MEASURING THE CAPACITY AND CAPABILITY OF PUBLIC FINANCIAL MANAGEMENT SYSTEMS

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ABSTRACT

The objective of this paper is to measure the capacity and capability of public financial management (PFM) systems and to identify the resulting implications for PFM reform. Data envelopment analysis (DEA) is applied to the Public Expenditure and Financial Accountability (PEFA) framework and database of 69 country PFM systems to obtain estimates of PFM capacity and PFM capability. The results suggest that capacity and capability are negatively correlated. Econometric analyses of the resulting estimates of capacity and capability against PEFA core input dimensions indicate that popular interventions; such as improving budget classification schemes, introducing a multiyear perspective in budgeting, internal auditing, and other PFM reforms promoted by multilateral, bilateral and other agencies; could have differential and conflicting impacts on the capacity and capability of PFM systems. Accordingly, in order to achieve improved PFM performance, agencies may need to take account of the existing PFM capacity/capability configuration of respective PFM systems when designing programs for PFM reform.

Keywords *- Benchmark Reference Set, Capability, Capacity, Correlation, Performance, Public Expenditure and Financial Accountability (PEFA), Public Financial Management (PFM), Regression, Technical Efficiency*

INTRODUCTION

In a recent chapter on the roles, responsibilities, structure and evolution of central financial agencies (CFAs), Richard Allen and Phillip Krause (2013) make, what they consider to be, an important distinction between the capacity and capability of CFAs. They point out that most countries have focussed attention on strengthening capacity, with little influence on strengthening capability. According to Allen and Krause capacity refers to the volume or scope of inputs, such as human resources or IT systems. Capability is defined as relating to the efficiency of these inputs in achieving better performance through mechanisms such as clarifying roles and responsibilities in performing CFA functions; clarifying relations with line ministries, civil society groups, develop-

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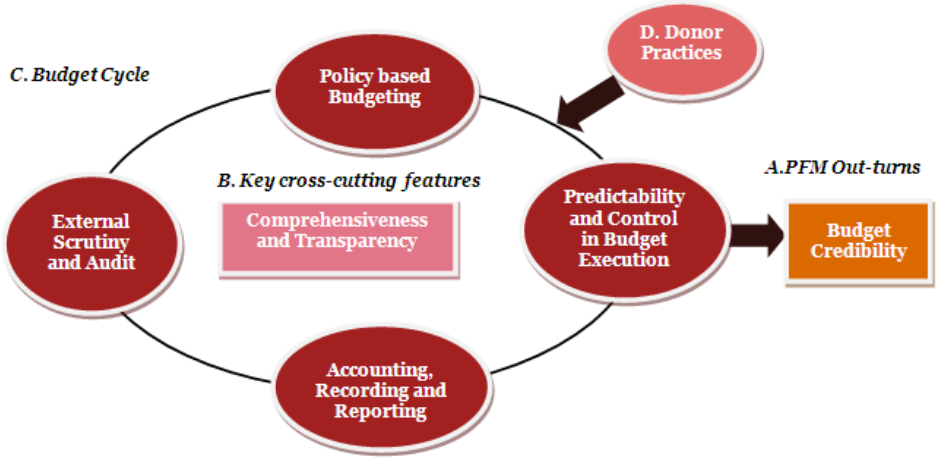
ment partners and other stakeholders; improving the management of internal business processes such as decision-making hierarchies, corporate planning and information systems; and strengthening the management of human resources and internal incentives. Performance is defined as the effectiveness of government in taking decisions on the budget and other financial issues and in executing financial policies. Allen and Krause further suggest that the two concepts, capacity and capability, are typically linked: when capacity is low, capability is also likely to be limited. However, they caution that this relationship does not hold in all cases: a weak configuration and/or organization of inputs and a high cost operating environment, perhaps also marked by institutional constraints such as a finance minister who lacks a power base within the government, may mean that when capacity is high, capability may be low. In other countries, the reverse situation of low capacity and high capability may arise: finance functions are well organized and professionally staffed and business processes are efficient, but outcomes are constrained by limited inputs.

The public financial management (PFM) system as conceived by the Public Expenditure and Financial Accountability (PEFA) secretariat is portrayed by figure 1.[1]

Figure 1: Core Dimensions of the PFM System



Following this model, the output or out-turn of the typical PFM system is *budget credibility* measured in terms of the following key indicators:

1. Aggregate expenditure out-turn compared to original approved budget;
2. Composition of expenditure out-turn compared to original approved budget;
3. Aggregate revenue out-turn compared to original approved budget; and
4. Stock and monitoring of expenditure arrears.

While Westcott (2008) suggests that the PEFA scores relate to the efficacy of PEFA processes and not the desired outcome of more effective and efficient public services, Pretorious and Pretorious (2008), note that PEFA has identified the critical dimensions of an open and orderly PFM system. These are:

1. Comprehensiveness and transparency;
2. Policy based budgeting;

3. Predictability and control in budget execution;
4. Accounting, recording and reporting; and
5. External audit and scrutiny.

The introduction of sound systems and procedures in these areas, according to Pretorious and Pretorious, should lead to dimension (6) budget credibility.[2]

In terms of the framework of Allen and Krause outlined above, these five critical dimensions would provide measures of the inputs of the PFM system while the output dimension, budget credibility would provide a measure of the performance of the PFM system. Capability of the PFM system would be measured as the ratio of the performance of the PFM system to best practice (or maximum attainable performance) given the existing configuration (volumes) of inputs. In other words capability refers to the technical efficiency of the PFM system. It follows that capacity of the PFM system can be calculated as the ratio of performance of the PFM system to capability. In terms of the PEFA model as outlined by figure 1:

Capability = Budget credibility/Budget credibility at best practice

Capacity = Minimum (Budget credibility/Capability, 100%), since capacity by definition cannot exceed 100%.

