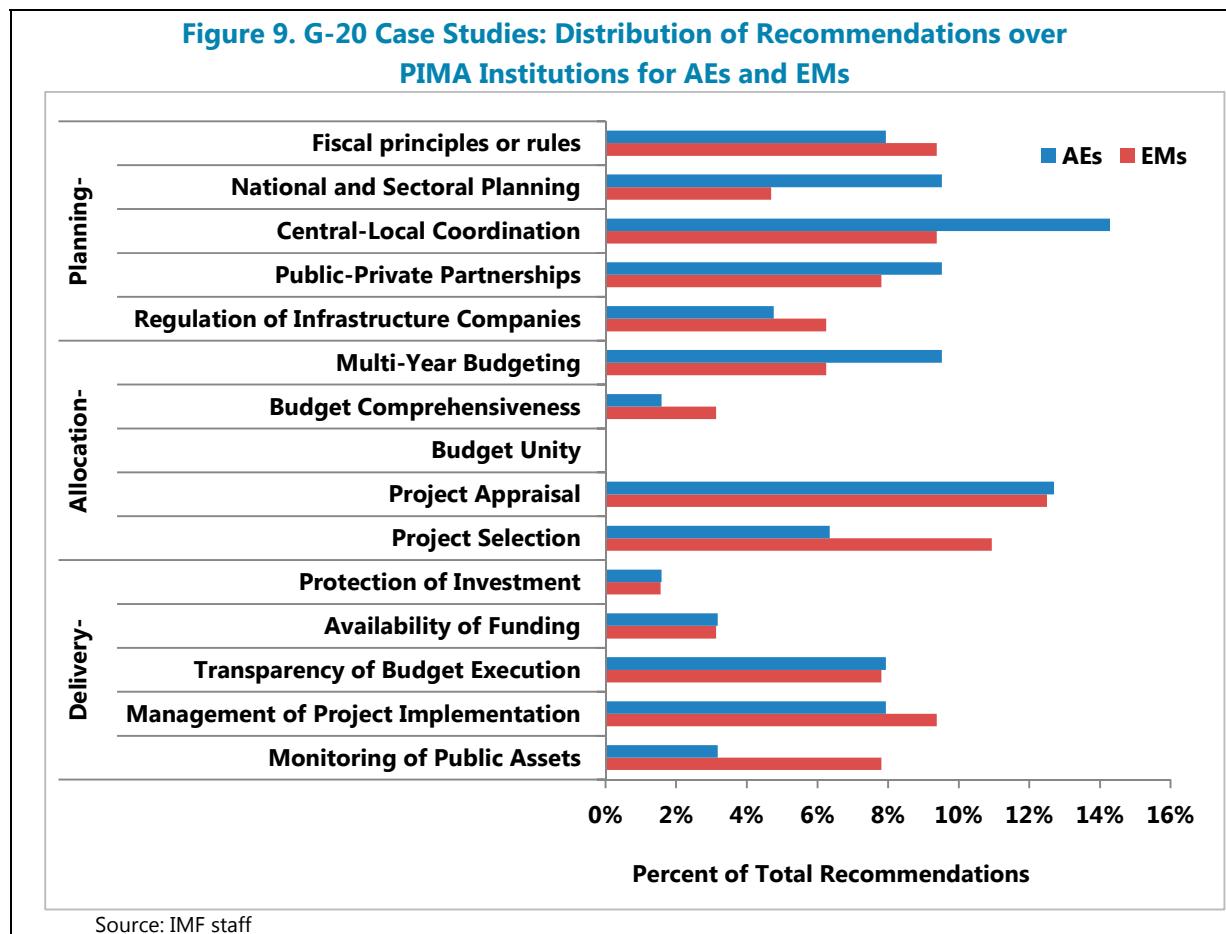
24. This final section identifies priorities for strengthening public investment management in the G-20. It is based on a set of case studies¹⁹ prepared by IMF staff and shared bilaterally with G-20 country authorities. Recommendations covered all three phases of the public investment management cycle and 14 of 15 institutions included in the PIMA framework (Figure 9).²⁰ The common themes emerging from these case studies are summarized below for advanced, emerging, and G-20 countries as a whole.

