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# Republic of the Philippines

## Basic Education Public Expenditure Review Phase II

### School Based Management in the Philippines: An Empirical Investigation

June 10, 2013

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## ABBREVIATIONS AND ACRONYMS

3D-SFSD	3 Division SBM Field Survey Database
AIP	Annual Improvement Plan
ALS	Alternative Learning System
ANOVA	Analysis of Variance
AusAID	Australian Agency for International Development
BEIS	Basic Education Information System
BEPER	Basic Education Public Expenditure Review
BESRA	Basic Education Reform Agenda
BFI	Big Five Inventory
COA	Commission on Audit
CPI	Consumer Price Index
D-LEAPS	DepED Learning Equity and Accountability Program Support
DepED	Department of Education
EFA	Education For All
GDP	Gross Domestic Product
IRA	Internal Revenue Allotment
JBIC	Japan Bank for International Cooperation
K+12	Kindergarten Plus 12 Years of Basic Education
KRT	Key Reform Thrusts
LGUs	Local Government Units
MOOE	Maintenance and Other Operating Expenses
MPS	Mean Percentage Score
MTEF	Medium Term Expenditure Framework
NAT	National Achievement Test
NCBST	National Competency Based Standards for Teachers
NCR	National Capital Region

NGO	Non Governmental Organizations
NPSBE	National Program Support for Basic Education
PARDO/SARDO	Pupils/Students at Risk of Dropping Out
PCR	Pupil Classroom Ratio
PER	Public Expenditure Review
PFM	Public Financial Management
PHP	Philippine Pesos
PIDS	Philippine Institute of Development Studies
PISA	Program for International Student Assessment
PSI	Political Skills Inventory
PTCA	Parent Teacher Community Association
PTR	Pupil Teacher Ratio
RA	Republic Act
RDBMS	Relational Database Management Systems
SABER	Systems Approach for Better Education Results
SARO	Special Allotment Release Order
SBM	School Based Management
SBRMS	School Based Repair and Maintenance Scheme
SEF	Special Education Fund
SGC	School Governing Council
SIP	School Improvement Plan /School Improvement Process
SPHERE	Support for Philippine Basic Education Reform
STRIVE	Strengthening Implementation of Visayas Education
TEEP	Third Elementary Education Project
TIMSS	Trends in International Mathematics and Science Study
NPSBE	National Program Support for Basic Education

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## Executive Summary

### Motivation and Objectives for the Study

The main objective of this study is to provide a rigorous empirical understanding about the current status of School Based Management (SBM) and the relationship between SBM and learning outcomes in the Philippines with a view to identifying the pathways to improving SBM implementation for improved student achievement.

### Main contributions of the Study

The study makes three potentially important contributions to the policy analysis in support of the implementation of Basic Education Sector Reform Agenda (BESRA) in general and SBM in particular.

*Construction of the BEIS-NAT Panel Database for 2005-2010:* Data from the annual school census was collected and stored in thousands of separate MS-Excel spreadsheets. Researchers from the study team have painstakingly put together a linked database for six years of over 2,500 variables for 38,000 public elementary schools and 7,200 public high schools. This carefully documented database is being provided to DepED to use for policy analysis not only for SBM but for many other programs.

*Methodology for policy analysis of SBM:* Better evidence based policy design and implementation requires both good data and a robust technical method. The study extends the current check list based method of measuring the implementation of SBM in new ways through innovations in the data collection instrument and in multi-variate analysis. The study will help to generate awareness about the usefulness of these methods as well as basic knowledge about their applicability.

*Findings from analysis of SBM:* The study has uncovered a number of interesting and useful insights into the application of SBM and the allocation of resources at the school level. Some of these findings are mentioned here: The study provides rigorous empirical evidence that SBM does indeed lead to improved school performance, so the focus and attention on SBM appears justified. The study indicates that resources at the school level are still a very small proportion of total educational resources, indicating that decentralization has a long way to go. Furthermore, measurable leadership skills of school principals are important to the implementation of SBM.

### Three Key Research Questions addressed by the Study

**Question 1: Does SBM lead to improvement in student achievement? What is the causal relationship between SBM and student achievement results, if any?** What factors underlie the different levels of impact of SBM? What is the magnitude of SBM impact on test scores? Does school autonomy and accountability lead to improved performance in terms of standardized student assessment? How have SBM interventions been targeted in the past? How has student achievement changed in general and how can we attribute changes in student achievement to SBM in particular? Can we determine how SBM implementation can be modified to improve student learning outcomes? What kind of effect does time have on implementation of SBM? Is there any evidence that with learning regarding SBM implementation, the impact may have deepened over time?

**Question 2: How has the resource situation at the school level changed in recent years? What is the financial resource situation of schools and what use is made by schools of SBM grants?** What resources are schools able to mobilize in addition to DepED transfers? Does the SBM grant act as a catalyst for the school to access other resources? What uses are made by the school from existing sources? What is the variation in pattern of uses from different sources? What is the relationship between resource allocation and school performance and what can be done to improve the efficiency and equity of resource allocation? What has been the resource allocation trend in the past few years? What do we know about the equity of resource allocation across schools? What factors contribute to inequality in resource distribution? What is the role of Local Government Units (LGUs) in supplementing the financial resources available to schools?

**Question 3: What is the association between Principal Leadership, SBM implementation and student achievement?** What association, if any, exists between principal personality and leadership styles and school performance? What is the level of political skill of principals? Can some patterns in relationships be discerned between school performance and principal political skills? Is there an effect of personality type on SBM implementation and school performance? What are the beliefs of the school principals and the heads of school governing councils (SGC) regarding the various SBM related measures required for improved school performance? What is their belief regarding the implementation of those measures? What is the association between principal characteristics and the resource situation in schools?

### Main Findings and Policy Conclusions

**1. SBM is indeed associated with better school performance as measured by student scores on the National Achievement Test (NAT).** Schools in which SBM was introduced in 2006 show better performance when followed-up three years later in 2009 – in comparison to schools where SBM was not introduced. The table below shows that the performance differential has come down by about four points or a third of a standard deviation. *The policy to support SBM is a good thing for the Philippines.*

Comparing School Performance: SBM introduced in 2006 and performance in 2009						
	SBM=1 (SBM in 2006)			SBM=0		
	Mean	SD	N	Mean	SD	n
Overall NAT Score 2006	56.07	12.94	2105	61.12	12.85	1860
Overall NAT Score 2009	69.42	12.10	2103	70.62	12.85	1937
Δ in Score 2006 to 2009	13.38	14.04	2093	9.69	12.95	1851

Source: BEIS-NAT

**2. Inequality in school resources has increased over time while inequality in student achievement has decreased.** This is a most intriguing finding. Inequality for the pupil-teacher ratio, people-classroom ratio, and per pupil teacher salary increased at the same time as inequality on student achievement decreased. This finding relates to all schools and does not focus on SBM in particular, but the time period considered - 2005-2010 coincides with the expansion in SBM to cover almost the entire basic education system. *The basic education information system called e-BEIS should include information about SBM and inequality should be closely monitored over time, possibly using the indicators developed in this study.*

**3. Financial decentralization to schools has doubled, but at PHP 450 per pupil per year for elementary schools and PHP 965 per year for high schools, school level funds account for only about 5% of overall basic education spending.** The sample survey data from 2010 indicates that high schools received about PHP 500,000 from various sources and elementary schools received an average of PHP 134,000 pesos. About 60-70% of these resources come from DepED in the shape of annual capitation grants for maintenance and operational expenses and occasional SBM grants. *DepED should consider accelerating the pace of resources transferred to the school level.*

**4. SBM Grant receiving schools do appear to also receive higher level of grants from LGUs.** There does appear to be some evidence of the so-called ‘fly – paper effect’ where central grants stick to the recipient and overall resource position of the school improves. Parent-Teacher-Community Association (PTCA) funds appear to be higher in the year following a school receiving a SBM grant. *These findings are based on a small sample and need to be investigated more closely on a larger sample for any definitive conclusion.*

**5. There is some robust evidence that different levels of SBM implementation do exist and that its constituent elements can be measured with some validity.** Participation and Autonomy do not appear to be very high on stakeholders’ list of favorite factors to improve schools. However, SBM appears to work by increasing the focus on teaching and learning practices in school, probably through improved school improvement planning. *The SBM self-assessment tool can be enhanced with closer attention to instrument construction and testing.*

**6. Personality and Leadership Skills.** This study breaks new ground by investigating personality and leadership skills of principals. Amongst the main five personality markers, conscientiousness stands out as the main differentiator for performance. Leadership skills are important for effective implementation for SBM, particularly networking skills, which can be learned. *DepED should consider giving more importance to leadership skills in the appointment or promotion decisions of school principals.*

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## Chapter 1: School Based Management in the Philippines

### A. School Based Management – Autonomy with Accountability

- 1. School autonomy and local accountability are the underlying features defining school based management.** Autonomy means the ability for schools to be empowered to take decisions. Accountability usually stems in SBM from a higher level of participation from the community, usually through a school committee which includes school level administrators, parents and teachers as members. In an influential recent book (Bruns, Filmer and Patrinos, 2011), the authors describe possible areas of decision making decentralized to the school level. The list includes topics ranging from monitoring of student performance to the hiring and firing of teachers. Decisions can cover various pedagogical and administrative tasks. The school may be able to take decisions regarding the curriculum and the monitoring of teacher performance and the school may be able to allocate its own budget, and in some cases, even hire and fire teachers. Variations in the areas of decision making delegated to the school, and the degree of autonomy provided for those decisions are two of the inputs into a typology of school based management. Another detailed examination of SBM (Barrera-Osorio et. al., 2009) describes the different types of controlling arrangements at the school level, depending on the devolution of authority to the principal, the teachers and the parents.
- 2. Decentralization of decision making to the school level is expected to lead to an improvement in the performance of individual schools and consequently the entire education system.** SBM is expected to lead to performance improvement because it clarifies and simplifies governance arrangements for service delivery – *“By giving a voice and decision-making power to local stakeholders who know more about local needs than central policy makers do, it is argued that SBM will improve education outcomes...”* (Bruns, Filmer and Patrinos, 2011; p. 16). The authors explain in detail the ‘SBM results chain’ between implementation of SBM and school performance. The increased participation of local stakeholders is expected to lead to greater transparency and effectiveness in the use of resources at the school level. There is an ‘increased understanding of the rules of the game.’ With better planning and performance measurement and monitoring to go with resources, the school would likely have more open and welcoming environments for all the actors. The services delivered of the school would then be of a higher quality, resulting in improvement in educational indicators such as lower repetition and drop-out and better test scores. The literature makes a difference between weak and strong forms of SBM, with stronger forms taken to mean greater decision making authority at the school level.
- 3. A stream of literature somewhat parallel to the service delivery set of arguments comes from educational researchers seeking to explain what makes an effective school.** In addition to the work on SBM done by economists, educational researchers have also studied SBM (Briggs and Wohlsetter, 2003). The authors arrive at a list of elements indicated in the literature to be characteristics of successful SBM schools. The list includes: a vision focused on teaching and learning; use of decision making authority to bring about meaningful changes in teaching and learning; development of teachers’ knowledge and attitudes towards a learning community; the distribution of power across stakeholder and shared leadership, mechanisms for collecting and communicating information about school performance. The list also includes additional resources to

the school - “Successful SBM schools cultivate resources from outside the school through involvement in professional networks and through entrepreneurial activity in the local business community.” The authors report that additional resources were found to be present in both successful and not successful SBM schools, but the differential that led to success was the particular uses of additional resources and the associations or networks accessed by the school principal and teachers. There is overlap between the economics of education and the school effectiveness literature, with some differences in detail. The economics literature stresses the rules and incentive effects while the education literature tends to emphasize the socialization process associated with changes in the teaching and learning process.

4. **A benchmarking study provides a comparison of SBM implementation along a set of dimensions across which the SBM implementation in a country can be rated and compared with other countries.**<sup>1</sup> The study investigates the prevalence of SBM across countries along four components of autonomy and accountability, with systems rated on the strength of SBM in each component. Following similar classification schemes, countries can be ranged along a spectrum of SBM implementation, ranging from very weak in countries like the Czech Republic and Mexico, to very strong in the case of Denmark and Netherlands.

<b>Table 1.1: Autonomy and Accountability at the School Level</b>			
Managerial Factor	Strength		
	LOW	MEDIUM	HIGH
Teacher and Personnel Management	Centralized Hiring and Firing	Regional Hiring and centralized firing	Local hiring and firing
Budget Planning and Approval	Centralized budget based on payroll plus an allotment for materials and utilities	Decentralized budget with regional variations. Budget based on payroll and equity considerations	Decentralized at school level. Budget approved by the school council and funds transferred directly to the school
Teacher Assessment	None	Routine evaluations, no direct accountability	Schools conduct routine evaluations that provide teachers and schools with incentives to perform better
Student Assessment	None or based on local tests	Periodic standardized testing but results not made public	Routine standardized testing; results made public

Source: Arcia et. al., 2011

5. **Wide variation across countries in the intensity of SBM exists together with wide variation in educational performance, leading to critical policy research questions about correlation and causation.** If SBM leads to the positive effects on educational performance, evidence of this can possibly be uncovered from a comparison across countries. There are two well-known problems

<sup>1</sup> The SABER framework – see <http://www.worldbank.org/education/saber>. The “School Autonomy and Accountability” policy domain describes the detailed indicators for each of the five dimensions.

regarding analysis along this line of enquiry. First, correlation does not mean causation – it is quite possible that the causality runs the other way around, that improved performance leads to the granting of more autonomy to schools; also there could be other driving factors for performance that lead in parallel to more SBM and better performance. A second problem is that education is a complex system with a very large number of interacting parts. In particular, the historical context of a particular country is very important, and the particular trajectory of sequencing of reform efforts may play an important causal role.

6. **Cross-country analysis from the PISA data indicates that school autonomy affects student achievement negatively in developing and low-performing countries, but positively in developed and high-performing countries.** A recent study investigates the effects of school autonomy rather than SBM, which is a concept that goes beyond school autonomy and also includes accountability at the school level and often involves additional resource flows (Hanushek, Link and Woessman, 2011). However, the findings are quite interesting. Autonomy is measured in PISA by examining if decisions are taken at the school level across a range of pedagogical and administrative areas. There is no differentiation in the paper between which school level actor is the focus of responsibility (principal, school board, teachers etc.). The concept is akin to SBM as the decision making areas investigated include autonomy over courses and content (i.e., curriculum), over textbooks, over hiring of school level personnel, over salaries and budget allocations made at the school level. The authors do not attempt to explain or speculate about the possible reasons for the divergence between developed and developing countries. It should be noted here that only a handful of developing countries do take part in PISA, and the ones that are included in the study are not necessarily representative of all developing countries. For instance, Thailand is the only Asian country represented in the sample and the sample does not include countries such as Nicaragua and El Salvador which were pioneers in introducing SBM.
7. **Researchers investigating the impact of SBM on educational performance in a number of developing countries find mixed evidence in support of SBM.** A review of the evidence from about 15 developing countries and some developed country contexts indicates that it usually takes a long time for SBM related reforms to take effect (Bruns, Filmer and Patrinos, 2011). While impact on attendance of teachers may be quick, positive impact on enrollment of students (in contexts of less than universal enrollment) usually takes longer. Impact on test scores took 8 years in a meta-analysis of 232 SBM studies. In the case of a study in Mexico, positive impact of SBM was attained after 11 years and in Brazil there was no impact even after 11 years. With regard to cases of *strong* SBM implementation, the authors report studies in El Salvador that indicated positive impact on administrative processes and classroom environment, but no discernible impact on test scores. Their investigation of *intermediate* forms of SBM reports on various states in Brazil that implemented an SBM reform centered on a school improvement plan (SIP). SBM had a modest positive impact in these cases. Studies in Mexico and Kenya also report improvement in test scores from SBM interventions that included specific measures such as the hiring of additional contract teachers at the school level or the provision of a school grant to improve quality. Evidence from *weak* forms of SBM comes from a large number of countries, including various rigorous impact evaluation studies, which show positive impact of SBM (e.g. Cambodia and Indonesia).