As well as *donor practices*, the PEFA secretariat also specifically mentions the countries legal framework and existing capacities within government as having a potential impact on PFM performance. Matt Andrews (2010) goes further, suggesting that exogenous factors potentially affecting the performance of PFM systems include country specific characteristics such as economic growth, stability, commitment to reform, political and institutional influences, and possibly colonial heritage. Likewise Paulo de Renzio (2009) highlighted factors such as the level of income, country size in terms of population and degree of aid dependency as having a measurable impact on the performance of PFM systems. However, in the present paper we heroically adopt the *ceteris paribus* (all else being equal) assumption and the implicit model of the PFM system portrayed in figure 1 where a PFM system's score on budget credibility is predominately a function of its performance or scores on the five input dimensions listed above.

The objective of the present paper is to measure the capacity and the capability of PFM systems by making use of the available PEFA database of national PFM systems and to outline the resulting implications for PFM reform, particularly for developing countries.

MEASURING THE CAPABILITY OF PFM SYSTEMS

Whiteman (2012) has provided estimates of the capability or relative technical efficiency of the 69 country PFM systems derived from the existing PEFA database. However these estimates are output oriented and based on an aggregation of the four key indicators of *budget credibility*. In the present paper the four key indicators of *budget credibility* remain separated and the measurement of the capability or relative technical efficiency of PFM systems is focussed on input efficiency.

The traditional radial efficiency measure focussing on input efficiency is defined as the minimal equi-proportionate reduction in all inputs which allows the production of given outputs.[3] Following Fare, Grosskopf and Lovell (1985), this input oriented measure of capability of PFM system k (k=1,...,69) is calculated as the solution (λ^*_k) to the following mathematical programming problem:

$$\text{Choose } z \text{ to minimise } \lambda$$

$$\text{such that} \quad y^k \leq \mathbf{Y}z$$

$$\text{and} \quad \mathbf{X}z \leq \lambda x^k$$

$$z \geq 0 \quad \text{and}$$

$$\lambda^*_k = \text{minimum value of } \lambda.$$

y^k represents a (4X1) vector of outputs (i.e. scores on the 4 key indicators of budget credibility) of the PFM system k with elements y_p^k (p=1,...,4). x^k is a (5X1) vector of PFM system k's inputs (i.e. scores on the 5 core input dimensions) with elements x_j^k (j=1,...,5). $\mathbf{Y}$ is a (4X69) matrix of the output (budget credibility key indicator) scores of all the PFM systems with elements y_k^i (i=1,...,69). $\mathbf{X}$ is a (5X69) matrix of the scores on the core input dimensions of all the PFM systems with elements X_j^i. z is a (69X1) vector of weights z_i to be determined. λ is a scalar value denoting the proportional reduction in all core input dimensions, holding relative input proportions and scores on the key indicators of budget credibility constant.[4]

The minimum value of λ that satisfies this mathematical programming problem (λ^*_k) is called the Farrell radial measure of technical efficiency (or PFM capability).[5] This represents the proportional reduction in the scores on the core input dimensions that could be achieved through adoption of best practices of the PFM systems in the sample.

DATA

Data on sixty-nine country PFM systems were derived from the *Public Expenditure and Financial Accountability (PEFA)* website[6] [7]. In the PEFA reports at this site, each key indicator is assessed against what is considered good or best international practice by PFM experts according to a 4-point calibration scale from A (highest) to D (lowest). However for the purposes of the present exercise, each of the PEFA indicator scores have been converted to a 4-point numerical calibration scale from 4 (highest) to 1 (lowest).[8] The score on each core input dimension is then calculated as the sum of the related PEFA indicator scores divided by the maximum possible score for the core dimension. In other words, the scores for the five input dimensions are expressed as percentages of what is perceived by PFM experts as good international practice.[9] The scores for each of the four key indicators of *budget credibility* are also expressed separately as percentages of what is perceived as good international practice. The resulting scores on the four key indicators of *budget credibility* and the remaining five core input dimensions for the sixty-nine PFM systems evaluated at a national level are provided in appendix II.

The descriptive statistics for the estimates of the core input dimensions and key indicators of *budget credibility* are summarised in table 1. These pretty much support the trends already noted by Paulo de Renzio (2009) and Matt Andrews (2010), namely that PEFA scores on average tend to be higher for the upstream budget formulation stages covered by the core (input) dimensions of *comprehensiveness and transparency* and *policy based budgeting* compared to the downstream budget execution stages covered by *predictability and control in budget execution*; *accounting, recording and reporting*; and *external audit and scrutiny*. Paulo de Renzio suggests a reason for this may be the overt focus of donors on aspects of budget formulation such as budget classification, macro-fiscal and medium term expenditure frameworks rather than integrated financial management systems (IFMIS).

Table 1: Descriptive statistics relating to PFM Systems

Symbol	Description	Mean (%)	Standard deviation	Mini-mum (%)	Maximum (%)
	Scores on core (input) dimensions				
X1	Comprehensiveness & transparency	66	14.2	38	97
X2	Policy based budgeting	65	13.1	33	86
X3	Predictability & control in budget execution	55	13.8	30	88
X4	Accounting, recording and reporting	57	16.1	25	100
X5	External audit & scrutiny	44	13.7	25	83
	Scores on key indicators of budget credibility				
Y1	Expenditure out-turn	67	24.0	25	100
Y2	Expenditure composition	58	25.5	25	100
Y3	Revenue out-turn	87	22.9	25	100
Y4	Expenditure arrears	54	28.0	25	100

SCORES ON CAPABILITY AND CAPACITY

The resulting scores on capability (λ^*_k), capacity (i.e. potential score on budget credibility at best practice) and existing performance (i.e. current score on budget credibility) along with the best practice reference sets identified (i.e. by non-zero weights z_i) are provided in appendix III. The descriptive statistics for capability, capacity and performance[10] are provided in table 2. Twenty-two of the 69 PFM systems scored maximum capability (i.e. 100%). This means that these PFM systems achieved a performance equivalent to their capacity given existing scores on PFM inputs.

Table 2: Descriptive Statistics

Statistics	Capability (%)	Capacity (%)	Performance (%)
Median	87.95	75.00	68.75
Mean	86.20	77.02	66.86
Minimum	55.65	43.75	31.25
Maximum	100.00	100.00	100.00
Standard deviation	13.13	15.46	14.58

As shown in table 3, while there is strong positive correlation between capacity and performance, there is negative correlation between the capability and capacity of the PFM systems.