25. Most recommendations for institutional strengthening for the G-20 are in the planning area, fewest in the delivery area. This reflects the findings in Section IV about the relative strengths of G-20 countries in investment implementation (especially availability of funding and protection of capital appropriations) and relative weaknesses in investment planning (especially fiscal and budgetary planning and central-local government coordination). At the same time, two aspects of investment allocation (project appraisal and selection) also represent important areas for improvement.

¹⁸ Tanzi and Davoodi (1997) confirm anecdotal evidence that higher levels of corruption are associated with higher levels of public investment, lower levels of operation and maintenance expenditure, and a lower level of infrastructure quality. Abed and Gupta (2002) stress the impact on institutions and economic performance.

¹⁹ Each case study described institutions in accordance with the Public Investment Management Assessment tool, and included recommendations for improvement. The case studies have been shared only with each respective country and will not be otherwise circulated or published. This section summarizes the overall results of the case studies without disclosing the details of any one case study.

²⁰ The PIM institution “budget unity” which discusses joint planning and budgeting of recurrent and capital expenditure did not appear to be a significant issue in the G-20.



A. Advanced G-20 Countries

26. A key priority for advanced G-20 countries is to strengthen central-local coordination of public investment. Sub-national governments fund and implement a large share of public investment in many advanced economies. Coordination can improve sectoral prioritization, project selection and synergies, and can make implementation more efficient. Anecdotal evidence suggests considerable issues with duplication in regional strategies and lack of tie in with national priorities. Recommendations made include establishment of information sharing mechanisms during the planning phase, linking of regional and national strategic planning, formalization of discussion/negotiation process, and publishing of consolidated public investment plans of all levels of government.

27. Many advanced G-20 countries have opportunities for strengthening multi-year budgeting. G-20 AEs actually score weaker on this issue than AEs in the wider IMF study. Medium-term budgeting enables line ministries to better allocate funds and provides a baseline of spending over multiple years. More predictability of funding at the ministry level promotes development of a pipeline of approved projects, better prioritization among projects, and disclosure of the total costs of proposed and ongoing projects. Investment spending ceilings by sector or ministry, either indicative or binding, will provide discipline in planning and implementation.

28. Advanced G-20 could also improve national planning and the sectoral and regional guidance this provides. Investment planning in many advanced G-20 has been largely decentralized to sectoral ministries and regional authorities. That has positive implications for project planning and implementation. However, it can also lead to rigidity in sectoral allocation and lack of coherence between national and sectoral and regional prioritization.

B. Emerging G-20 Countries

29. Emerging G-20 countries need to establish clearer criteria and procedures for project selection. Few emerging G-20 countries publish selection criteria for projects, thus making it easier to bypass, and minimizing benefits from project appraisals. It means that projects can be parachuted into the selection process from the political level without adequate scrutiny and evaluation. Feedback from ex post project evaluations is useful to inform and refine the project selection process and criteria. Several emerging G-20 countries approve more projects than can realistically be financed, resulting in degraded implementation performance.

30. Emerging G-20 countries need to better monitor of their existing stock of infrastructure assets. Knowledge of the stock and condition of infrastructure is a precondition for determining infrastructure needs and maintenance requirements. While countries often have requirements for asset registers, the data are often not reliable, particularly in EM G-20 countries where sub-national governments play a substantial role in infrastructure provision. Accounting systems often do not cover nonfinancial assets. With valuations missing, asset management is basic at best and privatization processes are impeded. Appropriate accrual accounting procedures and estimates of depreciation in financial statements can be a good proxy for the amount of maintenance and capital replacement costs that should be planned for.