## B. Introduction to School Based Management in the Philippines

8. **The Republic Act 9155 of 2001 regarding the governance of basic education in the Philippines sets out the roles and responsibilities of various administrative levels from the central to the school level.** Law RA 9155 forms an important historical milestone in the context of SBM in the Philippines. Section 3(f) of the law provides the legal basis for SBM by specifying the objective “*To encourage local initiatives for the improvement of schools and learning centers and to provide the means by which these improvements may be achieved and sustained.*” The law specifies the structure of the Department of Education (DepED), with enumerated responsibilities at the national, regional, division, district, and school levels. The law does not mention school governing councils (which were to come later), but vests the authority regarding SBM in the office of the school head – this indicates that in the original conceptualization the SBM model implicitly chosen was one of administrative and professional control, focused on the school head rather than on the school community. Indeed, to back up the new “*authority, accountability, and responsibility*” of the school head under RA 9155, strict new guidelines were also introduced regarding the promotion of school heads on the basis of performance. Section 7(e) of the law specified the “*powers, duties and functions*” of the school head to include both administrative and instructional or pedagogical responsibilities – detailed in Table 1.2 below.

<b>Table 1.2: Powers, Duties and Functions of School Head under RA 9155</b>	
1	Setting the mission, vision, goals and objectives of the school
2	Creating an environment within the school that is conducive to teaching and learning
3	Implementing the school curriculum and being accountable for higher learning outcomes
4	Developing the school education program and school improvement plan
5	Offering educational programs, projects and services which provide equitable opportunities for all learners in the community
6	Introducing new and innovative modes of instruction to achieve higher learning outcomes
7	Administering and managing all personnel, physical and fiscal resources of the school
8	Recommending the staffing complement of the school based on its needs
9	Encouraging staff development
10	Establishing school and community networks and encouraging the active participation of teachers organizations, nonacademic personnel of public schools, and parents-teachers-community associations
11	Accepting donations, gifts, bequests and grants for the purpose of upgrading teachers' learning facilitators' competencies, improving and expanding school facilities and providing instructional materials and equipment. Such donations or grants must be reported to the appropriate district supervisors and division superintendents
12	Performing such other functions as may be assigned by proper authorities

Source: RA 9155

9. **The Third Elementary Education Project (TEEP) implemented from 2000 to 2006 included the pilot implementation of SBM in nearly 6,000 elementary schools in 23 project divisions.** The TEEP project covered all public primary and elementary schools in the 23 provinces identified as the most socially depressed<sup>2,3</sup>. The total project cost was US\$221.16 million (\$91.07 million from JBIC and \$82.84 million from World Bank, \$47.25 million from the Philippine government). TEEP

<sup>2</sup> Primary schools cover grades 1 to 4, while elementary schools cover grades 1 to 6.

<sup>3</sup> The program covered both primary (grades 1–4) and elementary (grades 1–6) schools. Converting primary schools to elementary schools by extending enrollment up to grade 6 was also an important part of the TEEP program.

included a package of interventions for the school, including textbooks, teacher training and renovation/rehabilitation of the school infrastructure. School heads and teachers received training to help develop a School Improvement Plan, based on a diagnosis of school needs, including student achievement and learning goals. The SIP was further broken down into an Annual Improvement Plan (AIP) that was prepared with the participation of parents and other members of the school community. The SIP was used as an input by DepED to determine the particular package of interventions for each school. Schools also received cash grants for maintenance and operating expenses, based on the enrollment of the school. The schools were allowed and encouraged to raise their own funds from communities, parents, and others.

10. **TEEP was a successful program that met most of its objectives and set the mold for future SBM efforts in the Philippines, centered on the school improvement process.** A recent set of studies have reported on the impact in the short term on test scores and in the long term on schooling and labor market performance of students graduating from schools that benefited from the TEEP program. The authors find a substantial impact of about six years of exposure to the entire TEEP program on test scores (Yamauchi and Liu, 2013). Using a tracking survey to follow graduates, the authors also find a positive impact of TEEP in the length of schooling, migration and labor market earnings. Notably, the impact was better for females for all the long term impact variables (Yamauchi and Liu, 2012). Others focused on the SBM component of TEEP and find a positive impact, albeit of smaller magnitude (Khattari, Ling and Jha, 2012).
11. **Following from the success of TEEP, SBM was mainstreamed since the year 2006 into the system wide Basic Education Reform Agenda (BESRA).** BESRA was built around five key reform thrusts (KRTs) of which SBM constituted the first KRT. The precise wording of KRT1 was “*School-level stakeholders improve their own schools continuously.*” The progress indicators to monitor implementation of KRT1 under BESRA included the establishment of school governing councils, the preparation of school improvement plans, increased level of resources managed and controlled at the school level and improved performance of students on standardized achievement tests. The four other KRTs of BESRA provided the following complementary reform elements: KRT2: Enabling teachers; KRT3: Increased social support; KRT4: Early Childhood Development, Alternative learning systems (ALS) and private sector participation; and KRT5: Change in institutional culture of DepED to better support the other KRTs.
12. **DepED administrative data indicates an impressive level of implementation for KRT1 as measured by regularly monitored key indicators regarding three main elements of SBM – organization, finance and information.** *Organization:* Every school needs to have a School Governing Council (SGC) or other form of school community partnership. The principal and other school staff are trained on various aspects of SBM, including the preparation of a mandatory school improvement plan; *Finance:* Selected schools receive an SBM grant of PHP50,000 (since 2011, increased to variable amount up to PHP200,000) and all schools receive a Maintenance and Other Operational Expenditure (MOOE) grant that is proportional to school enrollment; *Information:* School officials are trained and expected to provide detailed monitoring reports on school performance to the community, including information on student learning. The eight indicators that are monitored as part of the joint World Bank supported National Program Support for Basic

Education (NPSBE; 2006-2012) and AusAID-supported Support for Philippine Basic Education Reform (SPHERE; 2008-2012) indicate an impressive level of SBM implementation, shown in Table 1.3.

<b>Table 1.3: SBM Output Indicators (based on schools that submitted data to DepED)</b>			
<b>SBM Implementation Indicator</b>	<b>Elementary Schools</b>	<b>High Schools</b>	<b>Total</b>
1. School Improvement Plan	89%	90%	89%
2. School Governing Council	80%	83%	81%
3. School Report Card	98%	96%	97%
4. School Heads oriented to SBM	96%	96%	96%
5. Schools oriented to Simplified Accounting Procedures	87%	88%	88%
6. Schools oriented to National Competency Based Standards for Teachers (NCBST)	93%	96%	94%
7. Schools using student tracking system	74%	65%	73%
8. Schools monitoring Pupils/Students at Risk of Dropping Out (PARDO/SARDO)	89%	86%	88%

Source: Status of BESRA Implementation: DepED, September 30, 2011;

### C. Objectives of this Study

13. **DepED seeks to move beyond the SBM administrative data to understand the dynamics of implementation of SBM in schools and uncover the possible impact of SBM on school performance.** Administrative data periodically collected by DepED indicates the effectiveness and efficiency of the DepED bureaucracy in providing SBM related inputs to schools. Evidence is also available regarding the presence of readily observable SBM outputs such as the constitution of a school governing council or the existence of a school report card. However, the administrative data do not provide insights regarding the functioning and effectiveness of the school governing council nor the utilization of the school report card to deepen accountability to the local community.
14. **This study is Phase II of the Basic Education Public Expenditure Review, part of an ongoing program of analytical support provided to DepED by the World Bank and AusAID.** The objective of this study has been: *“To identify the factors that have enabled and constrained the attainment of SBM objectives in the Philippines and to identify the policy options to clear these constraints towards the goal of better educational outcomes.”* Two lines of enquiry underlie BEPER Phase II - Has the SBM been effective in obtaining the goal of better school performance? What are the factors that influence the level of SBM implementation at a school? BEPER Phase I, a traditional PER study examined the trends and composition of public education expenditures and explored the problems that DepED had been experiencing regarding the timely execution of budgeted funds. Phase II focuses on SBM as it is central to DepED’s efforts to improve the quality of public education expenditures. The study deals with overall policy issues rather than the administrative process for implementation of SBM as that topic is covered in a separate audit of SBM commissioned by DepED and the Commission on Audit (DepED and COA, 2006-2009). Three themes are presented in this report – SBM impact, resources at the school level, and the leadership abilities and characteristics of the school head.

15. **SBM Impact in Chapter 2: Analysis of data on schools from the National Achievement Tests (NAT) indicates a significant positive impact of SBM on student test scores.** Chapter 2 presents the results from an impact evaluation study of the impact of SBM in non-TEEP districts in the years following TEEP, based on a five-year panel data from the period 2006-2010. The positive SBM impact indicates that the policy emphasis on this tool may indeed be a correct measure. The main contribution of this chapter is to explain the importance of evaluation of a program by comparing the change in SBM and non-SBM schools over a period of time. The secondary contribution of this chapter is the compilation of the panel data used for the analysis. The preparation of this data involved a large investment of time as the original data was fragmented in separate pieces and had to be assembled piece by piece into a single coherent database that combines schools characteristics with data on school achievement. This data, with continuous updating in the future using the new E-BEIS system, will be very useful to carry out similar impact evaluations of other programs, as well as other kinds of analysis.
16. **School level resources in Chapter 3: Schools do have control over a higher level of resources than before, but the proportion remains small as compared to centrally managed resources.** Resources are examined at two levels. At the national level, detailed information was collected on personnel expenditures at each school – though there is limited autonomy to schools with regard to personnel expenditures, these resources can be considered to be given endowments that generate a context for the implementation of SBM. The first part of Chapter3 examines the trend regarding the distribution of resources at the school level – especially to examine the equity of resource distribution. The analysis seeks to determine the patterns across divisions and across urban and rural areas. For a small sample of schools surveyed for this study, detailed information on sources and uses of funds is analyzed for three kinds of school level resources; (i) DepED: the main source is DepED through the division office which pays for all salaries and the maintenance and operating expenditure of schools, and provides school MOOE, SBRMS and SBM grants; (ii) Local Government: Local government units (LGUs – provinces, cities and municipalities) provide resources for schools through the Special Education Fund that is financed from a 1% locally levied property tax and their Internal Revenue Allotment (IRA).<sup>4</sup> Barangays that are the lowest level of local government also support schools using their IRA; and (iii) Community/Parents’ associations.
17. **Principal leadership in Chapter 4: Principal leadership skills and personality characteristics are linked to an innovative measure of SBM implementation to explore the link between principal characteristics and better implementation of SBM.** A long established literature in the psychological measurement of personality explores the traits of openness, conscientiousness, extraversion, agreeableness and neuroticism or emotional adjustment. The literature also establishes a close relationship between conscientiousness and job performance in general. This study investigates the importance of conscientiousness for school principals and examines the relationship between the various personality traits and school performance regarding SBM implementation as well as NAT test scores. The study utilizes an innovative measure of SBM implementation, adopting the Rasch analysis technique to compute an index of SBM implementation. In addition to personality, the chapter presents data regarding political skills of principals. Four kinds of political skills have been

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<sup>4</sup> For a detailed recent study of the SEF, see Manasan, Celestino and Cuenca, 2011.

identified in the literature and applied in this study – social astuteness, interpersonal influence, networking ability and apparent sincerity.

18. **Conclusions in Chapter 5: The key findings and conclusions reached by the study are summarized in this chapter.** The findings are grouped into four categories: (a) SBM implementation; (b) Resource allocation; (c) Principal professional development and (d) Data and information management. Detailed policy implications are preliminary at this stage as some of the findings from the small sample survey in three provinces would need to be further explored in a larger and nationally representative sample. The main conclusion on SBM is the finding that SBM is significantly associated with an increase in student's test scores. With regard to resource allocation, the data indicate that inequality in resources may have increased over the years and that overall inequality is more a result of inequality within divisions rather than inequality across divisions. Principals' personality traits do affect school results though not always in intuitively obvious ways, and differences in leadership skills do matter for school performance. Finally, the study has sought to demonstrate the usefulness of empirical data analysis as an input into policy choices. Strengthening data collection and analysis remain as important policy choices for DepED.

## Chapter 2: Impact of School Based Management

### A. Introduction

1. **A first group of impact evaluation studies used randomization between intervention and control groups to identify the impact of SBM.** Randomized trials allow for impact analysis to be free from selection bias that might arise if the group of schools that receives SBM benefits has certain peculiarities or special characteristics – a number of researchers have carried out SBM impact evaluation that deals with this source of bias.<sup>5</sup> Researchers found that students who were assigned to locally hired contract teachers (with the presence of parents' involvement in school management) showed significant improvement in test scores. In another study, devolution of decision making to the school/community level improved grade progression (and reduced repetition) but the impact on students' learning outcomes was insignificant. In a study in Indonesia, researchers found varying impact of different SBM elements. Measures to reinforce existing school committee structures demonstrates limited or no effects, but measures that foster outside ties between the school committee and other parties, lead to greater engagement by education stakeholders and to an improvement in learning outcomes. The findings suggest that the way to combine different elements of school autonomy together with appropriate training could be important to improving learning outcomes.
2. **The second group of SBM impact evaluation studies combined panel data and matching methods to control selection bias as well as the possibility of different effects over time between treatment and comparison schools.** SBM impact was assessed in Nicaragua by distinguishing between *de facto* and *de jure* autonomy (King and Ozler, 1998 and King, Ozler and Rawlings, 1999). The authors found that *de facto* devolution of decision making to the school/community level matters but *de jure* devolution does not. They find significant impacts on grade progression and grade repetition but not on learning outcomes. Another study using Nicaraguan data also reported ambiguous SBM impact on learning outcomes (Parker, 2005). An evaluation study of a program in Mexico has shown the combined impact of increased school resources and decentralized management (Skoufias and Shapiro, 2006). The Mexico study found that the reform decreased drop-out, failure and repetition rates, but the magnitude of the impacts is overall small.
3. **The impact evaluation of SBM presented as part of this BEPER Phase II study is closely related to an earlier study by Khattri, Ling and Jha, 2012 that evaluated the first phase of SBM reforms in the Philippines.** SBM was first piloted and introduced to 23 divisions as part of the Third Elementary Education Project (TEEP) during the period 2000- 2006. DepED intended to implement the pilot in three waves – thus the divisions in the later waves could serve as control groups for divisions that received the SBM intervention earlier - this is called the pipeline method of impact evaluation. Their empirical setting is characterized by two important features: (i) in reality, lags between the three waves were quite short; and (ii) the period covered is the very initial stage of introducing SBM in the Philippines. The authors estimate an impact in overall test scores from 2-year exposure to SBM is 1.45 points, which is quite small. Once TEEP was completed in 2006, SBM was scaled up to other non-TEEP divisions with support of neighboring TEEP divisions. In this period the

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<sup>5</sup> Papers using randomization to identify the impact of SBM interventions include Duflo, Dupas and Kremer, 2009; Chaudhury and Parajuli, 2010; Gertler, Patrinos and Rodrigues-Oreggia, 2012; and Pradhan et. al., 2011.

introduction of SBM was the only major change experienced at non-TEEP schools, in contrast to the situation where TEEP schools, when implementing SBM, received other investments such as building construction and renovation, textbooks, teachers' training, and other facility support.