Table 3: Correlation Matrix

	Capability	Capacity	Performance
Capability	1.0		
Capacity	-0.39	1.0	
Performance	0.27	0.76	1.0

The shaded rows in appendix III represent country PFM systems that have scored maximum capability based on the solution to the mathematical programming problem outlined above and the PEFA data for the 69 PFM systems.[11] These maximally capable PFM systems appear in the benchmark reference sets of the less capable PFM systems (i.e. with capability < 100%). The relative contribution of these twenty-two maximally capable systems to the benchmark or best-practice reference set of each of the remaining less capable PFM systems is measured by their respective weights (z_i) in the best practice or benchmark reference set. The number of occurrences of each of these maximally capable PFM systems in the benchmark reference sets of the less capable systems is summarised in table 4.

Table 4: Maximally Capable PFM systems

Country PFM system	Capacity (%)	Occurrences in benchmark reference sets (Number)
Montserrat	87.50	31
Burundi	68.75	20
Solomon Islands	68.75	16
Vanuatu	100.00	16

Madagascar	68.75	13
Indonesia	68.75	9
Kenya	81.25	7
Samoa	62.50	7
Sao Tome and Principe	56.25	7
Lao PDR	62.50	6
Mali	68.75	6
Democratic Republic of Congo	43.75	5
Belarus	87.50	4
Honduras	81.25	4
Mauritania	75.00	3
Senegal	68.75	3
Tonga	81.25	3
Timor-Leste	50.00	2
Benin	62.50	1
Dominican Republic	62.50	1
Niger	50.00	1
Rwanda	75.00	1

As shown in table 4 the maximally capable PFM systems do not necessarily have the highest capacity. The maximum capability score only implies that these PFM systems are making the best possible use of available PFM resources according to the mathematical programming model outlined above and the available PEFA database of PFM systems.[12]

The less capable systems are not making the best use of their available PFM resources according to this model and the available PEFA database. Norway, for instance, has performed at maximum capacity (100%) but with a capability score of 88.73% which is only marginally above the average score for capability in table 2. This indicates that the solution to the mathematical programming model was a hypothetical PFM system that could achieve the same performance as Norway but with lower scores on the core input dimensions. In other words, even though Norway has achieved maximum capacity according to the PEFA framework, these results are suggesting that Norway is still lacking in capability.[13]

DETERMINANTS OF PFM CAPABILITY AND CAPACITY

The results of regression analysis of the scores of the five core (input) dimensions against the estimates of capability and capacity are summarised in table 5.

Table 5: OLS Regression results*

Independent variables		Dependent Variables	
		Capacity	Capability
X1	Comprehensiveness & transparency	0.369	-0.434
		(3.039)	(-3.401)
X2	Policy based budgeting	0.395	-0.180
		(3.159)	(-1.369)
X3	Predictability & control in budget execution	0.139	0.344
		(0.995)	(2.334)
X4	Accounting, recording and reporting	0.235	-0.179
		(2.273)	(-1.650)
X5	External audit & scrutiny	-0.109	-1.146
		(-0.881)	(-1.123)
b	Intercept	10.772	124.010
		(1.451)	(15.883)
R^2	Coefficient of determination	0.583	0.360

*Figures in parentheses represent t-statistics.

These regression results suggest that PFM capacity is positively and significantly related to *comprehensiveness and transparency* while the capability of PFM systems is negatively and significantly related to the *comprehensiveness and transparency* of PFM systems as defined by the PEFA secretariat. In other words, according to the regression results, improvements in PEFA indicators PI-5 to PI-10 listed in appendix I will tend to increase PFM capacity while at the same time decreasing PFM capability or efficiency.[14] This implies that PFM reforms involved in moving to GFS/COFOG budget classification standards and/or improving budget documentation; reducing unreported extra-budgetary expenditure; improving the transparency of intergovernmental fiscal relations; and/or improving the monitoring and reporting of fiscal risks from subnational governments, autonomous government agencies and public enterprises would, according to the regression results in table 5, increase the capacity of PFM systems while, at the same time, reducing the capability of PFM systems. It is evident that these sort of PFM reforms would be better targeted at those country PFM systems that have exhibited below average capacity and above average capability in table 6.

Table 6: PFM Systems Capacity/Capability Configurations

	Country PFM Systems	
Above Average Capacity	Armenia, Bhutan, Botswana, Brazil, Burkina Faso, Columbia, Costa Rica, El Salvador, Georgia, Grenada, Jamaica, Jordan, Montenegro, Morocco, Paraguay, Peru, Serbia, South Africa, Trinidad & Tobago, Uganda	Belarus, Cape Verdi, Ethiopia, Honduras, Kenya, Mauritius, Moldova, Montserrat, Norway, Tonga, Tunisia, Ukraine, Vanuatu
Below Average Capacity	Afghanistan, Albania, Central African Republic, Cook Islands, Kyrgyzstan, Maldives, Pakistan, Seychelles, Sierra Leone, Yemen, Zambia	Benin, Bolivia, Burundi, Democratic Republic of Congo, Dominican Republic, Ghana, India, Indonesia, Kosovo, Lao PDR, Madagascar, Malawi, Mali, Mauritania, Mozambique, Nepal, Niger, Rwanda, Samoa, Sao Tome & Principe, Senegal, Solomon Islands, Tajikistan, Tanzania, Timor-Leste
	Below Average Capability	***Above Average Capability***

Policy based budgeting is significantly and positively related to capacity but, according to the regression results in table 5, does not appear to have any significant impact on capability. In other words, according to the regression results, improvements in PEFA indicators PI-11 and PI-12 listed in appendix I will tend to increase PFM capacity without affecting PFM capability. This implies that PFM reforms involved in improving the budget calendar and/or budget circular; budget approval processes; multi-year perspective; debt sustainability analysis; and/or linkages with sector strategies would improve capacity without affecting capability.[15] The country PFMs listed in table 6 with below average capacity and above average capability would also tend to benefit most from these reforms.