31. Project management and evaluation are bottlenecks in quite a few emerging G-20 countries, leading to delayed implementation and cost overruns. Project management capacity is often limited, not properly assigned or not properly overseen. Project implementation plans are not always developed prior to project approval, which, if done, would provide greater continuity between project design and implementation. Ex post evaluations of project management, outputs, and outcomes are also often overlooked even though they provide important inputs to planning, design, and appraisal of future projects. While ex post financial audits of projects should be done on a risk-based manner, emerging G-20 countries often do not have the criteria on when to audit a project and publish the results.

C. All G-20 Countries

32. All G-20 countries should look to make their fiscal frameworks more supportive of sustainable, stable, and adequate levels of public investment. Fiscal frameworks should protect investment spending against fiscal pressures in the near term—even if this is not always fully possible under tight financing constraints—and make investment flows less pro-cyclical and more fiscally sustainable in the longer term. The use of structural balance limits or investment floors,

coupled with firm ceilings on overall indebtedness has proven helpful in some countries. More predictable and stable levels of aggregate public investment support improved sectoral and major project planning, and ensure that recurrent spending shares in any consolidation efforts.

33. Most G-20 countries could strengthen the rigor and transparency of project appraisal.

This can be done, for example, through the adoption of standard project appraisal guidelines, more systematic use of cost-benefit analyses, and incorporation of risk assessments in project evaluation. Many G-20 countries conduct but do not publish project evaluations or cost-benefit analyses, which, if published, would provide an incentive to perform these studies in a more thorough manner and contribute to greater discipline in project selection. While many G-20 countries have devolved responsibility for project appraisals to line ministries, a central review or second opinion can ensure compliance with national priorities and comparability of project analyses across sectors. Feasibility studies conducted by external experts are often warranted in cases of large, complex, or politically sensitive projects.

34. Many G-20 countries are still struggling to make PPPs a cost-effective alternative to traditional budget financing of public infrastructure. Countries that have been successful in this area have published national strategies for the use of PPPs, select PPP projects based on value-for-money reviews by a dedicated PPP unit, and are guided by clear criteria for choosing between PPPs and traditional financing. PPP commitments should be systematically monitored, with overall limits on the accumulation of PPP liabilities, to minimize related fiscal risks.

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Annex I. The Public Investment Management Assessment (PIMA) Diagnostic

A. Basic Principles

The 15 public investment management institutions—and their key features—described in Section III.A provide the basis for a comprehensive evaluation of PIM practices in a sample of 25 countries. Each institution was assessed based on three indicators related to the key design features of that institution, resulting in a total of 45 indicators. The indicators were selected to characterize each institution, rather than as comprehensive descriptors of it.

Three possible scores were set for each indicator. The criteria for each score were intended to focus on key elements that contribute to PIM outcomes. While practices in a country rarely fit the scoring criteria exactly, the criteria provide valuable guidance to ensure that scoring is applied as consistently as possible. Scores were based on current practice. If current practice was very recently introduced, and thus had no opportunity to influence PIM outcomes to date, scores were calculated based on previous practice.

Criteria for each of the three possible scores within an indicator often accumulate key characteristics. In other words, the lowest score required the presence in a country of A, the next highest score required the presence of A and B, and the highest score required the presence of A, B, and C. Most indicators were intended to apply to all countries. In cases where B was not present, but C was, the middle score was given. A few indicators were not assumed to be present in every country. For example, a country that has not entered into any PPPs, and has no immediate plans to do so, was not scored on PPP-related indicators.

