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Performance Management in the Public Sector

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Government performance has been a global issue on the reform agenda of public administration for at least the past two decades. Performance management is now regarded as essential to good government, and there is a readily available literature of handbooks and texts that have translated the concept into a set of accepted proposals for implementation. What is performance management? Why has public sector performance management become so important at this time? What does experience reveal about its successes and failures? Where should we go from here?

Performance management may be defined as the use of performance measures in making management decisions. In the public sector, it is concerned with measuring the results of government activities in order to improve their performance. While efforts to measure the outputs and outcomes of government agencies, and concern with economy, efficiency and economy stretch back almost a century, the current emphasis on performance management has intensified the quest for incorporation of performance measurement into all aspects of public management (Hatry, 2006: 196).

This paper discusses the place of performance management and its implementation in the public sector. It begins with justifications for measuring performance, and the reasons for its current popularity, particularly related to the recent wave of government reform summarized under the heading of New Public Management. Public sector measures have been introduced into public agencies for a variety of purposes, but since a complete assessment of their implementation lies beyond a short paper, analysis here is restricted to two important areas of application: public budgeting and the management of contracts and networks.

The government of Korea is no stranger to performance management reform proposals, and has been involved in serious efforts to implement them as a key initiative in its government reform agenda since the mid-1990s. Yet, there are indications that despite these efforts, there has been little improvement in trust in government. An assessment of Korean government institutions, or even of its implementation of performance management, lies beyond the scope of this paper. Rather, its aim is to provide a general perspective that might be drawn on, in order to develop useful strategies in the specific Korean government situation.

Ⅰ.Reasons for Performance Management[1)]

During the 1980s and 1990s, many Western industrialized countries embarked on wide-reaching government reforms. Alarm at slowing economic growth, continuing public sector expansion, the apparent inability of governments to cope with unprecedented serious social and economic problems, and resistance to higher taxation despite persistent structural deficits, resulted in attacks on government, and calls for improved performance. This movement for reform differed from earlier efforts aimed at cutting waste, improving efficiency and productivity, and increasing transparency and accountability. Under the heading of New Public Management, it aimed additionally to increase managerial flexibility, responsiveness and autonomy, through devolution, decentralization and delegation, in order to improve productivity, results, and customer service.

1) This section of the paper and the one that follows draw on Gerald and Naomi Caiden, "Approaches and Guidelines for Monitoring, Measuring and Evaluating Performance in Public Sector Programmes," International Journal of Technical Cooperation, 4(Winter1998): 291-313. Reproduced in Korean Review of Public Administration, 3(No.21998): 7-42.

Further, the reforms were not merely organizational in nature, but directly targeted reassessment of the public sector, and whether its activities should continue to be carried out by government agencies, or should be privatized in one form or another.

The reforms followed a fairly uniform pattern. As part of a commitment to deregulation and smaller government, they stressed devolution (moving functions and services to lower levels of government), privatization, managerial decentralization, transparency, and customer satisfaction. All these were held to depend for credibility and accountability on measuring and assessing the results of programs. Deregulation demands evaluation of the effectiveness, costs and consequences of existing regulations, and monitoring of the effects of their elimination or replacement by alternative means of delivery. Devolution requires tracking of funds and monitoring their use. Contracting out of services demands standard setting, compliance monitoring, and measurement of performance. User fees require assessment of the real cost of services and their market value. Decentralization of management involves the loosening of traditional budgeting and personnel controls in the interests of managerial flexibility and autonomy; it thus implied managerial responsibility for results, which had to be measured. Where quasi-independent agencies are set up, run on essentially commercial principles, performance measures are essential to ensure that the agencies actually conform to the quantitative objectives that have been set out for them. Transparency and customer satisfaction require objective published standards so that the public can judge whether government agencies were performing satisfactorily and even doing a good job. The assumption that the performance of government could be measured underlay, and was key to the potential success of government reform.