Table 7: Capacity/Capability Configuration of PFM Systems

	Capability		
Capacity	***Below average (%)***	***Above average (%)***	***Total (%)***
Above average (%)	29	19	***48***
Below average (%)	16	36	***52***
Total (%)	***45***	***55***	***100***

Predictability and control in budget execution is significantly and positively related to capability but, according to the regression results in table 5, does not appear to have any significant impact on capacity. In other words, according to the regression results, improvements in PEFA indicators PI-13 and PI-21 listed in appendix I will tend to increase PFM capability without affecting PFM capacity. This implies that PFM reforms involved in improving taxation policy, assessment, appeals mechanisms and collections and/or cash flow planning, monitoring and management; management of debt and guarantees; personnel database and payroll controls; and/or procurement would improve the capability without affecting the capacity of PFM systems. The country PFMs listed in table 6 with below average capability but above average capacity would tend to benefit most from these reforms.

Accounting, recording and reporting is significantly and positively related to capacity but, according to the regression results in table 5, significantly and negatively related to capability. In other words, according to the regression results, improvements in PEFA indicators PI-22 and PI-25 listed in appendix I will tend to increase PFM capacity while at the same time decreasing PFM capability. This implies that PFM reforms involved in improving frequency of bank reconciliation and/or availability of information about receipt of resources by service units; timeliness of in-year budget reports and/or annual financial statements would improve capacity and reduce the capability of PFM systems. The country PFMs listed in table 6 with above average capability but below average capacity would tend to benefit most from these reforms.

According to the regression results in table 5 *external audit and scrutiny* is not significantly related to either capacity or capability. Accordingly, improvements in PEFA indicators PI-26 and PI-28 listed in appendix I would have no significant impact on PFM capacity or PFM capability. This implies that PFM reforms involved in improving external audit and/or legislative scrutiny are unlikely to increase either the capacity or the capability of PFM systems.

Following the regression results in table 5, the differential impacts of the PEFA key input indicators in figure 1 on capacity and capability are summarised in table 8.

Table 8: Impact of Input Dimensions on Capacity and Capability

Significance	**Capacity**	**Capability**
Positive impact	B. Comprehensiveness and transparency; C(i) Policy-based budgeting; C(iii) Accounting, recording and reporting.	C(ii) Predictability and control in budget execution;
Negative impact		B. Comprehensiveness and transparency; C(iii) Accounting, recording and reporting;
Zero impact	C(ii) Predictability and control in budget execution; C(iv) External audit and scrutiny	C(i) Policy based budgeting; C(iv) External audit and scrutiny

SUMMARY AND CONCLUSIONS

According to the model outlined in this paper, PFM performance is a function of the capacity and capability of PFM systems. Performance is measured as the PEFA PFM scores on *budget credibility* for 69 country PFM systems. Capacity is measured as potential or best-practice performance and capability is measured as the technical efficiency of the PFM systems. Input based data envelopment analysis (DEA) is used to meas-

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ure the technical efficiency or capability of each of the 69 country PFM systems. Best-practice performance or capacity is then calculated as the PEFA score on *budget credibility* divided by capability. The results suggest that, overall, PFM capacity is negatively correlated with PFM capability. Multiple regression analyses are then carried out relating capacity and capability to the following five critical input dimensions of a PFM system identified in the PEFA database:

1. Comprehensiveness and transparency;
2. Policy based budgeting;
3. Predictability and control in budget execution;
4. Accounting, recording and reporting; and
5. External audit and scrutiny.

The regression results suggest that capacity is significantly and positively related to (1) *comprehensiveness and transparency*; (2) *policy based budgeting*; and (4) *accounting, recording and reporting* and that capability is significantly and positively related to (3) *predictability and control in budget execution*; and negatively related to (1) *comprehensiveness and transparency*; and (4) *accounting, recording and reporting* while (5) *external audit and scrutiny* does not appear to have a significant impact on either capacity or capability.

These regression results suggest that some of the more popular PFM reforms favoured by multilateral and bilateral agencies such as the World Bank and the IMF will have differential impacts on PFM capacity and PFM capability.[16] Hence the introduction of GFS/COFOG budget classification standards could simultaneously have a significant positive impact on PFM capacity and a significant negative impact on PFM capability. While the introduction of an MTBF may have a significant positive impact on PFM capacity, our results suggest that it will have negligible impact on PFM capability. On the other hand improvement in commitment controls, procurement procedures and/or internal audit could significantly improve PFM capability without affecting PFM capacity. While improvements in bank reconciliation, accounting systems, in-year budget reporting and annual financial statements, according to the regression results, may have a significant positive impact on PFM capacity, these improvements could, at the same time, have a significant negative impact on PFM capability. Finally, improvements in external audit and legislative scrutiny do not appear to have any significant impact on either PFM capacity or PFM capability as defined in this paper.

Given these regression results, there is a need to be aware of the PFM capacity/capability configuration in planning interventions or PFM reforms to improve PFM performance measured in terms of *budget credibility*. There would be little need to intervene, for instance, in countries exhibiting above average PFM capacity and above average capability. Interventions in respect of countries with above average PFM capacity but below average PFM capability should focus on improving the *predictability and control in budget execution* dimension, e.g.: commitment controls, procurement procedures, internal auditing etc. Interventions in respect of countries with below average PFM capacity but above average PFM capability should focus on improving the *policy based budgeting dimension* in the first instance, i.e.: introducing an MTBF etc. and later

looking at possible improvements in scores on the *comprehensiveness and transparency* dimension, e.g.: budget classification etc.; and the *accounting, recording and reporting* dimension, e.g. accounting systems etc. Interventions in respect of countries with below average PFM capacity and below average PFM capability would be advised to initially focus on improving capability by strengthening the *predictability and control of budget execution* dimension and then moving to improve PFM capacity by strengthening the *policy based budgeting*; *comprehensiveness and transparency*; and *accounting, recording and reporting* dimensions.[17]

Focussing on the *comprehensiveness and transparency* dimension initially could be counterproductive for countries with relatively low PFM capabilities as capability would be further reduced even though PFM capacity may increase.[18] One way of increasing the capability of PFM systems recently implemented by the World Bank, IMF and a number of other agencies is the promotion of benchmarking partnerships to improve the capability or efficiency, effectiveness and transparency of public expenditure management systems.[19] In April 2006 the World Bank, IMF and a number of other agencies sponsored the establishment of the Public Expenditure Management – Peer Assisted Learning (PEMPAL) networks with the objective of improving the efficiency, effectiveness and transparency of public expenditure management in the Central and Eastern European and Central Asian regions. Twenty-one countries are currently involved in these networks. PEMPAL members are able to benchmark their PFM systems against one another and form benchmark partnerships with other members.[20]

NOTES

1 PEFA Secretariat, PEFA Public Expenditure and Financial Accountability: Public Financial Management, Performance Measurement Framework', World Bank. Washington DC, June 2005.