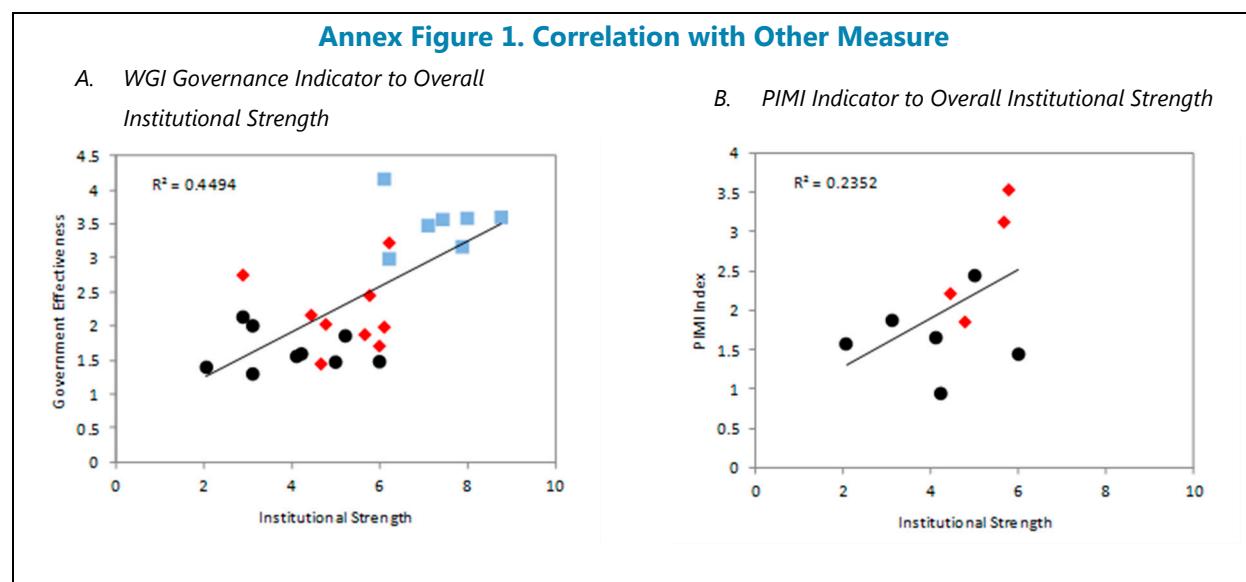
Institutions nominally in place are not equally effective across countries. For example, project appraisal procedures required by law, and reviewed by a dedicated unit in the Ministry of Finance, may be carried out better in Country X than in Country Y. In such cases, both countries would be scored equally if the project appraisal practices were broadly reasonable. However, if Country Y was nominally carrying out appraisal practices that were widely considered to be of low quality, the country would not be scored as if this practice was present. In short, the scoring was based on the assumption that practices were effective, and therefore present, unless there was clear evidence to the contrary.

The 45 indicator scores were aggregated using simple averaging. Averages were calculated for institutions, phases of the PIM process, countries, and classes of countries. If an indicator was judged to be inapplicable, as might be the case with PPP indicators, the indicator was removed entirely from the average calculation and thus affected the score only insofar as the total number of observations was reduced. Indicators and scoring criteria were designed with roughly equal weighting in mind.

Scoring was performed by the Fiscal Affairs Department (FAD) staff members with knowledge of public financial management practices in each country. The desk economist in the respective IMF country team reviewed the scoring for each country. Countries were consulted directly regarding any factual questions about particular institutions. An internal review to ensure consistency of scoring across countries was conducted.

B. Comparison with Other Indices

The above evaluation results are consistent with other measures of the strength of public institutions and investment management. The strength of PIM institutions, measured using the methodology described above, is highly correlated with wider measures of government integrity, such as the World Bank's Worldwide Governance Indicators (WGI) (Annex Figure.1.A).²¹ The results are also correlated with the Public Investment Management Index (PIMI) developed by the IMF and the World Bank for a range of emerging and low-income developing countries,²² although the overlap between sample countries is relatively low (Annex Figure.1.B). It also compares well to the conceptual framework for PIM developed by the World Bank.



²¹ A principal component analysis confirmed the correlations between our framework and WGI, but not the PIMI.