- 4. The analysis presented here shows significant positive SBM impact using data from post TEEP implementation of SBM.** The rollout of SBM into the non-TEEP divisions also took place over a number of years. In this study, we compare schools that received an SBM grant in 2006 with those that received the grant in 2009. School Improvement Plans and Annual Improvement Plans were required before a school could receive the grant so the receipt of a grant is assumed to be a sufficient condition for implementation of SBM. The data comes from the matched and merged Basic Education Information System (BEIS) and National Achievement Test (NAT) panel database for 2006-2010 that was generated for this study. The analysis indicated that SBM led to significant increases in NAT scores over the three-year period from 2006-2009. The magnitude of the impact is larger than the estimate previously reported from the TEEP period, probably due to the favorable effect of accumulating SBM experience.

## **B. Impact Evaluation Methodology**

- 5. The main methodological choice for impact evaluation concerns the definition of treatment and control groups of schools.** It is by now well established that merely examining the impact of an intervention such as SBM only within the group of schools that received the intervention is not adequate to measure impact. Impact evaluation requires a 'counter-factual' – an estimate of what would have happened to the same schools without the intervention. Since the same school cannot experience the two states (with and without SBM) at the same time, an impact evaluation study requires the definition of a control or comparison group of schools that are as similar as possible to the intervention group schools. There should not be any bias in the selection of membership into the control and intervention group schools – this is the reason why the scientifically most accurate approach is to randomly select into group membership. In this study, the schools that received SBM in 2009 serve as the control group for the treatment group of schools that received SBM in 2006. We know that the selection into either of the groups was not randomized. Schools that received SBM grants in 2006 may have certain characteristics, such as having an experienced principal with superior leadership skills. A simple comparison between the 2006 and 2009 SBM schools would capture the effect of the school principal, not the effect of SBM itself. The two groups may have already been on different time trends, even before 2006, and if we ignore that possibility, we will spuriously infer the impact of those trends as an impact of SBM. Because of the non-random assignment of schools to the 2006 and 2009 SBM groups, a method is required to render the two groups to be comparable for impact evaluation.
- 6. The method used to generate a comparable control group is based on estimating the probability of being an SBM grant recipient in 2006.** The method used here is called 'propensity score matching' or PSM. The first step in this method is to estimate a probabilistic regression equation of being an SBM grant recipient in 2006. The coefficients of the regression are used to generate predicted probabilities of selection for each of the schools. In estimating this regression we find that, complete and mono-grade schools were likely to receive SBM grants in 2006. Schools with higher

pupil-teacher ratios were also more likely to receive the grant in 2006. Total enrollment and pupil-classroom ratio are statistically insignificant as determinants of selection. Finally, the total of salaries of the school's professional staff and the years of experience of the teachers increase the probability of receiving an SBM grant in 2006. The second step in the method is to calculate the predicted probabilities of selection of schools in 2006 from among all the schools that were actually only selected for SBM in 2009. We can then match up schools with equal probabilities of selection into the treatment group of 2006 recipients. The matched schools had the same probability of receiving the grant in 2006, but in reality, some did and some did not – this method allows for a scientifically valid impact evaluation of SBM. We look at changes in NAT scores from 2006 to 2009. In other words, we compare changes in NAT scores between the treatment and control groups, conditional on the likelihood of having received SBM grant in 2006. If SBM has an impact on NAT scores, we will find a larger change in it among schools that received SBM grants in 2006. In this paper, we use non-TEEP divisions where SBM was introduced after 2006.

7. **To further ensure methodological soundness, the sample is restricted to measuring the gains in NAT achievement scores among non-city divisions that had not earlier been part of the TEEP project.** The outcome measure used in this study is the NAT score average for Grade 6 in 2006 compared with the average in Grade 6 in 2009. The objective is to compare the gains in NAT scores between 2006 and 2009 in the two groups of schools – schools that began SBM implementation in 2006 and schools where implementation of SBM was delayed until 2009. Examining the gains rather than levels of scores allows us to eliminate the legacy effects of differences predating the introduction of SBM. Restricting the sample to non-city and non-TEEP divisions serves three purposes - first, possible bias in measurement of impact from the effects of the TEEP project is eliminated; second, this allows us to avoid possible contagion effects of early SBM practitioners to other schools that have not officially implemented SBM – such effects are more likely to take place in cities due to easier communication and transportation between schools; thirdly it is not possible to encounter sufficient number of treatment and control group schools with matching probabilities within the city divisions – the sample is more homogenous.

### C. Empirical Results

8. **Schools that started early SBM implementation in 2006 tended to be lower in NAT performance as compared to non-SBM schools in 2006.** Table 2.1 shows summary statistics of NAT scores and their changes separately for the SBM 2006 and SBM 2009 schools. For simplicity they are termed as the SBM and the non-SBM schools. The NAT score averages in 2006 were lower among the SBM schools. It appears that SBM was more likely to be introduced in schools that were not performing well in NAT. Both groups of schools – SBM and non-SBM schools - did better in 2009 as compared to 2006. However, the improvement in SBM schools was higher than the improvement in non-SBM schools. For instance, the improvement for SBM schools in Mathematics was 10.70 points, as compared to an improvement of 5.42 points in non-SBM schools. This faster rate of improvement is a very important outcome that is the goal of any program targeted at low performing schools. Even if the SBM schools may still lag in performance at the later 2009 measurement, the difference has narrowed down. If the better performing schools were also the ones which were privileged to begin

with, this study's finding augurs well for SBM's impact on the equity of school outcomes in the Philippines.

<b>Table 2.1: NAT score changes 2006-2009 between Treatment and Control group schools</b>			
<b>Measure</b>	<b>Number of schools</b>	<b>Mean NAT Score</b>	<b>Standard Deviation</b>
<b>Treatment Group: SBM = 1</b>			
Overall Score 2006	2,105	56.07	12.94
Overall Score 2009	2,103	69.42	12.10
Change in overall score from 2006 to 2009	2,093	13.38	14.04
Mathematics Score 2006	2,105	54.67	17.77
Mathematics Score 2009	2,103	65.33	15.87
Change in mathematics score from 2006 to 2009	2,093	10.70	19.24
<b>Comparison Group: SBM = 0</b>			
Overall Score 2006	1,860	61.12	12.85
Overall Score 2009	1,937	70.62	12.85
Change in overall score from 2006 to 2009	1,851	9.69	12.95
Mathematics Score 2006	1,860	61.45	17.77
Mathematics Score 2009	1,937	66.64	16.77
Change in mathematics score from 2006 to 2009	1,851	5.42	18.28

Source: BEIS-NAT

9. **Using the method of propensity score matching with double differencing, the SBM is found to have an impact in three years to the tune of 4 to 5 percentage points in NAT scores.** While the raw differences shown in Table 2.1 already indicate the difference in means between the two groups, we also carry out a detailed econometric investigation of the change in SBM impact summarized in Table 2.2. SBM introduced 3 years earlier increases the national achievement test score by 4.2 (overall) and 5.5 (mathematics). Table 2.2 indicates only a very small decline in the size of SBM impact when we utilize the control variables. The results show that (i) the SBM impacts are significant and relatively large, (ii) whether or not controlling for school conditions does not affect the impact estimates, and (iii) change in mathematics score is greater than that of the overall score.<sup>6</sup>

<b>Table 2.2: Impact of SBM on National Achievement Test Score</b>				
<b>Dependent Variable; Change in NAT Score from 2006 to 2009</b>				
<b>Variable</b>	<b>Overall</b>		<b>Mathematics</b>	
<b>SBM implemented in 2006</b>	<b>4.2070</b> <b>(3.62)</b>	<b>4.1634</b> <b>(3.62)</b>	<b>5.6925</b> <b>(3.56)</b>	<b>5.5143</b> <b>(3.42)</b>
Controls	No	Yes	No	Yes
Number of observations	2,453	2,406	2,453	2,406
R-squared	0.2273	0.2300	0.1989	0.2014

Source: BEIS-NAT dataset; Numbers in parentheses are absolute t values using robust standard errors with district clusters. The above estimates are statistically significant at the conventional level. For details, see Yamauchi, 2012.

<sup>6</sup> The details of the propensity score matching method with double differencing is explained in Yamauchi, 2012. It is important to note that the results do not change qualitatively even if we include control variables. We experimented with the following control variables: changes in total enrollment, pupil-classroom ratio, pupil-teacher ratio, and total salaries of teachers in different ranks. We are testing for effects of other variables that may be the cause of the observed differences rather than SBM itself.

## D. Conclusions

10. **Evidence on declining inequality in NAT scores supports the evidence of improvement in NAT performance in the Philippines, particularly associated with implementation of SBM.** One possible criticism of the results on impact from SBM relates to the consistency of the NAT examinations. If NAT examinations may have become easier in recent years, the improvement in scores would only reflect changes in the difficulty of the examinations. Reviewing this hypothesis would require a detailed item-by-item analysis of NAT examination over the years, which could be the subject matter for another study. In terms of the evidence analyzed as part of this study, we can see that the inequality of NAT scores has declined over time (Table 2.3). While the variation of NAT scores across schools has decreased in the period 2005-2010, inequality in the distribution of school and teacher resource inputs appears to have increased over the same period.<sup>7</sup>

Table 2.3: Trend in Inequality of NAT scores and school resources			
Indicator		Division	District
Pupil-Teacher ratio 2005	Theil (national)	0.06142	
	<i>Within</i>	0.04576	0.03286
	<i>Between</i>	0.01565	0.02856
Pupil-Teacher ratio 2010	Theil (national)	0.10185	
	<i>Within</i>	0.06545	0.04598
	<i>Between</i>	0.03641	0.05586
NAT Overall Score 2005	Theil (national)	0.03010	
	<i>Within</i>	0.02101	0.01478
	<i>Between</i>	0.00908	0.01532
NAT Overall Score 2010	Theil (national)	0.01810	
	<i>Within</i>	0.01133	0.00796
	<i>Between</i>	0.00677	0.01014

Source: BEIS-NAT

11. **The empirical evidence provides strong support towards the conclusion that SBM in the Philippines has resulted in improved school performance.** NAT scores have improved in all schools, but they have increased more in SBM schools. SBM was initially implemented in schools that tended to be disadvantaged and their NAT performance on average was lower than other schools. However, over the three-year period 2006-2009; we find that SBM schools have been able to narrow down the initial difference. Further, we find that the difference can be attributed to SBM and not to overall improvement in school resources.

<sup>7</sup> The Theil inequality index reported in Table 2.3 is further detailed in Parandekar, Sipahimalani-Rao and Yamauchi, 2012. The measure allows trends in inequality to be measured at the national level as well as by its component parts meaning inequality across divisions and across districts within a division.

## Chapter 3: School Resources: Facilities, Teachers and Finance

### A. Introduction

- 1. Governance reform such as SBM is likely to be complementary to increasing schools resources in order to improve school quality, especially in resource constrained environments.** Recent studies show the importance of teachers' incentives and a decentralized and autonomous decision making process with the involvement of parents and community (e.g., Duflo, Dupas and Kremer, 2009; Gertler, Patrinos, and Rubio-Codia, 2011; Pradhan, et al., 2011). School resources and governance reforms are likely to be complementary to improve school quality. In this context, however, we noticed that teachers' experience has not been systematically analyzed in the quantitative context as a factor that affects students' learning outcomes, though human capital formation of teachers and its implications for student achievements are of great importance in education production. Young teachers might be more motivated to teach in classrooms, but experienced teachers are likely to know a more effective way to teach from their classroom experiences. In this chapter, we decompose the constituent parts of the human capital of teachers into its quantity (number) and quality margins, we investigate under what conditions the quantity and quality of school and teacher resources matter in determining students' achievements.
- 2. We also present details about school level financial conditions from the survey data of 150 schools carried out as part of this study.** Since school financial data is missing in any publicly released school data, our attempt is valuable to disclose recent changes of school-level budget conditions, though the sample is selective and of small size. The survey data complements the analysis of the BEIS-NAT national school panel database to explore potential inequality of school resources across regions and provinces and its dynamic changes in the period of 2005 to 2010, and their implications for students' achievements. In particular, we look at pupil classroom ratio (PCR) and pupil teacher ratios (PTR) and per-pupil teachers' salary at a school. PCR represents physical facilities at school, and PTR and per-pupil teachers' salary capture teachers' human resources at school. Moreover, human resources are disaggregated into the quantity and quality margins, measured by PTR and per-pupil teachers' salary, respectively. The first objective of this chapter is to know how these three measures of physical and human resources affect students' performance.
- 3. Analysis presented in this chapter indicates that the resource situation in urban areas is stressed due to overcrowding, which may be having a deleterious impact on student achievement.** Teachers' quality increases with on-the-job and off-the-job training. On-the-job training is closely related to accumulation of actual teaching experience in classrooms, while off-the-job training requires both direct and opportunity costs to have knowledge acquisition and transfer, e.g., attending a workshop and college. Their salary is a function of rank and position, which reflect their performance and accumulated experience. On the other hand, per pupil physical capital is captured by the pupil classroom ratio. Our findings are summarized as follows. First, the period of 2005-2010 observed that schools in urban areas are worse off in all the three measures than those in non-urban areas, and the overall situation has not improved. Second, NAT scores are also higher in non-urban schools. These observations show that both teaching conditions and learning outcomes are worse in urban schools that are most likely over-crowded. Interestingly, third, our estimation shows that

returns to resources (measures in terms of students' test score) significantly differ between urban and rural schools. That is, impacts of PCR and PTR on NAT scores are significant in non-city divisions, while impacts of per-pupil teacher salary are significant in city divisions.<sup>8</sup>

4. **The analysis of school survey data collected in three provinces shows several interesting observations related to the improved availability of financing at the school level.** First, the proportion of budget raised by LGUs and communities has been increasing in our sample schools, which is consistent with the expansion of SBMs. Second, the gap between planned and actual budgets looks smaller among schools that perform well in SBM. Though the data and sample cannot support an analysis linking the school-level budget condition to students' performance, our analysis from Chapter 2 implies that better school finance and more local resources that SBM seems to generate are expected to lead to better students' performance.