2 Tommasi (2012) suggests that the budget will be credible only if it is implemented as initially planned without arrears generation. World Bank (2013, p.50) identifies budget credibility within the PEFA framework as an instrument for comparing budgeting and PFM systems across countries.

3 Briec, Cavaigneac and Kerstens (2010).

4 Whiteman (1999)

5 Farrell (1957)

6 http://web.worldbank.org/WBSITE/EXTERNAL/PEFA/0,,contentMDK:22687152~menuPK:7313203~pagePK:7313176~piPK:7327442~theSitePK:7327438,00.html

7 Shand (2013, p. 827) points out that the PEFA PFM performance assessment tool is now generally accepted as the international standard in assessing the quality of a country's PFM system.

8 The scale used is similar to the ranking schemes used by Mathew Andrews (2010) and Paulo de Renzio (2009) where, in order to facilitate comparisons, all PEFA scores have been converted to numerical values.

[9] Whiteman (2012)

[10] Performance is calculated as the aggregated PEFA score for budget credibility based on the key indicators of budget credibility

[11] Following Farrell (1957, p256), if additional PFM systems are introduced, this may reduce, but cannot increase the estimated capability (i.e. technical efficiency) of a given PFM system.

[12] As Farrell (1957, p 255) suggests, "…, it is far better to compare performances with the best actually achieved than with some unattainable ideal".

[13] There is need for caution in interpreting such conclusions. Shields (2013, p. 630) and Ossowski (2013, pp. 529-530) point out that, unlike many other countries, Norway has been a pioneer in managing resource revenues and being able to respond flexibly to fiscal shocks such as the global financial crisis.

[14] Fritz, Hedger and Lopez (2011) suggest that high levels of aid can involve 'negative side effects' on institutional capacity in fragile states. Our results summarized in table 8 suggest that the 'negative side effects' of PFM reforms mainly impact on institutional capability rather than institutional capacity.

[15] Diamond (2013) suggests that the introduction of advanced PFM reforms such as MTBFs and program budgeting too early may prove counterproductive. Schiavo-Campo (2009) notes that while there have been positive results from the introduction of MTEFs, the negative impacts have been much heavier. Tanberg and Pasevic-Skerlep (2009) on the basis of their analysis of PFMs in South East European countries conclude that the more advanced upstream reforms such as medium term budgeting and program budgeting have had very limited impact on PFM performance and may have shifted focus away from critical weaknesses in the annual budget processes.

[16] Wehmer and de Renzio (2013, p.90), for instance, note the possibility that some reforms designed to strengthen fiscal discipline in the budget process may have adverse effect on allocative and operational efficiency (i.e. PFM capability).

[17] Wehmer and de Renzio (2013, p.94) point to the obvious risk of 'reform overload' in environments that may have limited human and physical capacity (i.e. capability) to pursue comprehensive reform programs aimed at redesigning fiscal institutions.

[18] Brumby and Hemming (2013, p.223) point out that studies of individual country MTEF experiences suggest that for every country where it can be claimed that MTEFs have improved budget preparation and execution, there is another country where there has been no improvement and even a step backwards.

[19] http://www.pempal.org/data/upload/files/2013/02/pem-pal-strategy-2012-17_final_eng.pdf

[20] Potentially relevant benchmark partners are identified in appendix III.

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APPENDIX I: PFM High-Level Performance Indicator Set

Performance Indicators	Description
	A. PFM Out-Turns: Budget Credibility
PI-1	Aggregate expenditure out-turn compared to original approved budget
PI-2	Composition of expenditure out-turn compared to original approved budget
PI-3	Aggregate revenue out-turn compared to original approved budget
PI-4	Stock and monitoring of expenditure arrears
(i)	Stock of expenditure arrears
(ii)	Availability of data for monitoring the stock of expenditure arrears
	B. Key Cross-Cutting Issues: Comprehensiveness and Transparency
PI-5	Classification of the budget
PI-6	Comprehensiveness of information included in budget documents
PI-7	Extent of unreported government operations
(i)	The level of extra budgetary expenditure (other than donor funded projects) which is reported
(ii)	Income/expenditure information on donor-funded projects which is included in fiscal reports
PI-8	Transparency of inter-governmental fiscal relations
(i)	Transparent and rules -based systems in horizontal allocation among lower level governments of unconditional and conditional transfers (both budgeted and actual allocations)
(ii)	Timeliness of reliable information to lower level governments on their allocations for the coming year
(iii)	Extent to which consolidated fiscal data (at least on revenue and expenditure) is collected and reported for general government according to sector categories
PI-9	Oversight of aggregate fiscal risk from other public sector entities
(i)	Extent of monitoring public enterprises
(ii)	Extent of central government monitoring of sub-national governments' fiscal position
PI-10	Public access to key fiscal information
	C. Budget Cycle
	C(i) Policy-Based Budgeting
PI-11	Orderliness and participation in the budget process
(i)	Existence and adherence to a fixed budget calendar
(ii)	Guidance on preparation of budget submissions
(iii)	Timely budget approval by the legislature
PI-12	Multi-year perspective in fiscal planning, expenditure policy, and budgeting
(i)	Preparation of multi-year fiscal forecasts and functional allocations
(ii)	Scope and frequency of debt sustainability analysis
(iii)	Existence of sector strategies with multi-year costing of recurrent and development/investment expenditure