²² The PIMI was developed as a composite index of the efficiency of the public investment process for 71 EMs and LIDCs across four consecutive stages: project appraisal, selection, implementation, and evaluation. Each of the stages is made up of several individual components (17 in total).

C. The PIMA Questionnaire

A. Planning Sustainable Levels of Public Investment					
1. Fiscal principles or rules: Are there permanent fiscal principles or rules that support sustainable levels of capital spending?					
	1.a.	Is fiscal policy guided by one or more permanent fiscal principles, or rules?	There are no permanent fiscal principles or rules	Fiscal policy is guided by one or more permanent fiscal rules but they have not been adhered to over the last three years and there is no provision in the law allowing rules to be suspended in exceptional circumstances	Fiscal policy is guided by one or more permanent fiscal rules and they have been adhered to over the last three years or there is a provision in the law allowing rules to be suspended in exceptional circumstances
	1.b.	Do fiscal principles or rules protect capital spending over the short term or medium term?	Capital spending is included under a target or limit for the overall fiscal balance or aggregate expenditure	Capital spending is included under a target or limit for the overall fiscal balance or aggregate expenditure, but these are expressed in structural terms	Capital spending is excluded from a target or limit for the balance (Golden Rule) or expenditure (Operating Expenditure Rule) or there is a floor on the overall level of capital spending
	1.c.	Is there a target or limit for government liabilities, debt, or net worth?	There is no target or limit for government liabilities, debt, or net worth	There is a target or limit for government liabilities, debt, or net worth	There is a target or limit for government liabilities, debt, or net worth with an automatic adjustment mechanism when the target is not being met
2. National and Sectoral Planning: Are investment allocation decisions based on sectoral and inter-sectoral strategies?					
	2.a.	Does the government publish national and sectoral strategies for public investment?	No national or sectoral public investment strategies are published	Either a national public investment strategy or sectoral strategy is published	Both national and sectoral public investment strategies are published
	2.b.	Are the government's national and sectoral strategies or plans for public investment costed?	The government's investment strategies or plans include no cost information on planned public investment	The government's investment strategies include broad estimates of aggregate and sectoral investment plans	The government's investment strategies include costing of individual, major investment projects
	2.c.	Do sector strategies include measurable targets for the outputs and outcomes of investment projects?	Sector strategies do not include measurable targets for outputs or outcomes	Sector strategies include measurable targets for outputs (e.g., miles of roads constructed)	Sector strategies include measurable targets for both outputs and outcomes (e.g., reduction in traffic congestion)

3. Central-Local Coordination: Is there effective coordination of central and sub-national governments' investment plans?					
	3.a.	Are there limits on subnational government (SNG) borrowing?	There are no limits on SNG borrowing	SNGs may borrow only for investments	SNGs may borrow only for investment and within limits set by law
	3.b.	Is capital spending by SNGs coordinated with the central government?	Capital spending plans of sub-national governments are not submitted to central government nor discussed with central government	SNG capital spending plans are consolidated alongside central government investments, but there are no formal discussions between the central government and SNGs on investment priorities	SNG capital spending plans are consolidated alongside central government investments, and there are formal discussions between central government and SNGs on investment priorities
	3.c.	Does the central government have a transparent, rule-based system for making capital transfers to SNGs, and for providing timely information on such transfers?	The central government does not have a transparent rule-based system for capital transfers to SNGs	The central government uses a transparent rule-based system for capital transfers to SNGs, but SNGs are notified about expected transfers less than six months before the start of each fiscal year	The central government uses a transparent rule-based system for capital transfers to SNGs, and expected transfers are made known to SNGs at least six months before the start of each fiscal year