Ⅱ. The Nature of Performance Measures

Performance measures are systematic quantitative or qualitative assessments over time of what an organization is doing, how well it is performing and the effects of its activities. It only seems reasonable that public organizations should know essential information about what they are doing. The language of performance measures reflects what should be a self-awareness, a conscious self-evaluation, and an understanding of why and how tasks are being carried out on behalf of the public. Performance measures thus include:

inputs, such as money, personnel, equipment, materials

workload or activity levels, such as applications processes, inventory levels, inspections carried out, students in class

outputs, such as the number of children vaccinated, miles of road built, tons of trash picked up, students graduated

outcomes of products or services, such as illnesses prevented, percentage of taxes collected, clean air levels achieved, accident free workplaces attained, poverty alleviated

productivity, such as cases conducted per case worker, applications processed per employee, emergency calls handled per dispatcher

costs, such as average costs to build one mile of highway, educate one child, maintain one public swimming pool or other public facility

customer satisfaction, such as numbers of complaints received, results of surveys, use of participative processes

service quality and timeliness, such as police response times, ability to access an agency, waiting time, compliance with transportation timetables, breakdown rates, service availability.

Where levels are specified for any measure, these constitute performance standards. Where reference is made to identifying and implementing the best practices in order to set out a standard for comparison for results and to enhance performance, this is known as benchmarking. When output is not directly measurable, proxies known as indicators may be used. Performance incentives may be used to assess individual performance to determine appropriate remuneration and reward productivity.

These measures are designed to assess the economy, efficiency and effectiveness with which a public organization delivers its services. Economy is concerned with the capacity of an organization to operate at the lowest possible cost, and may be assessed through input measures and comparisons through benchmarking. Efficiency is the relationship between inputs and outputs, i.e. using minimum inputs to achieve a given output, or gaining maximum outputs for a given level of input. Effectiveness delineates the success of programs and focuses on their results, as assessed through process measures relating to customer satisfaction and perceptions.

In concept, therefore, measuring performance appears relatively straightforward, but experience has shown many difficulties, first in devising and implementing useful performance measures, and second, in making use of the information they provide, i.e. managing performance. To gain a realistic understanding of performance measurement and management, it is therefore necessary to examine their assumptions.

Ⅲ. The Assumptions of Performance Measurement

There is no lack of literature explaining what performance measurement is supposed to do, but much less that analyses and evaluates its implementation. Although this literature outlines the variety of possible measures that might be used, it is biased in favor of measures of outcomes. Outcome measurement is seen as the highest form of performance measurement, and the level to which every public organization should aspire. Advocates of outcome measures assume that neutral, quantitative measures may be devised, and that data will be readily available to apply them. Outcomes refer not to the activities of the organization but to its impacts on society, economy and the environment. Thus, organizations are asked to measure changes in societal conditions, on the assumption that their programs are responsible for changes that have taken place.

Such assumptions are open to question. Frederickson and Frederickson note that in the normative literature, “there is no critical assessment of the assumption that baseline results or outcomes data are available or that such data can be efficiently and systematically gathered and processed”. (2006: 14) Measures also are open to choice and selection, and may “be more a function of data availability than data reliability or salience,” (2006: 15). In any case, the information measured may be interpreted quite differently by the agency officials themselves, and others. For some, the indicators show improved effectiveness; or others, they show how much still has to be achieved. Moreover, where the results of performance measurement show program overlap or duplication, this might well be because of policy decisions based on political considerations.

Developing meaningful program performance measures is not an easy task, and many agencies lack capacity and orientation to do so. Particularly in a time of budget constraint, skilled personnel, time and resources may be lacking for a demanding activity that does not contribute directly to the day-to-day operation of the organization.

Not all activities may be meaningfully quantified. Routine activities, such as processing of forms, picking up garbage, enrolling students, serving meals, carrying out inspections, are easily adapted to quantitative measures. At the other end of the scale, diplomacy, policy advice, negotiations, cultural activities, research, and many human services are not. Between is an area where performance measures would need to be applied along a variety of dimensions, because it is necessary to capture quality of service as well as quantity. In this area lie, for example, public health (air quality, control of contagious diseases, infant well-being); public safety (enforcement of traffic codes, clean streets, drug enforcement); education (curiosity, socialization, enjoyment development); and welfare (foster care, domestic abuse, job training and development, pre- and post-natal care). Such areas pose challenges for evaluation because they involve considerable variations in behavior and judgment that co-exist uneasily with standardized measures.

One of the most difficult issues in performance measurement is that of causation. Changes in social conditions – for example, declines in crime, improvements in health – may not necessarily be attributable to the results of government programs. For some programs, also, it may be difficult to demonstrate year-to-year gains, even though the long term picture might be quite different.