Performance Indicators	Description
(iv)	Linkages between investment budgets and forward expenditure estimates
	C(ii) Predictability and Control in Budget Execution
PI-13	Transparency of taxpayer obligations and liabilities
(i)	Clarity and comprehensiveness of tax liabilities
(ii)	Taxpayer access to information on tax liabilities and administrative procedures
(iii)	Existence and functioning of a tax appeals mechanism
PI-14	Effectiveness of measures for taxpayer registration and tax assessment
(i)	Controls in the taxpayer registration system
(ii)	Effectiveness of penalties for non-compliance with registration and declaration
(iii)	Planning and monitoring of tax audit and fraud investigation programs
PI-15	Effectiveness of collection of tax payments
(i)	Collection ratio for gross tax arrears being the percentage of tax arrears at the beginning of a fiscal year (average of the last two fiscal years)
(ii)	Effectiveness of transfer of tax collections to the Treasury by the revenue administration
(iii)	Frequency of complete accounts reconciliation between tax assessments collections, arrears records and receipts by Treasury
PI-16	Predictability in the availability of funds for commitment of expenditures
(i)	Extent to which cash flows are forecasted and monitored
(ii)	Reliability and horizon of periodic in-year information to MDAs on ceilings for expenditure commitment
(iii)	Frequency and transparency of adjustments to budget allocations, which are decided above the level of management of MDAs.
PI-17	Recording and management of cash balances, debt and guarantees
(i)	Quality of debt recording and reporting
(ii)	Consolidation of government's cash balances
(iii)	System for contracting loans and issuance of guarantees
PI-18	Effectiveness of payroll controls
(i)	Degree of integration and reconciliation between personnel records and payroll data
(ii)	Timeliness of changes to personnel records and the payroll
(iii)	Internal controls over changes to personnel records and the payroll
(iv)	Existence of payroll audits to identify control weaknesses and/or ghost workers
PI-19	Competition, value for money and controls in procurement
(i)	Evidence on the use of open competition for award of contracts that exceed the nationally established monetary threshold for small purchases (percentage of the number of contract awards that are above the threshold).
(ii)	Extent of justification for use of less competitive procurement methods
(iii)	Existence and operation of a procurement complaints mechanism
PI-20	Effectiveness of internal controls for non-salary expenditure

Performance Indicators	Description
(i)	Effectiveness of expenditure commitment controls
(ii)	Comprehensiveness, relevance and understanding of other internal control rules/procedures
(iii)	Degree of compliance with rules for processing and recording transactions
PI-21	Effectiveness of internal audit
(i)	Coverage and quality of the internal audit function
(ii)	Frequency and distribution of reports
(iii)	Extent of management response to internal findings
	C(iii) Accounting, Recording and Reporting
PI-22	Timeliness and regularity of accounts reconciliation
(i)	Regularity of bank reconciliation
(ii)	Regularity of reconciliation and clearance of suspense accounts and advances
PI-23	Availability of information on resources received by service delivery units
PI-24	Quality and timeliness of in-year budget reports
(i)	Scope of reports in terms of coverage and compatibility with budget estimates
(ii)	Timeliness of issue of reports
(iii)	Quality of information
PI-25	Quality and timeliness of annual financial statements
(i)	Completeness of financial statements
(ii)	Timeliness of submission of financial statements
(iii)	Accounting standards used
	C(iv) External Scrutiny and Audit
PI-26	Scope, nature, and follow-up of external audit
(i)	Scope/nature of audit performed (including adherence to auditing standards)
(ii)	Timeliness of submission of audit reports to legislature
(iii)	Evidence of follow up on recommendations
PI-27	Legislative scrutiny of the annual budget law
(i)	Scope of legislature's scrutiny
(ii)	Extent to which the legislative procedures are well established and respected
(iii)	Adequacy of time for the legislature to provide a response to budget proposals
(iv)	Rules for in-year amendments to the budget without ex-ante approval by the legislature
PI-28	Legislative scrutiny of external audit reports
(i)	Timeliness of examination of audit reports by the legislature
(ii)	Extent of hearings on key findings undertaken by the legislature
(iii)	Issuance of recommended actions by the legislature and implementation by the executive

APPENDIX II: Derived Scores on PFM systems

	Key Indicators of Budget Credibility				Core Input Dimensions				
PFM system	Expenditure outturn (%)	Expenditure composition (%)	Revenue outturn (%)	Expenditure arrears (%)	Comprehensiveness & transpa parency (%)	Policy based budg eting (%)	Predictability & control in budget execution (%)	Accounting, recording & reporting (%)	External audit & scrutiny (%)
Afghanistan (Jun 2008)	25	25	100	25	50	68	56	56	58
Albania (Jan 2012)	100	25	25	25	82	81	68	75	75
Armenia (Oct 2008)	75	100	100	75	80	84	72	56	50
Belarus (Apr 2009)	50	100	100	100	85	59	71	75	58
Benin (Sep 2007)	75	50	75	50	38	70	48	38	33
Bhutan (Jun 2010)	75	75	100	25	80	86	67	63	58
Bolivia (Oct 2009)	75	50	100	25	72	46	61	44	25
Botswana (Feb 2009)	50	50	100	25	67	66	50	69	50
Brazil (Dec 2009)	75	100	100	100	88	77	83	88	58
Burkina Faso (Jun 2010)	75	50	50	75	90	82	61	66	42
Burundi (Feb 2009)	75	75	100	25	50	51	32	31	25
Cape Verdi (Dec 2008)	100	75	75	75	70	73	60	53	42
Central African Republic (Jul 2010)	25	25	50	25	50	51	44	25	25
Columbia (Jun 2009)	100	75	75	25	78	81	67	69	67
Cook Islands (Aug 2011)	50	50	75	25	80	47	41	56	33
Costa Rica (Oct 2010)	75	100	100	50	97	78	62	75	67