4. Public-Private Partnerships: Is there a transparent framework for the scrutiny, selection, and oversight of PPP projects?					
	4.a.	Has the government published a strategy for PPPs and issued standard criteria for entering into PPP arrangements?	There is no published PPP strategy or set of criteria for entering into PPP arrangements	A PPP strategy has been published, but there are no standard criteria to guide the choice between traditional financing and PPPs	A PPP strategy has been published and there are standard criteria to guide the choice between traditional financing and PPPs
	4.b.	Are PPPs subject to value for money review by a dedicated PPP unit prior to approval?	PPPs are not normally subject to value for money review	All or most PPPs are subject to value for money review but not by a dedicated PPP unit	All or most PPPs are subject to value for money review by a dedicated PPP unit
	4.c.	Is the accumulation of explicit and/or contingent PPP liabilities systematically recorded and controlled?	Explicit and/or contingent PPP liabilities are not systematically recorded and there are no overall limits for the accumulation of such liabilities	Explicit and/or contingent PPP liabilities are systematically recorded but there are no overall limits for the accumulation of such liabilities	Explicit and/or contingent PPP liabilities are systematically recorded and there are overall limits for the accumulation of such liabilities

5. Regulation of Infrastructure Companies: Is there a favorable climate for the private sector and SOEs to participate in infrastructure provision?					
	5.a.	Does the regulatory framework support competition in contestable markets for economic infrastructure (e.g., power, water, telecoms, and transport)?	Provision of economic infrastructure is restricted to domestic monopolies	There is domestic competition in some economic infrastructure markets	There is international and domestic competition in major economic infrastructure markets
	5.b.	Are there independent regulators who set the prices of economic infrastructure services based on objective economic criteria?	The prices for economic infrastructure services are generally set by the central government	The prices for economic infrastructure services are set by independent regulators, but the regulators do not have full organizational, financial and managerial autonomy	The prices for economic infrastructure services are set by independent regulators, and the regulators have full organizational, financial, and managerial autonomy
	5.c.	Does the government oversee the investment plans of infrastructure SOEs and monitor their financial performance?	The government does not review the investment plans and financial performance of infrastructure SOEs	The government reviews, but does not publish, a consolidated report on the investment plans and financial performance of infrastructure SOEs	The government reviews and publishes a consolidated report on the investment plans and financial performance of infrastructure SOEs

B. Ensuring Public Investment is Allocated to the Right Sectors and Projects					
6. Multi-Year Budgeting: Does the government prepare medium-term projections of capital spending on a full cost basis?					
	6.a.	Is capital spending by ministry forecasted over a multiyear horizon?	No projections of capital spending are published beyond the budget year	Projections of total capital spending are published over a three-five year horizon	Projections of capital spending disaggregated by ministry or program are published over a three-five year horizon
	6.b.	Are there multiyear ceilings on capital expenditure by ministry or program?	There are no multiyear ceilings on capital expenditure by ministry or program	There are indicative multiyear ceilings on capital expenditure by ministry or program	There are binding multiyear ceilings on capital expenditure by ministry or program
	6.c.	Are projections of the full cost of major capital projects over their life cycles published?	Projections of the cost of major capital projects are not published, or are only published for the budget year	Projections of the total cost of major capital projects are published	Projections of the total cost of major capital projects are published together with annual projections over a three-five year horizon