These difficulties should not be brushed aside, since the assumed ability to measure performance of government agencies accurately and realistically underlies the premise of performance management. Performance management assumes that it is possible to use the information derived from measured indicators to prioritize resources, to distribute rewards and sanctions to gain improved performance, to assure quality service to clients, to gain and maintain the trust of the public, and to ensure accountability in fragmented systems for delivering public services. For these purposes, efforts have been made to institutionalize processes to measure performance within specific frameworks.

Ⅳ. Frameworks for Performance Measurement

Performance measurement is about more than simply devising and implementing measures of performance. Its aims may be seen from the introduction to the Government Performance and Results Act, passed in 1993 by the United States Government.

The purposes of the GPRA are:

1. to improve the confidence of the American people in the capability of the Federal Government, by systematically holding Federal agencies accountable for achieving program results;
2. initiate program performance reform···setting program goals, measuring program performance against those goals, and reporting publicly on their progress;
3. improve Federal program effectiveness and public accountability by promoting a new focus on results, service quality, and customer satisfaction;
4. help Federal managers improve service delivery, by requiring that they plan for meeting program objectives and by providing them with information about program results and service quality;
5. improve congressional decisionmaking by providing more objective information on achieving statutory objectives, and on the relative effectiveness and efficiency of Federal programs and spending; and
6. improve internal management of the Federal Government.

These ambitious goals are implemented through a program performance evaluation process that follows what has now become a standard framework. Each agency is required to take the following steps:

· state its mission;
· set goals for its programs in line with that mission;
· set up indicators to measure performance in reaching those goals;
· measure the indicators;
· report progress.

Each agency must submit a strategic plan every three years, an annual performance plan together with their budget requests, and an annual performance report (now integrated with the financial report under the Chief Financial Officers Act). (Kamensky, 2005:46) The central budget office, the Office of Management and Budget (OMB) was made responsible for the process.

The process was taken further by the current administration in the form of a numerical rating system for program effectiveness, called the Program

Assessment Rating Tool. PART is a questionnaire used to rate programs. The aim was "to strengthen the process for assessing the effectiveness of programs by making it more rigorous, systematic, and transparent"(US Budget, FY 2004: Budget and Performance Integration: 5). It consists of approximately 30 questions about four areas of assessment, each of which carries a weighted score:

Key questions in the last section include:

· Has the program demonstrated adequate progress in achieving its long-term performance goal(s)?
· Does the program (including program partners) achieve its annual performance goals?
· Does the program demonstrate improved efficiencies or cost effectiveness in achieving program goals each year?
· Does the performance of this program compare favorably to other programs, including government, private, etc., with similar purposes and goals?
· Do independent evaluations of sufficient scope and quality indicate that the program is effective and achieving results?

Source: United States Federal Budget Fiscal Year 2005, Budget and Performance Integration and the Program Assessment Rating Tool

The questions are designed to be answered "yes" or "no" and require a brief narrative. The obligation is on the agency to prove that its programs are effective. Programs are rated as effective, moderately effective, adequate, inadequate, or unable to demonstrate results.

· *Effective*. Programs rated effective set ambitious goals, achieve results, are well-managed and improve efficiency.
· *Moderately Effective*. Programs rated moderately effective have set ambitious goals and are well managed, but likely need to improve their efficiency or address other problems in order to achieve better results.
· *Adequate*. These programs need to set more ambitious goals, achieve better results,

improvement accountability or strengthen their management practices.

Source: www.whitehouse.gov/omb/expectmore/perform.html

PART assessments are published on the OMB website (www.omb.gov), but in contrast to the first year, where answers to all the questions were published in full, only abstracts are now available on the Expect More website. The FY 2008 United States budget notes that to date about 977 programs (96 percent) have been assessed. Of these, 17 percent were found effective, 30 percent moderately effective, 28 percent adequate, 3 percent ineffective, and for 22 percent the results were not demonstrated.

Other countries have stressed contracts, along the lines of New Public Management, most comprehensively implemented in New Zealand. An example is Malaysia, which, according to a recent report by Anwar Shah, "has gradually and successfully put in place aspects of results-oriented management to create a responsive and accountable public sector governance structure." All public agencies are required to state their mission and values; a "clients' charter" requires specification of standards of services to form the basis of public accountability; an output-based budget system requires program agreements for delivery of outputs, while allowing managerial flexibility in achieving agreed upon results; performance indicators for government agencies and other service providers are maintained and widely disseminated; federal government functions have been decentralized and deconcentrated by strengthening local governments; a partnership approach, involving public-private collaboration, has been adopted for service delivery. (Shah, 2005: 224).