Democratic Republic of Congo (March 2008)	25	25	100	25	50	33	30	44	33
Dominican Republic (Nov 2010)	50	50	75	75	55	61	63	56	25
El Salvador (May 2009)	50	75	100	75	77	61	76	84	42
Ethiopia (Sept 2010)	75	50	75	100	67	75	68	66	42
Georgia (Nov 2008)	25	50	100	75	75	78	52	56	50
Ghana (Jun 2006)	75	25	100	75	65	58	47	44	50
Grenada (Mar 2010)	25	50	75	50	65	54	50	50	42
Honduras (Apr 2009)	100	75	100	50	50	77	58	69	42
India (Mar 2010)	50	50	100	25	87	42	49	69	50
Indonesia (Oct 2007)	25	50	100	100	62	69	40	50	50
Jamaica (Jun 2007)	75	50	100	25	72	69	44	41	58
Jordan (Apr 2007)	100	25	100	25	77	78	75	53	67
Kenya (Mar 2009)	75	75	100	75	55	57	61	41	33
Kosovo (Mar 2009)	75	25	100	25	55	60	58	69	42
Kyrgyzstan (Dec 2009)	50	50	100	25	65	61	38	50	33
Lao PDR (Jun 2010)	75	25	100	50	40	51	40	38	42
Madagascar (May 2006)	75	100	25	75	70	73	51	34	33
Malawi (Jun 2008)	100	25	100	25	62	64	56	59	42
Maldives (Nov 2009)	75	25	25	25	70	50	39	56	25
Mali (Mar 2010)	100	75	75	25	50	75	51	41	42
Mauritania (Jun 2008)	50	75	100	75	43	80	44	41	42
Mauritius (Aug 2011)	75	25	100	100	68	70	78	100	50
Moldova (Jul	50	100	100	100	75	83	61	69	50

2008)									
Montserrat (Mar 2010)	100	75	100	75	55	42	44	50	25
Montenegro (Jul 2009)	75	50	100	25	60	66	65	75	50
Morocco (May 2009)	100	50	100	50	70	74	73	69	42
Mozambique (Feb 2008)	75	50	50	75	57	74	69	50	50
Nepal (Feb 2008)	75	50	100	25	50	57	46	53	25
Niger (Dec 2008)	50	100	25	25	47	54	47	31	42
Norway (Jun 2008)	100	100	100	100	85	81	88	66	67
Pakistan (Jun 2009)	25	75	100	25	70	73	50	66	33
Paraguay (Apr 2008)	50	75	100	50	58	65	47	56	50
Peru (Apr 2009)	75	50	100	50	90	80	71	66	67
Rwanda (Nov 2010)	100	25	100	75	75	70	74	41	67
Samoa (Apr 2010)	100	50	75	25	55	64	41	38	25
Sao Tome and Principe (Mar 2010)	50	25	100	50	58	34	39	25	25
Senegal (Jun 2011)	75	25	100	75	45	76	49	44	33
Serbia (Nov 2010)	75	100	50	75	63	75	64	100	42
Seychelles (Jun 2011)	50	50	50	75	65	67	63	53	33
Sierra Leone (Nov 2010)	75	50	50	25	65	46	48	75	42
Solomon Islands (Nov 2008)	50	75	100	50	40	42	30	38	42
South Africa (Sep 2008)	100	100	100	100	93	78	79	84	83
Tajikistan (Jun 2007)	75	50	100	50	58	55	39	50	33
Tanzania (Nov 2010)	100	25	50	50	55	51	49	47	50
Timor-Leste (Aug 2010)	25	100	50	25	50	48	42	50	33
Tonga (May 2010)	100	50	100	75	80	71	64	44	25

Trinidad and Tobago (Dec 2008)	75	50	100	75	82	60	62	63	33
Tunisia (Jun 2010)	75	50	100	100	78	69	78	72	58
Uganda (Mar 2008)	75	50	100	25	72	77	44	56	50
Ukraine (Mar 2007)	75	75	100	75	67	67	44	63	42
Vanuatu (Jul 2006)	100	100	100	100	58	60	46	69	33
Yemen (Jun 2008)	25	50	100	25	70	84	43	56	50
Zambia (Dec 2005)	50	25	100	25	47	65	42	53	58

APPENDIX III: Input oriented estimates of capabiliy, capacity, performance and benchmark reference sets

Country	Capacity (%)	Capability (%)	Performance (%)	Benchmark reference set (weights z_i)
Afghanistan	54.69	80.00	43.75	Lao PDR (1.0)
Albania	66.23	66.06	43.75	Mali (0.21), Samoa (0.23), Montserrat (0.56)
Armenia	100.00	82.47	88.50	Kenya (0.35), Burundi (0.22), Mauritania (0.03), Madagascar (0.29), Solomon Islands (0.27), Vanuatu (0.06)
Belarus	87.50	100.00	87.50	Belarus (1.0)
Benin	62.50	100.00	62.50	Benin (1.0)
Bhutan	100.00	60.41	93.75	Burundi (0.42), Lao PDR (0.05), Mali (0.14), Solomon Islands (0.33), Montserrat (0.09)
Bolivia	62.50	100.00	62.50	Burundi (0.60), Sao Tome & Principe (0.20), Montserrat (0.20)
Botswana	82.92	67.84	56.25	Burundi (0.41), Democratic Republic of Congo (0.12),Solomon Islands (0.48)
Brazil	100.00	79.44	93.75	Belarus (0.35), Indonesia (0.02), Madagascar (0.05), Vanuatu (0.51), Montserrat (0.10)
Burkina Faso	91.87	68.03	62.50	Madagascar (0.39), Vanuatu (0.41), Montserrat (0.05)
Burundi	68.75	100.00	68.75	Burundi (1.0)
Cape Verdi	90.93	89.35	81.25	Madagascar (0.18), Samoa (0.07), Montserrat (0.68), Rwanda (0.12)
Central African Republic	55.56	56.25	31.25	Burundi (0.25), Sao Tome and Principe (0.25)
Columbia	99.77	68.91	68.75	Burundi (0.02), Mali (0.24), Samoa (0.02), Montserrat (0.72)
Cook Islands	74.16	67.42	50.00	Burundi (0.15), Democratic Republic of Congo (0.13), Solomon Islands (0.16), Montserrat (0.32)
Costa Rica	100.00	72.81	81.25	Burundi (0.39), Timor-Leste (0.36), Solomon Islands (0.12), Vanuatu (0.09), Montserrat (0.21)
Democratic Republic of Congo	43.75	100.00	43.75	Democratic Republic of Congo (1.0)
Dominican Republic	62.50	100.00	62.50	Dominican Republic (1.0)
El Salvador	100.00	70.43	75.00	Solomon Islands (0.09), Vanuatu (0.09), Montserrat (0.83)
Ethiopia	79.74	94.05	75.00	Dominican Republic (0.04), Indonesia (0.34), Madagascar (0.03), Tonga (0.06),