7. Budget Comprehensiveness: To what extent is capital spending undertaken through the budget?					
	7.a.	Is capital spending mostly undertaken through the budget?	Significant capital spending is undertaken by extrabudgetary entities with no legislative authorization or disclosure in the budget documentation	Significant capital spending is undertaken by extrabudgetary entities, but with legislative authorization and disclosure in the budget documentation	Little or no capital spending is undertaken by extrabudgetary entities
	7.b.	Are externally funded capital projects included in the budget documentation?	Externally funded capital projects are not included in the budget documentation	Externally funded capital projects are included in an appendix to the budget documentation	Externally funded capital projects are integrated into ministerial or sectoral investment budgets in the budget documentation
	7.c.	Is information on PPP transactions included in the budget documentation?	No information on PPP transactions is included in the budget documentation	Information on PPP transactions is included in supplementary information or in an appendix to the budget documentation	Information on PPP transactions is fully integrated into the tables on capital investment by ministry or sector in the budget documentation
8. Budget Unity: Is there a unified budget process for capital and current spending?					
	8.a.	Are capital and recurrent budgets prepared and presented together?	Capital and recurrent budgets are prepared by separate ministries and/or presented in separate budget documents	Capital and recurrent budgets are prepared by a single ministry and presented in a single document but without using a program classification	Capital and recurrent budgets are prepared by a single ministry and presented in a single document, using a program classification
	8.b.	Does the budget include appropriations of the recurrent costs associated with capital investment projects?	The budget does not include appropriations of the recurrent costs associated with investment projects	The budget includes appropriations of the recurrent costs associated with investment projects for the budget year only	The budget includes appropriations (or estimates) of the recurrent costs associated with investment projects for the budget year and the medium term
	8.c.	Does the budget classification and chart of accounts distinguish clearly between recurrent and capital expenditure, in line with international standards?	The budget classification and chart of accounts includes some recurrent expenditure in the definition of capital expenditure or some capital expenditure in recurrent expenditure	The budget classification and chart of accounts includes some capital expenditure in financing or some financing in capital expenditure	The budget classification and chart of accounts clearly distinguishes between recurrent and capital expenditures and financing, in line with international standards

9. Project Appraisal: Are project proposals subject to systematic project appraisal?

	9.a.	Are capital projects subject to standardized cost-benefit analyses whose results are published?	Capital projects are not systematically subject to cost-benefit analyses	Cost-benefit analyses are usually conducted for major projects but not systematically published	Cost-benefit analyses are conducted systematically for major projects and the results published
	9.b.	Is there a standard methodology and central support for the appraisal of projects?	There is no published methodology or central support for project appraisal	There is either a standard methodology or central support for project appraisal	There is both a standard methodology and central support for project appraisal
	9.c.	Are risks taken into account in project appraisals?	Risks are not systematically assessed as part of the project appraisal	A risk assessment covering a range of potential risks is included in the project appraisal, but budgets do not include contingency reserves to cater for possible cost overruns	A risk assessment covering a range of potential risks is included in the project appraisal and budgets include contingency reserves to cater for possible cost overruns

10. Project Selection: Are there institutions and procedures in place to guide project selection?

	10.a.	Does the government undertake a central review of major project appraisals before decisions are taken to include projects in the budget?	Project selection is largely made by the line ministry	Major projects are reviewed by Ministry of Finance (MoF) staff prior to inclusion in the budget.	All major projects are scrutinized by MoF staff with input from external experts prior to their inclusion in the budget
	10.b.	Does the government publish and adhere to standard criteria for project selection?	There are no published criteria for project selection	There are criteria published for project selection but projects are regularly selected without going through the required selection process	There are published criteria for project selection and generally projects are selected through a required selection process
	10.c.	Does the government maintain a pipeline of approved investment projects for inclusion in the annual budget?	Investment projects are included in the budget on an ad hoc basis	The government maintains a pipeline of approved investment projects but other projects may be selected for financing through the annual budget	The government maintains a comprehensive pipeline of investment projects, which is used for selecting projects for inclusion in the annual budget, and for the medium term