These and similar reforms are designed to ensure that performance information is regularly produced, and that it is used for decision making and management purposes. Performance measurement is intended to be an integral part of administrative processes, and to improve the performance of public agencies. A comprehensive and comparative assessment of how successful the reforms have been in achieving this transformation lies beyond the scope of this paper, but it is worth exploring their impact on two key aspects of public management: budgeting and the management of networks.

Ⅴ. Performance Management: Budgeting

One of the major justifications for measuring performance of government agencies is to use information about program results to assist in determining budgetary requests and allocations. Past outcome information should be used "to help agencies develop their budget requests…subsequent reviews of budget requests should look for evidence on whether the resources (funds and staffing) and activities requested are likely to lead to desired outcome levels" (Hatry, 2006:197). Efforts to integrate budgets and performance information are long-standing, but have met with difficulties in implementation.

One of the primary reasons for introducing PART in the United States was the failure to integrate budgets and performance under the GPRA. According to the United States FY 2004 Budget,

- Past and planned results were not shown with budget requests, let alone linked in a cost-and-results relationship.
- Program managers responsible for achieving results often did not control the resources they use or have flexibility to use them efficiently.
- Performance and cost data were recorded in separate systems and not integrated to provide timely, analytical feedback to decision-makers and managers.

Since then, all agencies have been required to integrate their performance results into their budget requests. Thus, according to Frederickson and Frederickson, "the fiscal year 2005 budget…was the first in history of bring together agency budget requests, PART evaluations of agency performance, and actual measures of program performance. With these data it is easy to tie the administration's budget request for a specific federal program to that program's performance…The linkage between agency and program performance and the administration's budget request is now an accomplished fact in the federal budget." (2006: 44) But this does not mean to say that budgetary decisions are made on the basis of this information.

All over the world, countries have been making efforts to implement performance budgeting. Quite apart from the difficulties in constructing performance measures, the major problem remains that of actually using performance information in the budget.2) Even in Malaysia, a poor connection between allocations and performance targets has been reported (Andrews, 2005:47). In several developing countries, such as Bolivia, Ghana, Tanzania, Thailand and South Africa, introduction of performance budgeting has not compensated or reformed dysfunctional budget practices, and informal norms have often undermined the reforms (Symposium on Budgeting and Financial Management and Reform Implementation, 2005)

Even if good information is available on performance results of government programs, the link between that information and resource allocation decisions is not straightforward. How should reported outcomes affect decisions on funding levels? If a program is doing badly, and showing few results, does this mean it should be terminated, or provided with more resources to do a better job? Conversely, if a program is achieving its objects, should it be provided with more resources, or should it be cut back, or its funding stabilized, on the grounds that its purpose has been achieved and it is no longer needed? What is the standard of value to decide whether a given sum of money is too little, too much, or just right to preserve a species, operate a system of trauma centers, or monitor or control contagious diseases? A program starved of resources for political reasons or because of budgetary constraints may be doomed to failure, irrespective of the worth of its purpose and the capability of its implementers. Further, the effort to generate performance data across the

2) This section is based on Naomi Caiden "An Exploration into the Familiar and the New: Public Budgeting in Developing Countries," in Erick Otenyo and Nancy Lind, *Comparative Public Administration: The Essentail Readings*, Amsterdam: Elsevier JAI, 2006: 681-700.

board for the whole budget every year may result in superficial measures which are of little use to decision makers, while at the same time overwhelming them with their detail and volume.

Underlying the problems of using performance information generated by government agencies to make decisions about resources is the political nature of public budgets. First, performance measures and rating systems may either be manipulated to accord with political agendas, or take second place in making budget decisions. Second, even where information on outcomes is available, it may be ignored in formulating or deciding upon budget requests. Third, effectiveness is not an entirely objective standard. Even if effectiveness is translated as "effectiveness in achieving a given goal", there is still the question of whether the goal is accepted. Fourth, assessment of outcomes may not help in one of the basic purposes of budgeting, which is to compare and prioritize expenditures, and determine how they should be financed. To summarize, quality information about performance should play a part in public budgeting, but even in the UnitedStates, this result seems questionable. A recent assessment of PART noted

> It is unclear how the PART scores impact budgeting decisions within OMB as there are no consistent patterns to follow. It is hard to determine whether the PART is measuring programs accurately, consistently and in a value-neutral way. Even if it achieves these, there has been little attention paid to the question of whether the PART is measuring the right kinds of outcomes (Radin, 2005: 125).