## **B. Data and Empirical Findings**

5. **The analysis of this chapter relies on the BEIS-NAT panel dataset for 2005-2010 and the sample survey carried out in 150 schools in 3 provinces.** For the analysis of school and teachers resources, we use Basic Education Information System (BEIS) and national achievement test (NAT) score data. BEIS has a variety of information on school characteristics and student performance. It is census data, collected every school year. NAT data covers overall and subject-wise test scores. Mathematics, English, Filipino, science and social sciences are tested. We compare them between 2005 and 2010. All elementary schools, located in both city and non-city divisions, are used in the analysis. From BEIS, we construct school and teacher resource measures: pupil-classroom ratio, pupil-teacher ratio (both quantity) and per-pupil teachers salary (quality). BEIS has information on the numbers of principals and teachers, differentiated by their categories and ranks. For example, principals are ranked into 4 levels. Teachers are categorized into master teachers (2 levels) and normal teachers (3 levels). For each level/category, we have a salary scale, so the total salary payment can be computed. Per-pupil teachers' salary is calculated from the rank-salary table for principals and teachers, divided by total enrollment (Appendix 1). In the analysis of school finance, our data come from a survey recently conducted in three provinces covering 150 schools (100 elementary and 50 high schools). As discussed, the information collected in the survey is highly valuable since any other publicly available school data do not have details of school financial conditions. Though the sample is admittedly selective and of a relatively small size, the data reveals dynamic patterns of budget/expenditure compositions in the period of 2007-2011.
6. **Comparison of city and non-city divisions indicates that, in all three indicators of PCR, PTR and teacher salary, non-city division schools are better off than city division counterparts.** Table 3.1 shows that the differences have persisted and even increased over the time period considered of 2005-2010. Teaching conditions as measured by these three indicators are better in non-city schools than city schools. The pupil-classroom ratio in non-city schools has stayed around 34, while it has increased from 37 to 40 in city schools. The pupil-teacher ratio has increased slightly from 34 to 35

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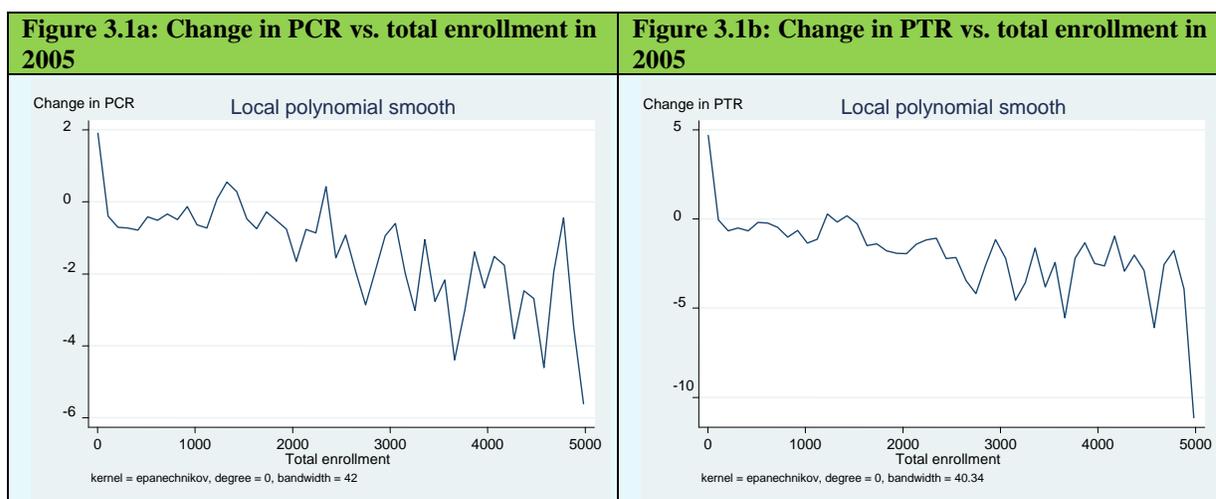
<sup>8</sup> For details on the analytical technique and empirical findings, see Yamauchi and Parandekar, 2012.

for non-city schools, while it has increased from 36 to 42 for city schools. The differential in per student pay was about PHP20 in 2005 and that has increased about PHP90 in 2010, though some of that increase can be attributed to inflation between the two periods.

Table 3.1: Comparing school level resources between city and non-city schools								
	2005				2010			
	Non-city		City		Non-city		City	
	N	Mean	N	Mean	N	Mean	N	Mean
Pupil-Classroom ratio	29,274	34.08	6,224	37.46	29,900	34.35	7,935	40.39
Pupil- Teacher ratio	29,029	33.74	6,137	35.79	28,735	34.55	7,502	41.67
Per pupil salary	27,519	362.90	5,762	344.39	25,902	618.06	7,195	525.52

Source: BEIS-NAT

- Examining the pattern of changes with respect to the initial enrollment level in 2005 indicates a tendency for convergence in the PCR and PTR. Over-crowded schools tended to experience a larger reduction of PCR and PTR. In Figure 3.1 below we examine the dynamic changes of these measures, plotted against total enrollment in the initial period, 2005. Intuitively, we can conclude that larger schools experience an improvement in their conditions if we observe a negative correlation between change in PCR or PTR and the initial school size, in particular when PCR or PTR decreases among larger schools. Figures 3.1a and 3.1b show that large schools are more likely to experience large improvements in both PCR and PTR over time, which implies that the distributions tend to be more equal over time. Analyzing the changes in the PCR and PTR against the initial value also reveals convergence as the decrease in 2005-2010 is greater if the initial value is large.



Source: BEIS-NAT

- Inequality in resource measures arises from differences in schools within a division rather than differences across divisions.** We decompose PCR, PTR and per pupil teacher salary at different disaggregation levels. The point of this exercise is to know whether school and teacher resources are allocated equally among schools within a division or not. Table 3.2 shows Theil decomposition results of the per pupil teacher salary in 2005 and again in 2010. The results reveal that divisions look

alike, but a large portion of inequality comes from within-division variations. That is, resource conditions at the school level look quite different within each division. Interestingly, if we use district as the basic unit of disaggregation, we observe that between-district and within-district inequalities look the same. Inequalities between districts within a division seem to need policy attention.

Table 3.2: Trend in Inequality of NAT scores and school resources			
Indicator		Division	District
Per pupil teacher salary 2005	Theil (national)	0.06356	
	<i>Within</i>	0.04364	0.03111
	<i>Between</i>	0.01992	0.03246
Per pupil teacher salary 2010	Theil (national)	0.08261	
	<i>Within</i>	0.05584	0.03988
	<i>Between</i>	0.02677	0.04272

Source: BEIS-NAT

9. **The impact of school resources on student achievement appears to vary across city and non-city divisions, with teacher experience being more important in city schools.** Appendix 2 shows the effects on test scores by subject separately for city and non-city divisions respectively. In city divisions, only per pupil teacher salary significantly affects test scores in all subjects. PCR and PTR are insignificant in the regression equations. We do not have a direct measure of teacher experience, but if we consider the fact that higher teacher salaries in the context of the Philippines means more experienced teachers, the results indicate the positive impact of teacher experience on student test scores in city schools. However, in schools belonging to non-city divisions, per pupil teacher salary does not impact test scores. In non-city schools, we find that quantity-based indicators – both PCR and PTR – significantly change test scores (8 out of 12 estimates are statistically significant in Appendix 2). These findings imply that improved quality of teachers has a larger impact on students’ learning performance in urban schools where per student resources are generally smaller.
  
10. **Survey data reveals that school level resources have increased indicating growing school financial empowerment but not substantial school level financial decentralization.** An increased share of resources is managed at the school level compared to total national government spending on basic education in the last five years. Funds managed at the school level have grown in absolute and per pupil terms during the last five years. School level resources were almost double among the sample high schools at PHP 965 per student in 2010 when compared with only PHP 449 per student among the sample elementary schools (in nominal terms). Average real per student school-level managed funds doubled from just under PHP 200 in 2007 to nearly 400 pesos in 2010 in the survey sample schools (in constant 2005 prices). Nevertheless, compared to the national average spending per pupil, school level managed resources remain a small proportion of 5.4 percent in 2010.
  
11. **In the sample schools, the overall size of school managed funds has grown from 2006 to 2010 even as DepED share of school level resources has not increased substantively in the survey schools.** It is important to understand how much of these increases in school level managed resources represent a deliberate trend towards financial decentralization by DepED versus a voluntary increase in contributions towards capital expenditures, teacher salaries and various MOOE expenses by LGUs, PTCA and the community. If this trend were to represent the results of a deliberate strategy by

DepED to give increased financial autonomy to schools, the role of DepED grants including school MOOE, SBM and SBRMS grants would increase over time. Table 3.3 illustrates that DepED resources have hovered around 70% of total school level resources. While the share of resources the school is able to mobilize from local and community sources as compared to what it receives from DepED in terms of MOOE, SBM and SBRMS grants has fluctuated slightly in the last five years, it has always between 25 to 30 percent of total school resources (except 2010).

<b>Table 3.3 Sources of School Level Funds (Mean values in constant 2005 PHP)</b>										
	<b>2007</b>		<b>2008</b>		<b>2009</b>		<b>2010</b>		<b>2011*</b>	
DepED	53,000	70%	71,000	76%	98,000	73%	124,000	59%	119,000	73%
PTCA	15,000	20%	15,000	16%	21,000	16%	31,000	15%	21,000	13%
LGU	2,000	3%	3,000	3%	6,000	4%	28,000	13%	12,000	7%
Community	-	-	1,000	1%	2,000	1%	7,000	3%	6,000	4%
Others	5,000	7%	2,000	2%	9,000	7%	20,000	10%	4,000	2%
Total (%)	76,000	(100)	93,000	(100)	135,000	(100)	209,000	(100)	162,000	(100)

*Source: 3D-SFSD. \*2011 data not complete. \*\*Figures have been rounded off to the nearest '000*

12. **The financial role of LGUs in basic education has been growing in keeping with DepED policies to enable deeper partnerships between DepED and local government units.** Table 3.3 indicates that in 2010, the share of non-DepED school level funds rose to a high of 41 percent of total school managed funds. This was driven by LGUs contributing a substantially greater amount of 8.9 percent of per pupil school level funds (up from 6.6 percent in 2007). A possible hypothesis to explain this is that 2010 was an election year, causing local governments to spend more on basic education as a strategy to win votes. It remains to be seen whether LGU funding for basic education as a whole and as a share of total basic education funding continues to increase in real terms post 2010. Of the four major sources of funds that the school can manage, funds contributed by the parent-teacher association (PTCA) form the highest share every year, although the percentage varies between 33 to almost 75 percent of school mobilized non-DepED funds. Nevertheless, about one-third of the sample schools either did not receive any PTCA funds or did not maintain records of these funds in 2010. Further investigation is required to determine if this is an effect of the no-collection policy issued in 2009 which was strictly enforced by DepED from 2010.
13. **The surveyed schools did receive some in kind resources in 2011 but the estimated value of these resources was very small at only 0.7% of total funds received by the school.** Data on in-kind resources were collected only for the year 2011 and the analysis shows that the only source from which in kind resources form a bigger portion of their contribution was donors, where in kind resources were 18% of total donor contributions. When data about municipal per capita income is included, we find that the richest municipalities received significantly more at 4.5 times the amount in terms of the value of in kind resources as compared with the schools in the poorest municipalities. However, the value of in kind resources received by schools with higher SBM levels of implementation was not significantly different from that received by schools with lower SBM levels of implementation.

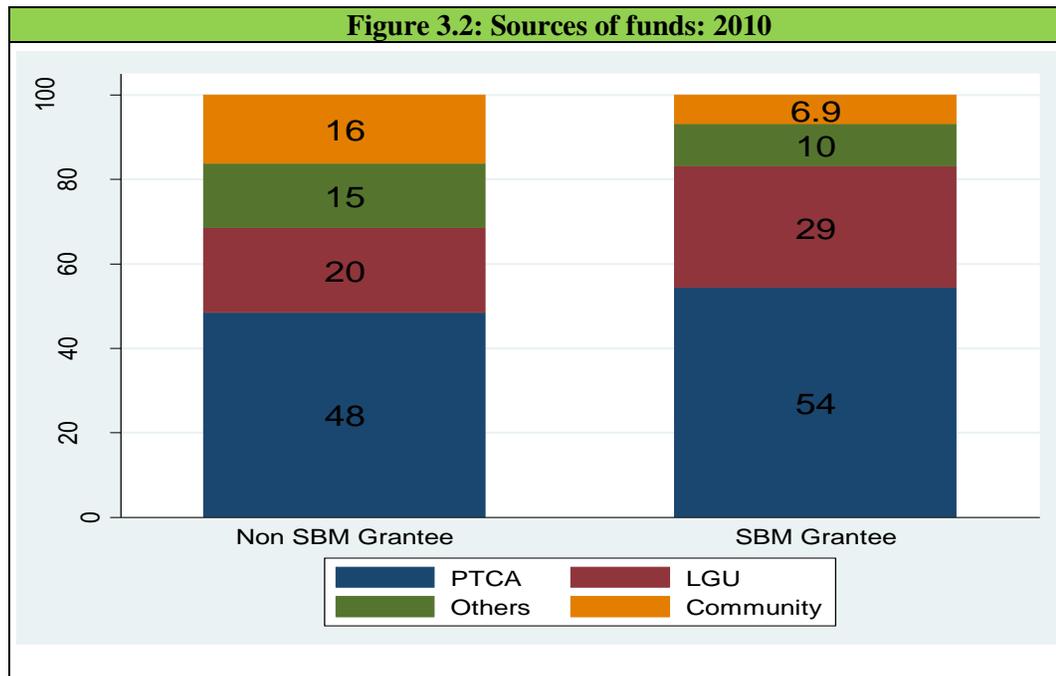
14. **Schools with higher SBM implementation levels seem to have better planning capabilities in terms of financial resource management.** Comparing plans with actual performance is a measure of the effectiveness or quality of the planning process. We are able to examine the comparison between planned and actual expenditures in schools with varying levels of SBM (Table 3.4). Table 3.4 indicates that the gap between planned and actual funds was lower in schools with high level of SBM implementation. Comparing the years 2010 and 2011, we find that actual school level funds received were higher than the funds the school had planned to mobilize, but the gap has decreased from 69% to -4% among high-SBM performing schools. A second observation from Table 3.4 is that the number of schools that reported budget plans has increased from 2010 to 2011. SBM contribution towards better planning is an important outcome, though better planning needs to take place in a sustained manner for an extended period of time for there to be positive impact on educational outcomes.

<b>Table 3.4: Comparing Planned and Actual Expenditures at School Level (Percent)</b>			
<b>Year</b>	<b>Overall</b>	<b>Low SBM</b>	<b>High SBM</b>
2010	133% (39)	176% (15)	69% (16)
2011	5% (82)	52% (27)	-4% (37)

*Source: 3D-SFSD. Percentages reported are ((Actual-Planned)\*100/((Planned)). Where planned funds were reported as zero, these have been treated as missing data. The number of schools is reported in parenthesis.*

15. **The proportion of schools that receive the SBM grant annually is growing but still remains small.** In 2011 only 20 of the 150 survey schools received the grant (only 2 schools received it in 2007). Three of the 150 schools received the SBM grant in two years. No sample school received the grant more than twice. The percentage of funds represented by SBM grants for those schools that did receive the grant has remained at about one-third of total school level funds in the last three years. The number of schools that received school MOOE grants has increased substantially in the last five years from merely 13 in 2007 to 115 schools in 2011. The percentage of funds represented by school MOOE grants for those schools that did receive the grant has remained at about 60 percent of total school level funds in the last three years. All the schools have school MOOE allocation, and the allocation per school is posted in the DepED website. However, during school visits in the implementation support for NPSBE2-SPHERE, it was observed that there were still schools which: a) opted not to get their MOOE allocation but instead requested their Division Office to provide the Division-procured supplies based on their list of requirements or requested Division to pay their utility bills directly; b) did not request their allocation because of large unliquidated cash advance; or c) the Division decided not to provide the allocation for the same reason.
16. **An analysis of the sources and uses of funds data for 2011 shows that a greater proportion of school level resources for survey schools that ever received a SBM grant was from LGUs and PTCAs.** We can see from Figure 3.2 below that schools that ever received the SBM grant received an average of 26,331 pesos from LGUs in 2011. The average LGU funds in 2011 received by schools that were never SBM grant recipients were much lower at about 7,000 pesos. SBM grant recipient schools were also significantly more likely to raise higher resources from PTCAs in 2011- an average of 49,700 pesos compared with an average of 17,000 pesos for schools that never received the SBM

grant. However, SBM grantees mobilized fewer resources from community and other sources compared with non-SBM grantees.