C. Delivering Productive and Durable Public Assets				
11. Protection of Investment: Are investment projects protected during budget implementation?				
	11.a.	Are total project outlays appropriated by parliament at the time of the project's commencement?	Outlays are appropriated on an annual basis	Outlays are appropriated on an annual basis, but information on total project costs is included in the budget
	11.b	Are in-year transfers of appropriations (virement) from capital to current spending prevented?	There are no limitations on virement from capital to current spending	The finance ministry may approve virement from capital to current spending
	11.c	Can unspent appropriations for capital spending be carried over to future years?	Unspent appropriations for capital spending lapse at the end of the year	Unspent appropriations for capital spending may be carried over within certain limits
12. Availability of Funding: Is financing for capital spending made available in a timely manner?				
	12.a.	Are ministries/agencies able to plan and commit expenditure on capital projects in advance on the basis of reliable cash flow forecasts?	Cash flow forecasts are not prepared or updated regularly and ministries/agencies are not provided with commitment ceilings in a timely manner	Cash flow forecasts are prepared or updated quarterly and ministries/agencies are provided with commitment ceilings at least a quarter in advance
	12.b	Is cash for project outlays released in a timely manner?	The financing of project outlays is frequently subject to cash rationing, leading to significant delays in project implementation	Cash for project outlays is sometimes released with delays, leading to some delays in project implementation
	12.c	Is external (donor) financing of capital projects integrated into cash management and the TSA?	External financing is largely held in commercial bank accounts outside the central bank's government accounts/TSA	External financing is held at the central bank's government accounts but is not part of a TSA

13. Transparency of Budget Execution: Are major investment projects executed transparently and subject to audit?					
	13.a	Is the procurement process for major capital projects open and transparent?	Few major projects are tendered in a competitive process, and the public has limited access to procurement information	Many major projects are tendered in a competitive process, but the public has only limited access to procurement information	Most major projects are tendered in a competitive process, and the public has access to complete, reliable and timely procurement information
	13.b	Are major capital projects subject to monitoring during project implementation?	Most major capital projects are not monitored during project implementation	For most major projects, annual project costs, as well as physical progress, are monitored during project implementation	For all major projects, total project costs as well as physical progress, are centrally monitored during project implementation
	13.c	Are ex post audits of capital projects routinely undertaken?	Major capital projects are usually not subject to ex post external audits	Some major capital projects are subject to ex post external audit, information on which is published by the external auditors	Most major capital projects are subject to ex post external audit information on which is regularly published and scrutinized by the legislature
14. Management of Project Implementation: Are capital projects well managed and controlled during the execution stage?					
	14.a.	Do ministries have effective project management arrangements in place?	Ministries do not systematically identify senior responsible officers for major investment projects and implementation plans are not prepared prior to budget approval	Ministries systematically identify a senior responsible officers for major investment projects, but implementation plans are not prepared prior to budget approval	Ministries systematically identify senior responsible officers for major investment projects, and implementation plans are prepared prior to budget approval
	14.b.	Has the government issued rules, procedures and guidelines for project adjustments that are applied systematically across all major projects?	There are no standardized rules and procedures for project adjustments	There are standardized rules and procedures for project adjustments that are generally applied but do not include a fundamental review and reappraisal of a project's rationale, costs and expected outputs	There are standardized rules and procedures for project adjustments that are applied systematically and if required include a fundamental review of the project's rationale, costs and expected outputs

	14.c.	Does the government systematically conduct an ex post review and evaluation of a project that has completed its construction phase?	Ex post reviews are neither systematically required, nor frequently conducted	Ex post reviews focusing on project costs, deliverables and outputs are sometimes conducted	Ex post reviews focusing on project costs, deliverables and outputs are conducted regularly, as are evaluations of project outcomes, in some cases
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15. Monitoring of Public Assets: Is the value of assets properly accounted for and reported in financial statements?

	15.a	Are surveys of the stocks, values, and conditions of public assets regularly conducted?	Asset surveys are conducted rarely or only on an ad hoc basis by external stakeholders	Asset surveys are conducted regularly by the government for some sectors or subsectors	Comprehensive asset surveys are conducted regularly by the government
	15.b	Are nonfinancial asset values recorded in the government balance sheets?	Balance sheets do not include non-financial assets	Balance sheets include some non-financial assets, which are revalued irregularly	Balance sheets include all or most nonfinancial assets, which are revalued regularly
	15.c	Is depreciation of fixed assets captured in government operating statements?	Depreciation of fixed assets is not recorded in operating statements	Depreciation of fixed assets is recorded in operating statements based on statistical estimates	Depreciation of fiscal assets is recorded in operating expenditures based on asset-specific depreciations