				Vanuatu (0.57)
Georgia	83.26	75.07	62.50	Indonesia (0.37), Sao Tome & Principe (0.29), Solomon Islands (0.16), Vanuatu (0.07), Montserrat (0.11)
Ghana	72.29	95.10	68.75	Kenya (0.18), Indonesia (0.08), Madagascar (0.11), Sao Tome & Principe (0.34), Senegal (0.12), Montserrat (0.25)
Grenada	79.90	62.58	50.00	Kenya (0.05), Indonesia (0.04), Madagascar (0.03), Sao Tome & Principe (0.15), Solomon Islands (0.20), Montserrat (0.29)
Honduras	81.25	100.00	81.25	Honduras (1.0)
India	62.50	90.00	56.25	Democratic Republic of Congo (0.50), Montserrat (0.50)
Indonesia	68.75	100.00	68.75	Indonesia (1.0)
Jamaica	81.25	76.92	62.50	Burundi (1.0)
Jordan	80.25	77.88	62.50	Burundi (0.46), Samoa (0.46), Montserrat (0.19)
Kenya	81.25	100.00	81.25	Kenya (1.0)
Kosovo	61.87	90.91	56.25	Burundi (1.0)
Kyrgyzstan	67.75	83.02	56.25	Burundi (0.68), Democratic of Congo (0.32)
Lao PDR	62.50	100.00	62.50	Lao PDR (1.0)
Madagascar	68.75	100.00	68.75	Madagascar (1.0)
Malawi	72.29	86.46	62.50	Lao PDR (0.15), Honduras (0.15), Mali (0.15), Montserrat (0.59)
Maldives	45.98	81.56	37.50	Samoa (0.44), Montserrat (0.31)
Mali	68.75	100.00	68.75	Mali (1.0)
Mauritania	75.00	100.00	75.00	Mauritania (1.0)
Mauritius	86.69	86.52	75.00	Belarus (0.03), Vanuatu (0.97)
Moldova	99.49	87.95	87.50	Kenya (0.14), Mauritania (0.12), Indonesia (0.13), Madagascar (0.19), Solomon Islands (0.06), Vanuatu (0.51)
Montenegro	85.23	73.33	62.50	Burundi (0.13), Lao PDR (0.50), Honduras (0.02), Solomon Islands (0.18), Montserrat (0.17)
Montserrat	87.50	100.00	87.50	Montserrat (1.0)
Morocco	98.23	76.35	75.00	Lao PDR (0.04), Benin (0.19), Honduras (0.15), Mali (0.04), Montserrat (0.64)
Mozambique	72.05	86.74	62.50	Kenya (0.43), Senegal (0.45), Vanuatu (0.09)
Nepal	62.50	100.00	62.50	Burundi (1.0)
Niger	50.00	100.00	50.00	Niger (1.0)
Norway	100.00	88.73	100.00	Kenya (0.18), Indonesia (0.15), Madagascar (0.32), Senegal (0.01), Vanuatu (0.12), Montserrat (0.46)

Pakistan	75.00	75.00	56.25	Burundi (0.58), Montserrat (0.42)
Paraguay	87.26	78.79	68.75	Kenya (0.12), Burundi (0.28), Mauritania (0.10), Honduras (0.02), Solomon Islands (0.42), Montserrat (0.05)
Peru	100.00	55.65	68.75	Burundi (0.22), Lao PDR (0.28), Sao Tome & Principe (0.22), Solomon Islands (0.03), Montserrat (0.25)
Rwanda	75.00	100.00	75.00	Rwanda (1.0)
Samoa	62.50	100.00	62.50	Samoa (1.0)
Sao Tome & Principe	56.25	100.00	56.25	Sao Tome & Principe (1.0)
Senegal	68.75	100.00	68.75	Senegal (1.0)
Serbia	87.10	86.11	75.00	Timor-Leste (0.03), Niger (0.31), Vanuatu (0.67)
Seychelles	66.63	84.42	56.25	Madagascar (0.38), Tonga (0.03), Vanuatu (0.43), Montserrat (0.03)
Sierra Leone	72.37	69.09	50.00	Samoa (0.02), Montserrat (0.73)
Solomon Islands	68.75	100.00	68.75	Solomon Islands (1.0)
South Africa	100.00	79.33	100.00	Belarus (0.02), Indonesia (0.03), Madagascar (0.06), Vanuatu (0.81), Montserrat (0.13)
Tajikistan	75.22	91.39	68.75	Burundi (0.34), Solomon Islands (0.33), Montserrat (0.34)
Tanzania	56.94	98.78	56.25	Mali (0.13), Samoa (0.19), Montserrat (0.67)
Timor-Leste	50.00	100.00	50.00	Timor-Leste (1.0)
Tonga	81.25	100.00	81.25	Tonga (1.0)
Trinidad & Tobago	97.13	77.22	75.00	Madagascar (0.03), Sao Tome & Principe (0.06), Tonga (0.13), Montserrat (0.80)
Tunisia	88.44	91.87	81.25	Belarus (0.34), Indonesia (0.17), Madagascar (0.08), Vanuatu (0.31), Montserrat (0.17)
Uganda	85.71	72.92	62.50	Burundi (1.0)
Ukraine	92.17	88.15	81.25	Solomon Islands (0.47), Vanuatu (0.47), Montserrat (0.06)
Vanuatu	100.00	100.00	100.00	Vanuatu (1.0)
Yemen	70.93	70.49	50.00	Burundi (0.14), Democratic Republic of Congo (0.49), Solomon Islands (0.37)
Zambia	58.34	85.71	50.00	Solomon Islands (1.0)

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