Source: 3D-SFSD

### C. Conclusions

17. **This chapter showed that impacts of school and human resources on student achievements depend on school and social conditions – whether over-crowded or not, being located in urban or rural areas.** In many urban schools where the number of students per classroom or teacher is relatively large, the marginal effect of improved school facility or adding a teacher is found to be small or insignificant, but the improvement of teachers’ quality has a significantly positive impact on students’ test score. In contrast, relatively small schools in non-urban areas significantly benefit more from increasing the quantity, that is, more classrooms and more teachers. Though the above analysis was not directly linked to SBM implementation, such differentiated effects of school and teacher resources have interesting policy implications too as the allocation of school and teacher resources and successful implementation of SBM are regarded as complements that both mutually improve students’ learning performance (e.g., Yamauchi and Liu, 2012).
  
18. **It is not clear from the data whether schools that were low in performance were prioritized to receive the SBM grant.** In 2011 schools which received the SBM grant were significantly more likely to come from the fourth and fifth income class (poorer) municipalities. However, if the school level indicators are analyzed, the data do not support the hypothesis that DepED guidelines to target low performing schools were followed. None of the performance indicators of the schools including the NAT scores, drop-out, repetition, cohort survival and failure rates, are significant predictors of a school being an SBM grant recipient in any year. However, a separate analysis about the probability of ever receiving an SBM grant (not just in 2011) indicated that the probability of ever receiving a

grant was significantly positively correlated with SBM level of implementation as reflected in the SBM self-assessment tool. The rules regarding eligibility for SBM have tended to change from year to year. From the small sample of data, it is not possible to tell with a fair degree of precision if schools with a good performance were rewarded with an SBM grant or if disadvantaged schools were prioritized by DepED with a view to improve their performance.

**19. A large portion of inequalities in the measures we look at comes from within-division variations.**

In other words, there are large inequalities across districts within a division. It is worth looking into this distributional issue and further clarifying its implications for educational equity as well as efficiency. The analysis of school finance using our school survey data collected in three provinces shows several interesting observations. First, the proportion of budget raised by LGUs and communities has been increasing in our sample schools, which is consistent with the expansion of SBM. Second, the gap between planned and actual budgets looks smaller among schools that perform well in SBM. Though the data and sample cannot support an analysis linking the school-level budget condition to students' performance, our analysis from Chapter 2 implies that better school finance and more local resources are expected to lead to better student performance

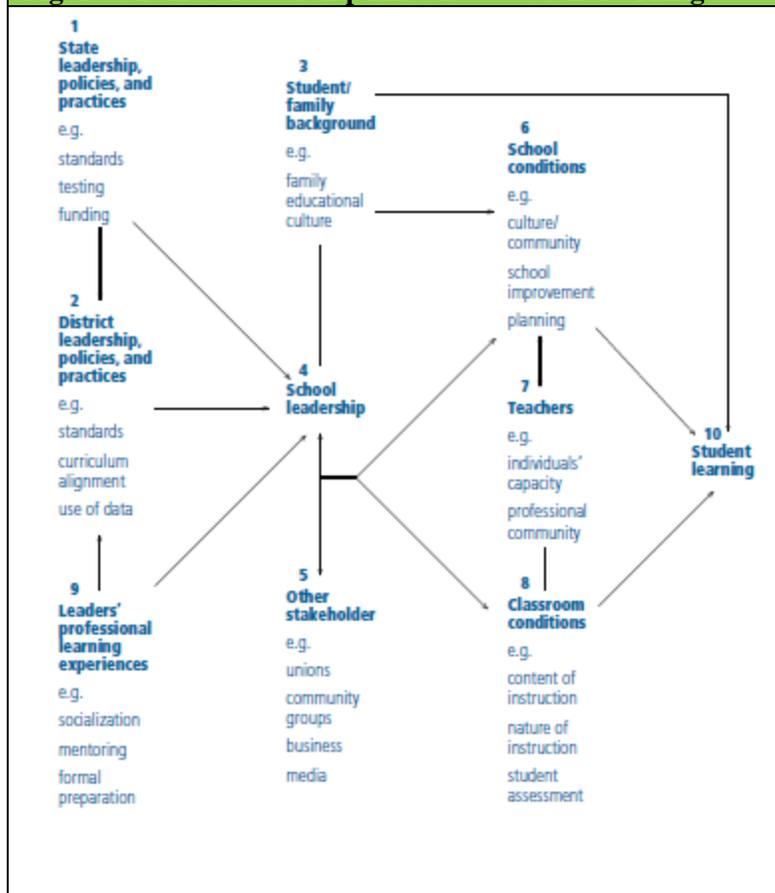
## Chapter 4: School Based Management and Principal Leadership

### A. Importance of Principal Leadership in SBM Implementation.

1. **There is substantial research evidence that the leadership of the school head is critically important for school quality.**<sup>9</sup> The main reason that leadership is so important to school quality is the large number of inter-related variables that determine school quality. The school head or principal is in a position to influence some

of these variables directly or indirectly, or in a position to influence the way that the variables interact with one another, for instance how parents participation in the school is perceived by the teachers – whether the teachers see it as a welcome sharing of responsibilities or they might perceive as undermining their professional tasks. SBM only sharpens further the importance of school leadership. Figure 4.1 shows the leadership influences at work, and even though the figure is based on research in the United States, the implications are also relevant for the Philippines. The figure only purports to show parts of the influences between 10 selected variables. School leadership is the central node that links the leadership from other levels of government and other stakeholders to the actual conditions of the school and the classroom. Student’s background including family and community has a direct relationship to student learning and also through the teachers’ actions and the school environment – factors which are heavily influenced by the Principal.

**Figure 4.1: How leadership influences student learning**



Source: Leithwood et. al, 2004; p. 18.

Student’s background including family and community has a direct relationship to student learning and also through the teachers’ actions and the school environment – factors which are heavily influenced by the Principal.

2. **This chapter brings together analysis of SBM implementation with the leadership qualities and personality characteristics of school heads.** SBM implementation varies from one school to another, even in the same division and district for the same level of education. In some schools, the implementation of the same rules regarding autonomy and accountability are applied with greater efficacy and efficiency than in other schools. In this study, we develop a new method to assess the implementation of SBM that will help DepED to improve the quality of its own school SBM self-

<sup>9</sup> Hallinger and Heck, 1998; OECD, 2008; Leithwood, et. al, 2004.

assessment tool.<sup>10</sup> The first part of the chapter describes the results from this exercise regarding levels of implementation of SBM. In the second part of the chapter we focus on the personality attributes of principals and on their leadership skills. The analysis draws on certain well-accepted instruments used in the psychology literature on personality and performance as well as a tool developed to identify political skills. The second part of the chapter also seeks to determine the relationship between SBM implementation and principal characteristics.

## B. Level of SBM Implementation

3. **Importance and Implementation Rating:** A list of 38 SBM related variables was developed, grouped into 9 conceptual dimensions (see Table 4.1). In the sample survey conducted as part of this study, the principal, School Governing Council (SGC) chairperson, and a randomly selected teacher each rated the 38 variables or items on the *importance* of the item for school quality on a ten point scale, followed by a rating on the *implementation* of each factor in the school from 1 ‘extremely poorly implemented’ to 10 ‘extremely well implemented’.<sup>11</sup>

<b>TABLE 4.1: SBM Conceptual Dimensions</b>	
<b>Variable Name</b>	<b>Conceptual dimension and variables within each dimension</b>
	<b>PARTICIPATION</b>
PAR_1	- Closer integration of school with local community
PAR_2	- Parent participation in purchases made with the school budget
PAR_3	- Participation from alumni association and barangay or local NGOs in organizing events and celebrations
PAR_4	- Parent participation in organizing events and celebrations
PAR_5	- Parents help to make sure that children study at home and come to school on time
	<b>RESOURCES</b>
RES_1	- Funds raised by the parents to supplement government budget
RES_2	- School has adequate financial resources to purchase educational material
RES_3	- Adequate resources to pay for MOOE other than educational material
RES_4	- Higher level of school budget
	<b>TEACHING PRACTICES</b>
TCH_1	- Teachers are able to get the training they need to upgrade their skills
TCH_2	- Teachers are encouraged to innovate new teaching methods
TCH_3	- Teachers have a say in pedagogy related decisions at school
TCH_4	- Teachers provide timely and periodic feedback to parents about their child’s school performance
TCH_5	- Teachers have special meetings amongst themselves to discuss pedagogical issues
	<b>AUTONOMY</b>
AUT_1	- School can upgrade building or facilities as required

<sup>10</sup> Each school assesses itself along six dimensions i.e. school leadership, internal stakeholders, external stakeholders, school improvement process, school resources, and school performance accountability. This data is available in databases at the division level for all public schools in the Philippines.

<sup>11</sup> For purpose of recording the ratings, care was taken by presenting the items one by one in a shuffled set of cards so that each respondent would get a different order of presentation of questions. This method eliminated position order bias for the items and also was instrumental in helping the respondents think independently about importance and implementation ratings. This technique is borrowed from the vast literature on customer satisfaction from the discipline of marketing management. In this literature, consumers rate products on the importance of a set of product features or service quality dimensions and they also rate their satisfaction or their perception of performance of the product on those features or dimensions. (Martilla and James, 1977).

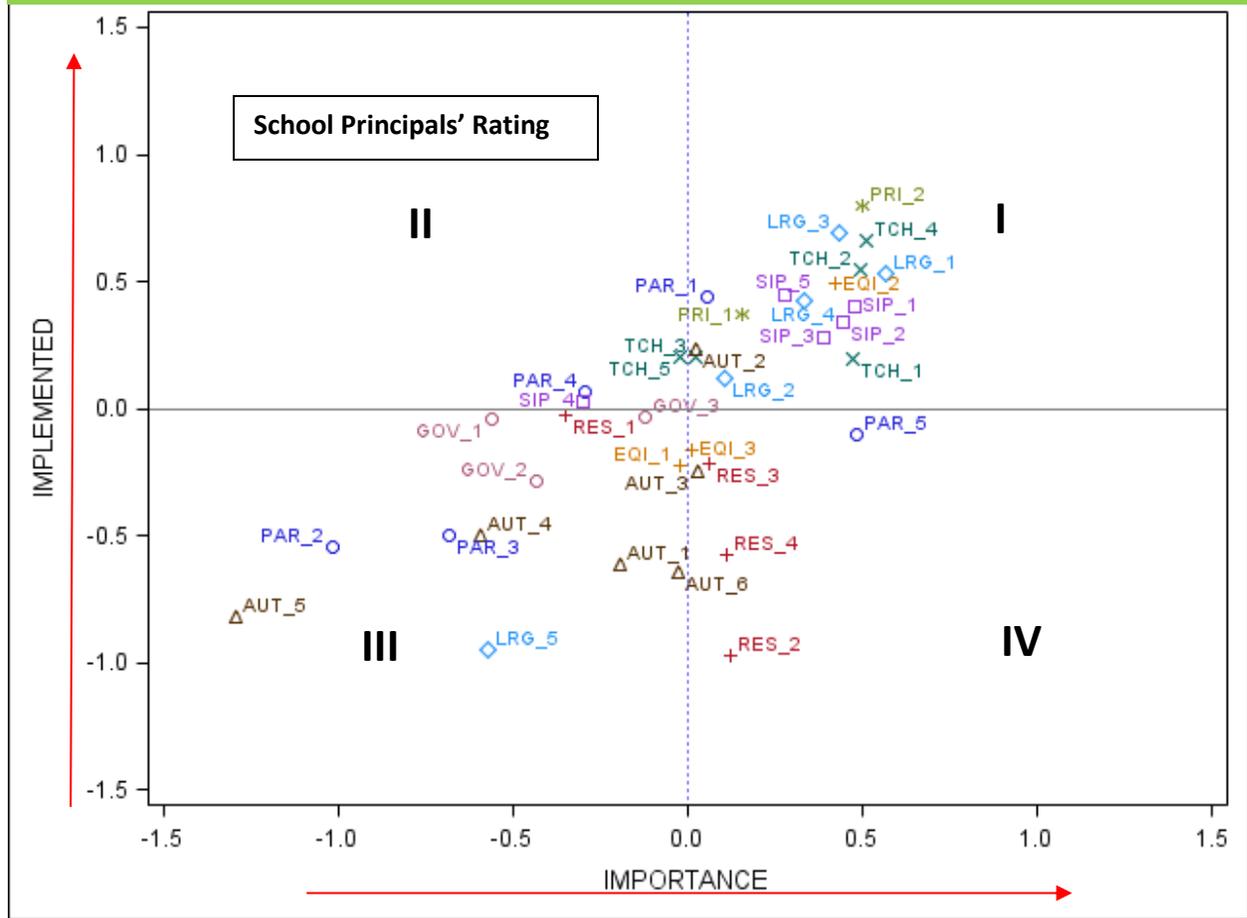
AUT_2	- School undertakes own school-based procurement for school needs
AUT_3	- Support from local government with financial matters
AUT_4	- Parent participation in decision about allocation of school budget
AUT_5	- Parent participation in evaluation of teacher performance
AUT_6	- School is able to secure additional number of teachers when required
<b>SCHOOL IMPROVEMENT PROCESS</b>	
SIP_1	- More effective school administration
SIP_2	- Goals in the School Improvement Plan are realistic and attainable
SIP_3	- School records are kept in perfect order
SIP_4	- Students have extra-curricular opportunities like sports, music and dance
SIP_5	- School grounds and toilets are always clean
<b>PRINCIPAL LEADERSHIP</b>	
PRI_1	- School head provides pedagogical feedback to teachers
PRI_2	- School head has harmonious relationships with local authorities
<b>STUDENT LEARNING</b>	
LRG_1	- Deeper attention to student learning and other student outcomes
LRG_2	- All stakeholders are aware of NAT results
LRG_3	- Teachers hold preparatory classes to help students do well in the NAT
LRG_4	- Teachers maintain portfolios of each students achievements
LRG_5	- School does well in regional competitions like Math Olympics
<b>GOVERNANCE</b>	
GOV_1	- More DepED control or oversight of school functioning
GOV_2	- DepED division and district supervisors visit school frequently
GOV_3	- School receives technical assistance as needed from district and division officers
<b>EQUITY AND INCLUSIVENESS</b>	
EQU_1	- Care better for students with learning difficulties or special needs
EQU_2	- Remedial classes are held for weaker students
EQU_3	- School feeding program ensures that no children are hungry

Source: 3D-SFSD

4. **Teaching and learning processes and school improvement are considered to be important and schools are strong on their implementation; participation and autonomy variables are relatively low in terms of importance and implementation.** A comparison by the school principal of the average ratings of each item on its importance and implementation scores is shown in Figure 4.1.<sup>12</sup> Graphs depicting views of SGC heads and teachers are not shown, though they are similar. Note the cluster of school improvement process and teaching and learning variables in the top right-hand Quadrant I, which indicates the variables with high scores on both reported importance and implementation. ‘Closer integration of school with local community’ (PAR\_1) is rated highly, as is the variable ‘School undertakes own school-based procurement for school needs (AUT\_2). However, Quadrant III in Figure 4.2 (low importance and low implementation) is mainly populated by participation and autonomy variables. The one learning related variable that makes an appearance in this quadrant is LRG\_5 or ‘School does well in regional competitions like Math Olympics’ but this is not a crucial learning related variable like LRG\_1 ‘Deeper attention to student learning and other student outcomes’. The sample for this study is not large enough to make definitive conclusions about the entire system, but the results indicate the possibility that greater outreach is required to communicate the core SBM concepts of autonomy and participation.