An insider noted with regard to the Office of Management and Budget

> OMB recommendations to the White House also have to take into account administration policy and preference, as well as knowledge of the relative strengths of interest groups and members of Congress. Thus, OMB cannot always reward the agency programs that show the best results. OMB cannot function effectively if it operates entirely as if it were in an ivory tower, able to consider only objective evidence of results…OMB's priority in the

> end is to support and help develop administration priorities. Usually that means supporting programs with good results – but not always and not routinely in any administration under any results-based management initiative (White, 2005: 289).

Similarly, when it comes to making priorities,

> Traditionally, the rigidities of agency, congressional committee, and OMB structure, coupled with the efforts of interest groups and program advocates, work against systematically comparing the results of similar programs in different agencies (White, 2005: 292-3).

There has also been little indication that congressional appropriators have paid attention to performance information, much less make decisions based on it. (Frederickson and Frederickson, 2006: 185)

Ⅵ. Performance Management: Accountability in Contracting and Networks

While efforts to implement performance budgeting are longstanding, the use of performance measures to ensure accountability where governments are not providing services directly is relatively new. In recent years, initially following the direction of New Public Management and then trends toward “networks”, performance measurement has taken center stage. Performance measures have been central to a “principal-agent” theory, according to which the “principals” (policy maker) and the “agents” (contractors, grantees) try to maximize their own interests. Since these interests do not (by definition) coincide, the principal has to devise means to ensure that the agent actually does serve the principal’s interest. This scenario may or may not represent the true situation. It is mentioned here, because it accounts for the interest in performance measures as a means for gaining and maintaining accountability where services are not provided directly by government bureaucracy.

There now appears to be a common pattern of government functions being carried out by "third parties," working within "networks". Third parties are "nongovernmental organizations and institutions carrying out public purposes using granted or contracted" government funds (Frederickson and Frederickson, 2006: 11). They may also include lower levels of government, using grants or mandates to carry out national policies. Networks are vertical complexes tied together by grants, contracts and regulatory requirements, in which managers are carrying out government-funded programs. Unlike bureaucratic departments, networks do not depend on hierarchies to implement policies, and the hierarchies "in charge" at the top may be relatively small. Instead, the use of contracts and grants "involves the administration or coordination of highly dynamic, interative patterns of mutual adjustment between parties in vertical network structures" (Frederickson and Frederickson, 2006: 12). In this environment, performance measures appear essential to ensure accountability.

It is unclear how far the network framework, or "third party government" described above has actually been implemented outside the UnitedStates. It certainly appears to fit the highly fragmented, federal structure of government in the U.S. and follows the prescription of New Public Management for greater administrative autonomy and decentralization. In this context, "performance management" means "managing on the basis of goal clarification and the measurement of the achievement of agency goals" (Frederickson and Frederickson, 2006: 45). How successful has it been?

As indicated earlier, most of the literature on performance management is prescriptive in nature, and relatively little research has been done on its actual working or effects. One recent detailed study of five health agencies in the United States, is doubtful about the use of performance measures in gaining accountability where third parties are the primary providers of services. Using the information provided by PART, which distinguishes among different kinds of programs (directed federal programs, competitive grant programs, block/ formula grant programs, regulatory-based programs, capital assets and service acquisition programs, credit programs, and research and development programs), the authors concluded that direct government programs achieved higher overall scores, particularly for management, than third-party based programs (except for R & D programs) (Frederickson and Frederickson, 2006: 66).

It is difficult to disentangle the potential of performance measurement for accountability from assessment of “third party” government, New Public Management, widespread contracting of government services, and the uses of federal networks. In the United States, the concept of accountability (never very clear) has become “stretched” in recent years to include “multiple accountability expectations and relationships” (Romzek and Dubnick, 1987), while the federal government itself is considered as having a “quite limited or indirect influence in determining whether a desired goal is achieved” (Frederickson and Frederickson, 2006: 28). If performance measurement is regarded as one way for a government to reassert its influence in such an attenuated set of relationships, is it an adequate tool, given all the problems in constructing and implementing valid measures for policy outcomes? The study suggests that while performance measures may not increase formal accountability in the usual sense, they may assist in clarifying and integrating the goals of the federal government and those it is funding to carry out its policies.