<sup>12</sup> Variable names are defined in Table 4.1. The scores are standardized for each individual. Standardization entails computing the mean rating for each individual and subtracting the actual rating for a variable from this mean, and then expressing the difference in standard deviation units.

**Figure 4.2: Importance vs. Implementation on SBM dimensions/school quality determinants**



Source: 3D-SFSD

### C. Rasch Analysis of SBM Levels

5. **To combine information from ratings on various sub-dimensions into a single dimension, a sound analytical method is required rather than simple averaging across all variables.** The problem with simple averaging is that each of the 38 items cannot be equally important in determining the SBM level of a school. The 38 items intended to capture SBM dimensions have been selected in such a way that a high rating of agreement on either the importance or the implementation scales is normatively superior – meaning more agreement is better. As an illustrative example, if there were a school for which each respondent gave the highest rating of 7 on each of the 38 ratings for importance and the highest rating of 10 on each of the 38 implementation ratings, this would probably be the best school in the Philippines. Conversely, the school with the lowest rating of 1 on both of these scales would be the poorest performing school. The theoretical extremes are well identified but the main problem concerns the range in between that most schools lie in. Some of the 38 items are more important than others in determining the actual SBM performance and ignoring this information will lead to incorrect overall rating. A school may do very well on the most critical ratings and consequently be a high SBM performer, but if for some reason it does not have a high rating on a set of unimportant items, its average score will be pulled down and it will not be classified as a high

performer. A converse counter-example can also readily be visualized, where a school misses out on the critical SBM items and yet be classified (wrongly) as a high performer. A scientifically valid method is required to combine the information from individual items to an overall SBM rating for a school.

6. **The popular Rasch analysis technique used for assessing student performance can be adapted for analysis of SBM ratings to generate a conceptually more sound SBM rating.** Student assessments using item-response theory (IRT) include questions of differing difficulty so that students of varying ability can correctly answer a varying number of questions. To apply the method to SBM rating, the first parameter needed is a *difficulty* parameter. Consequently, the items on the list in Table 4.1 are meant to include some items that all or most schools would rate high on importance and implementation – these are equivalent to the *easy* questions on a student assessment test. Some items would get a high rating only from schools that have higher levels of attainment of SBM – these are equivalent to the *difficult* questions on a student examination. Each of the 38 variables or items can be thought of having differing levels of difficulty to agree. For example, the first question in participation: PAR\_1 ‘Closer integration of school with local community’ could be more difficult to implement than SIP\_3 ‘School records are kept in perfect order’. It would seem that it is an easier task for a principal to keep school records as the records are completely under the control of the principal and her staff. For closer integration of school with the local community, the principal and staff might make an intense effort, but the outcome is dependent on variables the principal does not control, at least directly – such as the disposition or attitude of parents, their level of education and the time they are able to devote to help out with school related issues.
7. **The second parameter needed for Rasch analysis of SBM is the actual presence of varying levels of SBM at a school that will generate a variation in response to easy and difficult questions – equivalent to student *ability* in a student examination.** If there is indeed something called “SBM level” analogous to the ability of the student, the school principal from a high SBM level school will be able to agree more with more of the items. Conversely, for a low SBM level school, there will be lower agreement with fewer items. Since we have both importance and implementation related questions, we can check both the respondent’s preferences about SBM and also the implementation of SBM. A brief formal introduction of the Rasch model is presented in Appendix 4 for readers who might be interested in the derivation of the model. The formalization of the concepts of item difficulty and school ability is also sketched in the appendix. One of the advantage of using a Rasch methodology or similar dimension reducing methodology is that the resulting ratings are more robust and accurate. Comparisons across schools or district and division level aggregates of SBM implementation will be more valid, as will track the progress of SBM across time carry more meaning.
8. **The perceived importance of SBM is not related to the SBM performance from the self-assessment conducted by all public schools.** The sample survey was distributed across three groups of elementary and high schools according to their level of SBM performance as recorded from the SBM self-assessment tool. The analysis showed that no matter what their current position is in terms of their SBM performance (defined in the DepED assessment format), all the actors – principal, SGC chairperson and teachers – think of the importance of SBM in a similar manner. The findings indicate that there is no difference of SBM *importance* between schools defined as good and poor

SBM performers in the SBM self-assessment. That is, means of Rasch ‘importance’ measures are not statistically different between the two groups of High and Low SBM. The findings are reported in Table 4.2.

<b>Table 4.2: Comparison of Rasch index between High and Low SBM levels by DepED measure</b>			
	<b>DepED Classification</b>		t-test
<b>Importance</b>	<b>High SBM</b>	<b>Low SBM</b>	
Principal	2.1632	2.1641	0.0051
SGC Chairperson	2.7437	2.5785	0.8734
Teacher	3.5832	3.5485	0.1633
<b>Implementation</b>			
Principal	1.0150	0.7833	1.7306*
SGC Chairperson	1.1655	0.8741	1.7675*
Teacher	1.0882	1.0729	0.1027

Source: 3D-SFSD: Rasch analysis n= 150 schools; \* indicates significant at 5% level

#### D. Big Five Inventory of Principal Personality

9. **One of the most widely accepted constructs to measure personality dimensions is the Big Five Inventory (BFI) originally developed by psychologists but now used in multiple contexts including recruitment, performance and the study of social networks.**<sup>13</sup> The BFI has a storied trajectory of over forty years and there is now a large literature in existence that applies the BFI to

<b>Table 4.3: Explanation of the Big Five Personality Dimensions</b>		
	<b>Low Scorers</b>	<b>High Scorers</b>
Extraversion	Loner; Quiet; Passive; Reserved	Joiner; Talkative; Active; Affectionate
Agreeableness	Suspicious; Critical; Ruthless; Irritable	Trusting; Lenient; Soft-hearted; Good-natured
Conscientiousness	Negligent; Lazy; Disorganized; Late	Conscientious; Hard-working; Well-organized; Punctual
Neuroticism	Calm; Even-tempered; Comfortable; Unemotional	Worried; Temperamental; Self-conscious; Emotional
Openness	Down-to-earth; Uncreative; Conventional; Uncurious	Imaginative; Creative; Original; Curious

Source: *Psychology: A Journey*; Dennis Coon and John O. Mitterer; Cengage, 2009

varied groups of individuals. The version used here is the BFI-44 – a list of 44 questions regarding personality attributes that were self-administered by school principals as part of the field survey for this study. Each principal was asked “Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please write a number next to each statement to indicate the extent to which you agree or disagree with that statement. Scores on 44 items are converted to generate dimension level scores for the five main dimensions of personality: Openness; Conscientiousness; Extraversion; Agreeableness; and Neuroticism or OCEAN. It is believed that these 5 personality factors account for most important aspects of personality differences across cultures, occupations and adult age groups. The score on each of the five factors is calculated from scores on individual items that relate to the factor.

<sup>13</sup> John, Naumann and Soto, 2008. See also, Barrick and Mount, 1991.

10. **BFI Personality dimensions have been linked to performance and leadership - BFI profiles of principals can potentially reveal useful insights about school performance.** The literature seeks to relate the five personality dimensions to aspects of job performance. Researchers have investigated particular dimensions of the BFI and have related BFI dimensions to other individual traits, such as ability. Recruiters utilize personality tests to make recruitment decisions – it seems plausible to assume that you might not make a very good salesperson if you scored very low on “Agreeableness”. Similarly, it seems unlikely that an advertising agency might hire you in their creative department if you score low on “Openness to experience”. But what about school principals? Do more agreeable school principals perform better on the job, or perhaps it is better if they are not so agreeable then everyone obeys them? Is there any correlation between principal personality characteristics and their job performance? Awareness about these issues will help to generate greater effectiveness in the selection and deployment of principals.
11. **Comparing personality characteristics across the two groups of principals of high performing and low performing schools shows more similarities than differences.** The data on personality characteristics of principals was examined for differences across the groups of high performing and low performing schools as measured by average National Achievement Test (NAT) scores. Appendix 5 lists the mean personality scores for each of the 44 items of the BFI inventory from the groups of high performance and low performance schools – there are 65 schools in the high performance group and 55 schools in the low performance group. The data of the 44 items consolidated into the five main personality dimensions is presented in Table 4.4. Contrary to intuition which might suggest that principals who need to work with many individuals in course of a day may do better if they are outgoing, the dimensions of ‘openness’ and ‘extraversion’ do not figure in the list of significant differences. Similarly, though high performers score lower on the neuroticism dimension, the difference is not statistically significant.

<b>Table 4.4: Principal BFI: High and Low Performers (Mean)</b>		
	<b>High Performers</b>	<b>Low Performers</b>
Extraversion	-1.36	-1.35
Agreeableness	5.86	5.36
<b>Conscientiousness*</b>	<b>4.69</b>	<b>3.80</b>
Neuroticism	-7.90	-6.83
Openness	1.13	1.27

Source: 3D-SFSD \* indicates significant at 95%

12. **Conscientiousness is the only personality dimension that is associated with school performance as measured by student achievement.** The personality dimension of *conscientiousness* does show a difference that is large enough to be statistically significant. According to the items used in BFI-44, conscientious principals are hardworking and careful about doing a thorough job. They can be relied upon to persevere until a task is finished. They are not easily distracted and make plans which they follow through in an organized and efficient manner. While conscientiousness is the only one of the big five dimensions to show up as a differentiating marker regarding performance, some of the individual inventory items also show up as markers – Appendix 5 indicates that 12 of the 44 items

indicate significant differences in the mean values between the two groups. Principals from the high performing group score higher on “has a forgiving nature”, “is generally trusting” and “remains calm in test situations.”

13. **When it comes to SBM implementation, almost all dimensions other than conscientiousness appear to be important.** Principal personality comparison by SBM implementation level reveals quite a different picture from the one for NAT achievement. We now compare principals from schools with high levels of SBM implementation to principals from schools with low levels of SBM implementation. Though the usual caveat applies regarding causation and correlation from cross-sectional data, the most important predictor of high level of SBM implementation seen in Table 4.5 is *agreeableness*. This is intuitive, as SBM requires working together with multiple stakeholders and exercising leadership, a topic we explore more closely in the next sub-section of this report. Table 4.5 also shows the association of high SBM performers with emotional stability (opposite of neuroticism), again important in dealing with stakeholders. Finally, openness to new ideas is also associated with SBM implementation, which is intuitive as well, given that SBM represents a novelty from the traditional hierarchical management of schools.

<b>Table 4.5: Principal BFI: High and Low SBM (Mean)</b>		
	<b>High Performers</b>	<b>Low Performers</b>
Extraversion	-1.04	-1.63
Agreeableness*	6.03	5.17
Conscientiousness	4.32	4.29
Neuroticism*	-8.14	-6.72
Openness <sup>+</sup>	1.60	0.81

Source: 3D-SFSD <sup>+</sup> indicates significant at 90%; \* indicates significant at 95%

14. **Differences in personality types potentially influence the ability of school heads to mobilize resources for their schools.** School heads who rated high on the *openness* scale, defined by items such as being original, inventive, imaginative and curious received significantly greater funds for their school in 2010 in the form of per student personnel expenditure and per student MOOE grants. *Extraversion* seems to matter only for receiving school MOOE funds. On the other hand school heads who scored higher on the neuroticism scale, described as being nervous, moody and tense; as worriers who don’t handle stress well and get depressed easily – tended to be in schools which received fewer per student funds. While these results cannot confirm causality, they do indicate that personality types of school heads may be related to resources available to the school. Further research would be needed to understand the channels of causality, but the results seen so far indicate that exploring the issue of personality of principals as a research topic could provide useful insights.

## E. Political Skills Inventory

15. **The importance of political skills of a principal are heightened under SBM as the principal has to be even more effective in getting work done from and through people.** Political skill is defined as “the ability to effectively understand others at work and to use such knowledge to influence others to act in ways that enhance one’s personal and/or organizational objectives” (Ferris et.al. 2005). In the DepED guidelines for selection of principals (Order No. 42, 2007), emphasis is placed on the need

of the school principal to exercise “educational leadership, people leadership, and strategic leadership.” It is clear that in order to exercise such leadership, a principal will need high level of political skills. We use the Political Skill Inventory (PSI), a list of 18 items following the same 7-point Likert scale self-rating as the BFI (Ferris et. al. 2005). PSI is of a more recent vintage than BFI and though the literature on PSI is not as vast as the one for BFI, the inventory has also undergone detailed investigations of reliability, validity and robustness, as well as applicability to performance. From a practical perspective, while personality traits are usually considered to be given for an individual, skills by their very definition can be acquired and learned – if attention and effort is provided for that purpose.

16. **Social Astuteness, Interpersonal Influence, Networking Ability and Apparent Sincerity are the four dimensions that constitute Political Skill:** (i) *Social astuteness*: “Individuals possessing political skill are astute observers of others and are keenly attuned to diverse social situations. They comprehend social interactions and accurately interpret their behavior, as well as that of others, in social settings”; (ii) *Interpersonal Influence*: “Politically skilled individuals have a subtle and convincing personal style that exerts a powerful influence on those around them. Individuals high on interpersonal influence... are capable of appropriately adapting and calibrating their behavior to each situation in order to elicit particular response from others”; (iii) *Networking Ability*: “Individuals with strong political skill are adept at developing and using diverse networks of people...easily develop friendships and build strong, beneficial alliances and coalitions; and (iv) *Apparent Sincerity*: “Politically skilled individuals...are or appear to be, honest, open, and forthright... focuses on the perceived intentions of the behavior exhibited.”

17. **Networking Ability and Apparent Sincerity are the main differentiators between principals from High and Low NAT score achieving schools.** Table 4.6 shows the difference between mean values on Political Skill and its four constituent elements for high and low performers on NAT scores. The table shows that political skill is statistically significantly higher for principals from the high performer group of schools. The main dimensions that contribute to that difference are *networking ability* and *apparent sincerity*. These are preliminary findings and more research needs to be done before any definitive conclusions are

<b>Table 4.6: Principal BFI: High and Low Performers (Mean)</b>		
	<b>High Performers</b>	<b>Low Performers</b>
Social Astuteness	6.15	6.05
Interpersonal Influence	5.18	5.18
Networking Ability*	5.70	5.42
Apparent Sincerity*	5.76	5.43
POLITICAL SKILL <sup>+</sup>	5.72	5.54

Source: 3D-SFSD <sup>+</sup> indicates significant at 90%; \* indicates significant at 95%

made. It is possible that social astuteness and interpersonal influence are genuinely very high for all school principals, but difference in networking ability are instrumental in some school principals being able to attract more resources through denser, more effective networks. Apparent sincerity is a very important political skill that is sometimes underrated by individuals who need it most. It is very important even for the most genuine and honest and hardworking individuals to be perceived as honest – if followers do not believe a leader, even if a leader is genuine, his or her efforts may not be

fruitful. The word ‘apparent’ here is instrumental – though it can be taken to be somewhat cynical, because leaders may appear to be sincere who are not really so.

## F. Correlation between SBM rating and Principal Leadership

18. **Only the leadership factors significantly affect the degree to which SBM is implemented, while only the personality factors significantly affect the level of importance attached to SBM.** There is a statistically significant correlation between the BFI measures of personality and political skills (Appendix 6 provides details). With regard to the correlation between personality and political skills on the one hand, and SBM level on the other hand, there is a clear contrast between determinations of importance and implementation of SBM (as shown in Table 4.7). Analysis of the data indicates that only the leadership factors significantly affect the degree to which SBM is implemented, while only the personality factors significantly affect the level of importance attached to SBM. To determine the implementation of SBM, therefore, we can conclude that leadership factors matter more significantly than personality factors. Future research needs to examine the interaction effects between personality traits and political skills and how they together predict or not predict school performance and SBM implementation.<sup>14</sup>

<b>Table 4.7: Comparing effects of Personality and Political Skills</b>		
	<b>Rasch Index for SBM</b>	
	<b>Implementation</b>	<b>Importance</b>
Personality Factor 1	0.0408	<sup>+</sup> 0.2094
Personality Factor 2	0.0404	*0.1914
Leadership Factor 1	<sup>+</sup> 0.1685	0.0153
Leadership Factor 2	<sup>+</sup> 0.1836	0.0208
<i>R-squared</i>	0.1112	0.0678

Source: 3D-SFSD<sup>+</sup> indicates significance at 90%; \* indicates significance at 95%

<sup>14</sup> To compare factors linked to the principal’s personality and political skills in determining the level of SBM importance and implementation, Rasch measures for SBM were regressed on the first and second factors derived from personality and political skills inventories. We adopted this approach because we are interested in the overall impact of personality traits and political skills rather than in the constituent elements and we want to abstract away from the actual personality of the principal. At the first stage, a factor analysis was conducted to identify the first and second most important latent factors as linear combinations of the original scores. This exercise was done separately for the BFI-44 data on personality and the data on the PSI. At the second stage, Rasch measures of importance and implementation are regressed on these factors.

## Chapter 5: Conclusions and Policy Implications

1. The key findings and their policy implications are summarized in this chapter. The findings are grouped into four categories: (A) SBM implementation, (B) Resource allocation, (C) Principal professional development, and (D) Data and information management. Needless to say, these issues are inevitably interrelated so it is important for us to integrate the findings to derive policy implications.

### A. SBM implementation

2. **SBM is found to significantly increase student's test scores.** An analysis using nation-wide elementary school data to assess the impact of SBM on Grade 6 NAT scores reveals that SBM implementation increases the average score by 4.2 percentage points (Overall) and 5.5 percentage points (Mathematics). The above findings support that overall implementation of SBM in the country is successful, delivering the expected result on students' learning achievements.
3. **The impact can be attributed to SBM rather than to other simultaneously occurring factors.** The methodology used in this study allows us to separate out the effects of SBM from other simultaneously occurring events. Rather than merely comparing before and after scores of schools that implemented SBM, this study carefully sets up a homogenous group of schools that started SBM implementation in 2006 and compares them with a matching group of control schools that did not implement SBM until 2009. The method allows to control for variables such as the pupil-teacher ratio (PTR) and the pupil-classroom ratio (PCR). The conclusion is that the learning gains occur because of the SBM rather than to reduction in the PTR and the PCR. NAT scores have improved for all tested schools in the Philippines, but SBM was initially targeted to disadvantaged schools and these schools appear to have reduced the magnitude of the gap separating them from other schools.
4. **Experience of teachers and principals is found significantly correlated with good implementation of SBM.** The analyses of our SBM survey and national school data reached a common finding that teachers' experience, measured by their rank (three levels within each category of instructor, teacher and master teacher) significantly influence SBM implementation. First, it was shown that schools with more experienced teachers are likely to prepare SIPs and thus receive SBM grants earlier. This hypothesis was clearly supported by the national data analysis using non-TEEP non-city division schools. Second, the survey data analysis showed that those schools are also likely to implement SBM more proactively and much further than their perceived level of its importance. However, we also find some evidence that schools are less motivated to implement SBM if their initial level of NAT score is already high before its implementation.
5. **Good SBM implementation supports better financial resource management.** The school resources analysis shows that schools with higher SBM implementation levels, based on the DepED tool, were capable of better financial resource planning. The difference between planned and actual school funds is narrower among schools that show higher levels of SBM implementation. That is, in those schools, levels of resources that were committed in the SIP from various sources vis-à-vis the actual resources mobilized are close. The combination of good principals and good SBM implies that

such schools may be ‘empowered’ to speak up or complain to divisions if they don’t get their expected share of the School MOOE.

## **B. Resource allocation**

6. **The national data show that school-teacher resources are more unequal within division than between divisions in 2005-2010.** It is striking to find in our analysis that school and teachers resources, measured by pupil classroom ratio, pupil teacher ratio and per pupil teachers’ salary, are more unequal within a division than between divisions. The average levels of the above resource allocation measures are quite similar across divisions, but a greater proportion of the total inequality comes from variations within each division. Interestingly, the inequalities in both within and between division dimensions have been increasing in recent years. All the above findings imply that potential roles of division offices are greater to optimize school resource allocation to achieve a more equitable allocation of education resources.
7. **School level resources have increased indicating growing school financial empowerment but *not* substantial school level financial decentralization.** The survey of school level resources conducted as part of this study reveals that an increased share of resources are managed at the school level compared to total national government spending on basic education in the last five years. School level managed funds have grown in absolute and per pupil terms during the last five years. School level resources were almost double for high schools at PHP 965 per student in 2010 when compared with only 449 PHP per student at the elementary level (in nominal terms). Average real per student school level managed funds doubled from just under PHP 200 in 2007 to nearly 400 pesos in 2010 in the survey sample schools (in constant 2005 prices). Nevertheless, compared to the *national* average spending per pupil, school level managed resources remain a small proportion of 5.4 percent in 2010.
8. **Even though small, school managed resources appear to have become more equally distributed as compared to overall resources at the school level.** Though pupil classroom and teacher ratios and per pupil teachers’ salary became more unequal nationwide in recent years, it is not the same case for school managed financial resources. Our sample schools experienced better equality of school managed financial resources per pupil from 2007 to 2010. During the time of the new administration in 2010, there was a conscious and deliberate effort to improve the distribution of School MOOE and, in 2011, there was also increased transparency as they uploaded in the DepED website the School MOOE that each public school are expected to receive. Interestingly, we also observe from the national data that the distribution of NAT scores became more equal in 2005-2010 which in fact suggest that some other factors, such as SBM implementation and actual school managed financial resources, are likely to play increasingly important roles to determine students’ learning outcomes.
9. **A structural difference was observed between city and rural schools in the role of school teacher resources in improving students’ test scores.** Our analysis shows that impacts of teachers’ experience, i.e., per pupil teachers’ salary, on NAT scores are significantly greater at city schools, whereas impacts of physical conditions, i.e., pupil classroom and teacher ratios, are more important at rural schools. Since the average classroom size is larger in city divisions, the above finding implies that experienced teachers are better able to handle large classes than inexperienced (or younger) teachers. The analysis also reveals that there is a clear small-class size advantage in test scores, i.e.,

the average test score is higher in rural schools that generally have better pupil classroom and teacher ratios. While the conventional thinking is that rural schools should be favored with more experienced teachers, in the case of the particular time period studied in the Philippines, it is possible that some unknown peculiarity of urban schools leads teacher experience to be relatively more productive for test scores in urban areas. This issue clearly needs further research before a definitive policy conclusion can be reached.

10. **SBM implementation and actual school-level financial structures are closely linked.** First, the proportion of school managed funds in the total spending in per-student terms remains small, around 5-percent, in the survey schools. That is, though school-level resources are expected to increase, financial decentralization is still relatively small. Second, we found that the sample schools with higher SBM implementation levels, based on the DepED tool, were indeed capable of better financial resource planning. Third, DepED's role in empowering schools to manage their own operating expenses funds should be to compensate by targeting its grants towards schools that receive less funds from LGU, community, PTCA and other sources. The survey data show that the sample schools that received the SBM grant in 2011 were likely to come from the 4th and 5th income class municipalities, which follows the DepED guidelines for targeting of SBM grants for 2011 toward poorer municipalities.

### C. Professional development of Principals

11. **Conscientious school heads are better leaders as they are associated with high performing schools while more agreeable, open and more emotionally stable school heads are significantly better at implementing SBM.** The analysis of the survey data shows that principal leadership and personality factors are related to how SBM is implemented and to school performance. This issue is often cited as a critical factor for successful implementation of SBM by the community stakeholders as well as government officials, but this study offers the first statistical evidence to support this intuition. Interestingly, leadership factors of principals do influence SBM implementation but does not generally affect how they think of importance of SBM itself. Whereas personality factors are generally considered as a given, political skills can be learned and improved with training and practice.
12. **Principals' leadership and select political skills influence the perceived level of importance attached to different issues on SBM as well as the actual implementation level of SBM.** -This is the first evidence connecting often regarded latent factors of principals' leadership and personality and SBM implementation. Leadership factors are a driving force of SBM implementation, but they do not directly influence perception of importance. The finding that principal's leadership definitely matters in effective implementation of SBM urges DepED to focus attention on the measurement of leadership skills and leadership training for school heads as an important part of their professional development.
13. **Principals' personality factors affect school-level financial management.** School heads' perceptions of their own personalities does have a significant influence on resources they receive for their schools for certain kinds of funds but not for others. It is particularly noteworthy that more open, extroverted and emotionally stable school heads are in charge of schools that receive higher per

student school MOOE funds. SBM and SBRMS grants are not statistically related to school head personality types.

#### **D. Data and information management**

14. **The conversion of hundreds and thousands of individual spreadsheets from the BEIS and NAT datasets for 2005-2010 into a usable database format constitutes an important contribution of the current study.** It also demonstrates the tremendous value added of the new E-BEIS that DepED has launched since this would enable the data to be used for monitoring, planning and analysis much more easily than at present. At this stage, it requires huge efforts for individual researchers to consolidate BEIS and NAT across divisions by selecting sections that they need to use for their analytical purposes, but it is highly desired that the whole database should be operationally manageable to be friendly to any users. It will be important for the E-BEIS system to include key data regarding SBM implementation, all DepED grants as well as other school-level financial resources. To complement the school data, it would be more useful if it includes some basic community or municipality characteristics.
  
15. **Further improvement of BEIS is required to integrate different education cycles and alternative systems.** The recent development of the Learner Information System (LIS) is a step in the right direction as having a unique serial number for each student will make it possible to track the progress of an individual child across school levels. From a policy analytic viewpoint, the important aspect is to maintain a relational database engine so that data can be easily retrieved and future researchers would not have to generate usable data from thousands of separate spreadsheets. In the future, it is also worth having some parts of the alternative learning system database integrated to the main BEIS database. The omission of detailed data on private schools in the information system is a large pitfall which needs to be addressed in the future.

## Appendices

### Appendix 1: List of school personnel and salary range

			2005	2006	2007	2008	2009	2010
	SG	SG	7/1/2001	7/1/2001	7/1/2007	7/1/2008	7/1/2009	6/24/2010
<b>A. School Administration</b>								
<b>I. Principal</b>								
-Principal I	18	19	15,841.00	15,841.00	17,425.00	19,168.00	23,703.00	27,088.00
-Principal II	19	20	16,792.00	16,792.00	18,471.00	20,318.00	25,295.00	29,052.00
-Principal III	20	21	17,799.00	17,799.00	19,579.00	21,537.00	26,671.00	30,945.00
-Principal IV	21	22	18,510.00	18,510.00	20,361.00	22,397.00	28,134.00	32,973.00
<b>II. Head Teacher</b>								
-Head Teacher I	13	14	11,837.00	11,837.00	13,021.00	14,323.00	17,147.00	19,112.00
-Head Teacher II	14	15	12,546.00	12,546.00	13,801.00	15,181.00	18,292.00	20,490.00
-Head Teacher III	15	16	13,300.00	13,300.00	14,630.00	16,093.00	19,514.00	21,969.00
-Head Teacher IV	16	17	14,098.00	14,098.00	15,508.00	17,059.00	20,819.00	23,555.00
<b>III. Senior Bookkeeper</b>								
	9	9	9,318.00	9,318.00	10,250.00	11,275.00	12,469.00	13,663.00
<b>IV. Disbursing Officer</b>								
-Disbursing Officer I	4	4	6,522.00	6,522.00	7,174.00	7,891.00	8,713.00	9,536.00
-Disbursing Officer II	6	6	7,606.00	7,606.00	8,367.00	9,204.00	10,133.00	11,062.00
<b>V. Vocational School Administrator</b>								
-Vocational School Administrator I	22	22	19,251.00	19,251.00	21,176.00	23,294.00	28,134.00	32,973.00
-Vocational School Administrator II	23	23	20,020.00	20,020.00	22,022.00	24,224.00	29,684.00	35,144.00
-Vocational School Administrator III	24	24	20,823.00	20,823.00	22,905.00	25,196.00	31,334.00	37,473.00
<b>B. Teachers</b>								
<b>I. Master Teacher</b>								
-Master Teacher I	16	18	14,098.00	14,098.00	15,508.00	17,059.00	22,214.00	25,259.00
-Master Teacher II	17	19	14,944.00	14,944.00	16,438.00	18,082.00	23,703.00	27,088.00
-Master Teacher III	18	20	15,841.00	15,841.00	17,425.00	19,168.00	25,295.00	29,052.00
<b>II. Teacher</b>								
-Teacher I	10	11	9,939.00	9,939.00	10,933.00	12,026.00	14,198.00	15,649.00
-Teacher II	11	12	10,535.00	10,535.00	11,589.00	12,748.00	15,119.00	16,726.00
-Teacher III	12	13	11,167.00	11,167.00	12,284.00	13,512.00	16,101.00	17,880.00
<b>III. Instructor</b>								
-Instructor I	12	12	11,167.00	11,167.00	12,284.00	13,512.00	15,119.00	16,726.00
-Instructor II	13	13	11,837.00	11,837.00	13,021.00	14,323.00	16,101.00	17,880.00
-Instructor III	14	14	12,546.00	12,546.00	13,801.00	15,181.00	17,147.00	19,112.00
<b>IV. Volunteers</b>								
<b>V. SPED Teacher</b>								
- SpEd Teacher I	13	14	11,837.00	11,837.00	13,021.00	14,323.00	17,147.00	19,112.00
- SpEd Teacher II	14	15	12,546.00	12,546.00	13,801.00	15,181.00	18,292.00	20,490.00
- SpEd Teacher III	15	16	13,300.00	13,300.00	14,630.00	16,093.00	19,514.00	21,969.00
- SpEd Teacher IV	16	17	14,098.00	14,098.00	15,508.00	17,059.00	20,819.00	23,555.00
- SpEd Teacher V	17	18	14,944.00	14,944.00	16,438.00	18,082.00	22,214.00	25,259.00
<b>C. Non-Teaching Personnel</b>								
<b>I. Utility Personnel</b>								
	1	1	5,082.00	5,082.00	5,590.00	6,149.00	6,862.00	7,575.00
<b>II. Librarians</b>								
- Librarian I	10	11	9,939.00	9,939.00	10,933.00	12,026.00	14,198.00	15,649.00
- Librarian II	14	15	12,546.00	12,546.00	13,801.00	15,181.00	18,292.00	20,490.00
<b>III. Guidance Counselors</b>								
- Guidance Counselor I	10	11	9,939.00	9,939.00	10,933.00	12,026.00	14,198.00	15,649.00
- Guidance Counselor II	11	12	10,535.00	10,535.00	11,589.00	12,748.00	15,119.00	16,726.00
- Guidance Counselor III	12	13	11,167.00	11,167.00	12,284.00	13,512.00	16,101.00	17,880.00