Ⅶ. Where Now?

It is easy to be over-optimistic or over-skeptical regarding performance measures and performance management. On the side of optimism are the large number of texts and manuals providing advice on how useful performance measures may be produced and implemented (see, for example, Wholey, 2006). At its best, this literature is sober, practical and realistic, explaining both the uses and limitations of performance information, and emphasizing its role as a part of management, rather than a purely technical activity. On the side of skepticism are the difficulties in constructing and implementing meaningful performance measures, problems in interpreting and using the information, issues of political manipulation, and disappointment that performance management has not fulfilled its promise in the context of New Public Management.

Performance measures, to quote a recent manual, may be used in a number of ways:

1. Help fulfill elected officials' and the public's demands for accountability.
2. Help formulate and justify budget requests.
3. Help allocate resources throughout the year.
4. Trigger in-depth examinations of why performance problems (or successes exist).
5. Help motivate personnel to continue improving the program.
6. Formulate and monitor the performance of contractors and grantees (performance contracting).
7. Provide data for special, in-depth program evaluations
8. Support strategic and other long-term planning efforts…
9. Analyze options and establish priorities.
10. Communicate better with the public to build trust and support for public services.
11. Above all, help provide services more effectively (Hatry, 2006: 196).

But this list only describes the potential uses of performance measurement, and does not promise that merely setting up and monitoring a group of performance indicators will necessarily bring about transformation of government. Nor does the list favor any single kind of performance measure – rather measures need to be devised to relate to the kind of activities involved and the purpose for measuring them.

In the current fashion for adopting performance measures as the foundation for management, there appear to be several misconceptions.

1. Valid quantifiable performance measures may be constructed for all public agencies, and can capture all aspects of activities. It is not possible to quantify everything, and sometimes the more important elements may not be quantifiable in a meaningful way.
2. Outcome measures are the only really important measures. While they are undoubtedly useful in many contexts, other, often simpler, performance information may be more appropriate
3. Performance information can be carried out as part of regular activities. The collection

of information, particularly regarding outcomes, on a regular basis is not costless, and where data is not readily available, may be quite difficult

4. Performance measures are entirely neutral and objective, quite apart from the interests and concerns of those who construct them. The measures chosen will very much influence the kinds of information collected, and what it will show. Rating systems may be particularly misleading, since they weight and aggregate information in a subjective way.
5. Performance information will provide “answers” as to what actions should be taken regarding expansion, downsizing, or elimination of specific activities. It is usually only one element in such policies, and does not by itself provide guidance in priority setting.
6. Performance management can substitute for accountability, particularly where activities are carried out indirectly. By itself, it is a weak foundation for accountability, particularly where only outcome measures are relied upon.
7. Performance management is non-political, concerned only with efficiency and effectiveness on a business management model. Performance management in the public sector, like any other form of management, cannot be abstracted from politics, and can only be one element in political judgments. It risks either being ignored or manipulated for political reasons.

All of this does not mean that measuring many aspects of performance is necessarily without value. One recent observer has noted performance measurement that had “a lot to offer public managers, government employees, elected officials, and the public at large when it is implemented by people who are well trained and believe in it. However, in most instances, this is not the case.” He concludes that performance measurement may not be successful because of failure to take into account “human behavior, the nature of government agencies as institutions, and the shaky assumption at the heart of performance measurement that studying the past is a sure way to navigate into a better future” (Halachmi, 2005: 266).

In short, those wishing to implement performance management should proceed with caution, avoid fads and fashions, and use common sense, good judgment and the lessons of experience to match reforms to purposes.

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Naomi Caiden: California State University에서 정치학과 교수로 재직하고 있다. 성과관리와 재무행정에 관심을 가지고 연구하고 있으며, 주요 저서로는 Wildavsky와 공저를 한 「The New Politics of the Budgetary Process」등이 있고, 주요 논문으로는 Public Budgeting amidst Uncertainty and Instability 등이 있다(ncaiden@calstatela.edu).