Source: DepED Planning and Programming Division; Figures are in nominal Philippine Pesos

## Appendix 2: Panel data regression results of test scores on resource endowments

<b>City sample</b>						
Dependent: Change in test score	Total	Math	English	Science	Filipino	Social science
Sample: City divisions						
Frequency weight: total enrollment in 2005						
Change in pupil classroom ratio	0.0542 (0.89)	0.1242 (1.64)	0.0567 (0.76)	0.0467 (0.64)	-0.0130 (0.33)	0.0561 (0.82)
Change in pupil teacher ratio	0.0403 (0.62)	0.0316 (0.38)	0.0319 (0.45)	0.0557 (0.78)	0.0282 (0.52)	0.0539 (0.85)
Change in per pupil teacher salary	1.5610 (2.38)	0.0257 (2.64)	0.0202 (2.54)	0.0180 (2.14)	0.0101 (1.82)	0.0174 (2.31)
Included:						
Change in the number of principal, head teacher, master teachers, and teachers by rank						
Division dummies						
Number of observations	398940	398940	398940	398940	398940	398940
R squared	0.4013	0.3786	0.3655	0.3554	0.3138	0.3544
Numbers in parentheses are absolute t values using Huber robust standard errors with division clusters.						
<b>Non-city sample</b>						
Dependent: Change in test score	Total	Math	English	Science	Filipino	Social science
Sample: Non-city divisions						
Frequency weight: total enrollment in 2005						
Change in pupil classroom ratio	-0.0552 (2.10)	-0.0597 (1.53)	-0.0447 (1.42)	-0.0503 (1.70)	-0.0530 (2.90)	-0.0686 (1.96)
Change in pupil teacher ratio	-0.0496 (3.36)	-0.0291 (1.74)	-0.0802 (4.25)	-0.0524 (2.95)	-0.0387 (2.59)	-0.0479 (2.78)
Change in per pupil teacher salary	-0.0009 (0.48)	-0.0003 (0.10)	-0.0020 (1.14)	-0.0001 (0.05)	-0.0016 (1.17)	-0.0007 (0.27)
Included:						
Change in the number of principal, head teacher, master teachers, and teachers by rank						
Division dummies						
Number of observations	796111	796111	796111	796111	796111	796111
R squared (within)	0.2921	0.2573	0.2497	0.2648	0.2048	0.2230
Numbers in parentheses are absolute t values using Huber robust standard errors with division clusters.						

Source: BEIS-NAT

### **Appendix 3: Description of 3 Division SBM Field Survey Database (3D-SFSD)**

- 1. The BEIS-NAT database (2005-2010) is supplemented in this study by a field survey directed at a detailed investigation of SBM related issues.** The three divisions of Pangasinan II, Bohol and Surigao Del Sur were chosen as the sample divisions for the field survey. These were chosen to represent the three island groups of Luzon, Visayas and Mindanao respectively. The divisions were also selected because they represent varied experiences with SBM implementation. Surigao Del Sur schools have a longer experience with school level planning and management as part of the Third Elementary Education Project (TEEP) which started in Surigao Del Sur, along with in 22 other divisions, in 2001. Bohol has had the benefit of experience from the AusAID financed Strengthening Implementation of Visayas Education (STRIVE) which introduced school level planning and SBM related data management systems in the division. Pangasinan II, on the other hand, has not had the experience of any externally aided project, and SBM tools such as School Improvement Plans were introduced in most schools as late as 2009/2010. This study is not to provide an analysis of the three divisions – the study was spread across three divisions only to increase the overall diversity and hence the representativeness of the sample for the field survey.
- 2. Cost considerations limited the sample size to a total of 100 elementary and 50 high schools and schools were selected using a purposive but systematic sampling method within each of the three divisions.** The systematic method was to generate strata for three key variables and to select randomly within the strata. The variables were the level of implementation of SBM in a school as determined by an SBM index; the NAT score performance across the past 6 years computed as a NAT index and the school size (enrollment). The SBM index and NAT index was used to generate a matrix (Table 2.1). This matrix was constructed for each of the three divisions and schools were randomly selected from each of the four corner cells and the middle cell of the matrix. The purpose of this stratification was to ensure that the sample had a sufficient variation in SBM implementation and NAT score performance and that there was adequate representation of schools of different sizes. To the extent that the results of BEPER Phase II are found to be interesting and relevant for policy design and implementation, BEPER Phase III can possibly explore the issues in a more definitive manner through a larger and representative random sample of schools.
- 3. The SBM index is based on the observed frequency distribution of the SBM self-assessment scores in each of the three divisions.** The SBM self-assessment scores were taken from the latest available SBM self-assessment data from DepED which every school in the country is mandated to complete on a regular basis.<sup>15</sup> Each school assesses itself along six dimensions i.e. school leadership, internal stakeholders, external stakeholders, school improvement process, school resources, and school performance accountability. The SBM index created for the purpose of sampling used these scores by generating tags for the SBM index from the frequency distribution of each of the six dimensions for each of the three divisions. The tag value for each dimension was 1 if the school was

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<sup>15</sup> See “A Manual of the Assessment of School-Based Management Practices” (DepED, 2009). Each school assesses itself along six dimensions i.e. school leadership, internal stakeholders, external stakeholders, school improvement process, school resources, and school performance accountability. This data is available in databases at the division level for all public schools in the Philippines. For purpose of the study, investigators travelled to the division offices to collect the data for sample generation.

in the bottom third for the division, 2 if in the middle third, and 3 if in the top third of schools in the division. Next, the sum was calculated for tags across all six SBM dimensions to generate the index – so the SBM index could theoretically take values from a minimum of 3 to a maximum of 18. Finally, the schools were divided into 3 groups based on their SBM index and the index was given a value of 1 (low SBM implementation), 2 (medium SBM implementation) or 3 (high SBM implementation). This analysis was required to be done for each division as the stratification of interest was the level of SBM implementation within each division, and the average level of SBM implementation varied across division.

4. **The NAT score index was based on the average NAT scores for multiple years (2005-2010) depending on the years for which NAT data was available.** As there is some doubt about the comparability of NAT scores across different years, mean differenced scores were used - for each year, the deviation of the school NAT score from the division mean NAT score was computed. Each school was then categorized into one of 3 groups. If the deviation from the division mean was positive for at least four of the six years, the school was categorized as a “high performer” school with a NAT index of 3. If the deviation from the division mean was negative for at least four of the six years, the school was categorized as a “poor performer” with a NAT index of 1. All remaining schools were categorized as medium performer schools with a NAT index of 2. In some cases NAT scores were not available for all six years and the heuristic was adjusted to the number of years for which data was available. In the case of schools for which NAT scores were not available at all, the school was randomly assigned to one of the three performance groups. Approximately 30% of the schools in the overall data for the 3 divisions were randomly assigned to cells due to lack of data.

#### Appendix 4: Technical summary of single parameter Rasch model applied to SBM

**The use of the Rasch model can be formalized in a fairly simple way as a multinomial logit, with the options being the different discrete levels of agreement.** In the model, it is assumed that school – represented by the principal, SGC chairperson or teacher in our context – chooses the level of importance from  $\{1,2,\dots,7\}$  and the degree of implementation from  $\{1,2,\dots,10\}$ . The items were based on selected conceptual dimensions: participation (5 items); resources (4); teaching (5); autonomy (6); school improvement process (5); principal’s role (2); learning (5); government involvement in the school (3); and equity (3). In the analysis, we treat these categories equally to pool all the answers to the above 38 questions – together they are meant to capture the level of SBM, with weightage to variables depending on the estimated parameters of the Rasch model. To understand the formalization, it is best to start from a simple example. Suppose that we give ‘yes’ or ‘no’ to each question, rather than giving a score ranging from 1 to 7 (or 10). For instance, we are allowed to answer yes or no to the question: we have achieved closer integration of school with local community? The setting is analogous to conditional logit in econometrics where we take individual heterogeneity into account. Each school has its own likelihood to answer yes (rather than no), which is closely related to the level of SBM already implemented in the school. As discussed, different questions have their own difficulties too. In our setting, we have to extend the above to a multinomial logit, that is, answers are not yes or no, but scores ranging from 1 to 7 or 10.

Let  $X_{ni}$  be a random variable, a response from school  $n$ , taking on integer values between 0 and a maximum of  $m$ , for question  $i$ . In the importance questions, for example, the maximum score  $m$  is 7. In the implementation questions, it is 10. The probabilistic model is defined as

$$\Pr\{X_{ni} = x\} = \frac{\exp \sum_{k=0}^x (\beta_n - (\delta_i - \tau_k))}{\sum_{x=0}^m \exp \sum_{k=0}^x (\beta_n - (\delta_i - \tau_k))}$$

where  $\beta_n$  is the location of school  $n$ ,  $m$  is the maximum score for the question  $i$ ,  $\delta_i$  is the difficulty of question  $i$  and  $\tau_k$  is the  $k$ -th threshold of the rating scale which is in common to all the questions.  $\tau_0$  is chosen for computational convenience. More intuitively,  $\beta_n$  measures school-specific ability or what we term as a Rasch index of SBM. In our empirical context, it is school-specific level that represents the school actor’s assessment of SBM importance, or its implementation. The higher ability, the more likely they think the item  $i$  is important or the item is better implemented. Thus, a large number of  $\beta_n$  means that it is likely that SBM is generally thought to be important, or is generally implemented well. On the other hand,  $\delta_i$  is the difficulty of question  $i$ . A large value of this parameter for importance means that it is not easy to have that particular aspect of SBM well implemented.

<b>Appendix 5: Big Five Inventory: Principals from High Performing and Low Performing Schools</b>					
	<b>Hi</b>	<b>Lo</b>		<b>Hi</b>	<b>Lo</b>
1. Is talkative	3.53	3.73	23. Tends to be lazy**	1.52	2.15
2. Tends to find fault with others	2.11	2.02	24. Is emotionally stable, not easily upset	5.58	5.27
3. Does a thorough job	6.02	5.87	25. Is inventive	5.28	5.20
4. Is depressed, blue	2.61	2.24	26. Has an assertive personality	5.61	5.38
5. Is original, comes up with new ideas	5.86	5.64	27. Can be cold and aloof	3.30	3.65
6. Is reserved	4.72	4.55	28. Perseveres until the task is finished*	6.25	5.87
7. Is helpful and unselfish with others*	6.45	6.07	29. Can be moody	3.88	3.58
8. Can be somewhat careless	2.81	2.93	30. Values artistic, aesthetic experiences	6.08	5.87
9. Is relaxed, handles stress well*	5.27	4.78	31. Is sometimes shy, inhibited*	4.17	4.69
10. Is curious about many different things	5.78	5.76	32. Is considerate and kind to almost everyone	6.38	6.18
11. Is full of energy	6.08	6.02	33. Does things efficiently**	6.22	5.85
12. Starts quarrels with others*	1.16	1.42	34. Remains calm in tense situations**	5.92	5.55
13. Is a reliable worker	6.22	6.04	35. Prefers work that is routine	5.52	5.40
14. Can be tense	3.72	4.02	36. Is outgoing, sociable	4.64	4.76
15. Is ingenious, a deep thinker	5.45	5.20	37. Is sometimes rude to others	2.53	2.67
16. Generates a lot of enthusiasm	5.89	6.05	38. Makes plans and follows through with them	5.91	5.76
17. Has a forgiving nature**	6.41	6.05	39. Gets nervous easily*	3.23	3.76
18. Tends to be disorganized	2.34	2.76	40. Likes to reflect, play with ideas	5.58	5.44
19. Worries a lot**	3.20	3.98	41. Has few artistic interests	3.75	3.62
20. Has an active imagination	5.66	5.69	42. Likes to cooperate with others	6.58	6.45
21. Tends to be quiet	4.36	4.64	43. Is easily distracted	2.89	3.29
22. Is generally trusting**	6.34	5.73	44. Is sophisticated in art, music, or literature	4.77	4.65

Source: 3D-SFSD \* indicates significant difference at 90% level; \*\* at 95% level of significance

**Appendix 6: Correlation between Personality Traits and Political Skills**

	PSKILL	EXTRVRSN	AGREEABS	CONSCIEN	NEUROTSM	OPENNESS	SOCIAL	INTER	NETWORK	SINCERE
<b>PSKILL</b>	1	0.298 (0.0002)	-0.160 (0.0502)	0.082 (0.3161)	-0.193 (0.018)	0.156 (0.057)	0.723 (<.0001)	0.752 (<.0001)	0.927 (<.0001)	0.845 (<.0001)
<b>EXTRVRSN</b>		1	-0.269 (0.0009)	-0.224 (0.0058)	-0.445 (<.0001)	0.155 (0.0582)	0.176 (0.0314)	0.242 (0.0028)	0.285 (0.0004)	0.262 (0.0012)
<b>AGREEABS</b>			1	0.008 (0.9241)	-0.216 (0.0078)	-0.024 (0.7728)	-0.075 (0.3641)	-0.221 (0.0066)	-0.090 (0.2749)	-0.163 (0.0463)
<b>CONSCIEN</b>				1	-0.469 (<.0001)	-0.109 (0.1845)	0.174 (0.0327)	-0.020 (0.8108)	0.068 (0.4115)	0.043 (0.5975)
<b>NEUROTSM</b>					1	-0.131 (0.1099)	-0.264 (0.0011)	-0.090 (0.271)	-0.151 (0.0656)	-0.125 (0.1276)
<b>OPENNESS</b>						1	0.204 (0.0122)	0.204 (0.0122)	0.073 (0.3725)	0.034 (0.6753)
<b>SOCIAL</b>							1	0.350 (<.0001)	0.538 (<.0001)	0.486 (<.0001)
<b>INTER</b>								1	0.612 (<.0001)	0.488 (<.0001)
<b>NETWORK</b>									1	0.809 (<.0001)
<b>SINCERE</b>										1

Source: 3D-SFS; n=150

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